6 Academic and Professional Written Registers

6.1 Introduction

Written texts have always played a central role in academic inquiry. Written texts are more permanent than spoken texts, and easier to distribute to a wide audience. Further, the production circumstances of writing enable the author to revise and edit the text, so that it effectively communicates the intended content. Videos have become increasingly common over the past several years, resulting in relatively permanent records of spoken texts distributed online to a potentially very large audience. However, the original speech event is still produced in real time (unless it is scripted), and it is still comparatively difficult to revise and edit the video recording of a speech event. For those reasons, written texts remain the primary means of communicating new research findings in academia.

But the importance of informational writing extends well beyond academic domains. Many professions rely heavily on written texts to report the results of their work and, often, to obtain new work. Thus, professionals in architecture, business, engineering, science, and medicine all regularly need to produce written texts as part of their day-to-day work responsibilities.

Of course, students are also required to produce written informational texts in almost every course taken during their university education. Surprisingly, though, one of the most common complaints heard from professional employers is that university graduates lack proficiency in writing the documents and reports required in the workplace. Part of the problem is that writing instructors often lack awareness of the register differences associated with texts from different academic disciplines and professions. As a result, first-year writing courses often focus on registers that are not actually prevalent in disciplinary courses or the professional workplace – registers like personal narratives and persuasive essays. And at the same time, writing courses often disregard the informational registers required for professional and academic communication, like lab reports, case studies, research papers, and project proposals.

In Chapter 5, we introduced the idea of variation among sub-registers within the general register of academic writing. In this chapter, we explore register variation in academia and professions in more depth. The differences turn out to be extensive, relating to systematic patterns of variation across academic disciplines, across the range of writing tasks required as part of a university

education, across academic and workplace documents in a single discipline, and even across the different sections of conventionalized academic and professional genres like research articles or memoranda. An understanding of these linguistic patterns of variation is important for educational and career success. While we cannot describe the linguistic characteristics of all academic and professional registers here, we do hope to at least raise awareness, and provide you with the tools that will enable you to explore the register characteristics of written texts in your own chosen profession.

6.2 Disciplinary Registers

In Chapter 5, we presented a few examples of how there are important sub-registers within general written register categories. This kind of variation turns out to be especially important in academic writing. We discussed in Section 5.4.2 some of the ways in which university textbooks differ from academic research articles. However, it further turns out that there are striking situational and linguistic differences among academic sub-registers across academic disciplines.

Universities are organized into general disciplines, characterized by different research priorities and traditions. For example, engineering and natural science are both technical disciplines, applying empirical/quantitative methods in their research. However, science focuses on discovering and explaining how the natural world works, while engineering is generally focused on applying scientific generalizations to solve real-world problems. At the opposite extreme, humanities research is usually qualitative with a focus on offering new interpretations and perspectives on our everyday experiences. Unlike scientists, humanities researchers are not discovering and documenting new natural phenomena and processes. Rather, their work is much more interpretive, attempting to describe and understand common human experiences in new ways. Other disciplines have other distinctive goals and methodologies. For example, social science research is similar to natural science in that it often applies quantitative/empirical methods, but the focus is on describing human behavior rather than the natural universe. And education research can be anecdotal, focused on offering advice concerning best practices for classroom instruction.

In Section 5.3, we described linguistic characteristics of academic prose as a general register, contrasted with news reports and conversation. One of the general linguistic characteristics of university textbooks is a reliance on present-tense verbs, associated with the informational focus of academic prose (see Table 5.2). However, as Figure 6.1 shows, this generalization does not apply equally to university textbooks from all disciplines. At one extreme, past-tense verbs are rare in engineering textbooks (and verbs overall are less common than in the other disciplines). Past-tense verbs are also relatively rare in natural

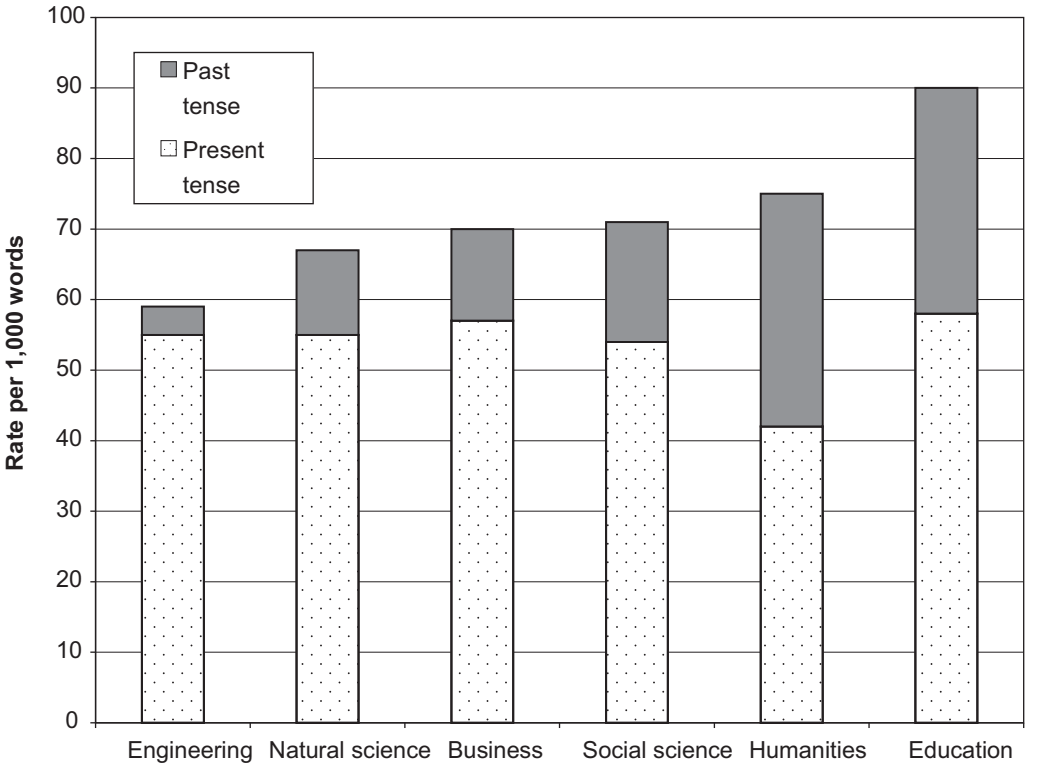

Figure 6.1 *Finite verbs across disciplines of textbooks, broken down by present tense versus past tense*

science and business textbooks. However, the pattern of use is quite different in humanities and education textbooks. Both disciplines use more verbs overall than the other disciplines, and this difference is especially noteworthy in education textbooks. In addition, both disciplines rely on past-tense verbs to a much greater extent than in other disciplines.

These linguistic differences are associated with the differing research goals and methods of the disciplines. For example, the focus of engineering is on documenting quantitative patterns and relationships that exist in nature and describing how they can be applied to solve everyday problems. These are timeless regularities, and thus the prose descriptions rely almost exclusively on present tense and non-finite verb phrases. Consider Text Sample 6.1 from a textbook on vehicle dynamics. The prose consistently relies on present-tense verbs, verb phrases with modal verbs (e.g., *can be, will have*), and non-finite verbs. The copula *be* (including *is* and *are*) is common, used to identify simple relationships among entities. In addition, many of the verb phrases in this text are in the passive voice with no identified agent, including both present tense passives (*has been recognized, are modeled*) and non-finite passives (e.g., *seen, shown*).

Text Sample 6.1 University Textbook: Engineering

[Present-tense verbs are in **bold**; non-finite verbs and modal verbs are in *italics*; passive voice verb phrases are underlined.]

Although many ride problems **are** peculiar to a specific road, or road type, the notion of "average" road properties *can* often *be* helpful in understanding the response of a vehicle to road roughness. The general similarity in the spectral content of the roads *seen* in Figure 5.2 (that elevation amplitude **diminishes** systematically with increasing wavenumber) **has long been recognized** as true of most roads. Consequently, road inputs to a vehicle **are often modeled** with an amplitude that **diminishes** with frequency to the second or fourth power *approximating* the two linear segments of the curve *shown* in the figure. The average properties *shown* in the figure **are derived** from recent studies of a large number of roads. The spectral contents **are** slightly different for bituminous and Portland Cement concrete (PCQ) roads. Other less common road types, such as surface treatment and gravel roads, *will have* slightly differing spectral qualities. The general level of the elevation of the curve *may be raised or lowered* to represent different roughness levels, but the characteristic slopes and inflection points **are** constant. The difference between the bituminous and PCC average curves **is** the relative magnitude of high versus low wavenumber content.

T2K-SWAL Corpus

In contrast, education textbooks employ frequent narratives to illustrate the kinds of problems that teachers have faced and solutions that successful teachers have employed in the past. With a heavy reliance on past-tense verbs and third-person pronouns, these portions of the text are in some ways similar to the fictional narratives described in Chapter 5. However, there is also often a heavy reliance on past-tense passive voice verb phrases when the agent of the action is obvious (usually the teacher or students). For example:

Text Sample 6.2 University Textbook: Elementary Education

[Past-tense verbs in **bold**; passive voice verb phrases are underlined.]

In one high school where I **was working**, one of the most respected English teachers **amazed** her colleagues when during training she **shared** a description of the first three days of the semester in her English class. As soon as the students **entered** the room, they **were given** a form upon which they **were** to put their name, address, and phone number. Any students who **did not have** pencils **were given** them with a private message that this would be the last pencil that they would ever be given and that they would be expected to bring their own pencil and paper in the future. As this task **was nearing** completion, with an overhead projector the teacher **showed** the class a list of basic rules for her class to be copied onto the first page of each student's notebook. While the rules **were being copied**, the teacher **used** the information the students **had just supplied** to fill out her seating chart, grade book, and attendance forms.

After the students **had copied** the rules, the teacher **rearranged** the students' seating in alphabetical order, and the students **were told** that they would be expected to use those same seats in the future. The teacher then **discussed** the rules, one at a time, for the remainder of the period while answering questions and continually stressing her high standards.

T2K-SWAL Corpus

Many textbooks in the humanities also frequently employ past-tense verbs. In the case of history textbooks, past-tense verbs are used to narrate past events. However, references to past historical events are also common in many other sub-disciplines of the humanities, including art, philosophy, and literature. The following excerpt from an Art History textbook illustrates the intertwining of timeless generalizations (present tense) with descriptions of past events that provide a historical context.

Text Sample 6.3 University Textbook: Art History

[Past-tense verbs in **bold**; present-tense verb phrases are underlined.]

Late Baroque and Rococo overlap and interpenetrate in the early decades of the century, although Rococo has distinctive features of its own. The scale and grandeur of Baroque architecture, its spatial dynamism, **persisted** in an age when the grandees of Europe **were emulating** Versailles in palace architecture and when splendid churches **continued** to be built and dedicated by royalty. One of the finest of these, the Superga, near Turin in northwestern Italy, **was built** by FILIPPO JUVARA (1678–1736) for Victor Amadeus II, king of Savoy, to commemorate his victory over the French in 1706. This **was** during the War of the Spanish Succession, when the "Sun King," Louis XIV of France, **suffered** his final eclipse.

Juvara, the royal architect, **began** his career in the lavish Baroque manner of his predecessor at Turin, Guarino Guarini, but study at Rome **turned** him toward the enduring Classical style. Even so, the setting of the Superga, in itself, is entirely Baroque. Placed on a lofty hill some 2,000 feet above the city of Turin, the church and the monastery, of which it is the frontispiece, command a sweeping view of the city and the surrounding countryside.

T2K-SWAL Corpus

The differences in the use of present- versus past-tense verbs across disciplines are not very surprising once we take a minute to think about the differences in communicative purposes. However, you might be more surprised to learn that academic disciplines also differ in the complexity of their prose styles – and even more surprised to learn that humanities texts are in some ways more grammatically complex than science. Thus, Figure 6.2 shows that all three major types of finite dependent clauses are much more common in humanities academic writing than in natural science (with social science being intermediate between the two).

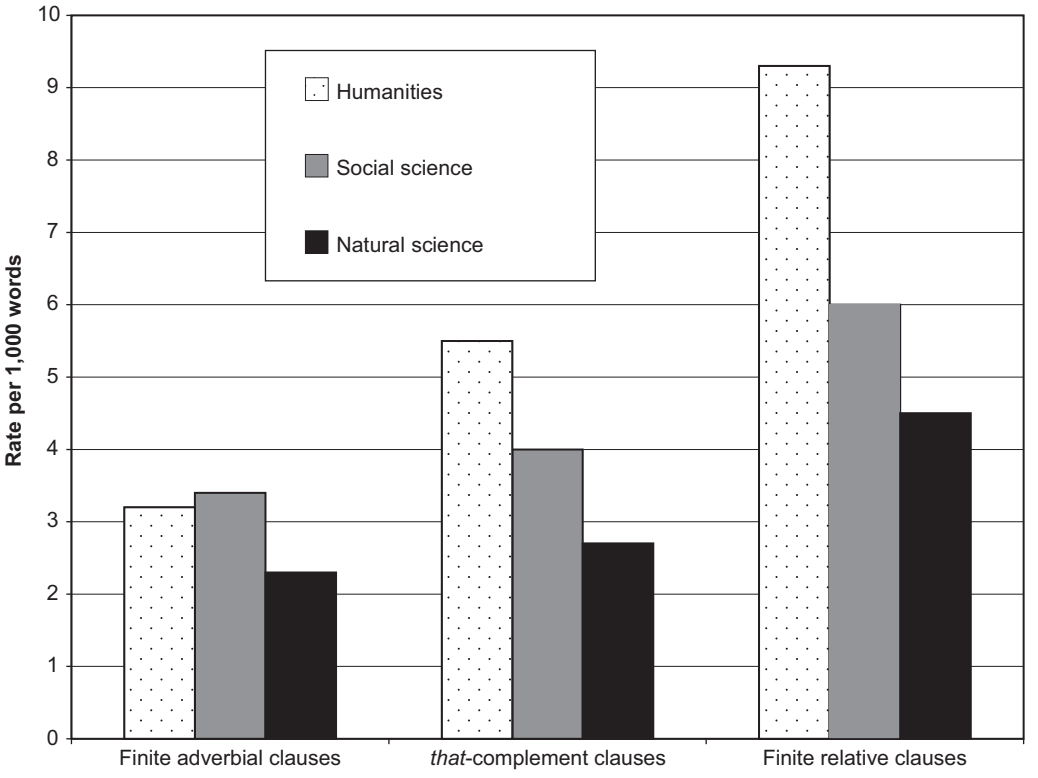

Figure 6.2 *Finite dependent clauses across sub-disciplines of academic writing*

Text Sample 6.4 University Textbook: Art History

[Finite adverbial clauses are in **bold**; finite relative clauses are in *underlined italics*.]

Late Baroque and Rococo overlap and interpenetrate in the early decades of the century, **although Rococo has distinctive features of its own**. The scale and grandeur of Baroque architecture, its spatial dynamism, persisted in an age **when the grandees of Europe were emulating Versailles in palace architecture** and **when splendid churches continued to be built and dedicated by royalty**. [. . .] This was during the War of the Spanish Succession, **when the "Sun King," Louis XIV of France, suffered his final eclipse**.

[. . .] Placed on a lofty hill some 2,000 feet above the city of Turin, the church and the monastery, *of which it is the frontispiece*, command a sweeping view of the city and the surrounding countryside. [. . .]

At the same time, there is a Palladian Classicism in the deep, four-columned portico surmounted by a balustrade, *which continues around the building*, and the relation of the portico to the rotunda-like structure behind it recalls the ancient Pantheon. The severity of the portico and of the colossal orders *that articulate the walls* is offset by the light, fanciful bell towers *that flank the dome*.

T2K-SWAL Corpus

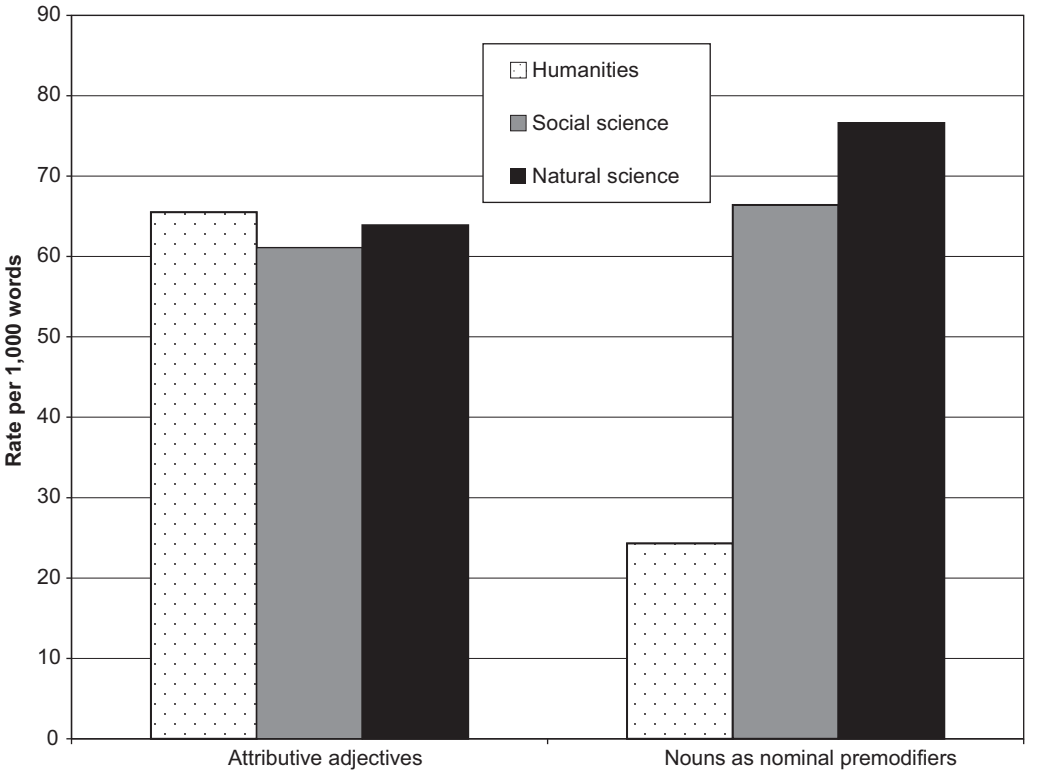

Figure 6.3 *Noun phrase premodifiers across sub-disciplines of academic writing*

Text Sample 6.4, taken from the same university textbook as Sample 6.3, illustrates the dense use of adverbial clauses and relative clauses typical of humanities academic prose.

This surprising difference between the disciplines raises the question of how natural science prose expresses complex informational content. It turns out that science texts tend to package information into phrasal modifiers (without verbs) rather than dependent clauses. So, for example, prepositional phrases as noun modifiers are much more common in science prose than in humanities. Another linguistic feature is even more characteristic of modern science writing: a noun as a premodifier of another noun. As Figure 6.3 shows, premodifying nouns are almost three times more common in science prose than in humanities. In contrast, attributive adjectives are common in both disciplines. Text Samples 6.3 and 6.4 illustrate the dense use of attributive adjectives in humanities prose (e.g., *early decades, distinctive features, spatial dynamism, final eclipse*). But premodifying nouns are rare in humanities writing. In contrast, consider the dense use of both attributive adjectives and premodifying nouns in Text Sample 6.5, from a biology textbook.

Text Sample 6.5 University Textbook: Biology

[Premodifying nouns are in **underlined bold**; attributive adjectives are in *italics*.]

Before attempting to understand descriptions, **comparison** tables, or **identification** keys here or in manuals, or to communicate with others about **tree** identification, one first has to become familiar with the morphology of *vegetative* and *reproductive* parts and *descriptive* terminology for these parts – the *necessary* jargon of dendrology. The *important* terms are explained and illustrated here.

[. . .]

Under **forest** competition, the form is very different: the bole is long, more cylindrical, often clear of branches for one-half or more of its length, and the crown small. *Certain* species, especially those which are extremely tolerant, resist **crown** restriction, but it may be said that most trees develop *typical* shapes only in the open.

[. . .]

The *basic* **growth** form within a species is genetically controlled, but the *ultimate* architecture is also easily modified by habitat (sun, shade, competition), *natural* or *artificial* pruning, or **branch** damage due to lightning, ice, or insects. For a *concise* treatment of *woody* **plant** form and structure, see Spur and Barnes (1980).

T2K-SWAL Corpus

In Chapter 8, we discuss these same disciplinary differences from a historical perspective (see especially Section 8.4). We show there that academic science writing in the eighteenth century was relatively similar to humanities writing: both disciplines used elaborated styles, with long sentences and frequent dependent clauses. Over the past two centuries, humanities writing has changed little. However, science writing has undergone dramatic changes, resulting in the present-day register that employs extensive phrasal modification but relatively few finite dependent clauses. As a result, the study of academic research writing provides an ideal case study illustrating the importance of sub-registers within a general register category.

6.3 Variation among Student Writing Registers within the University

At this point, you might be saying to yourself that you are already personally aware of the wide range of sub-registers found within the general register of university academic writing. Over the course of a university education, or even within a single term, a student might need to write papers belonging to many different registers, including argumentative essays, personal narratives, self-reflection essays, lab reports, case studies, literature reviews, research reports, or research proposals. In fact, you might be saying to yourself that you are more aware of these differences than your writing instructors! That is, first-year writing courses often emphasize argumentative essays, while completely disregarding the other registers that are required for content courses. As a result,

students have little opportunity to learn about the situational and linguistic differences among these other registers before they enroll in the disciplinary courses that require them – and sometimes they end up writing papers for these differing tasks as if they all represented the same register.

Applying the methods for register analysis helps to make the differences among university writing tasks more salient. As in all previous chapters, the first step is to describe the situational differences among sub-registers. With respect to many characters, including participants, interactiveness, and setting, student writing tasks are all pretty much the same. Production circumstances can vary: for example, an informational essay written for an exam will be produced under strict time constraints, while an essay written at home for a writing course can be extensively revised and edited. However, the most important differences among student writing registers relate to communicative purpose. For example, essays present information from a variety of sources, usually with textual evidence. Argumentative essays additionally take a personal stance on an issue, while informational essays (e.g., on an exam) simply explain the information. A research report is also informational, but additionally presents the rationale, methods, and results of a study carried out by the student. A research proposal is similar, except that there is no presentation of results. Lab reports are also similar to research reports, except they focus on a pre-assigned experiment, and thus there is no need to persuade the reader that the study contributes new knowledge to the field.

Such differences in communicative purpose correspond to important linguistic differences. For example, compare the linguistic characteristics of a persuasive/informational essay (Text Sample 6.6) to those of an abstract from a research report (Text Sample 6.7). In both cases, the student tends to write extremely long and convoluted sentences – especially so in the case of the persuasive essay. Beyond that similarity, though, the two student papers are quite different, reflecting a strong awareness of register differences. The persuasive/informational essay employs multiple grammatical devices that directly express the stance of the author, including stance verb + *that*-clause, stance noun + *to*-clause, and an extraposed *to*-clause controlled by a stance adjective (all three examples underlined in the text sample). Adjectives are also common in this text, which often function to express other evaluations (e.g., *central, supposed, pertinent, artificial, vast, relativist, important*). Perfect aspect verb phrases are employed to describe the current state of affairs, while also making the point that the state of affairs has existed for some time (e.g., *have been closely entwined, has ceased*). The copula *BE* is used repeatedly in this sample, simply identifying the existence of certain states or conditions (e.g., *have <u>been</u> closely entwined, has ceased to <u>be</u> a central issue, the issues that <u>were</u> pertinent . . . <u>are</u> still with us*).

In contrast, there are no stance expressions in the research paper abstract (Text Sample 6.7). The verbs are mostly dynamic activity verbs (e.g., *ask, complete, analyze, find, arise*), but the text mostly employs passive-voice past-tense verb phrases (e.g., *were asked, were analyzed, was found*). Passive voice is used because the author is the understood agent of these actions, and past tense is used because the abstract outlines the steps undertaken to conduct the study.

Text Sample 6.6 Persuasive/Informational Student Essay: History

[Structures expressing stance are underlined.]

The luxury debates have been closely entwined with the rise of modernity, and while "luxury" has ceased to be a central issue, in the supposed "post-modern" World, I would argue that the issues that were pertinent to the writers of the eighteenth and late nineteenth century are still with us today; [. . .] It is my intention to examine the implications of the eighteenth and late nineteenth century luxury debates by employing these categories as a means of injecting a bit of order (albeit artificial) into the vast amount of literature written on this subject.

Despite the tendencies of our relativist age to avoid crouching [sic] the debate in the language of morality, it is important to note that morality remains very much an integral part of the luxury debates, despite the shift from the vice dichotomy to one of dependence/freedom.

BAWE Corpus[1]

Text Sample 6.7 Abstract from a Student Research Report: Psychology

Participants were asked to complete a questionnaire on three self-conscious emotions: embarrassment, shame and guilt. The results were analyzed to find what the main characteristics of the situations each arises in and if they can be distinguished from each other. It was found that, although there was clear distinction between the three, there were also overlaps that may indicate poor definitions of the three or that they lie on a scale, all being widely spaced variations of the same emotion.

BAWE Corpus

Text Samples 6.6 and 6.7 illustrate some ways in which students begin to develop awareness of the communicative differences among university registers and employ the appropriate linguistic features associated with those differing purposes. It would be easy to illustrate additional linguistic differences among the sub-registers of student writing through consideration of other texts, and you will find a number of studies of student writing in the appendix. More importantly, even from the short examples in this section, you should see how employing the methods of register analysis can raise your awareness and facilitate the development of your own advanced writing skills for different disciplines and student registers.

6.4 Even More Specific Sub-Registers: Variation across the Sections of Academic Research Articles

So far we have covered distinct sub-registers within the general register of academic prose. However, it turns out that these sub-registers can have even more specialized registers within them.

One group of specific sub-registers that has been described in previous research is the sections of scientific research articles: Introduction, Methods, Results, and Discussion. These sections have become an entrenched convention in traditional scientific disciplines. Each section has a different communicative purpose:

Introduction:	describes the current state of knowledge and the additional information this study will add
Methods:	reports the data, techniques, and procedures used in the study
Results:	reports the findings of the analysis
Discussion:	interprets the results and argues what their significance is, referring back to what was previously known about this area of research

Each of the four sections contributes to an article's overall purpose of contributing new information to the field and convincing readers that this new information is significant and trustworthy. But since each section has a different specific purpose, each section also has its own characteristic linguistic features.

For example, consider the distribution of verb tense in introduction and methods sections. Text Sample 5.5 (in Chapter 5) came from the introduction section of a research article about the breeding of snowy plovers. If you look back, you will see that this text passage is written exclusively in the present tense – *Breeding site tenacity **is** widely believed*; *Potential advantages **include***, etc. Present tense fits the function of telling the current state of knowledge.

The linguistic characteristics of that introduction section can be contrasted with the methods section from the same article:

Text Sample 6.8 Academic Prose: Research Article about Breeding of Birds, Methods Section

[Past tense verbs in ***bold italics***.]

Materials and methods

We uniquely ***color-banded*** adult and fledgling snowy plovers, and closely ***monitored*** their presence, nests and broods at the Monterey Bay focal study area from 1984 to 1989 and at the Point Reyes focal study area from 1986 to 1989. To qualify as a breeder in either focal area, plovers ***had to be found*** with a clutch of eggs or a brood during the study period. We also ***included*** in this study observations of qualifying breeders occurring prior to these periods or extending into 1990. Before 1984, some areas . . . ***were checked*** only infrequently. At Salmon Creek, plovers ***were regularly monitored*** only in 1989 and 1990. At both focal study areas, field methods ***were similar*** to those of Warriner et al. (1986) . . .

L. Stenzel, Jane Warriner, John Warriner, K. Wilson, F. Bidstrup, and G. Page, Long-distance breeding dispersal of snowy plovers in western North America, *Journal of Animal Ecology* 63, 1994, pp. 887–902

In contrast to the introduction section, the methods section narrates specific past events, and so all verbs are in the past tense. Corpus research studies have

shown that the difference in verb tense illustrated here is typical of introduction and methods sections generally: the introduction describes what is currently known about a topic (and thus has frequent present-tense verbs), while the methods section describes what was done to conduct a particular study (with frequent past-tense verbs). Although this correspondence between form and function may seem obvious to you here, many students learning to write research articles have difficulty recognizing and using these register features appropriately.

The distribution of passive voice verbs provides a second example of the linguistic differences across subsections of articles. In general, passives are much more frequent in methods sections than in the other sections. As Sample 6.8 illustrates, the focus in the methods section is on the research procedures, not the actors who carried out those procedures. That is, it makes no difference if it was an individual or the entire research group who performed an action. The important point is to understand how the experiment was conducted. As a result, passive voice is common in the methods section.

Most people are surprised to learn that passive voice is also much more common in discussion sections than in introduction or results sections. Discussion sections make statements that summarize the evidence in the study and argue for its scientific significance. These summaries are often written in passive voice, for example:

> The tendency for sex ratios of adults to be skewed towards females, therefore, ***can be attributed to*** differential survival. [from a research article about differential survival in male and female wild horses]
>
> Competition for space between these two study insects ***was*** readily ***documented*** for two reasons ... [from a research article about competition between two insects]

As noted in Section 5.3.2 for academic prose generally, the use of passive voice here allows an abstract concept (in this case, the findings of the studies) to be the topic of the discourse.

Many linguistic features beyond verbs also vary across the different sections of research articles. But even by considering just tense and voice, it is clear that registers can be identified at high levels of specificity – in this case, the specific sections within the more general register of research articles within the still more general register of academic prose.

6.5 Professional Written Registers in Academia and the Workplace

So far in this chapter we have covered linguistic differences within academic prose that correspond to differences in disciplines and communicative purposes. We noted in the chapter introduction (Section 6.1) that writing is important for many professions – and it is also important to

remember that academia is only one context for professions. Research articles, textbooks, and class papers might be a major concern for university faculty and students, but many more professionals write and read within other, non-academic contexts.

Even a quick skim through the appendix and references of this book will convince you that register and genre studies are often conducted with texts typically used in academic contexts, especially research articles but also textbooks, grant proposals, conference abstracts, etc. Even when a study focuses on professions that are well known outside of academia, the texts analyzed for the study are often taken from an academic context. For example, in studying dentistry, Basturkmen (2012) studies the discussion sections of academic research articles. In investigating business, Nathan (2013) examines case reports in business schools. In a study of law, Tessuto (2015) analyzes empirical law research articles. Such studies reveal useful information about academic writing in different fields, and their findings can have important applications for helping students succeed. But we need to be careful not to generalize from academic contexts to all professional texts in a discipline. That is, to fully understand a discipline and help prepare students to write in professions after they graduate, we need register descriptions of non-academic professional texts.

In this section, therefore, we turn to an investigation of academic versus industry texts within one discipline: civil engineering. We compare journal research articles to reports written by consulting engineers in industry.

Neither of the writers of this book is a civil engineer. Furthermore, we are most familiar with academia, not industry contexts. In a situation like this, it is especially important to have expert informants for a register study. The analyses discussed below were part of a project that included interviews with over twenty civil engineers in industry, fifty students, and fifteen faculty members. The interviews asked some general questions – for instance, about the types of texts participants used, their writing practices, and writing features they thought were important. Beyond that, an essential addition was a discourse-based component, where the participants answered questions about particular linguistic choices in text samples and discussed how the impact changed when the samples were rewritten with alternative features, such as changing active voice to passive voice or changing the verb tense. This kind of discourse-based interviewing can be especially helpful when informants do not have much conscious knowledge of their language choices or much meta-language to talk about language. This was often the case with the engineers, who usually knew little grammar terminology and often gave vague answers to general questions, but who could give specific, concrete explanations about the functions and impacts of alternative versions of a text. Discourse-based interviews can be useful both early in the register analysis process, for identifying features likely to be important in a field, and in later stages, for interpreting findings. (Further interview details are available in Conrad, 2017, 2018.)

6.5.1 Writing in Civil Engineering

The field of civil engineering concerns the design, construction, and maintenance of infrastructure such as transportation systems, buildings, bridges, drinking water systems, sewer systems, tunnels, and dams. To many people's surprise – because engineering tends to be associated with math and science skills – the civil engineering workplace requires a great deal of writing. All stages of a project require written documents, from early scoping notes, feasibility studies, and proposals, to technical memoranda, permit applications, preliminary reports, final design reports, and construction specifications.

Register and genre analyses stand to make an important contribution within civil engineering education because writing instruction is a particular challenge for the field. Students are often assigned writing tasks that mimic workplace writing, but employers and alumni consistently identify writing development as a weakness of programs. Even decades ago, a civil engineering faculty member explained, "We are never advised to require more calculus or give students more details about, say, riveted joints. Employers always ask for improved writing skills" (Berthouex, 1996: 107). Nonetheless, most programs still struggle with how to improve students' preparation for writing in the workplace. One reason is because little is known about the writing of practicing civil engineers. Previous research is often generalized to all engineering disciplines, even when civil engineers were not included (e.g., Sales, 2006). Well-known studies in industry have tended to be case studies (Winsor, 2003) or decontextualized surveys of writing preferences (Couture, 1992), without systematic text analysis. Furthermore, faculty are most familiar with academic writing, and students rarely see workplace documents as they go through school. In a situation like this, register and genre analyses can provide essential information to improve our understanding of registers, which can then be applied in helping students in courses and novices in the workplace.

6.5.2 Journal Articles and Reports in Civil Engineering

For this case study, we compared fifty journal articles and fifty industry reports in civil engineering, collected from a variety of publishers and firms, and covering the four major specializations of transportation, geotechnical, structural, and water resources engineering. The two types of texts share many situational characteristics. Most notably, they are both highly planned and edited written texts that have undergone review by others. They are both informational in purpose, and both expect audiences to have a high level of shared background knowledge. But the two registers also have distinct differences, especially in their more specific characteristics of audience and communicative purpose. Journal articles are written to be published in a journal for a non-specific audience, to add new information to the field about certain concepts, procedures, design parameters, or materials. A typical title is "Behavior of hollow tubular-flange girder systems for curved bridges" (Dong and Sause, 2010), reflecting the generalizable nature of the research. Workplace reports, on the other hand, are about particular projects. They are not meant to contribute to

general knowledge in the field; rather, they address a specific problem in a specific location for a specific client. In their interviews, the workplace engineers were quick to point out that there were other potential audiences they kept in mind, such as regulators or a judge and jury, but the client was their immediate reader. The specificity of reports is obvious from their titles, for example, "24th Street (Paine Avenue) Bridge No. 05R09 – Type, Size, and Location Report."

To start our linguistic comparison of academic and professional engineering registers, we consider three features that we have previously discussed because they are common in informational writing – nouns, attributive adjectives, and prepositions. You might remember from Chapter 5 that these features are often used in informationally dense, highly specific noun phrases in academic prose and news reports. Section 6.2 explained that condensed noun phrases, especially with nouns premodifying other nouns, are even more common in the sciences than humanities. Given the shared content field, informational purpose, and extensive editing, you might expect that the two civil engineering registers will be similar in their use of these features.

In fact, the use of these features is somewhat similar, but there are some intriguing differences (Figure 6.4). Both civil engineering registers have a very high frequency of nouns, higher than general academic prose. But the reports are even more extreme in their noun frequency than the journal articles, and they

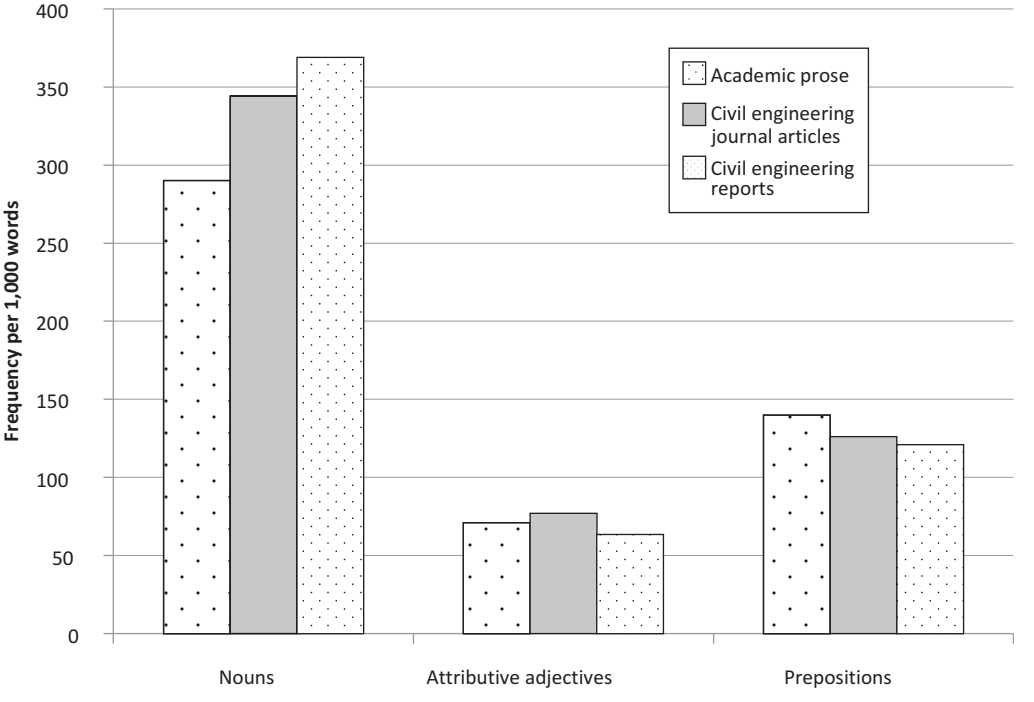

Figure 6.4 *Nouns, attributive adjectives, and prepositions in the civil engineering registers and academic prose*

have slightly fewer attributive adjectives and prepositions than the articles. Not surprisingly, the journal articles, a type of academic prose, are closer to general academic prose than the reports are.

As in other highly edited, informational registers, the nouns, attributive adjectives, and prepositions in the civil engineering registers build highly specific noun phrases. In many passages, these three features build the majority of the text, as in these examples (Text Samples 6.9 and 6.10) that both describe analytical approaches:

Text Sample 6.9 Civil Engineering Journal Article

[Nouns, attributive adjectives, and prepositions used in noun phrases are in **bold**.]

Damage to pier foundations due to **seismic activities**, **tidal wave actions** and **environmental corrosions**, can severely undermine the **functionality of** the **superstructure**. [. . .] There are several **experimental approaches** to determine the **frequency response function of** a **system**. [. . .] Using **SLV**, the **measurements** can be either **FRF data at single frequency** or **operating deflection shapes at individual frequencies**. Since **SED** is a **function of curvature**, its **sensitivity** improves with **increased spatial data densities**.

S. Chen, D. Boyajian, & H. Inyang, SLSE damage detection technique for foundation strengthening using plates. *Geotechnical and Geological Engineering*, 29(3), 2011, pp. 237–248.

Text Sample 6.10 Civil Engineering Report

[Nouns, attributive adjectives, and prepositions used in noun phrases are in **bold**.]

As a **standard practice for traffic impact analysis**, **roadway segment Average Daily Traffic (ADT) volumes** have been used in addition to **peak hour intersection volumes** as a **secondary performance measure** and **indicator of LOS** and **operating conditions**. The **Wilson County General Plan Circulation Element** adopts **volume thresholds** published in the 2009 **Florida Quality/Level of Service Handbook**. The **handbook** provides **guidance for LOS D volumes on various types of roadway facilities**.

Private collection

In both registers, some nouns modify other nouns simply because of structures and terms in this field (e.g., *pier foundations, frequency response function, roadway facilities*). But these passages also illustrate typical differences in noun-phrase structure that correspond to the specific differences in the registers' situations of use. Compared to the report, the journal article contains more general noun phrases, constructed with prepositional phrases and attributive adjectives – e.g., *damage to pier foundations, functionality of the superstructure, experimental approaches, function of curvature*. Other articles used attributive adjectives and prepositional phrases as they described the

significance of experiments and results (e.g., *fundamental experimental study, complex physical mechanisms, a large set of experimental data, the consistency of the test conditions*). This is consistent with the more conceptual nature of academic research.

The reports, on the other hand, are concerned with the particular approach for the particular project. More of the noun phrases are named phenomena; for example, Text Sample 6.10 refers to *roadway segment Average Daily Traffic (ADT) volumes* and *peak hour intersection volumes*. It also names specific regulations and handbooks (*Florida Quality/Level of Service Handbook, Wilson County General Plan Circulation Element*). Throughout the reports, the naming of specific projects, documents, regulations, and variables accounted for the extreme frequency of nouns, with many of the names composed of four or more nouns, for example:

> capital planning level report
> State Bridge Delivery Program
> soil surface acceleration coefficient
> vehicle turning movement counts
> Lincoln County Congestion Management Program
> Federal Rail Administration's Highway-Rail Grade Crossing Accident/Incident Report

You might wonder if these differences in the structure of noun phrases are even important. After all, compared to a very different register such as conversation, the civil engineering registers would seem very similar to each other. But, in the interviews, many comments by the workplace engineers highlighted the important role played by these dense noun combinations. They noted the importance of naming documents, regulations, and analyses to record sources of evidence, to demonstrate that they had followed standards of practice and met regulations, and to record the parameters for the project. When presented with text alternatives that used more pronouns or general descriptions (e.g., *counts of vehicles turning* instead of *vehicle turning movement counts*, or *the program for replacing bridges* instead of *State Bridge Delivery Program*), they emphasized that those alternatives introduced too much potential ambiguity. Many who supervised junior engineers also said that providing enough specific, thorough documentation was a common challenge for novices in the workplace.

The workplace engineers also put a premium on conciseness. They emphasized that clients needed to be able to read (or skim) a document quickly. Since their readers usually shared background knowledge, a name like the *State Bridge Delivery Program* was a short, fast referent for readers. The value put on conciseness was further reflected in the use of adverbial clauses and relative clauses in the reports compared with the journal articles. Section 6.2 explained that, in academic texts, the longer forms of elaboration with clauses are more typical of the humanities, whereas phrasal modifiers are more typical of the sciences. As you can see from the first feature in Figure 6.5, for civil engineering, adverbial and relative clauses are more common in journal articles than reports. The pattern is illustrated in Text Samples 6.11 and 6.12.

Text Sample 6.11 Civil Engineering Report

[Adverbial clause is underlined.]

We drilled six (6) exploratory borings on the dam between October 27 and November 1, 2017. The borings were designated BH-1A and BH-6A to distinguish them from the bridge borings. [. . .] Upon completion of drilling, the soil cuttings were collected in 55-gallon drums and disposed of off-site. BH-1, BH-2, and BH-3A were backfilled with bentonite-cement grout in accordance with OWRD and USACE guidelines. The grout was tremied from the bottom of the boring to within 3 feet of the ground surface.

Private collection

Text Sample 6.12 Civil Engineering Journal Article

[Adverbial and relative clauses clauses are underlined.]

Although ostensibly clear-water conditions (V_{up} / ($V_{updcrit}$ d 0.75) prevailed upstream of the model bridge, small-scale bed forms or ripples developed near the flume inlet where the surface bed material changed from gravel to medium sand. In order to minimize the extraneous effects of these ripples on the approach flow, a run would be terminated when the ripples arrived within 0.5 m of the model bridge. The time available before this would occur depended sensitively on V_{up}, which limited severely the range of V_{up} and/or T.

Private collection

Both text samples describe methods of data collection. Both use an adverbial clause of purpose to tell why a particular action was undertaken (*to distinguish*; *in order to minimize*), but beyond that they are very different in syntax and function. The report tells what was done, using sentences that contain one finite clause. It doesn't explain procedures so much as state them, referring to established guidelines. In contrast, the journal article explains the methods in sentences with multiple finite clauses that express concession (*although*), describe characteristics of places and times (*where the surface bed material changed*; *when the ripples arrived*), and tell effects (*which limited*). There are no established guidelines referred to. When they were shown clausally complex writing like this, workplace engineers identified it as too difficult for clients to read quickly. Easy reading meant clients would be happier (important for attracting more work in the future) and also more likely to understand the intended information. One interviewee noted explicitly that "simple sentences are less likely to be ambiguous or misinterpreted." This is especially important because the content of the report is typically meant to be used immediately by the clients. Faculty, on the other hand, never brought up a specific concern about ease of reading. They wanted their ideas to be understood, but they never expressed concern for readers, again reflecting the less immediate audience and more general purpose of journal articles.

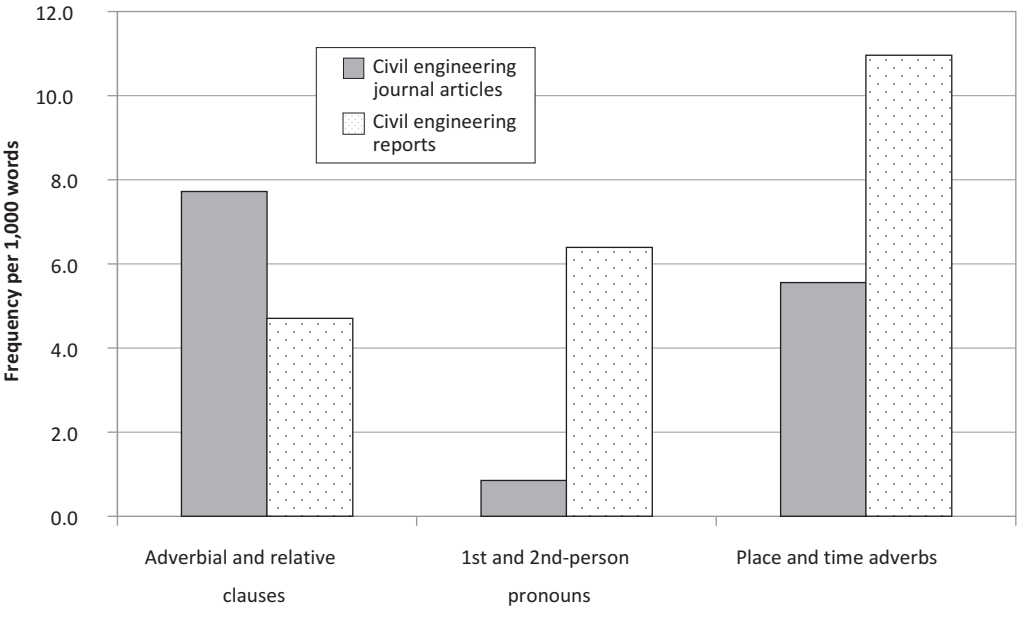

Figure 6.5 *Pronouns, adverbs, subordinators, and relative pronouns in the civil engineering registers*

Figure 6.5 presents two other types of features that illustrate how linguistic variation corresponds to the differences in industry and academic contexts. First- and second-person pronouns, and place and time adverbs, are more common in the reports than in the journal articles.

Reflecting the specific audience–writer relationship, report writers occasionally referred to themselves or their clients directly, most commonly when offering further assistance but also for other circumstances:

> If **you** have any questions regarding this report, please contact **us**.
> **We** understand that **you** have come to a tentative agreement with the owner of the adjacent property to the south

More commonly, the reports use first-person pronouns for explicit statements about actions and judgments, for example:

> **We calculated** the static axial capacity for HP310x79 (A-36 steel) sections
> **We observed** no indications of landslide activity in the vicinity.
> **We expect** remedial grading will be relatively shallow
> **We anticipate** that up to a 1-inch grind will be required
> In late June 2007, **we received** topographic information from [company name]
> **We recommend** the SBR be designed as follows.

The sentences with first-person pronouns are often surrounded by sentences with agentless passives, but the workplace informants noted the importance of occasionally explicitly establishing who was responsible for what. Being explicit

was a way to reduce unintentional liability that could result from too many agentless passives that never distinguished responsibility. The workplace engineers also emphasized that they were hired to make professional judgments, and many of the first person + verb combinations expressed those judgments (*we expect, anticipate, recommend*). Journal articles, on the other hand, have almost no mention of agents. As described for Biology research articles in Section 6.4, it should make no difference for the research who performed an action. One faculty member, who instructs students to avoid first-person pronouns in their writing, commented that first-person pronouns "just don't sound academic." The analysis of journal articles bears this out. Unfortunately, students often generalize this to "first-person pronouns just don't sound like civil engineering" – a damaging misconception for writing in the workplace.

The frequencies of place and time adverbs reflect the focus on specific projects in reports versus the more general concepts in journal articles. Physical characteristics (locations, directions of roads or streams, etc.) can have important consequences for the practitioners' work and are often described in reports with place adverbs:

> Paine Avenue runs **east** to **west** and slopes **downhill**
> The potentially active Fulton fault is located approximately 4 miles **southwest**

The time adverbs typically cover both historical information for structures and description of specific construction plans:

> The original bridge was constructed in 1954 and **subsequently** widened in 1975.
> The new superstructure, which can be constructed in the previously mentioned adjacent ODOT maintenance yard, will **then** be transported into place using the Mammoet or similar heavy lift and transport system. The approach roadway will **then** be completed, including end panels and approach guard rails, and the bridge will **then** be opened to traffic.

Since journal articles rarely concern a specific structure or specific construction, they have less need for such adverbs.

Numerous other characteristics could be added to this comparison of academic and industry registers, but even these short comparisons show that linguistic variation corresponds to the difference in context. When they are compared to a very different register, such as conversation, the differences might look minor. But within the discipline, the differences are important. Many conditions of workplace practice – including the specificity of projects, concern for client ease of reading, desire to reduce unintentional liability, need for documentation, and inclusion of recommendations for construction procedures – have an impact on the linguistic choices in texts. Since most writing instruction concerns academic texts, it is no surprise that alumni and employers alike are dissatisfied with graduates' writing preparation.

6.6 A Genre Perspective on Professional and Student Writing

In addition to a register perspective, a genre perspective can provide useful information about professional texts and students' attempts to learn them. In our consideration of genres so far in this book, we have not exemplified one of the most popular approaches: analyzing the conventional sequence of "rhetorical moves." In this section, we use this type of genre analysis to continue our investigation of civil engineering texts.

A "rhetorical move" is a chunk of discourse that has a unified micro-purpose. Analogous to the moves in chess, these rhetorical moves (the micro-purposes) build on each other to fulfill the overall purpose of the genre. Swales (1981, 1990) initiated work with this approach with an analysis of introduction sections of research articles in the sciences. He found three major rhetorical moves (and the "steps" within them that are used to accomplish the move):

Move 1 Establish a territory (by claiming centrality of the issue, making topic generalizations, and reviewing previous research);
Move 2 Establish a niche (by giving counter claims, or indicating a gap, or raising questions, or explaining how the study continues a tradition);
Move 3 Occupy the niche (by outlining the purpose of the study, and [optionally] announcing the research findings and indicating the structure of the article).

These moves build together to the overall purpose of research article introductions, which Swales described as creating a space for the new research study. Swales thus named this the Create a Research Space (CARS) model. This perspective of rhetorical moves can reveal a well-defined genre, with a typical structure for the texts, even though (as in research article introductions) there are no genre markers (defined in Chapter 3). Several studies in the appendix describe analyses from this genre perspective, and you will examine one of the moves of the CARS model in more detail in the activities at the end of this chapter.

To illustrate this genre perspective here, we consider another professional civil engineering genre and students' attempts to achieve it. We use one genre within one branch of civil engineering: technical memoranda ("tech memos") in geotechnical engineering. Practicing geotechnical engineers identified this as a very common type of document in the workplace, usually used to communicate analysis and recommendations for relatively uncomplicated projects, such as mitigating the effects of a small landslide or designing a common type of foundation. Students in a geotechnical engineering course during the final year of their Bachelor's degrees were given an assignment that closely mimicked the workplace task: to fulfill a client's request to analyze soil and make recommendations for a foundation on a specific site. The students were given an invented client and told to write their analysis and recommendations in a technical memorandum to this client. The similarity of the practitioner and student tasks thus make a solid basis for comparing professionals' and students' genre knowledge.

The case study used twenty-five practitioner memos from three engineering firms and ten student memos from two years of the course. The twenty-five practitioner memos were chosen to maximize potential variation due to specific sites, clients, and authors. The number of student memos was limited by the number of students who consented to their use.

When a genre has never been analyzed before, this type of analysis requires a bottom-up approach identifying functional chunks in texts. That is, you must read texts and identify for yourself what lines of text contribute to a unified micro-purpose. Headings may provide information about the writer's intended purpose, but headings can be highly variable or even inaccurate, so they cannot replace reading to determine functional chunks. After analyzing several texts, you can then see the extent to which the texts have the same chunks in the same order.

The case study of geotechnical tech memos was part of a larger study (Conrad, 2017) in which two readers coded the practitioner memos. When we were unsure of the meaning of passages, we checked with engineers. We then developed a descriptive model based on the moves and sequencing that the majority of the texts followed. Checking our model against the experiences of practicing geotechnical engineers was also important, and they found it consistent with their experiences.

Over 75 percent of the practitioner memos had the same rhetorical moves in the same order. This consistency was remarkable given that the memos varied in length from less than one page to eight pages, and had diverse section headings. The moves are identified and exemplified in Text Sample 6.13, which covers analysis and repairs for a landslide that damaged a road.

Move 1 re-establishes the contact with the client, identifying that this work has been done under contract (in this case stated as "at your request"). The sample includes specific steps that are common in Move 1, including statements about previous documents related to the project and about the content of this memo. These steps add up to stating that the memo is delivering what was asked for. Move 2 provides the context of the project. The memo in Text Sample 6.13 describes general information about what was already known about the problem site; for projects that are embedded in larger projects, more details about the overall project is typically included (who owns the project, what the goals are, etc.).

Moves 3–6 reflect the typical sequence of the engineering process by (3) recounting the methods and procedures for gathering and analyzing data, (4) describing the data and analytical results, (5) describing the engineering analysis or evaluation, and (6) stating recommendations based on the analysis or evaluation. In this sample, Move 5 includes both evaluation (judgments based on the engineers' observations and previous experience) and an engineering calculation (the friction angle, Φ). Move 7, boilerplate from the firm's professional liability insurance carrier, states limitations on the firm's responsibility and conditions that need to be met for changes. Finally, Move 8 closes the memo; although offering to answer questions was a typical strategy to fulfill this function, the engineers described this as a formulaic closing because the client knew to call about any questions anyway.

Text Sample 6.13 Professional Geotechnical Tech Memo: Rhetorical Moves

Move 1: Re-establish contact and contract with the client

At your request, we have completed a field investigation, slope stability analysis and geotechnical design for the Sunrise Court landslide. On April 16, 2015, we transmitted the results of the subsurface investigation and the findings of the preliminary analysis. In that memorandum we discussed alternatives for repair of the landslide including construction of a rock-filled buttress, shear piles, drainage improvements, lightweight fill and removal and replacement of the slide mass. Based on conversations with the County, replacement of the slide mass is presented in this memorandum as the preferred landslide repair option.

This memorandum presents the results of the field exploration and recommendations for preliminary design of the landslide repairs. [. . .]

Move 2: Provide context of project

Background. On February 10, 2015, we visited the site of a recent landslide near the end of Sunrise Court in Roosevelt County, Washington. A 3-foot high headscarp ran down the center of the road with landslide cracks and pavement damage extending onto a private driveway. Most of the movement reportedly occurred when a water line broke on the uphill side of the road. Some additional movement appears to have continued after the water line was repaired. The site is in an area where clayey soils and slope stability issues are relatively common. A local resident reported some cracking and slide damage in the same area after the 1996 flooding. [. . .]

Move 3: Recount methods/procedures for data collection and analysis (Additional function: to document that standards of practice were followed)

Field Exploration. On March 22, 2015, we drilled one geotechnical boring and installed a piezometer to investigate the subsurface conditions within the landslide. The boring was drilled near the edge of the embankment within the slide area and extended to a depth of 35 feet. A 1-inch diameter standpipe piezometer was installed in the boring to monitor the ground water elevation. The piezometer pipe extends below the suspected slide surface so that additional movement could be detected by the deflection of the pipe.

The boring was sampled at 2.5-foot intervals to 18 feet, then at 5-foot intervals. [. . .] The locations of the explorations are shown on Figure 2 and the results of the exploration are summarized on the attached boring and test pit logs. [. . .]

Move 4: Describe data and results of investigation

Subsurface Conditions. The boring encountered fill consisting of soft clayey silt to a depth of 10 feet. Between 10 and 12 feet, the exploration encountered wood, clayey silt and cobble that we have interpreted to be the natural ground surface. From 12 to 15 feet, the boring encountered medium stiff to stiff, medium plasticity clayey silt. [. . .]

Test pits excavated near the toe of the proposed excavation encountered 2 to 4 feet of fill and topsoil over soft to medium stiff clay. BH-1, near the southwest corner, encountered weathered siltstone/claystone at 6½ feet. [. . .]

Move 5: Describe engineering analysis and/or evaluation

Slope Stability Analysis. Based on the material encountered in the subsurface investigation and the width of the headscarp graben (15 feet), we estimate that the slide is likely between 12 and 15 feet deep at the boring. Based on the cross-section and surface observations, we believe the landslide most likely toes out in the grove of cedar trees, below the road embankment. [. . .]

We back-calculated a friction angle of $\Phi=16^{\circ}$ for the slide surface. From our experience, based on the materials encountered, this is within the range of expected values. [. . .]

Move 6: State recommendations

Recommendations for Excavation and Repair of the Landslide. Excavation and replacement of the landslide mass and failed embankment appears to be the most practical and least-cost option. The proposed repair consists of the following:

1. Construct a 6-inch drain line from Sunset Drive to the excavation area.
2. Excavate the slide mass with temporary slopes of 1(H):1(V) along the general boundaries and grades shown in Figure 2 and Figure 3.
3. Extend the drain line 20 feet into the base of the excavation with a 6-inch diameter perforated pipe to collect and drain water from the base of the embankment.
4. Fill the bottom 3 feet of the excavation with clean quarry spalls to provide drainage and a firm foundation for the embankment construction.
5. Construct the embankment using Washington DOT standard 2–03.3(14) and compact the embankment using 2–03.3(14)C, method B.

[. . .]

Move 7: State limits of liability (often boilerplate from liability insurance carrier)

VARIATION OF SUBSURFACE CONDITIONS, USE OF THIS REPORT AND WARRANTY. The analysis, conclusions, and recommendations contained herein are based on the assumption that the soil and surface profiles encountered during the reconnaissance are representative of the overall site conditions. The above recommendations assume that we will have the opportunity to review final drawings and be present during construction to confirm the location of the erosion surface. No changes in the enclosed recommendations should be made without our approval. We will assume no responsibility or liability for any engineering judgment, inspection, or testing performed by others. [. . .]

Move 8: Close memorandum

We trust this information meets your present needs. Please call if you have any questions.

Private collection

The moves in the genre analysis of the geotechnical tech memos correspond to a variety of situational characteristics that were discussed for practitioner work in the last section from the perspective of register. For example, the direct relationship of the consulting engineer and client is reflected in moves 1 and 8, which remind the client of the ongoing, contracted work and provide a polite

closing – both of which are very different from the opening and closing of journal articles, which have no direct writer–reader relationship. The specificity of workplace projects is apparent in moves 2 and 6, which provide particular background and detailed recommendations for design or construction, including standards to meet (e.g., in Text Sample 6.13, *Washington DOT standard 2–03.3 (14)*). The concern for legal liability is apparent in Move 7. In sum, rhetorical moves and situational characteristics are clearly associated, just as linguistic features and situational characteristics are.

The numbers of the moves reflect their linear sequencing in the majority of the tech memos (Figure 6.6). The only recurring variant was for projects with multiple parts that required iteration of methods, data, analysis, and recommendations (type 2 in Figure 6.6).

In interviews, practitioners described this sequence of moves as "logical," saying it reflected the process (they had to understand the context before gathering data, they had to gather data before they analyzed the data, etc.). They were not surprised that sequencing was similar across firms because the tech memos were fulfilling the same purpose in the same field. The predictability made it more efficient to write these memos. They used old memos as templates for new memos, and many said that in their first jobs, they learned the pattern from examples they were given by a supervisor. Equally important in their eyes, the predictability made it easy for clients to find the information they needed.

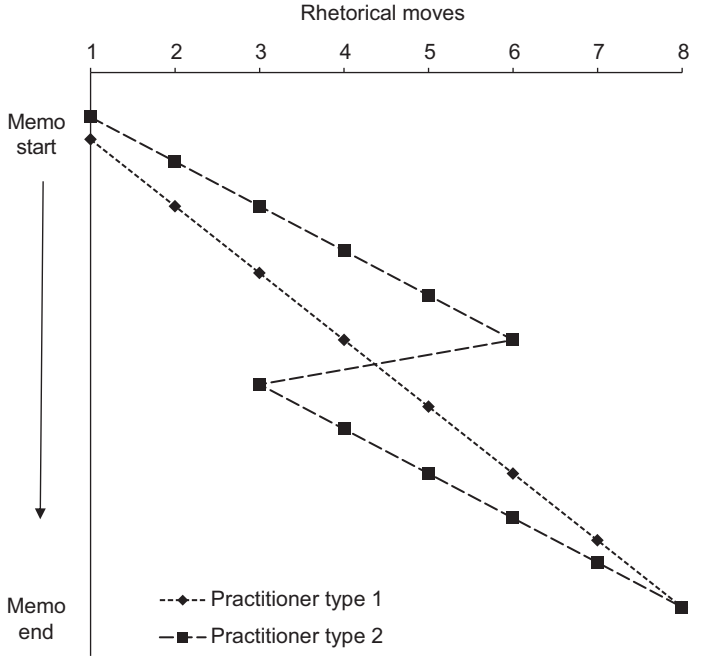

Figure 6.6 *Sequence of rhetorical moves in practitioner technical memoranda*

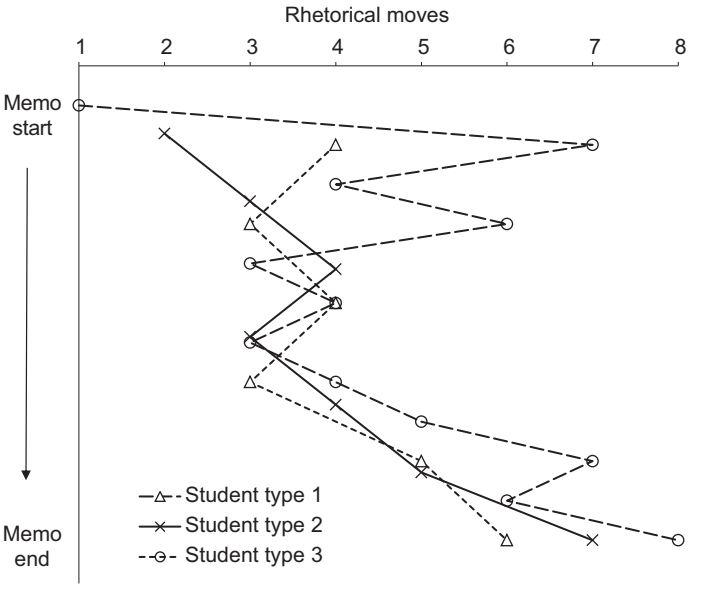

Figure 6.7 *Sequencing of rhetorical moves in student technical memoranda*

The student tech memos attempted the same rhetorical moves, but no single memo had all the moves in the same order as the practitioner memos. Instead, there was great variation in which moves were included and in their sequencing. Three major types were identifiable (Figure 6.7). All types reiterated moves, sometimes adding more information and sometimes simply repeating what was already stated. Type 1 memos confined themselves to the engineering process part of the memo – methods, data, analysis, and recommendations. They read like answers to a homework problem, with little context and no recognition of a client. Type 2 memos included a context section, but they tended to skip explicit recommendation moves, and – like Type 1 – had no opening or closing that addressed a client. Type 3 papers covered more of the rhetorical moves and addressed the client, but they also tended to have the least linear sequencing. In all three types, some sentences were so ambiguous it was difficult to determine their intended function. Furthermore, if we had judged the effectiveness of moves rather than just the attempt, results would have been even worse.

The results make obvious that these students did not have the genre knowledge necessarily to complete the assignment effectively. Asked about this assignment in interviews, a few students said they thought they knew how to write a tech memo from previous laboratory assignments, but those were not written for specific contexts or specific clients. Other students said

they checked the Internet to find something called a tech memo, asked friends what they were writing, or just tried something and then looked to see what grade they got. Most had never seen a tech memo to a client. Many thought their lack of knowledge of this sort of document contributed to disjoined organization. One student summed up the problem, "When you don't know what to do, you just throw up on the paper."

Even this small case study illustrates the useful role a genre perspective can play for understanding – and improving instruction for – a professional genre. Routine workplace tasks tend to use recognizable genres that make the task more predictable for readers and writers. Because you study language, you may be used to recognizing and using genre patterns even when they are not explicitly pointed out to you, but other students do not have your experience or knowledge. Rather than leaving them to fumble on their own or give them vague writing instructions such as "use logical organization," an analysis of rhetorical moves allows instructors to be explicit both about the expected functions of chunks of text and what constitutes "logical" sequencing for a particular kind of text.

6.7 Chapter Summary

Throughout this book we have noted that there is not one "right" perspective from which to analyze registers, but that registers can be analyzed at different levels of specificity. This chapter has provided a number of illustrations to show how a general register like academic prose has more specific sub-registers. Disciplinary differences in methods and goals correspond to differences in word classes, verb tenses, and clausal and phrasal complexity. Variation in communicative purposes in student writing and the more specific sections of research articles also corresponded to linguistic differences. In addition, the chapter demonstrated ways that registers vary when viewed from the perspective of academic versus workplace contexts, even though disciplines are most often studied with academic texts. The civil engineering case studies showed that even when texts are in the same field and so share the same general methods and goals, different audiences and settings for the work can have a large impact on linguistic features. These same situational characteristics have an impact on the conventional genre structure of texts, too. The chapter also highlighted the need for choosing informants carefully when studying more specifically defined registers and for studies with educational applications. Without the workplace informants in the civil engineering study, we could have recognized linguistic patterns, but interpreting their importance – especially for helping students to be better prepared for workplace writing – would have been impossible.

Chapter 6 Activities

Reflection and Review

1. To provide further practice with grammatical analysis, read through Activity Text 11 (the university student research paper) and identify the ***first*** instance of each of these linguistic features:

   a. attributive adjective
   b. nominalization
   c. prepositional phrase modifying a noun
   d. noun phrase that includes two prepositional phrases as modifiers
   e. passive voice (as a main verb)
   f. past-tense verb
   g. present-tense verb

2. Interview someone who has a job that requires writing in a non-academic, business setting to find out what the person writes and how the registers/genres compare to the writing assignments in school. Any field can work – technology, finance, engineering, science, health, etc. Ask questions to elicit information about what kind of texts your interviewee writes and the major situational characteristics that distinguish among the registers/genres. (You might have to prompt your interviewee to realize that writing includes even short messages such as emails.) Then ask what the person remembers being required to write as a student and how those writing tasks compare to writing at work. Finally, how do the reflections of your interviewee compare to what is said in this chapter about workplace and academic writing in civil engineering?

Analysis Practice

3. Table 6.1 displays the quantitative findings for a comparison of the student research paper excerpt (Activity Text 11) and academic prose. Using the activity text to see how the features are used, write a short summary of the findings. How is the student paper similar to and different from academic prose generally? Propose functional

Table 6.1 *Selected Linguistic Features in Academic Prose and a Student Research Paper (Normed per 1,000 Words)*

Linguistic feature	Academic prose	Student research paper
nouns	290	253
prepositions	140	120
attributive adjectives	71	50
personal pronouns	21	66
present-tense verbs	61	67
past-tense verbs	18	42
% of finite verbs that are passive	25%	10%
linking adverbials	7	10

Academic prose counts based on findings reported in Biber, Johansson, Leech, et al. (1999); preposition count based on Biber (1988)

interpretations to account for the differences (tying them to the specific situational characteristics of the paper). Are there some differences that you think are just the student's personal style or a sign of less experience with academic writing?

4. As described in Section 6.6, Swales' (1990) genre analysis of introductions of research articles has Move 2 described as follows:

Move 2 Establish a niche (by giving counter claims, or indicating a gap, or raising questions, or explaining how the study continues a tradition)

Although there are not "genre markers" that always identify this move, this specific rhetorical function is likely to correspond to differences in the use of linguistic features.

Consider the following "Move 2 " statements from biology research articles. Identify any linguistic features that appear to be associated with "establishing the niche" – that is, with giving counter claims or indicating a gap or raising questions. Why are these features useful for this rhetorical function?

> Records of long-distance within a breeding season are rare . . . The paucity of long-distance records is undoubtedly in part due to a lack of opportunity[2]
>
> No study to date has measured the variance in lifetime reproductive success in a monogamous mammal.[3]
>
> Perhaps because of this lack of baseline information, little attention has also been given to the climatic controls of tree growth in tropical moist or wet forests.[4]
>
> [We] still do not have a sense of how reproductive investment is regulated among shoots within individual plants, and how similar the two morphs are in this respect.[5]
>
> The microhabitat of these two species has not previously been described quantitatively, nor have root distribution and shoot morphology been related to physiological responses.[6]

5. Below are the openings of four students' geotechnical tech memos. Answer the following questions. We know you are probably not a geotechnical engineer, but even if you have never heard of a "hollow stem auger" or "Shelby tube," you should be able to analyze genre and register features in these texts!

a. Using the information about tech memo rhetorical moves in Section 6.6, which moves do you see in each student text? Identify where each move starts and ends.
b. What feedback would you give to each student concerning their use of genre conventions? In particular, what has the student done well, and what advice would you give for improvement?
c. The linguistic features of workplace tech memos are similar to workplace reports as covered in Section 6.5.2. Choose one of the student memos and analyze the use of two or three linguistic features in it, explicitly saying how the use is similar to or different from professional workplace writing. For example, you might cover condensed noun-phrase structures (nouns, attributive adjectives,

and prepositions), the use of adverbial and relative clauses versus dense noun phrases, or the use of first-person pronouns and place and time adverbs.

Memo 1
Introduction: A sub-surface site investigation was performed on March 2, 2006 to ascertain the soil properties found at the location of a proposed two-story apartment building near the intersection of Johnson St. and Olive St. A minimum of (3) borings were performed, however, only data from the third boring was made available for analysis.

Methods: Five samples were retrieved through the use of a hollow stem auger. Four of the samples were obtained through the use of a split-spoon device and the fifth was made with a Shelby tube.

Memo 2 [the complete text]
I first assumed specific gravity of the soils were 2.65. The unit weight of water was 9.81 Kn/m^3. After calculating the values for Cu average value was 200 Kn/m^2. The average friction angle was 37 degrees. The average unit weight was 18 Kn/m^3.

Memo 3
After reviewing the boring log I do have some recommendations for your design project we discussed. These recommendations must first be seen as initial thoughts, because unit weights were assumed since I was not informed of them. For this reason these recommendations are elementary and should be overlooked once proper tests are conducted to gain the properties of the soils.

Memo 4
The boring log from the two-story apartment building located at Johnson & Olive Street dated March 2, 2004 was received and analyzed. This memo concerns boring number three conducted with a hollow stem auger. The specific weight of the soils was assumed to all layers. The given N60 values were adjusted using the CN correction factor equation given by Seed et al. (1975).

Project Ideas

6. Analyze three of your own academic papers and compare your use of linguistic features with the findings for academic prose generally. Interpret differences, making clear which are due to the particular sub-register that you employed, and which are more likely to be stylistic differences or differences having to do with your experience writing academic prose.

7. Collect a small number of texts from a professional workplace and a small number of journal articles in the same discipline. Conduct a register analysis, covering five to seven linguistic features. Interpret the similarities and differences in the linguistic features relative to disciplinary characteristics that are shared by the registers and the situational characteristics that differ for the two contexts. As in this chapter, a branch of engineering would make an interesting comparison, but other fields will work as well; for instance, you could compare marketing reports in any field versus journal

articles; geology reports, such as work from a field geologist for a company, versus geology journal articles; or writing produced by a financial planner versus finance journals. Be aware that real workplace documents can be difficult to obtain, however, so choose the field based on the workplace documents you can get. Be careful about trying to get documents from the Internet. Many sources that sound like workplace documents are actually academic; for example, if you search for "engineering reports," you will find many academic sources. Other internet documents are idealized templates. You need authentic documents from a real workplace.

Notes

1 The British Academic Written English Corpus.
2 Lynne E. Stenzel et al., Long-distance breeding dispersal of snowy plovers in western North America, *Journal of Animal Ecology* 63 (1994): 888
3 D. O. Ribble, Lifetime reproductive success and its correlates in the monogamous rodent, Peromyscus Californicus, *Journal of Animal Ecology* 61 (1992): 458
4 D. A. Clark and D. B. Clark, Climate-introduced annual variation in canopy tree growth in a Costa Rican tropical rain forest, *Journal of Ecology* 82 (1994): 866
5 L. F. Delph, Factors affecting intraplant variation in flowering and fruiting in the gynodioecious species of Aebe supalpina, *Journal of Ecology* 81 (1993): 288
6 P. S. Nobel, M. E. Loik, and R. W. Meyer, Microhabitat and diel tissue acidity changes for two sympatric cactus species differing in growth habit, *Journal of Ecology* 78 (1991): 168