EVALUATING CAUSAL DISCOURSE IN ACADEMIC WRITING

by

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Abstract

According to the Canale and Swain model of language evaluation (1979, 1980), discourse can be assessed in an integrative manner using their theoretical framework of communicative competence, yet this framework, which reflects Chomsky's 1965 notion of competence as the knowledge of language rules, offers only a taxonomy of elements without showing how these elements can be integrated. In sharp contrast to this is systemic functional linguistics, which views language as resource. According to Halliday and Martin (1993), speakers of a language use a variety of language features to construct meaning. These authors examined the causal line in scientific writing and established a clear example of the integration of form and function.

This qualitative study attempts to discover whether Canale and Swain's framework is able to evaluate texts which demonstrate the integration of form, meaning, and the visual line. To do this, discourse samples were collected from fifty participants who wrote accounts of the water cycle using a visual prompt. Twenty-seven of these accounts were discussed in two small focus groups, and from these twenty-seven, five samples were rated using an assessment instrument based on Canale and Swain, and analyzed using a discourse analysis tool presented in Veel (forthcoming). The following questions were asked:

1. Can readers intuitively detect differences in the quality of descriptions written using a visual prompt, and can they notice the relationship between the discourse and the visual prompt?

2. Can readers using an assessment instrument based on the Canale and Swain theoretical framework assess the quality of descriptions written using a visual
prompt, and can they notice the relationship between the discourse and the visual prompt?

3. Can a Hallidayan functional analysis illuminate the quality of the descriptions and address the relationship between the discourse and the visual prompt?

The findings raise questions about the assumptions of the Canale and Swain framework as a model for assessing differences in the quality of academic writing, and recommend instead the examination of systemic functional linguistics as a framework for teaching and assessing academic language.
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Chapter One: Introduction

Introducing the Research Problem

According to Canale and Swain (1979, 1980), discourse can be assessed in an integrated manner using their theoretical framework of communicative competence. Integrative texts, those which contain a clear element of integration, have been analyzed by discourse linguists such as Longacre (1990), who examined the narrative storyline, and Halliday and Martin (1993), who looked at the language of cause and effect. The research captured in this paper attempts to discover whether Canale and Swain’s framework can evaluate integrative discourse such as that which Halliday and Martin discuss. Canale and Swain’s model has been the basis for much recent research and theorizing in the field of second language testing; therefore, concerns raised about this model have implications for current work in the field of second language testing in general.

Communicative competence, according to Canale and Swain (1979, 1980), is defined as the relationship and interaction among three main competencies: grammatical competence, or the knowledge a speaker has about the rules of grammar; sociolinguistic competence, or the knowledge of the rules of language use in social situations; and strategic competence, which refers to the knowledge of strategies, both verbal and non-verbal, that a speaker may have which can compensate for deficiencies in the other two areas of competence. The authors criticized much of the earlier work for failing to address this third competence, arguing that a crucial part of language use concerns the handling of breakdowns in communication, and that speakers need to have knowledge of verbal and nonverbal strategies, the latter which is understood to encompass the visual aspects of communication such as gestures, eye contact, and graphic conventions. The authors furthermore stated that
there is no motivation for considering one of these competencies to be any more or less important than the others, and that the goal of a communicative approach is to “facilitate the integration of these types of knowledge for the learner” (p. 27).

Although Canale and Swain stated that each of these competencies can be examined separately, they emphasized that for second language teaching and testing purposes, a communicative approach “must integrate aspects of both grammatical competence and sociolinguistic competence” (p. 6), and materials developed to teach this way must consider what the learner needs to participate in authentic communication. The authors proposed a functional approach to syllabus organization rather than one based on grammar, stating that a concentration on functions allows for a more natural integration of the knowledge of the target language and culture. Teaching methodology should focus on the use of meaningful communicative activities which reflect the type of language the learners are most likely to need when immersed in the target culture.

With respect to testing communicative competence, Canale and Swain recommended using both discrete point tests and integrative tests to assess the language user. The use of discrete point tests helps make the learners aware of their ability to control “the separate components and elements of communicative competence” (p. 34-35). This type of test, they claimed, is easy to administer and score reliably. The authors advocated the use of integrative tests to assess the learner’s performance in actual communicative situations, suggesting that integrative assessment should ideally be done on several occasions by evaluating the learner’s ability in regular classroom performance throughout the course.

The authors claimed that their theoretical framework offers the general boundaries and contents of communicative competence deemed necessary and important to consider when
evaluating the learner’s performance. When developing assessment instruments based on this framework, therefore, the assumption is made that the performance, or discourse, can be evaluated holistically by examining the taxonomy of elements presented in Canale and Swain’s framework. Raters, then, should be able to assess the discourse by attending to the writer’s use of the mechanics of the language (grammatical competence) combined with the ability of the discourse to convey the message using appropriate language for the context (sociolinguistic and strategic competence).

In spite of the vast number of times Canale and Swain used the term integrative in the discussion and presentation of their theoretical framework of communicative competence, it was not clear how one was supposed to achieve this integrative assessment. The authors argued, for example, that there needed to be a balance between the emphasis placed on grammatical accuracy and the emphasis placed on getting one’s meaning across, yet they offered no suggestions as to what this balance should be nor how to assess it. Their assertions about the what were strong, yet the how remained vague:

In our view, an integrative theory of communicative competence may be regarded as one in which there is a synthesis of knowledge of basic grammatical principles, knowledge of how language is used in social contexts to perform communicative functions, and knowledge of how utterances and communicative functions can be combined according to the principles of discourse. (Canale & Swain, 1980, p. 20)

Their description of the framework suggests that the synthesis of this knowledge can be assessed by comparing the learner’s performance with the elements listed in the theoretical framework, yet there is no indication as to how the assessment can be approached holistically, beyond using the listed elements as an overall checklist for the performance.
Canale and Swain claimed that their framework is able to offer an integrative assessment of discourse using what is basically a list of elements which the authors consider necessary components of communicative competence, yet Canale and Swain do not explain how the various elements are integrated. To examine their assumption, therefore, a test case was assembled to see how well the framework could assess written descriptions of the water cycle. This test case offers a clear example of integration in that the visual prompt which was chosen for the task presents a visual and explicit line of logic which can be followed, and a wide range of language features can be employed by the writer to construct this line. The discourse samples included in this test case were collected from both native and non-native speakers of English at various levels of proficiency, and the samples demonstrate both the use of the visual line and the range of features clearly. The Canale and Swain theoretical framework of communicative competence will be applied to this test case to examine how well it can assess the quality of the descriptions, given the guidelines established by the visual prompt.

The assumptions made by the Canale and Swain framework regarding the integrative assessment of discourse will be compared to contrasting views of Halliday (1994) and the notion of functional grammar. Halliday maintains that language cannot be examined through its discrete elements; it should instead be considered in terms of how an individual uses it to construct meaning. His concept of discourse stems from systemic functional linguistics, which differs from the view reflected in Canale and Swain (1978, 1980) in five orientations. The first contrasts language as resource with language as rule. This concerns the speakers' "meaning potential (what they can mean) rather than neurologically based constraints on what they can say" (Halliday and Martin, 1993, p. 22). This latter idea plays an important
role in Chomsky's concept of competence as knowledge, as stated in his 1965 book. The second and third orientations are the focus by systemic functional linguistics on texts rather than sentences, and on the relations between texts and social contexts. In other words, Halliday and Martin do not emphasize the knowledge of rules which are reflected in decontextualized sentences; they concentrate on whole discourse in its social context. Furthermore, as mentioned, Halliday and Martin consider language as "a system for construing meaning, rather than a conduit through which thoughts and feelings are poured" (Halliday and Martin, 1993, p. 23). Systemic functional linguistics, Halliday states, is interested in the development of an elaborate model of language in which other modes of meaning besides the verbal—such as the visual—can be viewed in semiotic terms. A functional analysis based on Halliday and Martin's concept of language will also be applied to the test case outlined above.

Background to the Study: The Path of the Researcher

Because this section attempts to explain the motivation behind this study, and more often than not motivation stems from a personal perspective, I shall speak in my own voice to relate the events which have brought me this far in the research. I became involved in language testing while working in the field of language education in Japan, where the test I was requested to administer and was later responsible for producing used visual prompts to elicit written discourse which was then assessed for its grammatical accuracy, spelling, and punctuation. I found it both frustrating and fascinating that some individuals who had taken the test in one of its earlier forms had found ways to increase their scores considerably by preparing a generic sample and making it fit the visual prompt, usually by commenting that the picture made them think of the time when such and such had occurred. As test markers,
there was little we could do beyond give the examinee the score the preplanned sample reflected, which was frequently much higher than the one which would have been earned in the usual manner. The assessment, after all, was based on language use and not on the connection between the discourse and the visual prompt.

My interest in the connections between the verbal and the visual led me to the work of Michael Halliday and the field of systemic functional linguistics. By this time, however, my research interests had evolved to encompass the study of a more academic style of writing, so I was therefore intrigued by Halliday and Martin's (1993) work on scientific discourse, particularly their discussion on the evolution of causal discourse. I was also intrigued by their claim, similarly made by Veel (forthcoming), that the dimensions which have evolved historically also occur in first language development in that simpler observable events are understood and discussed earlier than the more abstract causal connections. Having collected several discourse samples using a graphic representation of the water cycle during a small research project for a course assignment on the interpretation of visuals, I wondered whether Veel's dimensions would have any implications for assessing the quality of causal discourse, and in particular the causal discourse produced by second language learners.

My thoughts on the roles of functional grammar in assessing academic writing, combined with my earlier experiences with visuals and testing in Japan, led me to investigate the theories behind language testing. I became interested in Canale and Swain's theoretical framework of communicative competence (Canale & Swain, 1979, 1980), examining it with the assumption that academic discourse must also fall under the topic of communicative competence, particularly considering that this framework attempted to follow Chomsky's (1965) definition of competence which equated it with the knowledge an ideal speaker has of
his or her language. It was unclear to me, however, how the elements listed in Canale and Swain’s framework could account for any differences in the quality of causal discourse. To clarify this issue, I decided to examine the assumption made in the framework and test it by applying the framework to causal discourse samples. I also decided to see how professionals in the field of language education felt intuitively about the quality of this discourse, to see if their intuitions matched mine. Finally, I wanted to see if a functional analysis would illuminate the assessment process. Of course, the connection between the verbal and the visual still persisted; hence the selection of what I believed was a clear visual prompt. These concerns became the basis for my research questions.

Using the discourse samples which were collected for this test case, therefore, I attempted to answer the following questions:

1. Can readers intuitively detect differences in the quality of descriptions written using a visual prompt, and can they notice the relationship between the discourse and the visual prompt?

2. Can readers using an assessment instrument based on the Canale and Swain theoretical framework assess the quality of descriptions written using a visual prompt, and can they notice the relationship between the discourse and the visual prompt?

3. Can a Hallidayan functional analysis illuminate the quality of the descriptions and address the relationship between the discourse and the visual prompt?
Chapter Two: The Review of the Literature

In Canale and Swain's theoretical framework of communicative competence (Canale & Swain, 1979, 1980), the claim is made that a learner's ability to communicate competently can be assessed in an integrative way by considering the various components which are listed in the framework. This view contrasts with that of Halliday (1994) who maintained that language can only be assessed by examining what the learner can do with it. As both views consider non-verbal or visual modes of communication to be part of language use, an examination of the discourse produced by using a visual prompt may serve to illustrate how each approach handles the integrative assessment of the discourse, given the guidelines established by the visual prompt.

This chapter will begin with a look at Longacre's (1990) notion of the storyline, showing how the above-mentioned test-case discourses can be considered one example of integration in that they contain a line of meaning which can be represented verbally using a variety of language features and visually using graphic conventions. Having established the concept of an integrated line of meaning in discourse and its relation to both the visual prompt and communicative competence, the chapter will offer a brief historical overview of the issue of communicative competence, introducing Chomsky's (1965) concept of competence in contrast with the more socially rooted views of Hymes (1971). This will not involve a comprehensive review of the many theories which have been presented on the topic of communicative competence; such a review is unnecessary for the current argument. It will, however, show that the term communicative competence has not maintained a constant definition over the years, a situation which, according to Taylor (1988), has resulted in some confusion between the notions of competence as state (tacit knowledge) and
competence as process (ability or proficiency). This section will be followed by a description of the theoretical framework of communicative competence as proposed by Canale and Swain (1979, 1980).

The chapter will continue by examining Halliday's view of discourse and meaning, including his opinions on communicative competence, a view which differs considerably from the ones expressed in the North American context. His work in systemic functional linguistics and his ideas on language open up two areas which are of primary interest in this research: the holistic conception of discourse and the visualization of meaning in text. This section will also make connections between the line of meaning in a text and the way it can be represented visually, a key concept behind approaches to language and content teaching which use graphic organizers and key visuals. This will lead to a discussion of the practice of using visuals in testing, concentrating primarily on the use of visuals to elicit ratable discourse samples. A description of a variety of tests which have used this approach will be offered as well as a discussion of the difficulties which can arise when using visuals as prompts for language testing.

The conclusion will tie together the various strands presented in this chapter and restate the questions which guide the current research project.

**Integrating Language and Use: The Concept of Storylines**

Before beginning a discussion of what communicative competence means and how it can be assessed, the concept of integrative approaches to discourse analysis should be addressed. Moreover, to examine the extent to which the Canale and Swain theoretical framework of communicative competence—or any framework for that matter—can assess the quality of a description based on a visual prompt, it is necessary to make a connection
between the visual prompt and the ways in which it can be represented verbally. The work of Longacre (1990) offers insight into both how language features and meaning can be integrated and how this integration can be represented visually.

Longacre proposed that there exist in discourse lines of meaning which are constructed using various language features. His discussion, which revolved around the storyline in narratives, illustrated how, for example, verbs can be used in clauses to distinguish the main storyline from other strands of development. Existential verbs, he claimed, serve to establish the setting, whereas verbs in the past continuous refer to actions which are occurring behind or alongside the main storyline. Longacre implied that the main storyline of a narrative can be plotted onto a visual time line which illustrates the progression of the narrative. He further suggested that other forms of discourse, such as procedural or hortatory discourse, have similar lines of meaning which can be constructed and visualized in the same way.

Longacre also argued that to do an adequate analysis of a text, one needed to be aware of the way grammar is used to construct the line of meaning in the discourse. His discussion implied that the incorrect use of particular verb forms, for example, could lead the reader to believe that the line which is being constructed is conveying meaning other than that which the writer was intending, therefore possibly resulting in communicative difficulties in the narrative discourse. The implication from Longacre's discussion is that grammar and meaning, form and function, cannot be separated; they interact intimately to construct the storyline in the discourse. In this sense, therefore, a line of meaning in a narrative could be considered one example of integrative communication.

Following Longacre's argument, it can be claimed that the discourse samples in the test case presented in this study also reflect a line of meaning and can thus also be considered
examples of integrative communication. The discourse in this study contains a causal line which can be represented in discourse using language features characteristic of this type of discourse. Assessing the communicative competence of the writer, in this case, would involve examining how he or she uses the language to construct this line of meaning. Furthermore, just as Longacre suggested that narrative storylines can be visualized as time lines, the discourse in this study should mirror the causal line which was presented in the visual prompt.

Longacre offers a convincing argument that discourse contains a line of meaning which is constructed using the grammatical features of a language and can therefore be considered an integrative approach to assessing the communicative quality of a text. In storylines and causal lines, the connection between this line of meaning and a visual line is straightforward. With this view of integrative assessment in mind, Canale and Swain’s theoretical framework of communicative competence needs to be examined to see how well it is able to assess the quality of the line of meaning in the discourse, and how it accounts for the correspondence—or lack of—between the discourse and the visual prompt. Before this is attempted, however, the concept of communicative competence as it informs the Canale and Swain framework should be reviewed.

A Brief History of Communicative Competence

At the time Canale and Swain (1979, 1980) developed their theoretical framework of communicative competence, the argument over the definition and concept of competence had been in the limelight of linguistic discussions for almost fifteen years and was expected to continue. Since Chomsky (1965) used the term to mean “the speaker-hearer’s knowledge
of the language” (p. 4), *competence* has been used to reflect a variety of meanings in the fields of linguistics. Chomsky’s concept of competence reflected his orientation towards formal linguistics and psycholinguistics, fields in which the interest lies primarily with the individual:

> Linguistic theory is primarily concerned with an ideal speaker-listener, in a completely homogeneous speech community who knows its language perfectly and is unaffected by such grammatically irrelevant conditions as memory limitations, distractions, shifts of attention and interest, and errors (random or characteristic) in applying his knowledge of the language in actual performance. (p. 3)

Chomsky equated competence with “intrinsic tacit knowledge” (p. 140), a state which is absolute in the ideal speaker-listener and which should not be confused with the ability to use this knowledge. He distinguished competence from performance, the latter which he defined as “the actual use of language in concrete situations” (p. 4).

Because researchers with a more social orientation to language study considered Chomsky’s original concept of competence to be too narrowly focused on grammatical or linguistic competence, the notion of communicative competence was proposed by Campbell and Wales in 1970. According to Archibald and Libben (1995), however, it was sociolinguist Dell Hymes who has since been credited with coining the term *communicative competence*. Both Campbell and Wales (1970) and Hymes (1971, 1972) criticized Chomsky for failing to consider appropriate use of language in context. Hymes (1972) argued in favor of including the notion of appropriateness within the definition of competence by stating that “there are rules of use without which the rules of grammar would be useless” (Hymes, 1972, p. 278).

Hymes extended Chomsky’s concept of competence in two major ways. He helped clarify the domain of performance by arguing that there existed rules of language use which
should be considered as competence—a notion which Chomsky later recognized as “pragmatic competence” (Chomsky, 1980, p. 59)—and he introduced “ability for use” (Hymes, 1972, p. 282), something which Chomsky had taken great care to eliminate from his more absolute concept. According to Taylor (1988), who reviewed the work of various researchers on the notion of competence and concluded that many of the current uses of the term do not reflect Chomsky’s original concept, Hymes gave the impression that “all aspects of language use fall within the domain of his communicative competence, thus implying that they can be accounted for systematically in terms of rules” (p. 156). Taylor commented that while Hymes was criticizing Chomsky for his “‘dustbin’ view of performance” (Taylor, p. 157), Hymes was creating a similar dustbin definition of competence; as McNamara (1996) stated, Hymes proposed a combination of abstract models, “both a sociolinguistic model of language performance and a broadly psychological model of language performance, all subsumed under a single term, communicative competence” (p. 55-6).

As clearly stated in this section, a difference exists between Chomsky’s formal linguistic definition of competence and the more sociolinguistic definition which includes notions of ability and proficiency. Spolsky (1989) stated that Chomsky used the term in a manner “quite differently from its normal use” (p. 138) and warned readers to avoid confusing it with the idea of ability, a reiteration of Taylor’s 1988 comments. Widdowson (1989) commented that competence is “a slippery customer, a fuzzy concept” (p. 134) which becomes problematic when it is associated with ability, yet Hymes as well as subsequent writers encompassed aspects of both knowledge and performance through this assumption. The theoretical frameworks proposed by Hymes and others acknowledged not only the importance of both Chomsky’s notion of knowledge, but also recognized, as did Stalker
(1989), that it was important to consider “what the ideal is and what the criteria are for determining how closely we approximate to that ideal” (p. 185), once again acknowledging the difference between knowledge on one hand, and ability or proficiency on the other, while showing how the two interrelate. From a social perspective, what people knew about language and what they did with it were very much intertwined.

Hymes’s definition of communicative competence, according to Spolsky (1989), was particularly relevant to those interested in both second language learning and the teaching of a second language for communication. Spolsky stated that the “communicative teaching approach postulated that the second language learner must acquire not just control of the basic grammar of the sentence but all the communicative skills of a native speaker; it seemed easy to call these skills ‘communicative competence’” (p. 139). The notion that this knowledge is to be acquired over time by non-native speakers further distinguished the social concept of competence from Chomsky’s narrower view of the knowledge which is contained in the head of the ideal speaker, yet the two concepts—skills and knowledge of language components—are tied together in the common view of language proficiency.

Some researchers have challenged the idea that language can be divided into skills and language components. Oiler and Hinofotis (1980) and Scholz, Hendricks, Spurling, Johnson, and Vandenburg (1980), for example, presented research findings which supported what was referred to as the unitary competence hypothesis. This hypothesis suggested that “the components of language competence, whatever they may be, may function more or less similarly in any language-based task” (Oller & Hinofotis, 1980, p. 14). This contrasted with the divisible competence hypothesis, which suggested that language proficiency can be
divided into separate components. Oiler and Hinofotis emphasized that their research results at times contradicted themselves, and Oiler has since rejected the unitary factor hypothesis.

Oiler’s initial findings were further made questionable by the work done by Cummins (1984). Cummins challenged the notion of language proficiency, which assumed that the ability to communicate face to face was no different from the ability required to perform academic tasks. He acknowledged that there was as yet no consensus as to the nature of communicative competence and proposed that there is a difference between surface fluency, or “basic interpersonal communicative skills (BICS)” and “cognitive/academic language proficiency (CALP)” (1984, p. 136). These differences are reflected in Spolsky’s 1989 comment about the learner needing all of the communicative skills of a native speaker; communicative competence, therefore, should encompass academic language proficiency as well as basic communication skills.

The connection between Hymes’s notion of communicative competence and language testing was obvious in consideration of second language pedagogy:

Language tests involve measuring a subject’s knowledge of, and proficiency in, the use of a language. A theory of communicative competence is a theory of the nature of such knowledge and proficiency. One cannot develop sound language tests without a method of defining what it means to know a language, for until you have decided what you are measuring, you cannot claim to have measured it. (Spolsky, 1989, p. 140)

It was the need to measure the achievement of students enrolled in communicative French immersion programs in Canada which prompted Canale and Swain to become interested in theories of communicative competence. The ideas originally presented by Hymes formed the basis of their 1979 framework, which is considered by Bachman (1990) to be “seminal to research on communicative competence” (p. 109). Subsequent writers have in turn based
their models on the one proposed by Canale and Swain. The next section will describe the Canale and Swain framework and offer their definition of communicative competence.

**Canale and Swain’s Theoretical Framework of Communicative Competence**

This theoretical framework for communicative competence, still one of the most influential theories in the field of language testing, was proposed by Canale and Swain (1979, 1980) as an attempt by the authors to “establish a clear statement of the content and boundaries of communicative competence—one that will lead to more useful and effective second language teaching, and allow more valid and reliable measurement of second language communication skills” (1980, p. 1). The authors distinguished communicative competence from communicative performance, appearing to reject Hymes’s (1971) concept of ability for use and siding with Chomsky’s (1965) view that competence refers to the knowledge a language user has about a language while performance refers to the actual use of the language. They also noted that whereas performance can be observed, competence cannot be measured directly.

In proposing their theory, Canale and Swain reflected a social orientation, working under the assumptions that communication occurs in a social context using authentic language, is carried out under constraints of performance, and is judged successful or unsuccessful through its behavioral outcomes. They considered communication to involve oral and written, verbal and non-verbal means; thus their framework claims to include visual means of communication. This framework, intended for use in second language teaching and testing in line with an integrative communicative approach, emphasizes preparing second language learners to exploit—initially through aspects of sociolinguistic competence and strategic competence acquired through experience in communicative use of of the first of dominant language—
those grammatical features of the second language that are selected on the basis of, among other criteria, their grammatical and cognitive complexity, transparency with respect to communicative function, probability of use by native speakers, generalizability to different communicative functions and contexts, and relevance to the learners’ communicative needs in the second language. (1980, p. 29)

The framework divides communicative competence, which the authors claimed is not the highest or broadest level of language competence, into three main competencies: grammatical competence, sociolinguistic competence, and strategic competence.

Grammatical competence concerns the knowledge a language user has about the rules of grammar, whereas sociolinguistic competence is the knowledge of rules of language use.

Strategic competence refers to the knowledge or strategies a language user has available “to compensate for breakdowns in communication due to performance variables or to insufficient competence” (p. 30). Figure 2.1, a visual representation of Canale and Swain's framework, shows how the concept of communicative competence is parsed into the various competencies and their constituents.

A difficulty immediately surfaces when the visual representation of the framework is examined. According to Canale and Swain (1978, 1980), strategic competence consists of verbal and non-verbal communication strategies, and such strategies will be of two main types: those that relate primarily to grammatical competence (e.g. how to paraphrase grammatical forms that one has not mastered or cannot recall momentarily) and those that relate more to sociolinguistic competence (e.g. various role-playing strategies, how to address strangers when unsure of their social status). (p. 30)

Grammatical competence and sociolinguistic competence are represented in two areas of the framework, causing the question to arise as to which of the two areas is being taught or tested at a particular time. In other words, is the learner experiencing difficulty with the
grammar of the language he or she is learning or is it the learner's inability to correctly use his or her strategic competence in that situation? This may seem a trivial question on the surface, but when developing testing instruments, it is crucial to know what the assessment tool is measuring, and having duplicate categories creates ambiguities which may result in a less reliable test.

Although Canale and Swain indicated that communicative competence is the interaction and relationship between grammatical competence and sociolinguistic competence, their discussion places remarkably little emphasis on this relationship, but instead emphasizes the classification of the parts of communicative competence, an emphasis that would be more appropriate to discrete point testing than integrative testing. The authors stated, for example,
that "the classification of language skills proposed by Munby... will serve as an initial
indication of the types of operations, subskills, and features that are involved in successful
communication" (p. 30), further indicating that Canale and Swain considered discourse as
something that can be broken down into discrete items for teaching and testing.

Canale and Swain included a discussion of the implications of a communicative
approach for both teaching and testing, reviewing the issues of syllabus organization—how
to order the teaching of the pieces—and textbooks, teaching methodology, and teacher
training. In the area of testing, they advocated the use of both integrated tests, which they
suggested may be suited to assessing communicative performance, and discrete-point tests,
which they claimed could assess "the learner’s control of the separate components and
elements of communicative competence" (p. 35). They stated that the latter were often
easier to use and more reliable in their scoring than the integrated tests, an understandable
statement considering that their framework breaks language into separate components and
fails to offer a satisfactory explanation as to how these elements are integrated. Canale and
Swain concluded their discussion of testing communicative competence by stating that their
proposed framework could guide the selection of assessment criteria and help establish
levels of proficiency which are acceptable at various stages of second language development.

The Canale and Swain framework claims to support integrative testing, but their model
provides only a classification of the elements which comprise communicative competence
and fails to account for how these grammatical and sociolinguistic components are integrated
in discourse. The Canale and Swain framework mentions non-verbal communication, but it
fails to provide an account of how visual elements are to be taken into consideration in
testing. To illuminate the notion of integration, the following section will consider the
construction of meaning, introducing the views of Michael Halliday and systemic functional linguistics, views which focus on how language users combine linguistic features to construct meaning in the discourse as a whole. It will also consider systemic work which relates verbal and visual modes of meaning.

Halliday and Systemic Functional Linguistics

Whereas the discussion in North America was frequently centered around the distinction between competence and performance, Halliday (1970) regarded the dichotomy as misleading and unhelpful. He believed that language should be considered in terms of how it is used, viewing it as a system of connections between linguistic forms and the meanings they realize. Halliday and Martin (1993) emphasized language as resource, explaining that language users use various features to build structures of meaning, such as the causal line, which is being addressed in this study. Halliday’s orientation towards language as resource contrasted sharply with Chomsky’s 1965 notion of language as rules which are formalized in the users’ heads. In the foreword to his book on factual writing, Martin (1989) elaborated on Halliday’s notion:

The most serious and confusing of these myths [on how to teach language] are those which would suggest we can dissociate language from meaning—form from function, or form from ‘content’. Where such myths apply, teaching about language becomes a matter of teaching about ‘language rules’—normally grammatical rules—and as history has demonstrated over the years, such teaching rapidly degenerates into the arid pursuit of parts of speech and the parsing of isolated sentences. Meaning, and the critical role of language in the building of meaning, are simply overlooked, and the kinds of knowledge about language made available to the learner are of a very limited kind. (p. v-vi)

Thus, in the opinions of both Halliday and Martin, there is an interrelationship between the form of a language and the meaningful use of this form by the users of the language, and as
suggested by the term *functional grammar* (functional meaning use, and grammar referring to form), this form and meaning must be examined holistically. A discourse analysis based on a functional grammar such as Halliday (1994), therefore, looks at how linguistic features are combined to construct meaning in the text as a whole.

Using this functional approach, Schleppegrell (1998) analyzed the discourse produced by 128 ethnically diverse seventh and eighth grade students in five science classes. The students were directed to work in pairs to choose a picture of an animal or plant from a magazine, and to write a description of the picture they chose. The students' written texts were then analyzed to identify the grammatical structures used to construct the descriptions and the areas which were problematic for the students. The author found that students' choices of structures reflected different orientations to the task, with some students writing from a purely personal perspective while others were more aware of the need to write analytically. Schleppegrell concluded that through an understanding of the language features common to various types of academic discourse, teachers can help students develop and improve their writing skills.

Christie (1986) examined conjunction and theme in three types of commonly valued genres in the school system: a narrative text, a scientific essay, and a literary character study, describing the language features which characterize narrative and expository discourse. Through her analysis, she showed how a student failed to present a good character study because the language features he used to construct meaning in his text were representative of description rather than interpretive discourse. Christie argued that the failure of students “to master the skills, capacities, and knowledge of schooling goes hand in hand with an inability to handle the language structures necessary to make such mastery possible” (p. 239). She
concluded that teachers can better guide learning if they are aware of these language structures and can demystify them for their students.

Derewianka (1990) advocated using a functional approach to teach language, stating that “if children have an explicit knowledge of what language resources are available, they are in a better position to make informed choices when developing texts of their own” (p. 5). Derewianka’s book offered a practical guide to teaching the language features associated with various genres and presented several examples of how these features are used in children’s writing.

Martin (1990) emphasized that writing in science is distinct from writing in other parts of the curriculum, and that to understand scientific discourse, one needs to look closely at the language scientists use. He discussed in depth how the language of science organizes the world and argued that everyday common-sense language is not an adequate tool for explaining or understanding science. Martin concluded that because language plays a major role in “building up a scientific picture of the world” (p. 115), it should not be watered down. To combat the problem of science literacy, he insisted, teachers need to understand how scientific genres are structured linguistically.

Both Mohan (1997) and Mohan and van Naerssen (1997) discussed the language of cause and effect in student recall of reading passages. Both articles criticized sentence-level views of causal discourse as being inadequate for training in first and second language academic environments, and both showed that causal meanings are constructed and expressed using a combination of rich lexical and grammatical resources. The authors introduced and described what they called the regularity and powers models of cause and effect, indicating that the angle from which students view causal relations is reflected in the
language they use to talk about events. The authors concluded that “causal discourse is a matter of meaning as well as form” (Mohan, 1997, p. 216; Mohan & van Naerssen, 1997, p. 28, 29), and that for students to be able to understand and produce academic discourse, they need to be aware of the subtleties of causal meanings and how to construct them. Halliday and Martin (1993) argued that the language of science—discourse that can be challenging and alienating to both children and adults alike—reflects the evolution of scientific knowledge itself. The authors suggested that “physical scientists led the way in expanding the grammar of the language, as they found it, so as to construct a new form of knowledge” (p. 67). This “new” form of knowledge which is taught in schools replaces common-sense understanding, offering an alternate interpretation of the world. Halliday and Martin presented and discussed various language features which characterize scientific writing, most notably nominalization, and commented that readers are able to identify the language as scientific because they are responding to the combined effect of a number of language features, not simply to the existence of technical terms. They stated:

Whenever we interpret a text as ‘scientific English’, we are responding to clusters of features.... But it is the combined effect of a number of such related features, and the relations they contract throughout the text as a whole, rather than the obligatory presence of any particular ones, that tell us that what is being constructed is the discourse of science. (1993, p. 56)

The move from common-sense interpretation based on observations to a deeper understanding is also reflected in the evolution of causal discourse. Halliday and Martin (1993) pointed out that this form of scientific English has evolved from a simple construction of “a happens; so x happens” to “happening a is the cause of happening x” (p. 66), the latter representing nominalization of the events. Veel (forthcoming) noted a similar progression in the way science is presented in the school curriculum. Scientific exploration, he observed,
follows a path from simpler sequential explanations based on hands-on activities and observable phenomenon to more abstract explanations which demonstrate an understanding of the underlying cause and effect relationships between the events being described, a progression from simple to difficult which has an interesting parallel to the differences between BICS and CALP as presented by Cummins (1984). Veel emphasized the need to make students aware of the language features which characterize the various types of scientific discourse.

Veel (1997) discussed the language of science in terms of doing and challenging science. He explained the types of genres which typically fall into each category. Doing science, Veel claimed, is concerned with among other things, procedures, sequential and causal explanations, and descriptive and taxonomic reports. The genres associated with challenging science, on the other hand, are exposition and discussion, both of which aim to be persuasive. Veel concluded, as others have, by suggesting that rather than attempting to change or simplify the language of science, educators need to teach students ways to access this discourse, thereby opening up the field to those who are otherwise marginalized.

Underlying a number of the genres identified by Martin (1990) and Veel (1997) are what Mohan has referred to as knowledge structures (see Mohan, 1991). Underlying the narrative genres, for example, is the knowledge structure of time sequence, as the storyline of a narrative is a series of events ordered temporally. These knowledge structures reflect general organizational patterns of information, both at the discourse level and at deeper levels of abstraction. Mohan (1986) offered six structures as a core group, considering action knowledge to be comprised of description, sequence, and choice, and dividing background knowledge into classification, principles, and evaluation. Just as those who
follow functional grammar approaches advocated teaching students about the language features characteristic to each genre, Mohan asserted that “if students are more aware of the structure of knowledge, they are better equipped to manage content learning tasks independently” (1986, p. 75), and stressed that there are language features and graphic conventions associated with each knowledge structure. To illustrate the knowledge structure of sequence, for example, Mohan listed the grammatical features, semantic notions, and speech acts which are associated with sequence, and suggested as a visual a basic time line on which the series of events can be situated.

Mohan’s concept of a sequential time line ties in closely with Longacre’s (1990) discussion of narrative storylines, discussed earlier in this chapter. Longacre illustrated, among other things, how verbs can be used in clauses to distinguish the main storyline from other strands of development in the narrative. Longacre suggested that other forms of discourse, such as procedural or hortatory discourse, have similar lines and that to do an adequate text analysis, it is essential to have an awareness of the way grammar is employed to construct the lines of the particular text.

Longacre’s concept of storylines and other lines of meaning in tandem with Mohan’s observation that knowledge structures can be visualized raises an interesting question as to whether semiotic analysis can connect discoursal and visual expressions of meaning. The work of Kress and van Leeuwen (1996) suggests that this may be true. In their book, *Reading images: The grammar of visual design*, the authors positioned themselves in the field of social semiotics and explained communicative multimodality through an examination of the ways in which visuals convey messages. They discussed in great detail how sign-makers, graphic designers, and artists represent various verbal processes, showing
how concepts such as narration and classification can be represented visually, and using images from newspapers and textbooks as well as children’s drawings to support their ideas. The description of their visual grammar borrows heavily from Halliday’s work in systemic functional linguistics, which is another area of social semiotics and which further implies a connection between the visual and the verbal.

Halliday’s work in systemic functional linguistics, as well as the work of those who follow his ideas, allows for the integration of form and function, thereby offering an integrated view of discourse which contrasts sharply with the one held by Canale and Swain (1978, 1980). Kress and van Leeuwen (1996) used Halliday’s work to connect the verbal to the visual, a connection which is reinforced through the idea of storylines and lines of meaning as perceived by Longacre (1990). The concept of using visuals to elicit a ratable sample of discourse for assessment purposes is a common practice in second language education and research. The next section will examine the complexities of this practice.

**Visuals and the Assessment of Language**

Visuals—illustrations, pictures, graphs, charts, and other diagrams—are commonly used for testing purposes in education. In school science examinations, for example, frequent use is made of cross-sectional, or cut-surface, diagrams which require students to do various tasks such as label the parts (see Constable, Campbell, & Brown, 1988). In language arts courses, according to Sinatra, Beaudry, Guastello, and Stahl-Gemake (1988), “pictures have been traditionally used by teachers to stimulate students’ oral and written language expression” (p. 399). Questions on mathematics or business tests are often accompanied by charts and graphs, presupposing that students have the necessary knowledge to read the visual information (see Daniel, 1986). The following example, from Hughes (1989), offers
an example of a business writing test which assesses the understanding of the visual material as much as the test-taker’s writing ability:

Suppose you are writing a report in which you must interpret the three graphs shown above. Write the section of that report in which you discuss how the graphs are related to each other and explain the conclusions you have reached from the information in the graphs. Be sure the graphs support your conclusions. (p. 85)

It is unlikely that the examinee who is unable to interpret the graph correctly will get a good score for this writing assignment, even if the quality of the writing is high.

Visuals have also had a long history in the field of second language teaching and learning. In their book on foreign language testing, Finocchiaro and Sako (1983) included a section on using visuals for language testing, suggesting that “the pictures should illustrate familiar, culture-free, and culture-fair actions” (p. 141). They commented that there are several areas which can be effectively tested by using visuals to elicit a sample of discourse, naming quantity of discourse, vocabulary choice, grammatical accuracy, and paragraph development as the principal ones. The authors recommended using model samples to increase objectivity in the scoring of tests elicited in this way.

Andrew Wright, in Visual materials for the language teacher (1976), claimed that the use of visuals for testing purposes serves the following functions:

1. To avoid the use of text by the examiner in order that the student derive the answer from a selection of language from his memory.
2. To reduce the number of decisions and actions involving language not directly relevant to the feature being tested e.g. testing listening comprehension by indicating an appropriate picture instead of speaking or writing an answer which is a test of these skills as well as that of listening.
3. To stimulate the examinee’s own ideas and to give him things to talk about.
4. To give a real life context to the test without the provision of any specific information. (1976, p. 53)
Regarding the third point above, Wright stated that “this type of test is not a ‘strict’ test; there is no basis for comparison between pupil and pupil; or pupil and criterion” (p. 52). He emphasized that the type of visual used and the amount of information contained within it must be determined by the function of the test.

The function of the Bilingual Syntax Measure (BSM), developed in 1973 by Burt, Dulay, and Hernandez Chavez, was to “measure children’s acquisition of English and/or Spanish grammatical structure while they are in the process of becoming bilingual” (Dulay & Burt, 1978). The BSM consists of thirty-three questions based on seven cartoon-style colored illustrations. Dulay and Burt (1978) claimed that the administration of the test was similar to “chatting with a child about some pleasant pictures” (p. 350), insisting that there were no correct answers and that children frequently responded differently depending on their knowledge and backgrounds. The authors stated that the BSM looks only at how proficient a child is in using particular grammatical structures which have been made obligatory by the question prompt, yet it would appear that getting the results also depends largely on the clarity of the pictures presented and the child’s understanding of those pictures. This emphasis on the visual is further implied when Dulay and Burt (1978) asserted that the question prompts were “not only highly structured and specific, but the pictures to which the investigator points suggests the question in many cases” (1978, p. 357).

Concern that the BSM may be assessing the child to be at a lower degree of proficiency due to a misunderstanding of the picture may not appear on the surface to be warranted, yet it is not unreasonable to think that the child’s overall comprehension may be delayed if he or she cannot easily match the questions with the visual items. According to the instructions in the Child response booklet (Burt, Dulay, and Hernandez Chavez, 1975), levels one and two
are determined simply by the number of questions the child has attempted to answer, yet it is very possible that the child’s inability to respond rests on his or her indecision as to what the visuals mean. As for the higher levels (three, four, and five) in which the answers are rated on their grammaticality, Dulay and Burt (1978) confessed that they had omitted some of their data from consideration because there were times when they could not determine the structure the child was attempting, in spite of their claim that it was “relatively easy to tell what structure the child offered within the context of the ‘BSM conversation’” (p. 357).

The interpretation of visuals in language testing is indeed a valid concern. Many researchers claim that visual literacy—the ability to understand and use images to convey meaning—is learned, and that as a result many visual aids are viewed through the viewer’s individual and cultural lens. Constable, Campbell, and Brown (1988) found, for example, that elementary school children could not always interpret the illustrations in their science textbooks. Findings by Lynn (1993) showed how children used their own background information in the form of stereotypes to interpret history visuals. Modiano, Maldonado, and Villasana (1982) commented that one-fifth of the illustrations shown to Mexican children were incorrectly interpreted. After administering her Visual Test to 263 international students, Daniel (1986) concluded that students’ background knowledge and experience at times prevented them from understanding the visuals being used. Hewings (1991) reported that in observing British EFL classes which used printed illustrations, teachers often attributed students’ inappropriate responses to difficulties with English when in fact the students were answering based on their own perceptions of the visuals. Parker (1988) and Canagarajah (1993) have reported similar difficulties with the interpretations of visuals, and Gruba (1994), in an article discussing the design and development of the video-mediated
Kanda English Proficiency Test (KEPT), warned that “testing biases created by the inclusion of visuals may need to be investigated” (p. 34).

Hughes (1989), while advocating the use of visuals in testing, asserted that to obtain reliable scores, a task should restrict the range of possible responses an examinee can offer. Using visuals, however, may have the opposite effect. In an article describing the effects of task variation on interlanguage performance, Duff (1993) commented that although she had categorized pictures with the assumption that one type would yield narration and the other description, her analysis of the data indicated that the anticipated genre was not always what was elicited. She found that her participant, JDB, sometimes described individual events in a series of pictures that were meant to elicit narration, and sometimes offered a story about a picture intended to yield a description. Similar observations were made about the discourse produced by Hungarian research participants:

The subject in Example 2, through her frequent use of “I saw” and “I see” appears to interpret the task as an exercise in visual acuity.... In example 3, the subject sees it as her task (or her right) to relate the picture to personal experience.... The subject in Example 5... proceeds to simply list the people in the picture and the activities they are engaged in. (Coughlan & Duff, 1994, p. 184)

In discussing the outcome of having an individual repeat the same task, Coughlan and Duff (1994) commented that the “retelling” of the picture, done some years after the first picture description task, should have reflected JDB’s linguistic progress, yet the authors claimed that this was not the case. Based on the discourse samples provided in the article, however, it is possible to construe that whereas in the first task, JDB was primarily giving a description of the events based on what he could observe, his retelling may have been an attempt to offer an explanation of these events. According to Veel (1997), this move from what is observable
to what is outside one’s own experience can often be a difficult one to accomplish. JDB’s linguistic ability may have appeared to backslide, yet it is possible that his attempt to *explain* rather than *describe* the events in the picture represented a progression in his ability to interact meaningfully in English. Although a deeper analysis would be needed to determine whether JDB was indeed attempting this shift, such an analysis is unnecessary to justifiably conclude, as did Coughlan and Duff, that the picture description task did not guarantee a constant measure in the testing of interlanguage.

In spite of the variation that can be seen in the discourse elicited through the use of visuals, this practice is relatively common in language testing and particularly so in the assessment of oral proficiency. Cohen (1994) described the Speaking Proficiency English Assessment Kit (SPEAK), a test which is administered using a tape recorder. It consists of seven sections, two of which employ visuals. The SPEAK test was further developed into a face-to-face instrument made up of four sections, half of which use pictures, one picture to elicit a narrative and the other to yield a description. Another example of a language test which uses visuals to elicit discourse is the simulated oral proficiency interview (SOPI), described by Stansfield and Kenyon (1992) as a tape-recorded, criterion-referenced test which typically consists of six parts, three of which usually employ pictures. The SOPI is a variation of the oral proficiency interview (OPI), and both use similar scales based on guidelines provided by the American Council on the Teaching of Foreign Languages (ACTFL) to holistically measure oral language proficiency (see Stansfield, 1990, for a chart outlining the SOPI rating scale). After investigating the comparability of the OPI with the SOPI, the authors concluded that based on the research conducted thus far, “both test formats are highly comparable as measures of the same construct—oral language proficiency”
The authors were quick to emphasize, however, that it was not their intention to assess the validity of the OPI or the SOPI as measures of this construct.

The ACTFL proficiency scale on which SOPI assessment is based assesses an examinee’s mastery of functions, content, and accuracy. Although considered a holistic measure, it closely mirrors the various categories reflected in theoretical frameworks of communicative competence such as the one developed by Canale and Swain (1979, 1980). This is clearly illustrated by the breakdown of those areas of accuracy examined by the ACTFL scale: fluency, grammar, vocabulary, pronunciation, pragmatic competence, and sociolinguistic competence. The single holistic score assigned, however, makes the questionable assumption “that a particular level of grammatical ability will always be associated with a particular level of lexical ability” (Hughes, 1989, p. 91).

Another test which uses visuals to elicit oral discourse has avoided the problem of a single holistic score addressed by Hughes above. The Eiken Pre-first Grade test, produced in Japan by The Society for Testing English Proficiency Inc., provides a set of four pictures in comic-book style as a prompt for an oral story narration which is graded on a five-point scale (poor, not good, acceptable, good, and excellent) in three areas of language proficiency. According to the STEP'97 renewal information guide (Nihon Eigo Kentei Kyokai, 1997), the first area, section one, measures comprehension, coherency, and volume. Section two measures pronunciation, intonation, rhythm, and fluency, and section three measures vocabulary, grammar, and word usage. The oral examiner in the Eiken Pre-first Grade test must also use the five-point scale to assess the responses to four questions about the pictures as well as judge the overall attitude of the examinee as he or she works through the tasks.
The guide offers a model narration for the picture story, and although the implication is made that the development of a storyline is more valued than a description of the events, the evaluator is informed that as long as the examinee’s narration reflects the pictures, there should be no deduction in the score.

This section has demonstrated that the use of visuals to elicit a ratable sample of discourse is a common practice in language testing, yet it has also pointed out that there are problems associated with this practice, discussing in particular the difficulties the examinee may have in the interpretation of the visual itself—whether he or she can understand the information presented visually—as well as the question of which genre the visual is intending to elicit. These difficulties have not been addressed adequately by current test designers, who in most cases have assumed that the test-taker’s level of visual literacy is sufficient to understand the images presented to them, yet as this section has attempted to show, problems with interpretation may present problems which reduce the overall proficiency level that an examinee is judged to have, even in testing procedures which aim to assess only discrete linguistic points.

Conclusion

The Canale and Swain theoretical framework of communicative competence (1979, 1980), developed from the view that competence refers to the knowledge that language users have about the rules of grammar and use, claims to deal with the integration of language features in discourse. It addresses balances between grammatical accuracy and getting meaning across. It purports to encompass both verbal and visual modes of communication. Yet because the framework offers only a taxonomy of components which Canale and Swain
claim define the boundaries and content of communicative competence, it is difficult to see how all the elements in the framework interact in the assessment of discourse.

Halliday and his followers, on the other hand, offer a functional grammar which addresses the question of integration and furthermore suggests ways in which verbal and visual meanings may be understood in a common perspective. A review of work on visuals in language testing and teaching indicates that although there is some acknowledgement of the importance of this practice, the area is so much undertheorized that major questions remain to be asked.

In sum, this chapter has focused primarily on the differences between the concept of communicative competence as captured in the Canale and Swain theoretical framework and the functional approach to discourse analysis as described by Halliday and his followers. The two approaches are theoretically quite different, and one purpose of this thesis is to discover what implications these differences have on language assessment, and in particular on the assessment of causal discourse. The questions which will be addressed are as follows:

1. Can readers intuitively detect differences in the quality of descriptions written using a visual prompt, and can they notice the relationship between the discourse and the visual prompt?

2. Can readers using an assessment instrument based on the Canale and Swain theoretical framework assess the quality of descriptions written using a visual prompt, and can they notice the relationship between the discourse and the visual prompt?

3. Can a Halliday an functional analysis illuminate the quality of the descriptions and address the relationship between the discourse and the visual prompt?

Both chapters four and five will examine the data collected for this study. Chapter four will pay specific attention to questions one and two, and chapter five will address question three.
Chapter Three: Methodology

This study uses the methodology visualized in figure 3.1 to explore the assumptions made by Canale and Swain (1979, 1980) that their theoretical framework of communicative competence allows for the integrative assessment of discourse. In particular, the research asks whether this framework is able to assess the quality of causal discourse collected by using a visual prompt, and it aims to answer this question by testing the framework against these causal discourse samples. Furthermore, the discourse samples will be analyzed to show how writers use the lexicogrammar to construct causal text, an analysis which is held up in contrast to the taxonomic approach offered by the Canale and Swain framework. The aim of this research is not to examine cause and effect relationships, but to highlight the features of an evaluation model in theory and practice. The data used for this study is discourse, and because the primary difference between quantitative and qualitative research is that the former presents results with numbers and the latter with words, it would appear that the most suitable research approach is to present ideas about discourse using discourse. This does not imply that the numbers are irrelevant though; the fact is, simply stated, that the data presented here are focused more on the how rather than the how many. For that reason, it seemed natural and appropriate to follow a qualitative approach.

This study will use two qualitative methods: a discourse analysis to examine five texts, and focus groups to collect discussions. According to Morgan (1997),

Focus groups are basically group interviews... based on topics that are supplied by the researcher who typically takes the role of moderator. The hallmark of focus groups is their explicit use of group interaction to produce data and insights that would be less accessible without the interaction found in a group. (p. 2)
Figure 3.1: The methodology of the research

10 contemporary textbooks

50 discourse samples

27 texts
- 3 sets of 3
- 9 sets of 2

matched sets

sets of 2s AND 3s,
- similar with a limited number of variables
- different from set to set

showed to two focus groups

5 texts

examples brought to discussion as needed

analyzed using a functional analysis based on Veel

assessed using an instrument based on Canale and Swain

VISUAL PROMPT
"line of meaning" needed to be visible to the writer

CHOSEN BECAUSE
- showed dimensions of Halliday and Martin (1993), Veel (forthcoming)
- judged different in quality by the two focus groups
Morgan also stated that there are three principal uses for focus groups. This type of data collection can serve as the principal source of data, as supplementary sources where the primary source lies elsewhere, and as one of several equal means of data collection. In this study, the purpose of the focus group was to allow the researcher to see the kinds of criteria readers had for determining the adequacy or quality of written accounts of the water cycle. Had this been done one on one with the researcher, there may have been a greater chance that the data would have been biased by the types of questions or interactions. By using small groups—the researcher plus two participants—the researcher could observe the interaction between the individuals and intervene only to dig deeper on a topic. Although the same instructions were given to the first two groups (the third group used the assessment instrument at first), the questions asked by the researcher did not follow a strict interview schedule. Instead, most of the researcher questions were confined to “why,” “do you agree with…,” and “how would you compare this one to…” to get information.

Morgan (1997) stated that one weakness of focus groups is the possibility that the researcher will influence the group’s interaction in an attempt to keep the interview focused. Due to the nature of the task in this study, little needed to be done or said by the researcher to keep the interview on task; there was a greater likelihood that the group members would influence each other, although they were told they did not need to reach a mutual decision on the score for each text.

One of the biggest problems that can arise when a researcher enters the field with particular goals in mind is that other researchers may consider the study biased and criticize it for its lack of validity. Triangulation helps to address this problem. To guarantee that the anticipated range of causal discourse exists commonly in today’s society, discourse from a
variety of sources in both written and oral mode were collected. This procedure, along with
the selection of the discourse prompt, is described in the sections which both begin with
“The Collection of the Causal Discourse Data.” To make sure that the similarities and
differences in the discourse were noticeable by professionals in the field, three focus group
discussions were held; two groups used intuitive judgements to assess several sets of text
informally, and one group used an assessment instrument based on the Canale and Swain
(1979, 1980) framework. The procedure for this, including a description of the assessment
instrument which was used, is offered in the section titled “Collecting the Voices of the
Judges,” and the voices of these group members can be heard in chapter four.

The differences noticed by the focus groups regarding the causal discourse became the
target for the text analysis. Chapter five contains an analysis of a core group of five written
samples using an approach based on functional linguistics (Halliday, 1994) as presented by
Veel (forthcoming), and described in the section of this chapter titled “Functional Tools for
Analysis: An Explanation of Veel’s Explanation Sequences.” In accordance with standard
procedure in functional discourse analysis, the discourse analysis in chapter five will be
presented as unambiguously as possible in tables, diagrams, and more words, allowing the
readers to judge for themselves the value and the validity of the work presented here.

The Collection of the Causal Discourse Data:

Selecting the Discourse Prompt

Discourse can be elicited by using a variety of prompts, and various studies have been
undertaken to examine the effect the prompt has on the discourse task (see, for example,
Spaan, 1993; Polio & Glew, 1996). As noted in the previous chapter, visuals have an
established position as discourse elicitation devices in language assessment, although there
are problems that have been associated with this practice. Because this research is concerned with how writers construct lines of meaning through their discourse and how those lines can be visualized in graphic format, it was decided that the line should be clearly visible to the person responding to the prompt used to elicit the discourse. A visual prompt, therefore, was perceived to be the best route to follow. Furthermore, because this research aimed to examine the construction of causal meaning in particular, a prompt was needed that would elicit various shades of causality, from an implicit cause–effect relationship to one which is made more explicit by the language features chosen by the writer.

After a careful examination of the visuals which appeared in various school textbooks and resource materials, a graphic representation of the water cycle (Appendix A) was selected on the basis of the above considerations and the following assumptions:

**Assumption One:** The concept of the water cycle is part of basic scientific knowledge, so most, if not all, educated participants will be able to recognize it and discuss it in some way.

**Assumption Two:** The graphic conventions used in the visual (specifically, the arrows) are widely understood and can therefore be used to construct the explanation sequence of the discourse, even by those participants who may be unfamiliar with the concept of the water cycle.

**Assumption Three:** The visual, with its combination of words and arrows, is a straightforward representation of the water cycle; because of its unambiguity, the range of possible responses is restricted to explanations.

The instructions for the written task were given both orally and in written form to each participant. The oral instructions were to write the text that the participant believed would accompany the graphic. The written instructions said “please write a composition which explains what is happening in the above graphic.”
The Collection of the Causal Discourse Data:

Asking Individuals to Explain the Water Cycle

Discourse samples were collected from any individual—native or non-native speaker of English—who was willing either to complete both the oral and written tasks or to compose the written text only. It must be noted that the procedure outlined for the collection of discourse was done only to collect discourse and not to test the writers’ proficiency in constructing causal texts. Because it was the intention of this researcher to collect a range of cases of how writers use various features to construct different causal meaning in their written discourse, it was important to elicit a wide variety of samples. For this reason, any individual was welcome to participate, and a wide variety of ages, levels of education, and levels of English ability was sought. Only the written texts have been used in this study, and because the discourse is the object of investigation rather the individuals who wrote the discourse, these written texts are identified solely by number. The characteristics and backgrounds of the writers are not relevant to the aim of this research.

No information about the target audience was given to the participants by the researcher. It was decided that restricting the writing to a specific audience would create problems for those participants who were too young or too unfamiliar with the English language to adjust their register. It was also expected that participants would construct their discourse to reflect their own understanding of the cycle, and that writers who wanted to speak to a particular audience would somehow indicate this through their discourse. Finally, because it was thought that certain types of explanations may be easier or more difficult to understand (cf. Veel, forthcoming), specifying an audience for these texts may have restricted the range of samples otherwise available for analysis.
The individuals who participated in both tasks began with the elicitation of oral discourse. Although the focus of this research was on written discourse, eliciting oral samples was deemed important for two reasons. First, asking for an oral description allowed the researcher to determine whether the participants were interpreting the task correctly, and second, comparing the oral with the written discourse offered insight into the participants’ understanding of the causal relations in the water cycle. After a brief interchange during which greetings and small talk were shared, each person was shown the graphic of the water cycle (Appendix A) and asked orally to describe the picture. Once this task was completed, the participant was given a copy of the assignment sheet (Appendix B) and the same instructions that were given to those who completed only the written task. Once the written task was completed, the participants talked briefly about the task with the researcher. All the oral discourse was audio-recorded and later transcribed.

The Collection of the Causal Discourse Data:

Searching through the Schoolbooks

During the period in which the oral and/or written discourse samples were being collected from participants, the researcher was searching through school textbooks and reference books written for various ages and grade levels for explanations of the water cycle. The following two questions guided this phase of the data collection:

1. Is there a difference from textbook to textbook in the way the water cycle is explained?

2. If differences exist between the textbooks, do these differences follow the patterns presented in Veel (forthcoming)?

A functional approach using Veel (forthcoming) as a framework was used to examine a total of ten books, ranging in target levels from grade four to grade eleven (see Appendix C for a
list of these resources). Differences between the texts reflected those which Veel presented, and these differences will be addressed in Chapter Five.

**The Data Collection: Collecting the Voices of the Judges (Focus Groups)**

It was mentioned in chapter one that the researcher had a framework of analysis in mind when she read the texts the participants had written, a framework which resulted from reading the work of Halliday and Martin (1993) and Veel (forthcoming). This made the task of analyzing differences in the discourse samples more straightforward; after all, she knew what she was looking for and how to articulate what she found. The important questions, however, were whether these differences would be noticeable to others in the field, and if so, how these differences would be articulated. The logical way to find answers to these questions was to show the texts to other people and ask them to give their opinions, but to ask individuals to look at and assess fifty discourse samples was considered too much of a request. Besides, it was not necessary to rank the fifty texts; nor was it important to discuss each of the fifty in relation to all the others. The main goal of the group discussion was to see if people could notice the same types of differences in the way writers constructed their causal explanations as the researcher could. For this reason, an approach was undertaken which involved creating matched sets of data and discussing the differences between and among these sets of discourse samples.

In this approach, the researcher examined the fifty discourse samples written by the participants and matched the texts into sets of twos and threes. The purpose of the matching was to have texts which were similar but which contained a limited number of variables that differed somewhat from set to set; in other words, there was an effort by the researcher to control for certain writing features, mainly surface errors, which might detract the attention
of the judges. Some sets, for example, contained samples which had similar numbers of surface errors but which differed in the extent to which they contained adequate content. Some texts differed only in their emphasis on sequence versus explicit causality. One set contained two samples which were well written short expositions, and another set contained two one-sentence compositions, both of which contained serious structural and mechanical problems yet attempted to explain the water cycle. Three sets of three and nine sets of two—a total of twenty-seven discourse samples—were finally presented to the first two groups for discussion, and these two small focus groups completed the same basic task. The remaining twenty-three samples, most of which were written by native speakers of English, could not be grouped to form sets which would introduce new dimensions to the readers, and they were therefore set aside. The task for the two language professionals in each group was to discuss the following questions as they read each set of discourse samples:

Are both or all texts in the set adequate explanations of the water cycle?

How would you rank them? Why?

The sets were labeled A through L, and the texts in each set were given an identifying number such as A1, D2, or L1. No information was given to the discussion group members about the writers’ ages or first languages. Each set appeared on one sheet of paper. To increase the likelihood that all sets would be read with similar levels of enthusiasm, the first group read the twelve sets beginning with set A and finishing with set L. The second discussion group began with set L and finished with set A. The group members were asked to rate each text from zero to six and were told that this rating was only intended as a guide which could be referred to at the end of the discussion when they would be asked the following questions:
Which sets did the best job of explaining the water cycle?
Which sets did the least adequate job?
Which sets showed the widest discrepancy in quality?

It was not necessary for members to establish criteria for rating the samples or to maintain inter-rater reliability; the researcher was primarily interested in what the members had to say about the differences between and among the texts. These rating sheets were collected for examination at the end of the session. Both discussion group meetings were audio-recorded, and the discourse was later transcribed for analysis. The goal of this analysis was to examine the themes which emerged regarding the readers’ criteria for judging the overall quality of the discourse.

The four group members selected for these two discussion tasks were considered by the researcher to be professionals in the field of language education. Three were doctoral students, and two of these were nearing the end of their academic program. One was a master’s candidate in the same field. The combined number of years of English teaching experience among the four individuals totaled 44 years, with the least experienced group member having taught for three years. All four were proficient speakers of English, although English was not the first language for any of them.

One discussion group met in the researcher’s home during the early evening hours and spent eighty minutes discussing the twelve sets of discourse samples. The other group met in the researcher’s office for sixty minutes, also early in the evening. Although there may have been different levels of comfort between the two locations, both sessions maintained a fairly informal and relaxed atmosphere. Although the researcher was present during these sessions, she did not offer her opinions of the samples during these discussions; her
participation was limited to explaining the task and asking the members for their opinions and intuitive judgements. All group members knew the researcher and each other and had met to discuss other matters on numerous occasions prior to this research. As far as the researcher was able to determine, the group members were not aware of the details of this study before the discussion sessions.

As it was desirable to use a smaller set of texts with the third group so as to allow for greater discussion of the assessment instrument, this group was asked to discuss only five samples of discourse labeled A through E. These five represented two sets of discourse from the original twelve matched sets. One set was chosen because it contained one text which group members considered to be the best of the explanations (E2) based on the criteria the readers had established, as well as one text which prompted mixed reactions (E1). The differences in these two texts matched both Veel's (forthcoming) dimensions of sequence and cause/effect, and the causal dimensions illustrated by Halliday and Martin (1993). The other set, which consisted of three texts, was selected because these texts paralleled the same dimensions outline above, but the two sequential explanations differed in the adequacy of its content. Furthermore, the group members judged all three texts in this set to be inadequate.

The third discussion was held in the middle of a weekday afternoon in a small meeting room on a university campus. The two individuals in the group were raters experienced in using the criteria of a test based on the theoretical framework of communicative competence developed by Canale and Swain (1979, 1980) as an instrument for assessment. The purpose of the test with which the raters were familiar was to assess the level of communicative competence of future second language teachers. This purpose must be kept in mind when interpreting the discourse of these raters because they were attempting to assess the current
writing task through this perspective. Their view of what was acceptable language use was influenced heavily by the role the language user would have in the second language classroom, and therefore reflected a more “writer-responsible” attitude of communication.

The assessment instrument which the raters usually use and on which the assessment in this research was based has ten tasks, and in the assessment of each task, errors are classified in one of the five categories of competence: linguistic, sociolinguistic, discursive, strategic, and receptive. Linguistic competence refers to the knowledge an individual has of the lexis, phonology, morphology, and syntax of the language. It also includes the ability of the individual to use these to create words and sentences. The raters distinguished among vocabulary, mechanics (including spelling and punctuation), and morphology and syntax. Sociolinguistic competence is concerned with the understanding and use of these features to carry out functions in particular social contexts. Having discursive competence allows the individual to connect sentences into cohesive and coherent discourse, using devices such as transitional phrases and conjunctions. Strategic competence refers to survival strategies such as paraphrasing and guessing to compensate for a lack of other competencies and generally concerns the individual’s ability to communicate successfully. Finally, receptive competence is the ability to understand the language.

An error can only be counted in one category, and the raters must decide which category should be targeted. The scoring is binary within the categories for each of the ten tasks; in other words, the raters decided whether the examinee gets the point for the category, or she or he doesn’t. Although statistical analyses have determined that the overall reliability for this instrument is high, the agreement between raters as to which category the various errors belong is often low, strongly suggesting that the raters have trouble classifying each
error into its most appropriate category. Furthermore, the difficulties usually arise when judging between linguistic competence and the other competencies.

Although the two raters knew each other well through their working relationship, neither had met the researcher, but both had been in touch with her on several occasions by electronic mail. The discussion remained friendly and on task throughout the meeting and, as in the other discussion sessions, the researcher remained in the room but restricted her participation so as not to bias the direction of the assessment or the outcome of the discussion. In this session, she explained the task, answered questions about the execution of the task, asked the raters for their assessment of the samples, and elicited the opinions and intuitive judgements about the discourse samples. Her opinions were given once the task was completed.

The task which the raters were assessing in this research paralleled one that the raters could identify with, yet there were still important differences to consider. The task in this research assigned no specific role to the writer, and nor did it give the writer a context. Furthermore, as previously mentioned, no audience was stated. These differences prevented the category of sociolinguistic competence to be addressed by these raters, a situation that arose fairly quickly in the discussion. In the category of discursive, the raters looked for whether the text made sense or not, and the operational definition of strategic competence concerned whether or not the the writer got the message across. The rating guide permitted only a binary scoring system, preventing qualitative judgements to be made by the raters.

Once the texts were discussed in light of the assessment instrument, the raters were asked to offer their own intuitive judgements about the perceived differences in the five discourse samples. The meeting, excluding greetings and small talk, lasted approximately
sixty minutes and was audio-recorded. The discourse was later transcribed and examined to
determine which aspects of the discourse were considered to be important in establishing the
overall quality of the discourse or what might be referred to as the writer's level of
communicative competence as demonstrated in this writing task. These voices, as well as
those from the previous two discussion groups, can be heard in Chapter Four.

**Functional Tools for Analysis: An Explanation of Veel's Explanation Sequences**

The framework chosen for the discourse analysis was taken from Veel's book,
*Exploring literacy in school science* (forthcoming), and was based on Halliday and Martin's
work on scientific English (Halliday & Martin, 1993) and Halliday's work in functional
grammar (Halliday, 1994). A similar framework on a wider variety of subjects is offered in
Derewianka (1990). Veel offered an in-depth description of scientific explanations,
discussing the role they have in constructing and expressing knowledge, and contrasting
them with other scientific discourse such procedures and procedural recounts. He showed
that there is considerable variation in the range of explanations, claiming that this takes place
along two dimensions. One is the move from an explanation which is primarily sequential to
one which emphasizes causal relationships between the events on the time line. The other
concerns the move from those explanations which present a single result stemming from a
linear chain of events to those which have multiple factors occurring simultaneously and
which lead to a variety of consequences. This research has been designed to focus only on
the former dimension: the move from sequence to cause and effect.

Veel offered several examples of both sequential and causal explanations, explaining
the social purpose of each type and showing how both can be modeled for students.
Sequential explanations, he stated, are limited in the depth with which they treat a topic and
tend to pertain to events which are visible or easily understood. In other words, they are at
the empirical end of science. Causal explanations, on the other hand, deal with greater
abstraction. They usually concern events which are not as easily seen. They function to
explain why—rather than how—events occur and are therefore thought to be more socially
powerful as they offer possibilities for change. In spite of these differences, both sequential
and causal explanations have the same generic structure: an identification of the topic is
followed by an explanation sequence which consists of an ordered chain of events or phases
which explain the phenomenon under discussion. A further important connection between
the two types of explanations is their employment of sequencing devices. Both sequential
and causal explanations make use of various sequencing devices, but the latter goes beyond a
simple time line to make the causal relationships explicit. As figure 3.2 illustrates, causal
explanations, in essence, can encompass all the language features of sequential explanations,
but they involve more. They need to express explicit causal relationships, a task which can
be accomplished by using features such as causal conjunctions and processes of causation.

Veel pointed out that it is not simply the inclusion of these language features which
identifies the explanation sequence as being either sequential or causal. He discussed the use
of cohesive devices such as theme and rheme and how the positioning of these adds to the
construction of the line. His inclusion and discussion of various examples taken from
scientific texts helped establish an easy-to-follow illustration of the dimension which exists
between sequential and causal explanations. The discourse analysis presented in chapter five
follows Veel's framework, explaining language features as they surface in the written texts
and showing, as did Veel, the ways in which a writer combines these features to construct
their explanations. There are, however, some difference between the analysis and Veel's
Veel’s analytical framework of scientific explanations was selected because it followed an established functional approach to analyzing discourse and it presented a straightforward,
easy-to-follow description of the differences between sequential explanations and those of cause and effect. His examples clearly showed how writers use various language features—the lexicogrammar of English—to construct a strong, almost visible line of meaning. It is hoped that the discourse analysis presented in chapter five reflects the same clarity.
Chapter Four: Discussing the Discourse

The data presented in this chapter surfaces from the collection of the discourse samples and the discussions held with professionals in the field of language education. It was found that the use of small focus groups in this study was beneficial in that beliefs about what was important were expressed naturally and forcefully, allowing the readers' true opinions about the texts to surface. Their voices, as they read and commented on the selection of discourse samples, reflected a critical issue which underlies this research: how to examine discourse as a textual whole. The first part of this chapter will discuss the collection of the discourse samples and the difficulties met when using the visual prompt. The next section will present comments from the two discussion groups which evaluated twenty-seven texts using the readers' own intuitive and informed-by-experience judgements. The third part will examine the evaluation by two raters of five of these texts accomplished using an assessment instrument based on the Canale and Swain (1979, 1980) framework of communicative competence. These five texts are presented in Appendix D. The conclusion to this chapter will highlight any discrepancies between the two informal evaluation procedures.

The Interpretations of the Visual Prompt

A total of fifty people participated in this study, resulting in a database of fifty written and twenty-eight oral texts. The twenty-two individuals who volunteered to complete only the writing tasks were all English-as-a-second-language (ESL) students who performed the task towards the end of three different non-credit intermediate or advanced ESL discussion classes they had been attending. These students were offered the choice of participating in the research project or conversing with the researcher and/or the discussion leader. Not all
class members undertook the writing task. Those who did were given a copy of the
assignment sheet (see Appendix B) and were told orally to write the text that they thought
would accompany (or go with) the graphic in a textbook. The assignment sheet asked the
participant to write a composition which explained what was happening in the graphic. The
researcher offered no corrections, and no questions were asked of her. She collected the
texts from the individuals as they finished writing.

As mentioned in the previous chapter, the graphic representation of the water cycle was
selected as the visual prompt on the basis of the following assumptions:

Assumption One: The concept of the water cycle is part of basic scientific
knowledge, so most, if not all, educated participants will be able to
recognize it and discuss it in some way.

Assumption Two: The graphic conventions used in the visual (specifically, the
arrows) are widely understood and can therefore be used to construct the
explanation sequence of the discourse, even by those participants who may be
unfamiliar with the concept of the water cycle.

Assumption Three: The visual, with its combination of words and arrows, is
a straightforward representation of the water cycle; because of its unambiguity,
the range of possible responses is restricted to explanations.

The responses of the participants suggested that the first two assumptions were well
supported. Only one individual failed to recognize the water cycle in the initial stages of the
data collection task, yet this individual was able to explain the cycle orally when the title was
brought to her attention. All participants were able to offer a written text when shown this
graphic, and all discourse samples reflected an awareness of the graphic conventions used; in
other words, the arrows in their cyclical pattern were represented verbally to some extent in all written samples.

The third assumption proved to be the most problematic. Although all participants in this study offered a written text when shown the visual, five out of fifty failed to compose written explanations of the water cycle. One individual out of the five, as mentioned above, responded with a weather forecast, and the remaining four attempted expositions. The main difference between an explanation and an exposition is that the former explains the information systematically whereas the latter takes as its main thesis statement an opinion which the writer attempts to argue. Given the research on the difficulties of interpreting visuals as discussed in chapter two, it is no surprise that these different genres appeared. The findings strongly suggest that the visual prompt needs additional verbal material to elicit explanations reliably.

The people who completed both the oral and written task participated individually at different times and in various locations so as to reduce the amount of inconvenience to them. Although the majority of these people completed the tasks in classrooms or university offices, ten preferred to meet in less formal surroundings. Of these ten individuals, one did both tasks during a slow period at the used bookstore she owns, two participated in quiet coffee shops, and the rest worked in the comfort of their own homes. The use of different locations for the data collection is not considered a threat to the reliability of the findings; in fact, because the researcher aimed to examine the widest available range of discourse samples, the variety of situations in which the data were collected may have actually helped.

An examination of the oral and written data revealed that the researcher may have played a larger role in eliciting an acceptable interpretation from those who completed both
tasks than she did with the people who provided only a written text, lending support to Tang's (1991) findings that guidance may be needed by some individuals to successfully extract information from graphics. Mohan (in progress) suggests that in many oral interview tasks, "the interviewer is doing much more than simply eliciting a "rateable sample," and is engaging in a complex of co-construction strategies." Coughlan and Duff (1994) elaborate:

[T]he interviewer plays a large role in shaping the subject’s production. She does this by providing needed (or solicited) vocabulary, additional instructions about the task, questions or comments to focus the subject’s attention, positive signals (verbal and nonverbal) when a task is going "correctly" or negative ones when it is not, pauses to allow (or compel) the subject to speak... Surely this influences the outcome of a task... (p. 187)

Analysis of the oral description task indicated clearly when the researcher was supportive of an individual’s attempt to interpret the graphic. An example of this support appears in the following transcription of a female Dutch speaker. This person did not begin her task by explaining the water cycle; instead she interpreted the task as a simple picture description:

I: Can you describe that picture?
A: It’s a picture. It’s a picture of clouds... the sun is shining which is kind of weird... cuz it’s raining. Cool air... It’s a strange picture. Very strange. A big city up on a hill, look like Central Park here and the lake...

Even when the researcher asked what the picture was describing, she answered, “weather conditions, I would say.” Further co-construction ensued until the participant mentioned the term water cycle. At this point, the researcher asked if the speaker could explain the water cycle. She replied, “No, I can’t... I have no idea.” By then bringing her attention to the graphic and asking if she could explain the cycle “based on that picture,” and by using further co-construction strategies, the researcher was able to encourage the speaker to explain the graphic in the way the researcher wanted it to be interpreted. The subsequent written sample reflected this co-construction of knowledge.
Another participant who also initially “misinterpreted” the task was given no support, and her resulting discourse had little to do with the water cycle. This person, a Canadian English female, interpreted the graphic as a representation of a weather chart. No support was offered in the oral task; the researcher attempted to remain as neutral as possible:

I: Can you describe that picture?
C: The sun is shining... and there’s a cloud in the sky and it’s bringing cool air and rain down on a community... and it’s causing the uh... rivers to rise... the water vapor to go up into the sun which would be sometimes fog... That’s all I can suggest out of the picture.
I: OK.

This oral description resulted in the following written composition:

Weather Channel. Describing weather conditions or forecasts for today’s, tonight’s or tomorrow’s weather. Rising tides etc. Predicting cooler Air — Some rain or fog.

After the writing task, the researcher brought the individual’s attention to the water cycle. Upon realizing that this was what the researcher was interested in, she offered a basic explanation of the water cycle using the arrows and words in the graphic:

C: Water cycle?... I didn’t take that into consideration...The water cycle. That means that the cycle gives us water from the rain and the sun... It’s a it’s a whole cycle from the sun going to cooler air vapor dust and then into the rain and down into the rivers and back up into the sun.

All participants were aware that the researcher was looking at how people interpret graphics, a situation that must be considered when examining the data. The task output, therefore, was presumably influenced by such factors as the person’s willingness to assist the researcher, the importance of establishing or maintaining a relationship, and the desire to “appear intelligent, competent, and emotionally stable” (Schumacher & McMillan, 1993, p. 178). According to Coughlan and Duff (1994), a participant’s discourse may at times be
influenced by a wish to make the task "a more interesting one by evaluating events, making comparisons to personal experience, playing language games, and so on" (p. 185). Although the researchers in that study were referring to oral interview situations (and this wish was demonstrated in the oral discourse in the present study), based on the analysis of the samples provided by those people who completed only the written task, this observation could also be extended to writing, where the register and content may vary depending on the importance the individual places on the task, their interest in it, and the relationship between the subject and the researcher.

With the people who participated in both the oral and written tasks, friendly chatter, evaluation of events, and making comparisons to personal experiences often appeared in the oral discourse. Participants knew that they would have the chance to voice their comments. The written samples, therefore, focussed much more on the topic of the water cycle. In fact, out of the twenty-eight written samples elicited from this group, only five contained comments that were not characteristic of explanations. The participants in the writing-only group, however, had no chance to communicate orally about their task, and as a result, three of the twenty-two writers attempted an exposition rather than an explanation, and several samples contained comments, evaluations, and attempts at language games:

"By learning this cycle we can know how to protect our water sources, our environment."
"We should care about our environment around world wide area."
"I think I not good in Biology at high school times, etc."
"Because of this cyclic system of nature, not only human being but also animals and plants can live.
"I think Canadian have more care of natural cycle."
"I'm impressed very environmental thing by this picture."
"This graphic speaks about Vancouver in any given day, as we are living in wet coast!"
At least insofar as the interpretation of the visual and the task was concerned, it was apparent that the researcher had an effect on the type of discourse elicited and the content expressed in that discourse. This was most clearly demonstrated when guidance was deliberately withheld. In the writing-only groups, where there was little chance to establish friendly rapport, there was also little chance for the researcher to check whether individuals needed guidance to write an explanation or whether some people simply did not find the explanation of the water cycle interesting or important, a situation that can, according to Coughlan and Duff (1994) affect the outcome of the task.

Because this research revolved around the ways the participants constructed their explanations and how readers judged the differences between these explanations, the role that the researcher held during the oral task was a positive one in that she was able to ensure that the discourse would be written as explanations rather than as expositions or descriptions. She did not tell the writers how to construct the discourse by offering or requesting alternate wording; she simply guided them in their interpretations of the task and the visual wherever this was warranted or possible. The researcher’s role in this step of the data collection process, therefore, likely had little negative impact on the findings of this study. The differing levels of relationship between researcher and participants as well as the variety of locations in which the discourse samples were collected may have in fact benefitted the research by eliciting a wider range of discourse samples than what would have been possible if all participants had been in the same place maintaining the same social distance.
The Discussants: Evaluating the Meaning of the Whole Discourse

An examination of the transcripts showed that a crucial factor in the assessment of the samples was the writer’s ability to communicate his or her message. Evaluative comments such as “vague,” “clear,” and “easy to read” surfaced as the readers discussed the samples. Grammatical accuracy was not considered a major issue in their assessment of this ability, as reader one indicated:

For some reason I’m not looking for that. I’m looking for the structure as a whole, for a paragraph, . . . if it explains the task adequately. If it does, yeah it’s fine. Unless vocabulary usage is very noticeable, I don’t look at that either.

Linguistic accuracy was deemed important only when the sentence grammar or the word choice was incorrect to the extent that the reader had difficulty interpreting the meaning of the message. If, as one of the readers mentioned, “you have to stop for a few seconds and read each part before you can understand what they are trying to say,” then the message is not coming across and the text “would just lose points because of the language.” She concluded by admitting that although a writer who does this may understand the concept of the water cycle, he or she is not able to express it adequately.

Despite the readers’ claim that grammar and vocabulary were not particularly important, linguistic ability did appear to influence their judgements of the overall quality of the discourse. When comparing samples in a set, the differences in level were sometimes attributed to the “variety of resources” and the “variety in sentence structure” which the writer incorporated. The discussion of Set G illustrates the extent to which linguistic ability helped to determine the differences in quality:

Reader 1: Well, G1 and G3 are probably equal. G2 is a little bit weaker because G2 doesn’t provide as much information as G1 and G3 and the sentence structure for G2 is simpler...
Reader 2: I’d say that G3 was a little bit better than G1.... It uses more vocabulary like all the words like *mist, the soil absorbs the rain.* *Attributes* is not used correctly but you kind of get the general picture. It’s more complex in its language use.

Reader 1: And the tense is better for G3... and the verb agreement. G1 tends to fluctuate.

The readers may be forgiving in their acceptance of linguistic errors, but they are attending to the ways in which the writers use language features to construct their texts. Reader four, for example, was quick to judge G3 as the best of the three samples in the set, stating that the writer was able to use language to show the cause and effect relationships of the water cycle. He recognized G1’s linguistic errors, but commented that the writer’s language ability didn’t “impede or take away from” the message that the writer was trying to communicate.

An important consideration in the construction of the text is the writer’s use of cohesive devices, or “transitions” as they were often referred to in the discussions. Cohesion adds to the readability or “flow” of the text, and discourse samples which lacked cohesion were judged as being at a lower level. One reader, in explaining her rationale for choosing one sample over another in the set, commented that the writer included all “the reasons and the details, and the person is correct in explaining all these parts of it, but the way they’re put together, it totally doesn’t make any sense... you can’t understand how it’s all connected.”

The readers were sensitive to the types of cohesive devices being used by the writers and the variety of these that appeared in the text. According to the discussions, the most noticeable method of establishing logical connections in the discourse was the use of sequencing devices. The inclusion of words such as *then* and *after* helped illustrate the relationships between each event in the water cycle. The use of numbered steps was considered systematic, and readers noted that in some cases the use of this strategy made the
discourse “sound stronger” than it may have otherwise appeared. Reader three stated that she felt “linguistically G1 is a little bit stronger... because of the transitional words like first, second, third, and thus. If you don’t see the content it makes you feel that those sentences are connected because of those transitional words.” Yet as previously mentioned, the variety of sequencing devices used was also judged an important indicator of the writer’s ability.

The use of parallel constructions, defined by one reader as structures such as “when this happens, then that happens,” were useful in showing linear order, but according to the reader, they could be easily overused and may be indicative of an inexperienced writer. The reader observed that “when there are a lot of similar parallel constructions it becomes repetitive. You begin to think well is that the only construction that they know.”

Establishing a cohesive line through the use of sequencing devices enabled the reader to draw connections between events very clearly. As the following comment shows, the idea that the cycle should be visualized in the writing sample surfaced frequently during the discussions:

... it’s nice how it shows this cyclic nature. It starts with nature is cyclic. Air, soil, and water are cycled over and over again... so you have this clear picture and then it says again it rains and the water falls on the ground and so on... so it emphasizes several times how it’s cyclic.

In comparing one text to another, one reader observed that the first text explained the cycle clearly enough that “you can actually visualize it better.” Parallel constructions, it was claimed, helped the reader “see the cycle.”
Explaining the Visual Prompt

At times it became obvious that the readers were using the organization and the content of the visual prompt to judge the adequacy of the discourse, and several texts were faulted for omitting one or more parts of the cycle. In the discussion of Set G on the previous page, for example, reader one criticized G2 for not providing as much information as G1 or G3. She stated that in comparison to G1 and G3, G2 went “from stage one to stage four very quickly.” The readers’ assessment of Set H, which contained two passages more closely resembling expositions than explanations, further illustrates this dependence on the visual line:

Reader 1: H1 in comparison to H2 explains the picture more adequately because H2 doesn’t even talk about well water cycle that much. The word water cycle is mentioned but the process is not explained whereas H1 attempts to explain the water cycle a little bit more.

Reader 2: It sort of shows like one element, sun for evaporation, whereas the second one doesn’t.

Reader 3: The phrases are there but not the process.

Reader 4: If they are poor linguistically we can still see the sense of the cycle, so that is why we cannot apply linguistic anything here because the content is empty. They don’t really understand what the water cycle is.

Neither of these texts explained the water cycle adequately, according to the readers, and therefore both received low scores. The authors, the readers claimed, had “missed the point” or “didn’t get the task.”

The importance that the readers placed on the match between the verbal explanation and the visual prompt left little room for a misinterpretation of the visual or the task, as the comments about Set H above show. The criteria that the readers had established for assessing the texts centered around the adequacy of the text in delivering an explanation of
the water cycle. Because this task aimed to assess the language user’s communicative ability in writing, it was deemed crucial that he or she could understand and complete the task as required. Misinterpretations of the task would therefore lead to a negative assessment in spite of the writer’s ability to use grammar or vocabulary. In other words, if the writer did not deliver an explanation when one was requested, his or her ability to communicate was inadequate, at least as far as demonstrated in this writing task. The following discussion illustrates this:

Reader 2: No, they’re not adequate.
Reader 1: Yeah, I agree, but grammatically though I wouldn’t say that they’re low level. They might have missed the point but um grammatically they might be better than some of the others we’ve seen you know?
Reader 2: Although language is good... if it’s just a drill on the use of tenses or whatever I’d say yeah you all get great marks but
Researcher: As for an explanation of the water cycle?
Reader 2: Zero.
Reader 1: Zero.

The discussion of a sample which also received a low score indicated that the writer was faulted for being unscientific. As one reader stated, “it’s more like a story and the whole tone... is conversational.” The text in this case, however, was also attacked for its poor cohesion and lack of detail. To achieve a minimum grade, according to the discussions, the writer needed to attend to the instructions, provide detail which reflected the relationships illustrated in the visual prompt, and have sufficient linguistic ability to complete the task.

Explanations which were faulted because of their “conversational” style, such as the one mentioned above, illustrate the concern the readers had for “audience.” This topic most frequently surfaced through discussions about samples which “sounded more academic,” “more elementary school,” or “not as scientific.” Differences in audience were tolerated by
most readers as long as the discourse reflected the line of the visual, yet when it came to
comparing the overall quality of one text to another, the readers generally preferred a more
"academic" style. Set A, for example, contained two passages which were judged as being
adequate explanations of the water cycle, but which included descriptive information
considered "irrelevant" by one reader. Text A2 in particular was described as being "like a
story-telling." Set C and Set E, on the other hand, focused on the explanation of the water
cycle without containing "interesting" or "eye-catchy" statements. One reader explained:

If you are writing for kindergarten students then A is okay, but if you're
looking at academic writing, this wouldn't be good. C would be better
for academic writing. E is also good academic writing... the focus is there.
I would say either C or E [is the best].

This age dimension had two interesting parallels. One concerned the extent to which
the text was "more just a description" or "more of an explanation," and the other revolved
around the differences between the teaching of weather and the more abstract nature of the
water cycle. The description/explanation dimension was very much an issue in the readers'
discussions of Set E. In this set, E1 was presented very sequentially using numbers to list
the processes that water goes through. In contrast to this, text E2 was presented in paragraph
form and showed clearly the cause and effect relationships that characterize the water cycle.
The difference between E1's "description" and E2's "explanation" became a crucial issue.
Reader four states:

E1 is much worse than E2. He or she writes in point form without any
connection.... It doesn't follow. There's no connection. No cause and
effect transition whatever. But the second one!

This difference was also important in reader two's judgement, but she was concerned that
perhaps the distinction were related to the instructions of the task:
You see to me it seems it depends on how they felt the purpose of their task was. For example, if you said describe the picture then number one is sort of adequate. It describes it. That’s all it really does. It describes the picture. But then if you said explain the water cycle, then number one is not adequate at all because it doesn’t explain it. It only describes.

For readers one and three, the difference in quality between E1 and E2 was not as great, although they concurred that E2 was better than E1. Reader three agreed that E1 reflected “a list of things” whereas E2 was presented as a paragraph and looked “more sophisticated than E1.” Reader one rated E2 higher because of its “variety in sentence structure.”

The discourse samples in Set G raised the same issue of description and explanation. Reader four claimed that G1 and G2 simply described the events with “no connection between them.” He observed that “the logic is there but it’s missing the cause and effect” which, according to these readers, was the critical difference between a description and an explanation. Although reader three felt that G1’s use of sequencing devices added strength to his line of logic, she too agreed that his text was “like a description, like starting a story.” Both reader one and two admitted that G3 was better than G1 or G2 because it was not as descriptive. These readers were looking for an explanation; they wanted “to see the reasons behind all that evaporation.”

During one of the discussions of Set G, the observation was made that both G1 and G2 were addressing the topic of rain whereas G3 was explaining the water cycle. Reader two questioned whether this difference might be causing the variation in the complexity or adequacy of the discourse samples. She commented:

To me the water cycle is more than how rain is created. How rain is created is three steps and then there is one more step that completes the water cycle.
The exclusion of this step, she felt, created a gap when visualizing the cycle, resulting in a situation in which readers were “just looking at part of the picture.”

**Causal Elaboration as an Indicator of Quality**

The readers’ identification of descriptions, the weather, and sequence on one hand, and explanations, the water cycle, and cause and effect on the other is an intriguing one. Veel (forthcoming) observed that events which are easily observed, such as weather, tend to be presented as sequential explanations early on in the science curriculum, and those topics which are more abstract come later, once students can understand the causal relationships between the events. The readers in these two discussion groups seem to be associating causal language with a more advanced ability to understand and express the workings of the water cycle.

According to the discussions, the ability to make explicit causal connections was indeed an important indicator of overall quality. In an explanation of why she gave a low rating to Set J, reader three explained:

I also rated these two pretty low, the reason being that in the water cycle I’m also looking for the cause and effect kind of relationship because it’s not just events taking place. You need certain conditions for like for the water coming down to the ground. But it looks like the cause and effect conditions are not there in either of them. It’s not indicated in either of these two pieces.

Further support for this appeared in the discussion about Set E. As mentioned earlier, E2 was heralded as a good piece of writing in comparison to E1 because it explained the cycle rather than describing the visual. It was these explicit causal connections which convinced the readers that the discourse was explanatory. Reader two elaborated:
And there are a lot of different... ways of showing cause effect used. Like in sentence number two it says the cycle begins when the sun heats up the ocean to produce water vapor through evaporation. Like it shows what produces how it produces by using what. It's sort of covered and it all uses different language means if you will of expressing that so it has more variety and it sounds more um sophisticated.

The same causal connections existed in G3, readers two and four argued. They commented that in G3, the writer had stated that the heat from the sun made the sea water evaporate which became mist and produced a cloud, but that these causal connections did not appear in either G1 or G2. Reader two observed that she could “actually see how it’s all working.”

Transcripts of the discussions clearly indicated that the readers were looking primarily at the writer’s ability to communicate the content which the task required. Linguistic competence played a role when a lack of language interfered with the writer’s ability to convey the message, but once the readers established that this basic ability existed, they looked at the variety of language features which were used to express the connections between the events in the water cycle, and whether the content information matched that which was presented visually. The best text, it was decided, offered a focussed explanation using a variety of language and structures to show clearly the causal connections between the events pictured in the visual prompt. Reader two summed it up as follows:

I thought E2 was the best of them all. It had great language and great variety. It showed all the cause and effect connections and it was very to the point and precise.

Because these two discussion groups agreed that the writer’s construction of the causal line was an important determiner in the overall quality of the discourse, two sets containing five discourse samples reflecting the dimension of implicit and explicit causal relationships were chosen for closer inspection. These two sets, Set E and Set G, became the target for
discussion by two individuals who were using an assessment instrument based on the Canale and Swain framework to evaluate the five texts. The next section will highlight the areas which this instrument deemed important indicators of communicative competence as indicated by the evaluation discussion.

The Raters: Using the Assessment Instrument

As stated in chapter three, the assessment instrument evaluated five categories of competence: linguistic, sociolinguistic, discursive, strategic, and receptive. Linguistic competence was further divided into categories of vocabulary, mechanics (spelling and punctuation), morphology and syntax, and elements which are deemed important when assessing oral production, such as intonation, pronunciation, and delivery. The rating was done in a binary fashion. The writer received one point in a category if there were no problems exhibited, and zero if there were one or more examples of errors. For an illustration of this, see Table 4.1.

Whereas the earlier discussion groups maintained that the main criterion for judging a text was its ability to communicate the content, the discussion in this group focussed primarily on the aspects of the discourse related to violations of linguistic form and language rules. Talk did not center on how the writers used language features to construct the text, but on the errors which occurred in this construction and where they should be classified; in other words, the writers were faulted for their mistakes but not credited for their ability to use a variety of resources to express themselves. The three texts which made up Set G, for example, lost points for vocabulary problems and for errors in morphology and syntax. According to the raters, text G1 had “definitely a problem of vocabulary everywhere”; yet while it is true that this writer misused some words—most notably vapours—many of the
mistakes labeled as vocabulary errors revolved around the writer’s efforts to communicate with the linguistic knowledge he had. The following exchange illustrates the raters’ criticism of the writer’s efforts:

Rater 1: Now vapours. That’s not good vocabulary.
Rater 2: This is wrong, yeah.
Rater 1: And goes up to the sky.... That’s again vocabulary. It’s evaporates or something like that, right?
Rater 2: Yeah, the ocean water evaporates. And that makes clouds?

Vocabulary was faulted in G2 for similar reasons: the writer had stated that water *rises* rather than *evaporates*, yet her intention was still transparent. The readers in the earlier discussion groups, however, had found these same mistakes acceptable because they did not impede understanding.

Phrases which contained redundancies were usually considered mistakes in vocabulary as well. The writer of G1 was criticized for commenting that rain drops from the sky because the prepositional phrase *from the sky* was deemed unnecessary. The writer of G3 was similarly criticized for saying *by the sun heat*, a phrase which was judged incorrect in vocabulary usage as much as grammar.

The classification of errors seemed to be a major challenge for the raters. They frequently discussed which category the errors should be classified in. The following exchange on the topic of G2’s first sentence illustrates this difficulty:

Rater 2: ... So what do you classify that as?
Rater 1: Vocabulary.
Rater 2: No this is strategy because it how it rained it could also be... socio? I don’t know.
Rater 1: He’s not using the language the way...
Rater 2: Well I think it’s more grammar than anything else. No? Grammar or?
Rater 1: It’s probably a mixture of grammar and vocabulary.
Rater 2: Vocabulary in this case because the grammar is okay.
Rater 1: His grammar is okay... So it's vocabulary. Yeah. You're right.

This problem with category identification, as mentioned in chapter three, led to low reliability in the assessment of individual categories for this instrument even though the overall reliability was high. This suggests that when raters have to judge types of errors, they do not always agree on which of the components should be called into question.

In discussing the five discourse samples, it became apparent that the raters considered communication to be much more writer-responsible than reader-responsible because of the perspective from which the raters were judging the texts. As readers, they wanted to see an unambiguous, error-free text. When there was a problem which, according to the raters, rendered the entire text difficult to understand as a linked whole, the label of discursive problem surfaced. In text Gl, for example, the raters maintained that all the writer's failed strategic attempts resulted in an overall problem with the discourse because "the message is not coming across," and "I don't know what he wants to say actually." Furthermore, one rater implied that it was not the evaluator's duty to reach out for meaning:

Well, I think I know what this person means, but it's not clear, and we're not supposed to interpret. That's the problem. So if we don't interpret, we don't understand. Right?

These judgements came across as sounding much less reader-responsible in comparison to the opinions expressed by the readers in the other discussion groups. This could be a reflection of the raters' perspective on what the language user would need as a second language instructor.

There were some similarities between these raters' discussion and that of the other readers. The first concerned text G2. Whereas the other readers observed that the writer of G2 had not provided the same level of detail as the writers of G1 and G3 had, the raters in
this discussion noticed that there was “something missing in between those thoughts.” They concluded that there were no links, and after briefly considering this a strategic problem “because there’s something missing there for us to understand,” they decided to label the difficulty a discourse error. The second similarity concerned the issue of audience. In the raters’ discussion, this came up when they attempted to determine which texts should retain their point for sociolinguistic competence. Rater two initially stated that if sociolinguistic competence was to be included in the assessment, all the texts should receive a point. She soon agreed with rater one, however, that G1’s text was “a bit childish” because the vocabulary was basic. Rater one also insisted that G2’s text was too “elementary” as well. A final decision on the category of sociolinguistic competence was not reached.

The use of the visual prompt in the assessment contrasted in an interesting way between this group and the earlier discussion groups. Whereas the previous readers had judged the adequacy of the text to a great extent on its similarity to the visual representation of the water cycle, criticizing it if it included only “part of the picture,” the raters in this discussion appeared to use the visual to establish the truth value of the statements. The following discussion of text G1 illustrates this clearly:

Rater 1: So flow through a river. I don’t see any flowing through a river here in the picture, so where would that be?
Rater 2: Oh yes, it’s a stream. It could be a river because the river goes to the ocean. Yeah.
Rater 1: To me a river is way bigger than this little thing there.
Rater 2: Yeah, but this is a portion of a picture. Okay? We don’t have the whole thing. No, this is a river. Definitely.

Had the raters decided that the waterway in the visual was indeed a stream, vocabulary would have been targeted as the problem area. This was indeed the case with the same writer’s description of what makes clouds. Rater two believed the usage reflected a strategic
problem, but rater one convinced her that the writer was simply “describing what he’s seeing in the picture” and that’s “what the picture shows.” The difficulty was consequently treated as a vocabulary error because *makes* was considered an inadequate term for the process shown in the visual.

The assessment of Set E resulted in a rating which in no way reflected the previous groups’ discussions. Instead of noticing a difference in the two texts with E2 being credited as the better of the two, these raters judged them as equal, and neither achieved a perfect score. The writer of text E1 was faulted in the area of mechanics because she spelled *watersheds* as two words. A mechanics problem was also apparent in E2: the raters considered it wrong to use an upper case letter after a colon. These raters had good things to say about the texts in Set E as well. Rater one, for example, appreciated the writer’s use of *meanders*, commenting that it was “a nice word.” Text E2, both raters agreed, made sense:

> This one is uh textbook, unless no I don’t see anything wrong unless uh but I’m not a scientist. But as far as the English and the you know like the sequence, it makes sense.

Unfortunately, there was nothing in the assessment instrument that would allow the raters to add points for exceptional work because it was assessing minimum acceptable levels of competence.

Table 4.1 shows the ratings that resulted from this assessment. Because the issue of sociolinguistic competence remained unsolved, it is not included in the overall score, which consequently is out of six. The only category in which all texts retained points was the area of receptive competence. The raters agreed that based on the discourse samples, all five writers understood the task and should therefore receive credit. This table, however, does not reflect the raters’ intuitive judgements. In their opinion, text E2 was definitely “more
advanced,” “scientific,” and at a “higher calibre than” the others. Text E1 was given second place for overall quality, yet the raters admitted that the assessment instrument would not account for this discrepancy:

Researcher: So E1 and E2 you consider to be equal.
Researcher: But intuitively?
Rater 1: To me E2 is a higher calibre than
Rater 2: Yeah, yeah, yeah.
Researcher: It’s more sophisticated or?
Rater 2: Yeah, yeah.
Researcher: But there is nothing in your instrument that would make that difference?
Rater 1: No.
Rater 2: No.

They stated that the only way they could distinguish levels with the assessment instrument was when there were errors, and because E1 and E2 did not contain a great number of errors, they were difficult texts to assess.

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Intuitively, the raters placed text G3 in third place, a position which mirrored the evaluation done by the other two discussion groups but did not reflect the evaluation done by the assessment instrument. By examining the transcripts of the discussion, it became obvious that text G3 was not given this third place standing through its positive merits; according to the raters, texts G1 and G2 simply had more problems which made them lower in level than G3. Text G2 was given fourth place, and text G1, the raters claimed "is definitely the last." They agreed that the discourse of G1 was "too elementary, too basic" and that "it would not be understood." To attempt to teach with this level of English, they said, "would be... a laughable matter." Text G2, on the other hand, was only "missing thoughts that link the sentences," a situation which was not as disturbing as the quantity of linguistic errors which filled the text of G1. This order of G1 and G2 does appear to reflect a judgement of linguistic form; the previous four readers considered G1 more adequate and complete than G2 as far as communicating the content.

When the raters were asked about the contrast between their intuitive judgements and the scores assigned by the assessment instrument, they claimed that the same kinds of problems surface when they evaluate second language writing samples. At times, they said, they felt frustrated because of the instrument’s focus on linguistic elements. Rater two, in particular, expressed her dismay:

We have the same problem when we correct the [second language] one. You see... sometimes I’m so disappointed because it was so good and then it was sad because he put something in the middle that cancelled everything else.... Sometimes I think... this one has a good grade but really the [second language] it’s correct but it’s not it’s not the level that I’m expecting you know and some others are beautiful... but they don’t know how to spell.
The binary assessment instrument that the raters used, and which because of its dependence on the framework, classifies errors into categories, did not allow them to make a qualitative judgement of the discourse. The quality of the writing is considered important, however, and so a more qualitative evaluation is done at a later stage by a language education professional who judges the texts using a more intuitive approach.

**Conclusion**

No reliable conclusions can be made from such a limited number of readers making informal and intuitive judgements on the quality of the discourse; nor can the assessment instrument based on the Canale and Swain framework be truly challenged by these findings. The discussions do, however, suggest that there are differences in the five texts in this study which are noticeable intuitively, but which may not be adequately addressed by the assessment instrument. Table 4.2 summarizes these differences in focus between the two groups, listing factors which were important in judging the quality of the text as “major” and those factors which were not attended to or considered unimportant in the discussions as “minor.” The fact that there were so few similarities in the content of the discussions between the readers in the first two discussion groups and the raters in the final session suggests that there may be conflicting definitions of communicative competence, at least as this concept pertains to academic writing. The readers in the first two discussion groups were interested primarily with how the writers communicated their meaning, and linguistic accuracy only concerned them if the lack of it prevented the reader from understanding, yet the latter two raters focused on the errors that were made as the writers attempted to express themselves. As reader two explained:
I guess we could look at it from two different points of view. If you’re looking at it as a science teacher, like let’s say you’re a junior high school science teacher and then you think they’re all language mistakes and they’ll learn, but I want to see their understanding of it. But if it was just a language course and for some reason you had this picture and it doesn’t bother you at all as to whether they understand the connections or they don’t, then you’d look at the grammar and you’d think well they start with a present tense then they go on with a past tense and it’s inconsistent so I have to take points off for that.

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<th><strong>Assessment Instrument</strong></th>
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<tr>
<td><strong>showing cause and effect</strong></td>
<td>✔</td>
<td>✔</td>
</tr>
<tr>
<td><strong>register</strong></td>
<td>✔</td>
<td>✔</td>
</tr>
<tr>
<td><strong>transitions (cohesion)</strong></td>
<td>✔</td>
<td>✔</td>
</tr>
<tr>
<td><strong>use of the visual</strong></td>
<td>✔</td>
<td>✔</td>
</tr>
<tr>
<td><strong>showing the visual line in the discourse</strong></td>
<td>✔</td>
<td>✔</td>
</tr>
</tbody>
</table>
The comment above brings an interesting issue to the surface. If the focus is on grammar and “it doesn’t bother you at all as to whether they understand the connections or they don’t,” what purpose does the visual prompt serve? In the first two discussions, the visual line of the cycle was compared to the line of meaning, and the writer was judged able to communicate the content if the text followed that line with little interference by linguistic difficulties. Favorable ratings were given to those texts which contained all the events on the visual line and made the causal connections between them. In the final discussion group, however, the visual prompt played a much weaker role. The focus was placed on the errors the writer made when describing parts of the visual rather than the message that was being attempted, and efforts to communicate content were negatively assessed unless they could be accomplished in an error-free manner.

The binary method on which the assessment instrument depended reflected to a great extent Chomsky’s 1965 definition of competence as knowledge of the language system. The writer either had or did not have the knowledge needed to complete the task successfully. Except for the notions of strategic and discursive competence—which also depended exclusively on linguistic accuracy—the instrument did not appear to be able to judge language use: how the writer used this linguistic knowledge to communicate the content. It was not clear whether the instrument could distinguish between, for example, text E1’s sequential “description” and E2’s more scientific, causal “explanation” or between G1’s sequential discourse and the causal text written by G3, even though this dimension surfaced in the intuitive judgements of all six professionals involved in the discussions.

The raters admitted that their assessment instrument was unable to judge “the calibre” or “sophistication” of the text because of its dependence on errors to determine the various
levels. Although the instrument could illustrate the areas in which a writer had insufficient knowledge to use the language features correctly, it was not clear whether it could show how the writer integrated a variety of language features to communicate the content as a whole.

In sum, the discussions raised the suspicion that because Canale and Swain’s framework focuses on components and categories, an assessment instrument based on it may have problems determining which category to work with. Furthermore, the discussion implied that the framework may not be useful for adequately evaluating the types of written discourse presented in this research. If it is indeed the case that the framework is unable to determine these differences, it is missing out on important aspects of academic discourse, and its claim to evaluate “communicative competence” becomes questionable.

In the next chapter, the five texts which were assessed by all discussion group members will be analyzed using a functional approach to discourse analysis. This approach will address the line of meaning which the earlier discussion groups valued and show how writers use various language features to construct this line. It will attempt to illustrate why text E2 was intuitively judged better than text E1. Chapter five will also address the connection between the verbal line of meaning and the line which is expressed visually, a connection which the first two discussion groups found crucial in evaluating the communicative adequacy of the written discourse.
Chapter Five: The Functional Analysis of the Discourse

In chapter two, Longacre's (1990) concept of the storyline was introduced, as was the notion that writers use various language features to construct this storyline. In that discussion, it was further observed that other forms of discourse have similar lines of meaning. This chapter will concentrate on an analysis of the causal chain of the water cycle, and examine how writers use various language features to construct this line of meaning in their discourse.

The causal chain of the water cycle consists of a series of events which are related to each other both temporally and causally. One can claim that the events on this line are related sequentially in time in that event A comes before event B. Similarly, the events may be in a cause and effect relationship with event A causing event B. To give an adequate account of the water cycle, a writer needs to convey both types of relations in the discourse. How this is accomplished will be discussed in the following pages.

This chapter is divided into two main sections. The first section will concentrate on various accounts of the water cycle and show how writers use the lexicogrammar of English to construct their lines of meaning, beginning with a brief analysis of causal discourse as it is approached by systemic linguists. This initial section will be further divided into discourse samples which focussed primarily on the sequential nature of the water cycle, examining how this line is elaborated in the lexicogrammar. This discussion will be followed by an investigation into how writers use the lexicogrammar to construct a causal line of meaning. For both types of discourse—sequential and causal—it will be shown how writers vary in their degree of elaboration, and consideration will be given to the implications of this variation for the assessment of discourse.
The second section of this chapter will look at how the visual prompt was expressed in the discourse. The visual was used in this research as a prompt to support and guide writers as they wrote their accounts of the water cycle. It was noted in chapter two that there has been relatively little discussion of the ways in which visuals are coded into discourse. Test designers have used visuals to elicit discourse, yet there has been little attention paid to the connections between the verbal and visual beyond noticing that the intended match did not always occur. This section will examine the link between the discourse and the diagram and illustrate some of the ways in which writers varied in their verbal expressions of the visual element. The intention here is not to offer a framework for choosing reliable visual prompts for testing, but to identify some of the discourse evidence of coding as a basis for future discussions.

Section One: Water Cycle Accounts and the Elaboration of Lexicogrammar

The View of Causal Discourse from Systemic Linguists

Michael Halliday’s views on discourse, meaning, and communicative competence were discussed in chapter two, and his work, as well as that of his followers, was reviewed in light of the current research. This brief section will look at how scientific discourse mirrors and builds on scientific knowledge, as presented by Halliday and Martin (1993), and particular attention will be paid to causal discourse.

Halliday and Martin began their book Writing science: Literary and discursive power (1993), stating that “adults may choose to deny it, but children in school know very well that there is a ‘language of science’” (p. 2). This ‘language of science’, according to the authors, has over time been constructed in the lexicogrammar of a language to where it not only reflects scientific knowledge, but it allows for the continued construction of this knowledge.
Scientific discourse makes great use of grammatical language features such as complex nominalizations to change, for example, what is simply observable into scientific fact; in other words, “a happened” becomes “happening a,” a change which, through the grammar of the language, elevates ‘a’ from a simple, observable event to a piece of scientific knowledge. Halliday and Martin stated:

The evolution of science was the evolution of scientific thought. But thought—not all thought perhaps, but certainly all systematic thought—is construed in language; and the powerhouse of a language is its grammar. (1993, p. 12)

This shows, once again, the systemic views on the connections between form and function. Scientific meaning is built into the discourse by combining various features of the language—both grammatical and lexical—and a writer’s ability to compose scientific texts depends to a great extent on his or her ability to manipulate the lexicogrammar of the language.

Halliday and Martin described how the discourse of cause and effect has evolved over time from a simple construction of “a happens; so x happens” to “happening a is the cause of happening x” (1993, p. 66). As shown above, this illustrates a progression from events which are observable to nominalized forms which assume that the observed events have become scientific knowledge. This historical evolution from simpler to more advanced is also demonstrated in the way science is presented in school. Veel (forthcoming) noted that the language of science in the school curriculum shows a progression from simpler sequential explanations based on hands-on activities and observable phenomena to more abstract explanations which demonstrate an understanding of the cause-effect relationships between the events being described. Both types of explanations use the same generic
framework of an explanation sequence, and both establish a time line, yet causal discourse
goes one step further by elaborating on the causal connections between the events. There are
both simple and difficult language features available to describe both types of discourse.

The following short extracts from two science textbooks illustrate the dimensions
suggested by Halliday and Martin (1993) and Veel (forthcoming). Both examples are taken
from explanations of the water cycle, yet the two are very different:

1. Later that same day, the sun may have come out. And the puddles were gone!
   (Blecha, Beugger, Gega, Green, & Wied, 1977, p. 207)
2. Heat from the sun causes water in Earth’s oceans to evaporate.
   (Aldridge et al., 1993, p. 368-9)

Example one, taken from a science textbook targeted for use in elementary schools, offers
two events—*the sun comes out* and *the puddles disappear*—which students can relate to
based on their own experiences and observations. Although the grammatical construction is
somewhat more complex, example one is comparable to Halliday and Martin’s simple
construction:

\[
\begin{align*}
\text{a happens;} & \quad \text{the sun may have come out} \\
\text{so} & \quad \text{and} \\
\text{x happens} & \quad \text{the puddles were gone}
\end{align*}
\]

Rather than an explicit cause and effect structure using *so*, however, the two events are
sequenced in time through the use of such words as *later*. The cause and effect relationship
is only implicitly stated through this time line.

Example two, taken from a high school science textbook, does not explicitly show a
time line of events, although it is easy to determine the order in which the events occur.
Instead, the line of meaning is expressed through causal connections.
The preceding two examples from contemporary textbooks offer a simple and straightforward introduction to the ways in which writers use what Halliday and Martin refer to as the lexicogrammar of English to construct a cause and effect line of meaning. Whether the discourse focuses merely on a sequence of events or whether it shows causal relationships is an important factor in establishing the level of sophistication in the writing. These dimensions have evolved through history, as Halliday and Martin (1993) have noted, and they exist in textbooks and reference materials used in the schools, as shown above and discussed by Veel (forthcoming). The next section of this chapter will look at how the writers in this study used the lexicogrammar of English to construct a causal line of meaning. The first three writers focussed on the sequential nature of the discourse, leaving the causal relationship implicit through the ordering of events on the time line. These three writers vary to some extent in their use of the language features to build this line. Following this will be an examination of the discourse of two writers who chose to show an explicit causal relationship between the events on the time line, and in doing so varied in their use of the language features characteristic of cause and effect.

Focus on Sequence: G1’s Discourse

On the surface, the written discourse produced by G1 offers a basic but adequate description of the water cycle, although there are some problems with grammar and vocabulary:

You can see clouds in the sky. But where is rain come from? First, rain drops on the land from the sky and that rain water get together. Second, water that get together flow through a river and goes down to the ocean. Third, the ocean water vapours and goes up to the sky and that makes clouds. Thus, water cycle is characterized through this process.
As shown in Table 5.1, G1 identified the phenomenon that he will write about, where rain comes from, then proceeded to list in a sequential fashion the steps which occur in the water cycle. G1 used the causal conjunction thus in his final sentence to tie all the phases of the explanation sequence together and identify it as a causal process: these steps happen in this order, so the water cycle exists. The steps which G1 used to construct his explanation sequence make up what Veel (forthcoming) refers to as the “phases of explanation sequence,” phases which are characteristic of both the language of sequence and of cause and effect. To avoid confusion, it should be noted that both sequential and causal explanations contain explanation sequences, and in this paper, the explanation sequence is synonymous with the main line of meaning.

Table 5.1: G1's explanation sequence

<table>
<thead>
<tr>
<th>Phenomenon Identification:</th>
<th>You can see clouds in the sky. But where is rain come from?</th>
</tr>
</thead>
<tbody>
<tr>
<td>Explanation sequence:</td>
<td></td>
</tr>
<tr>
<td>Phase 1:</td>
<td>First, rain drops on the land from the sky</td>
</tr>
<tr>
<td>Phase 2:</td>
<td>and that rain water get together.</td>
</tr>
<tr>
<td>Phase 3:</td>
<td>Second, water that get together flow through a river and goes down to the ocean.</td>
</tr>
<tr>
<td>Phase 4:</td>
<td>Third, the ocean water vapours and goes up to the sky</td>
</tr>
<tr>
<td>Phase 5:</td>
<td>and that makes clouds.</td>
</tr>
<tr>
<td>Phase 6:</td>
<td></td>
</tr>
</tbody>
</table>
According to Veel, there are a variety of language features which characterize causal and sequential explanations. Some features, such as the sequencing devices used to establish an explicit time line in the explanation sequence, are common to both types. Others, such as the use of causal conjunctions, dependent clauses of cause, circumstances of cause, and processes of causation, help show an explicit causal relationship. Because G1’s discourse contains explicit sequence lexis and relatively few examples of the language of cause and effect, it reflects primarily a sequential explanation which only implicitly shows a cause and effect relationship.

The main language features which can be used as devices to build an explanation sequence are sequence words, such as first, second, and finally; dependent clauses of time, such as as clouds become full of water; circumstances of time, such as in the rainy season; time as process, such as the cycle begins; and time as participant, such as the first step in the cycle. Out of these sequencing devices, G1 used words such as get together, flow, go down, and go up, which only weakly suggest time as process, and depended primarily on the sequence words first, second, and third to construct his time line. These sequence words helped organize his paragraph, and the cohesion was reinforced by his strategy of using given and new information:

... rain come from
... rain drops ... water get together
... water that get together ... ocean
... ocean water ... clouds

The combination of the two strategies added strength to G1’s written discourse.

Other language features which are characteristic of sequential explanations, according to Veel, are circumstances of place, circumstances of means, the timeless present tense, and
the use of the passive voice. Circumstances of place, which tend to appear later in the sentence than phrases indicating time and therefore help to establish a theme/rheme pattern of cohesion, refer to the locations in which the events in the sequence take place. Their inclusion helps make the explanation seem less abstract or theoretical. G1 used place in phases one, three, and five to help establish the sequential and cyclical nature of his discourse: he explained that the rain drops on the land from the sky, this water flows through a river to the ocean, and the ocean water (water from the ocean) goes up to the sky, bringing the cycle full circle through his use of place.

Circumstances of means refers to the processes or means by which an event occurs, as shown in the following example taken from a grade eleven textbook. The circumstances of means have been italicized:

Some returns to the air by evaporation from the ground or by transpiration.
(Namowitz & Spaulding, 1987, p. 122)

The phases in G1’s explanation sequence do not contain any examples of this language feature, although the final sentence in which he summed up the process has one example: the water cycle is characterized through this process.

Although G1 used the timeless present tense consistently in his discourse, a strategy that identifies this passage as an explanation rather than a recount, he used the passive voice only once, in the final sentence. This is understandable. According to Veel (forthcoming), the passive voice is used in explanation sequences to give focus to the object undergoing the process. Placing the object consistently in theme position adds to the cohesion of the text and can help readers follow the object through the many processes it may undergo. In the water cycle, however, no single item undergoes the various processes, at least on the
observable level. The passive voice therefore rarely appears in any of the discourse samples collected during this study.

Another significant language feature of explanation sequences of both sequential and causal explanations and of scientific discourse in general is nominalization, a process through which a verb is turned into a noun. The following example offers a clear example:

This graphic... shows the process whereby water is converted to vapour....
The sun causes the evaporation...

The event or verb phrase, water is converted to vapour, has been turned into a noun which represents the process, evaporation, thereby compressing the information and lifting it from that which might be considered an observable happening to a more abstract level reflecting scientific knowledge. Nominalization allows writers to turn happenings or events into things, a strategy which is important for two reasons: it establishes cohesion by indicating the line of meaning through given and new information or through theme and rheme position, and it constructs knowledge through the introduction and definition of technical terms. The following example, taken from a grade five science textbook (Shymansky et al., 1990, p. 24), illustrates this. The italics indicate the event and the nominalized phrase, and the underlined phrase is the new term being introduced:

At the surface of the ocean, water evaporates.
theme rhyme

As the evaporated water, or water vapor, goes into the air,
theme

the salt stays behind in the ocean.
rheme

Although G1 used a strategy of given and new information, he did not demonstrate a strong ability to nominalize and neither did he introduce technical terms into his description. His
only attempt at nominalization was to change the event, *rain water get together*, into the noun phrase, *water that get together*, which closely resembles the event and which is clearly not a technical term, but simple, common-sense language. In fact, the only word he defined was *clouds*, which he stated are made from ocean water that evaporates, or *vapours* as he wrote, and rises.

Interestingly enough, the only term for which G1 attempted a definition for appears in the only phase of the explanation sequence which shows an explicit cause and effect relationship: *and that makes clouds* (phase six). As table 5.2 shows, much of G1’s discourse consists of happenings or events described in common-sense language and linked by words which suggest a time relationship; the causal connections between these events are only implicitly stated through the time line. His text is comparable to the example of the sun shining and the puddles disappearing, which illustrated Halliday’s construction of “a happens; so x happens.” The events in phases one through three are happenings that anyone can relate to based on observation and experience: rain drops, collects, and flows through

### Table 5.2: The phases of G1’s explanation sequence

<table>
<thead>
<tr>
<th>Phase</th>
<th>Linking word</th>
<th>Event or action</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>First</td>
<td>rain drops</td>
</tr>
<tr>
<td>2</td>
<td>and</td>
<td>rain water get together.</td>
</tr>
<tr>
<td>3</td>
<td>Second</td>
<td>water that get together flow through a river... to the ocean.</td>
</tr>
<tr>
<td>4</td>
<td>Third</td>
<td>ocean water vapours</td>
</tr>
<tr>
<td>5</td>
<td>and</td>
<td>goes up to the sky</td>
</tr>
<tr>
<td>6</td>
<td>*and that</td>
<td>makes clouds.</td>
</tr>
</tbody>
</table>

*suggests a causal rather than a sequential relationship
rivers down to the ocean. Beginning at the end of phase four, however, the events become less observable and more abstract through the introduction of the word *vapours*, G1's term for *evaporates*, and the causal connections start to become somewhat more explicit. Phase five suggests a weak causal relationship resulting from the intended meaning of *vapours* in phase four, and in phase six, where G1 defined *clouds*, the discourse has gone beyond a simple time-line description of "*x* happens" to a phrase which attempts to explain that "*happening a causes happening x.*" In other words, G1 did not simply state that clouds appeared; instead he implied that they formed because ocean water evaporated and rose to create them. In this single phase, he moved from the common-sense language of *how* something happens—a simple event—to an explanation of *why* it occurs:

\[
\text{and that [the evaporated ocean water which has risen] makes clouds produces result}
\]

G1 constructed knowledge through his definition of *clouds*, and he defined a term by showing a causal relationship.

The focus of the discussion up to this point has been on G1's explanation sequence, the middle section of his written discourse. It has been shown that he used common-sense language to describe a sequence of events rather than using a variety of the language features which explicitly identify causal discourse. In G1's phenomenon identification, he asked the question *but where is rain come from?* The phrase *come from*, being an example of causal lexis rather than an enquiry about which direction rain clouds have arrived from, makes G1's question one that begs a causal explanation, yet this is not delivered in his explanation sequence. Furthermore, an answer does not materialize in his final sentence, even though it contains a possible example of causal lexis: *thus*. As mentioned earlier, however, the final
sentence does serve to tie the explanation sequence together as a piece of causal discourse, in
spite of its failure to answer G1's question.

The ways in which the line of meaning is constructed—the types of language features
which are used to build this line and the extent to which the line reflects sequential events or
causal actions—help determine the quality of the discourse. Table 5.3 shows that rather than

<table>
<thead>
<tr>
<th>Table 5.3: Language features used in G1’s discourse</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>sequence words</strong></td>
</tr>
<tr>
<td>dependent clauses of time</td>
</tr>
<tr>
<td>circumstances of time</td>
</tr>
<tr>
<td>time as process</td>
</tr>
<tr>
<td>time as participant</td>
</tr>
<tr>
<td>circumstances of place</td>
</tr>
<tr>
<td>circumstances of means</td>
</tr>
<tr>
<td>timeless present</td>
</tr>
<tr>
<td>passive</td>
</tr>
<tr>
<td>nominalizations</td>
</tr>
<tr>
<td>causal conjunctions</td>
</tr>
<tr>
<td>dependent clauses of cause</td>
</tr>
<tr>
<td>circumstances of cause</td>
</tr>
<tr>
<td>processes of causation</td>
</tr>
<tr>
<td>definition of terms</td>
</tr>
<tr>
<td>introduction of technical terms</td>
</tr>
<tr>
<td>events (sequence of happenings)</td>
</tr>
<tr>
<td>actions</td>
</tr>
<tr>
<td></td>
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<td></td>
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<tr>
<td></td>
</tr>
</tbody>
</table>
showing causal actions and competently using a wide variety of both sequencing and causal language features to construct an explicitly causal line of meaning in his written text, G1 relied heavily on sequencing events using words such as first, second, third, and and, although circumstances of place helped establish the time line, and some of the verbs he chose weakly suggested time as process. His ability to nominalize events was shown to be weak, and his failure to introduce or define any technical terms limited his ability to demonstrate the construction of knowledge. The limitations exhibited in the lexicogrammar of G1’s discourse, combined with the mismatch between his intended causal explanation and the sequence of events that he delivered, resulted in a line of meaning which was not particularly well constructed, in spite of how adequate his discourse may appear to be on the surface.

**Focus on Sequence: E1’s Discourse**

Like G1, E1 chose to construct a line of meaning which reflects an explicitly sequential explanation of the water cycle, and like G1, she chose to question the reader in her phenomenon identification:

```
The water cycle.
What are the processes that “water” goes through?
1) Initially, the water cycle begins as snow melts from the glaciers.
2) The water then meanders through various water sheds until it reaches rivers and lakes. Water eventually reaches the oceans.
3) Water, then, becomes water vapour (it evaporates into the air) and accumulates in what we call clouds.
4) The “clouds” then distribute water in the form of rain, snow, or sleet back to the mountains where the cycle begins again.
```

E1’s explanation sequence, like G1’s, favors a sequence of events. Furthermore, rather than relying exclusively on verbal sequencing devices such as first and second, E1 chose to
number the steps of the process, a strategy which seems redundant, as can easily be seen in phases one, three, six, and nine in table 5.4. This numbering of the steps can make the writing appear very simplistic and unsophisticated.

Table 5.4: El's explanation sequence

<table>
<thead>
<tr>
<th>Phenomenon Identification:</th>
<th>Explanation Sequence:</th>
</tr>
</thead>
<tbody>
<tr>
<td>The water cycle.</td>
<td></td>
</tr>
<tr>
<td>What are the processes</td>
<td></td>
</tr>
<tr>
<td>that “water” goes through</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Phase</th>
<th>Linking word</th>
<th>Event or action</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>1); initially</td>
<td>the water cycle begins</td>
</tr>
<tr>
<td>2</td>
<td>as</td>
<td>snow melts</td>
</tr>
<tr>
<td>3</td>
<td>2); then</td>
<td>water meanders</td>
</tr>
<tr>
<td>4</td>
<td>until</td>
<td>reaches rivers and lakes</td>
</tr>
<tr>
<td>5</td>
<td>eventually</td>
<td>reaches oceans</td>
</tr>
<tr>
<td>6</td>
<td>3); then</td>
<td>becomes water vapour</td>
</tr>
<tr>
<td>7</td>
<td></td>
<td>it evaporates</td>
</tr>
<tr>
<td>8</td>
<td>*and</td>
<td>accumulates in clouds</td>
</tr>
<tr>
<td>9</td>
<td>4); then</td>
<td>distribute water</td>
</tr>
<tr>
<td>10</td>
<td>*where</td>
<td>cycle begins again</td>
</tr>
</tbody>
</table>

*suggests a causal rather than a sequential relationship

Unlike G1’s written discourse, E1’s composition does not show a clear pattern of given and new information. She introduced the topic of the water cycle in her phenomenon identification and asked the reader to consider the processes which water goes through, enclosing water in double quotation marks. Her explanation sequence began with the water cycle as theme and the melting snow of the glacier as rheme. Water became the theme for
the next three sentences, and clouds, the rheme of the last of these sentences, became the theme of the final sentence. When examined from this perspective, the pattern of the information sequence, or E1’s line of meaning in her discourse, indicates the following pattern:

The water cycle ... snow melts from the glaciers.
The water ... rivers and lakes.
The water ... oceans.
The water ... clouds.
The clouds ... the mountains.

The frequency of water in theme position adds to the cohesion which she established primarily with her sequencing devices.

In spite of her lack of a clear given and new rhetorical pattern, the apparent simplicity of her sequencing devices, and her focus on events rather than actions, the description of the water cycle which E1 offered still appears to be higher quality or more sophisticated than the one G1 wrote. An analysis of the way in which E1 constructed her line of meaning in the discourse may help explain why this is so.

A major difference between G1’s and E1’s discourse lies in the variety of sequencing devices that each used to establish the time line in the explanation sequence. Whereas G1 relied on the simple ordinal numbering of first, second, and third to connect his sentences, and the linking word and to connect events between phases within the same sentence, E1 chose vocabulary such as initially and eventually to link her phases temporally. Even though she used and twice and then three times, she was able to combine various sequencing devices to construct her time line. An example illustrating this combination appears at the beginning of her explanation sequence (phases one and two). She included a sequencing number (1), a sequencing word (initially), a verb which strongly suggests time as process

93
(begins), and a dependent clause of time (as snow melts from the glaciers) which included the sequence word as:

1) Initially, the water cycle begins as snow melts from the glaciers.

Out of the five main sequencing devices which are commonly used to establish the time line in an explanation sequence, G1 used only simple sequence words and everyday terms that weakly indicated time as process. E1 used a wider variety of devices in just one sentence.

The verbs each person used to define the time line are also worth examining. Whereas for his explanation sequence, G1 chose simple everyday phrases such as get together and flow and used only makes to show cause as process, E1’s use of words like meanders and melts reflects a greater command of English vocabulary. Furthermore, she used the explicitly causal term evaporates, albeit parenthetically to clarify the term water vapor. E1’s use of accumulate differs considerably from G1’s use of get together, even though the two terms can be considered similar. E1 used accumulates to imply a “build-up” rather than simply stating an event. Her construction suggests that it is the accumulation, the accumulative effect, of water vapor which causes clouds. G1, on the other hand, simply stated an event in which the rain water got together without suggesting that this happening caused anything further.

In phase nine, which comprises the first clause of her final sentence, E1 indicated a causal relationship in her time line through the use of the verb distribute:

The “clouds” then distribute water in the form of rain, snow, or sleet

Moreover, she suggested in this sentence (phase nine and ten) that it is this distribution of the water which causes the cycle to begin again.
The clause *where the cycle begins again*, although technically a circumstance of place (the mountains), carries some causal suggestion from the term *cycle*. The word *back* further helps to reinforce the relationship by illustrating the cyclical nature of the description.

Whereas Gl went outside of his explanation sequence to mention that the stated process characterized the water cycle, El showed within her time line that the cycle can begin again because the water has gone in a complete circle and is now back in the mountains where the cycle initially began. Both writers used some causal language, but El incorporated it implicitly into her line of meaning rather than leaving it on the outside to sum up the overall process.

Early in El’s composition, she stated that the cycle began when the snow melted from the glaciers. She concluded by suggesting that clouds distribute water in the form of snow back into the mountains. Her use of *back* not only helped establish the causal relationship and the rhetorical pattern, it offered the readers a context through which they could attempt a definition of the term *glacier*. If readers can visualize the cycle through the writing, they can infer that glaciers are made from the water which falls on the mountains. As suggested during the discussion of Gl’s definition of *clouds*, introducing and defining technical terms plays an important role in the construction of meaning, and these definitions are often accomplished through language which explicitly shows cause and effect relationships.

Both El and Gl stated that clouds were made up of ocean water which had evaporated and risen, thereby offering similar definitions. El, however, also introduced and attempted to define the technical term *water vapor* by rephrasing the concept parenthetically and using the verb *evaporate*. Furthermore, she helped the reader understand that this word means that the water becomes similar enough to air that it can somehow be absorbed “into” it. Through
her description, therefore, she built on the reader's comprehension of everyday language by introducing and explaining terms. An exception to this is the term \textit{watershed}, which she introduced but inadequately defined: the only clues as to the meaning were that they exist between glaciers, which the reader may know are in the mountains, and bodies of water such as lakes and rivers, which can also be located in the mountains.

Both G1 and E1 favored events over actions in their descriptions of the water cycle. Their preference for stating temporal events resulted in discourse that focused more on sequence than on cause and effect.

Although E1 failed to attempt any nominalizations in her discourse, table 5.5 shows that she used a variety of other language features to construct her line of meaning. E1 demonstrated an ability to write sentences which were syntactically complex, she maintained the timeless present voice in her composition, and she chose vocabulary which helped her construct a more explicit causal text. Although her description still strongly resembled a sequential explanation, particularly due to her overt numbering of the steps, her more subtle incorporation of language which hints at cause and effect, her introduction and definition of terms, and her lexicogrammatical elaboration within the category of sequential language features helped her create a text which appeared considerably higher in quality than the one G1 wrote.
<table>
<thead>
<tr>
<th>Table 5.5: Language features used in E1’s discourse</th>
</tr>
</thead>
<tbody>
<tr>
<td>sequence words</td>
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<tr>
<td>dependent clauses of time</td>
</tr>
<tr>
<td>circumstances of time</td>
</tr>
<tr>
<td>time as process</td>
</tr>
<tr>
<td>time as participant</td>
</tr>
<tr>
<td>circumstances of place</td>
</tr>
<tr>
<td>circumstances of means</td>
</tr>
<tr>
<td>timeless present</td>
</tr>
<tr>
<td>passive</td>
</tr>
<tr>
<td>nominalizations</td>
</tr>
<tr>
<td>causal conjunctions</td>
</tr>
<tr>
<td>dependent clauses of cause</td>
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<tr>
<td>circumstances of cause</td>
</tr>
<tr>
<td>processes of causation</td>
</tr>
<tr>
<td>definition of terms</td>
</tr>
<tr>
<td>introduction of technical terms</td>
</tr>
<tr>
<td>events (sequence of happenings)</td>
</tr>
<tr>
<td>actions</td>
</tr>
</tbody>
</table>
Focus on Sequence: G2's Discourse

The following written description of the water cycle was offered by G2:

This is a diagram of how it rains. The water from lakes and oceans rises and forms clouds. Eventually it would start to rain. The water would flow from streams and pond back into lakes and oceans and the cycle would start again.

She identified the topic she planned to write about and followed this with a three-sentence, five-phase explanation sequence in which she attempted to show the time line:

Table 5.6: G2's explanation sequence

<table>
<thead>
<tr>
<th>Phenomenon Identification:</th>
<th>This is a diagram of how it rains.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Explanation Sequence:</td>
<td></td>
</tr>
<tr>
<td>Phase</td>
<td>Linking word</td>
</tr>
<tr>
<td>-------</td>
<td>--------------</td>
</tr>
<tr>
<td>1</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td><em>and</em></td>
</tr>
<tr>
<td>3</td>
<td>eventually</td>
</tr>
<tr>
<td>4</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td><em>and</em></td>
</tr>
</tbody>
</table>

*suggests a causal rather than a sequential relationship

A noticeable and interesting difference between G2's description and those written by G1 and E1 is her preference of would over the timeless present usually used in explanation sequences. The word would can be used to demonstrate notions of cause and effect explicitly as the following example, taken from a grade seven science text, illustrates:

Without the water cycle, it would be difficult for living things to survive. (Barr & Leyden, 1979, p. 146)

In this example, the authors used a dependent clause of cause, without the water cycle, to construct a causal line of meaning, which is understood to mean because the water cycle
exists, living things are able to continue living. The use of would implies that not having the water cycle is a situation which is contrary to fact; the water cycle does in fact exist in nature. G2’s use of would does not reflect the same level of sophistication. She may have wanted to imply a causal relationship, but the language features which are characteristic of causal discourse, such as dependent clauses of cause, causal conjunctions, and the stating of causal actions rather than sequential events, are still lacking in her text, resulting in a line of meaning which only implicitly suggests causality. G2’s description, like G1’s and E1’s, is therefore primarily a sequential one.

Unlike G1’s use of ordinal numbers and E1’s combination of words and numbers, G2 used only the sequence word eventually in her description of the water cycle. She reinforced her time line by using such time-as-process words as start, a strong indicator of time which she used twice in her brief paragraph. Her syntax remained simple with no dependent clauses of time, and she provided no examples of nominalization. She offered a few examples of circumstances of place in support of her time line, namely lakes and oceans (using both from and into with this phrase) and into streams and ponds.

G2’s paragraph does not show cohesion through a strategy of using given and new information as G1’s writing exhibited. The following clearly demonstrates this:

The water from lakes and oceans... forms clouds.
It... rain.
The water... from streams and pond to lakes and oceans
... cycle would start again

In fact, G2 relied heavily on the reader’s knowledge of the common-sense events which make up the water cycle and reader’s ability to make connections based on this knowledge. She writes as though she assumes, for example, that everyone knows clouds create rain, even
though she states in her phenomenon identification that it is her intention to explain how this is accomplished. Furthermore, she does not make a connection between the rain (sentence three) and the water which flows (sentence four), leaving the reader to wonder if the water she refers to is the rainwater which has fallen, or whether it refers to other water which flows through streams and ponds. These gaps in content result in cohesive problems; the reader has to supply too much information to make sense of the discourse.

Like G1 and E1, G2 offered a definition of clouds, claiming that they are formed from ocean water that rises. None of these writers suggested a reason for the ocean water rising; in fact the majority of writers who favored a sequential explanation failed to identify the sun as being at all significant in the water cycle. G2, in contrast to G1 and E1, and perhaps due to a lack of familiarity with scientific terms, failed to mention vapour, a word which appeared in the graphic prompt, or evaporation. The successful use of either of these words, or the introduction and definition of other technical terms, would have allowed G2 to construct knowledge through her line of meaning; as it stands, even though she has presented a sequential relationship between the water and the clouds through her use of the action the water... rises and forms clouds, the reader is left wondering what it was that caused the water to rise and form clouds. The omission of this information prevents G2 from successfully reaching the stated goal of her description: explaining to the reader how it rains.

All of the five phases in G2's explanation sequence describe sequential events. The word and, which links the final two events in stage five of G2's explanation sequence, however, may imply an overall causal relationship in a similar manner to the way G2 used where in the clause where the cycle begins again. G2's concluding sentence can be
interpreted as meaning that the water flowing back to the lakes and oceans causes the cycle to begin again. The language features which appear, though, do not make this causality explicit.

<table>
<thead>
<tr>
<th>Table 5.7: Language features used in G2’s discourse</th>
</tr>
</thead>
<tbody>
<tr>
<td>sequence words</td>
</tr>
<tr>
<td>dependent clauses of time</td>
</tr>
<tr>
<td>circumstances of time</td>
</tr>
<tr>
<td>time as process</td>
</tr>
<tr>
<td>time as participant</td>
</tr>
<tr>
<td>circumstances of place</td>
</tr>
<tr>
<td>circumstances of means</td>
</tr>
<tr>
<td>timeless present</td>
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<tr>
<td>passive</td>
</tr>
<tr>
<td>nominalizations</td>
</tr>
<tr>
<td>causal conjunctions</td>
</tr>
<tr>
<td>dependent clauses of cause</td>
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<td>circumstances of cause</td>
</tr>
<tr>
<td>processes of causation</td>
</tr>
<tr>
<td>definition of terms</td>
</tr>
<tr>
<td>introduction of technical terms</td>
</tr>
</tbody>
</table>
| events (sequence of happenings) | water rises
it rains
water flows
cycle starts again
water forms clouds |
| actions | Ø |
Although there were many similarities between G2’s composition and those written by G1 and G2, most noticeably the preference for listing a sequence of events rather than constructing an explicitly causal line of meaning, there were some differences. G2 used *would* instead of the timeless present in her writing, and she included fewer examples of sequence and causal lexis, as shown in table 5.7. Her intention was to tell the reader how we get rain, yet the line of meaning which she constructed was unsuccessful in explaining this process because her discourse lacked the lexicogrammar and content needed to illustrate the cause and effect nature of the water cycle.

**Focus on Cause and Effect: E2’s Discourse**

Whereas G1, E1, and G2 relied mainly on sequence words, time-as-process verbs, and circumstances of place to establish their lines of meaning and only implicitly stated causality through these time lines, E2 went beyond these language features to show explicit cause and effect relationships:

The water cycle: The sun is the source of our water. The water, or hydrological, cycle begins when the sun heats up the ocean to produce water vapour through evaporation. This water vapour mixes with dust in the atmosphere and forms clouds. Cool air causes condensation of water droplets in the clouds, bringing about precipitation, or rain. This rain then falls into rivers, streams and lakes and eventually returns to the ocean, where the cycle begins again.

E2 first identified the subject of his composition, the water cycle. He then presented information which distinguished his discourse from the primarily sequential explanations written by G1, E1, and G2 and discussed earlier. E2 began his explanation sequence with a statement showing an explicit causal relationship between the sun and the water on Earth: *the sun is the source of our water.* After establishing the causal nature inherent in his topic,
he worked on constructing a causal line of meaning through an additional four sentences representing eleven phases.

As table 5.8 suggests, causal explanations share the same basic structure as sequential explanations. Both types of explanations identify the phenomenon to be discussed and both consist of an explanation sequence which can be divided into phases. Causal explanations, however, not only contain a description of how a series of events occur in time, they offer an explanation of the causal relationships between these events. Because of this, they contain language features which characterize both sequence and causality.

Table 5.8: E2’s explanation sequence

<table>
<thead>
<tr>
<th>Phenomenon Identification:</th>
<th>The water cycle</th>
</tr>
</thead>
<tbody>
<tr>
<td>Explanation Sequence:</td>
<td></td>
</tr>
<tr>
<td>Phase</td>
<td>Linking word</td>
</tr>
<tr>
<td>-------</td>
<td>-------------</td>
</tr>
<tr>
<td>1</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>*when</td>
</tr>
<tr>
<td>4</td>
<td>*to</td>
</tr>
<tr>
<td>5</td>
<td>*through</td>
</tr>
<tr>
<td>6</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>*and</td>
</tr>
<tr>
<td>8</td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>*bringing about</td>
</tr>
<tr>
<td>10</td>
<td>then</td>
</tr>
<tr>
<td>11</td>
<td>and eventually</td>
</tr>
<tr>
<td>12</td>
<td>*where</td>
</tr>
</tbody>
</table>

*suggests a causal rather than a sequential relationship

Cohesion was established in much the same way as it did in G1’s primarily sequential discourse, through given and new information:
The water cycle begins... water vapour.
This water vapour... forms clouds.
... in the clouds... rain.
This rain then falls... cycle begins again.

E2 also used circumstances of place, such as in the atmosphere, in the clouds, into rivers, to the ocean, and where the cycle begins again, to support his line of meaning. In general, however, he used fewer devices to show time explicitly. To show time as process, E2 used only begins and returns. Furthermore, E2's composition contained only two linking words which are explicitly temporal, then and eventually. As table 5.8 clearly indicates, most of his linking words, in contrast to the earlier samples of discourse discussed, suggest causality.

One language feature which Veel (forthcoming) listed as being characteristic of sequential explanations and which did not appear in the discourse samples provided by G1, E1, or G2 was circumstances of means. Phrases such as by evaporation show how an event can occur, but these phrases are also frequently ones which contain a notion of causality within them. The word evaporation signifies a process rather than a thing; here it can be considered a causal action in which the sun's heat has been applied to cause a change of state from liquid to gas. The use of evaporation or evaporate therefore implies causality. E1 used evaporate, G1 used vapours in a similar way, but E2 added to the construction of his line of meaning by choosing to nominalize the process and list it as the means through which the sun produces water vapor: through evaporation. By nominalizing phrases this way, he was also able to offer the reader a basic definition of the term evaporation, thereby constructing knowledge.

In the discourse samples discussed earlier, the word most commonly introduced and defined was clouds, a definition which was accomplished by all three individuals. E2 began
his definition of clouds in a similar manner, stating that they are formed when water vapor mixes with dust in the atmosphere, but he added more. The following sentence from E2’s discourse is worth a close analysis for its introduction and definition of terms, use of nominalizations, and expression of causality:

Cool air causes condensation of water droplets in the clouds, bringing about precipitation, or rain.

E2 introduced the technical term *condensation* and gave the reader several clues to help define the word. It can be understood from the context that condensation is something which is caused by cool air, suggesting that it is the opposite process to evaporation, which, according to information given earlier in the description, is caused by heat. It is also stated that condensation is something which happens to water droplets in the clouds, and that it is one step in the making of rain; in other words, water droplets may not fall from the clouds as rain until they have undergone this process. Even without knowing that condensation is a causal term describing a process in which gas or vapor becomes liquid, the reader is able to infer through the use of *causes* and *bringing about* that the water vapor which makes up the clouds becomes rain when cooled. Knowledge has been constructed through E2’s use of causal language.

Another nominalization which E2 introduced in this sentence is precipitation, which he said was caused by cool air. Webster’s Dictionary defines the term as “the deposition of moisture from the atmosphere upon the general surface of the earth.” Even though there is no explicit cause and effect relationship inherent in this definition, the causal potential of the “deposition” is clearer in the dictionary definition of the corresponding verb *precipitate*:

\[\text{v.t. 3. Meteorol. To cause (vapor, etc.) to condense and fall as dew, rain, etc.}\]
\[\text{v.i. 5. Meteorol. To fall as condensed vapor.}\]
The definitions refer back to the meaning of *condensation*, which, like *evaporation*, can be an example of causal lexis.

This sentence, therefore, contains two examples of cause as process verbs, *cause* and *bring about*, and two lexical examples of inherent causality, *condensation* and *precipitation*. It also contains a causal agent which G1, E1, and G2 failed to recognize or use: *cool air*. Had these writers included it, they might have constructed their sequential descriptions with a series of events using such words as *first, then, and finally*, as the following sequence of events shows:

First the air cools, then the water droplets in the clouds condense.

*Event 1*           *Event 2*

Finally, it begins to rain.

*Event 3*

In Halliday’s terms, these two sentences would look like *a happens; so x happens; so y happens*, although the causal relationships indicated by *so* in Halliday’s structure are only implicitly stated through the time line. E2’s sentence, on the other hand, contains a chain of nominalized events which construct a causal line of meaning and which could be rephrased in Halliday’s terms as *happening a causes happening x which causes happening y*. Event one has been nominalized as an agent which causes an effect, a complex nominalization of sequential event two above. This action in turn produces a result, a nominalization of sequential event three. These causal relationships are illustrated in figure 5.1.

The sentence in which E2 included the circumstance of means is also notable for a similar complex causal chain:

The water, or hydrological, cycle begins when the sun heats up the ocean to produce water vapour through evaporation.
Although the beginning of the sentence supports the sequential nature of the explanation sequence through the use of *begins* and *when*, the latter part of this sentence effectively illustrates its causal nature. The sun, as agent, causes an effect in the ocean which in turn produced a result, and the means by which this is done is evaporation:

- the sun *heats up the ocean* to produce water vapour through evaporation
- agent *causes effect* produces a result by a particular means

None of the other individuals came close to paralleling the complexity with which E2 constructed his causal line of meaning in these two sentences.
The discourse samples which showed a primarily sequential line of meaning mostly contained events. E2's discourse consisted of a relational statement, *the sun is the source of our water*, and several actions, thereby reinforcing the strong causal nature of his paragraph, as shown in table 5.9.

**Table 5.9: Events and actions in E2's discourse**

<table>
<thead>
<tr>
<th>Events</th>
<th>Actions</th>
</tr>
</thead>
<tbody>
<tr>
<td>water cycle begins</td>
<td>sun heats up ocean</td>
</tr>
<tr>
<td>water vapour mixes with dust</td>
<td>produces water vapour</td>
</tr>
<tr>
<td>forms clouds</td>
<td>evaporation</td>
</tr>
<tr>
<td>rain falls into rivers</td>
<td>causes condensation</td>
</tr>
<tr>
<td>returns to ocean</td>
<td>bringing about precipitation</td>
</tr>
<tr>
<td>cycle begins again</td>
<td></td>
</tr>
</tbody>
</table>

Not only did he link the events and actions together by choosing words which suggest causality as he constructed his line, he included a wide variety of syntactic strategies to make the connections. G2 used only *and* and *eventually* with simple syntax. G1 also stated his sentences simply, using *and* and the first three ordinal numbers. E1's variety was somewhat greater, but except for her use of *as* and *where*, she depended greatly on vocabulary to connect the events. E2's selection of linking words demanded a greater ability to manipulate the grammar to show the connections. Like E1, he used *where* in the last sentence to suggest that because the water has returned to the place where the cycle began, it can now start again. E2 chose to use *begins when*, a phrase which is parallel to E1's *begins as*. E2 went beyond these linking words to use the infinitive form to connect actions as in the
sun heats up the ocean to produce water vapour. Other linking phrases such as through and bringing about add variety to his composition, which in turn makes the writing appear more advanced or sophisticated.

E2 used all the language features that the others used, including the timeless present as table 5.10 illustrates. What distinguishes his writing from that of the other individuals is his emphasis on a causal line of meaning. E2 recognized that the water cycle contained causal processes and constructed his line of meaning to show that. As Veel (forthcoming) suggested, causal explanations tend to occur in the language of science later than sequential explanations because they demand a deeper understanding of the scientific processes involved. Furthermore, different combinations of language features are needed to express these processes or actions. The lexicogrammar involved in constructing causal lines of meaning is much more complex than what is needed to build a sequential explanation, and this complexity was reflected in E2's discourse.
<table>
<thead>
<tr>
<th>Table 5.10: Language features used in E2’s discourse</th>
</tr>
</thead>
<tbody>
<tr>
<td>sequence words</td>
</tr>
<tr>
<td>dependent clauses of time</td>
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<tr>
<td>circumstances of time</td>
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<td>time as process</td>
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<tr>
<td>time as participant</td>
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<tr>
<td>circumstances of means</td>
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<tr>
<td>timeless present</td>
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<tr>
<td>passive</td>
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<tr>
<td>nominalizations</td>
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<tr>
<td>causal conjunctions</td>
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<tr>
<td>dependent clauses of cause</td>
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<td>circumstances of cause</td>
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<tr>
<td>processes of causation</td>
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<tr>
<td>definition of terms</td>
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<tr>
<td>introduction of technical terms</td>
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<tr>
<td>events (sequence of happenings)</td>
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<tr>
<td>actions</td>
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</table>
Focus on Cause and Effect: G3’s Discourse

The writer of G3 attempted to construct a causal line of meaning in her description of the water cycle, but because she did not have the same high level of ability to manipulate the lexicogrammar of the language as E2 did, her discourse lacks the quality that his does:

The sea water evaporates by the sun heat and it becomes mist and produces a cloud. When it was cooled by the cold air, a cloud makes rain. The rain is falling down from the sky to the soil. The soil absorbs the rain and it attributes to the sea. It is called water cycle.

She chose not to place her phenomenon identification stage at the beginning of her description; instead, like G1, she concluded her composition by making a statement summing up the information she had given. She established cohesion primarily through given and new information:

- the sea water... produces a cloud
- a cloud makes rain
- the rain... to the soil
- the soil... to the sea

G3 phrased many of her phases as actions, a strategy which made her overall explanation of the water cycle appear very causal. Even though the linking words she used are sequential, as table 5.11 shows, the actions which follow or precede them make many of them implicitly causal. G3 chose to list actions with the sequence marker and, making some of her sentences appear somewhat simplistic. The following sentence illustrates this point. G3 used the sequence word and twice.

The sea water evaporates by the sun heat and it becomes mist and produces a cloud.

In spite of the sequence words, however, the cause and effect notion is still explicitly stated, although the order of the causal line is confusing. Usually, an agent causes an effect which
Table 5.11: G3’s explanation sequence

<table>
<thead>
<tr>
<th>Phenomenon Identification:</th>
<th>Ø</th>
</tr>
</thead>
<tbody>
<tr>
<td>Explanation Sequence:</td>
<td></td>
</tr>
<tr>
<td>Phase</td>
<td>Linking word</td>
</tr>
<tr>
<td>1</td>
<td>*by</td>
</tr>
<tr>
<td>2</td>
<td>*by</td>
</tr>
<tr>
<td>3</td>
<td>*and</td>
</tr>
<tr>
<td>4</td>
<td>*and</td>
</tr>
<tr>
<td>5</td>
<td>*when</td>
</tr>
<tr>
<td>6</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td></td>
</tr>
<tr>
<td>8</td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>and</td>
</tr>
</tbody>
</table>

*suggests a causal rather than a sequential relationship

produces a result by a particular means. In G3’s sentence, however, sea water is not an agent because it is only through the action of the sun’s heat that it can evaporate and produce clouds. The sun’s heat is the logical agent in the sentence. The sentence below has the same meaning, yet the circumstances of means has been changed to an agent, resulting in an explicit causal relationship stated as agent causes effect which produces result. The two examples of the linking word and have also been changed to constructions which are less noticeably sequence. The following sentence, as a result, appears more sophisticated:

The sun’s heat causes the sea water to evaporate into a mist which forms clouds.

G3 used language features of sequence again in her next sentence, although her choice of a dependent clause of time makes the sentence appear more syntactically complex:

When it was cooled by the cold air, a cloud makes rain

112
When it was cooled by the cold air, a cloud makes rain

The order in the line of meaning becomes confused. *Cold air* is the initial agent here, but G3 placed *cloud* in a more prominent position. Furthermore, the redundancy *cooled by the cold air* could have been avoided by changing the circumstances of means to a position of agent, a change which would also have resulted in a more salient causal relationship: *Cold air causes the clouds to make rain.*

Although G3 used a variety of language features which showed sequence, she did not include large numbers of examples of each feature. Whereas G1 and E1 used several different sequence words and numbers, G3 used only the temporal words *and* and *when*, and she used *and* three times. She offered limited examples of circumstances of place, another characteristic of sequential explanations. On the other hand, G3’s discourse contained more examples of circumstances of means than the earlier samples, a sequential language feature which nevertheless added to the overt causality in her line of meaning. Furthermore, she phrased many of her phases as actions rather than sequential events, and included two processes of causation verbs. The causality in her explanation sequence was well reflected in her choice of verbs. Words such as *evaporates, produces, cools, makes,* and *absorbs* are words which are explicitly causal in this text and which therefore helped to elevate the overall quality of her writing.

G3, like the others, was able to offer a definition of clouds. She also introduced the term *water cycle* and defined it through her description. Moreover, readers were able to determine the meaning of *evaporates* through her use of cause and effect relationships: sea
water becomes mist and produces clouds because the heat from the sun causes it, and this process of becoming mist is somehow related to *evaporates*. Unfortunately, as table 5.12 shows, G3 did not demonstrate a strong ability to nominalize events, nor did she use the timeless present consistently, difficulties which detracted from the overall quality of her text.

<table>
<thead>
<tr>
<th>5.12: Language features used in G3’s discourse</th>
</tr>
</thead>
<tbody>
<tr>
<td>sequence words</td>
</tr>
<tr>
<td>dependent clauses of time</td>
</tr>
<tr>
<td>circumstances of time</td>
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<tr>
<td>time as process</td>
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<tr>
<td>time as participant</td>
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<td>circumstances of means</td>
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<tr>
<td>timeless present</td>
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<td>nominalizations</td>
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<tr>
<td>causal conjunctions</td>
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<td>dependent clauses of cause</td>
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<td>circumstances of cause</td>
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<td>processes of causation</td>
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<tr>
<td>definition of terms</td>
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<tr>
<td>introduction of technical terms</td>
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<tr>
<td>events (sequence of happenings)</td>
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G3's discourse does not reflect Halliday's "happening a causes happening x" as closely as did E2's, but neither does it match closely the opposite end of his dichotomy. Her use of causal lexis and her preference for describing processes or actions rather than listing a sequence of events suggests a more explicit chain of causality than what was noticeable in the writing of G1, E1, or G2. This attempt to focus on causality, combined with the variety of temporal language features in her explanation sequence, made G3's paragraph reflect a higher quality than the sequential compositions written by G1 or G2, yet her inconsistency with the timeless present and her lack of expertise in manipulating the lexicogrammar of both sequence and causality prevented her from presenting the type of well-constructed line of meaning that was present in E1's and E2's discourse.

Summary of Section One

A description of the water cycle or any other inherently causal system can focus primarily on a sequential line of meaning or on a line which explicitly reflects cause and effect relationships. This chapter has suggested that discourse which is built as a temporal line with implicit causality generally tends to appear simpler or less "sophisticated" than that which constructs a strong, explicitly causal line of meaning. This observation supports Halliday's and Martin's (1993) comment that causal discourse reflects greater sophistication and knowledge of science. This analysis also supports Veel's (forthcoming) comments that a well constructed causal line of meaning requires a sophisticated use of language, and that students who are able to write this type of composition are often considered more intelligent and scientific than those who write explanations which are primarily sequential.

Table 5.13, compiled from the data presented in chapter five, suggests that E2's and G3's texts are primarily causal compared to the others. It should be noted, however, that a
Table 5.13: Number of language features used by the five writers

<table>
<thead>
<tr>
<th></th>
<th>G1</th>
<th>G2</th>
<th>G3</th>
<th>E1</th>
<th>E2</th>
</tr>
</thead>
<tbody>
<tr>
<td>sequence words</td>
<td>4</td>
<td>1</td>
<td>2</td>
<td>9</td>
<td>3</td>
</tr>
<tr>
<td>dependent clauses of time</td>
<td>Ø</td>
<td>Ø</td>
<td>1</td>
<td>1</td>
<td>1</td>
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<tr>
<td>circumstances of time</td>
<td>Ø</td>
<td>Ø</td>
<td>Ø</td>
<td>Ø</td>
<td>Ø</td>
</tr>
<tr>
<td>time as process</td>
<td>Ø</td>
<td>1</td>
<td>Ø</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>time as participant</td>
<td>Ø</td>
<td>Ø</td>
<td>Ø</td>
<td>Ø</td>
<td>Ø</td>
</tr>
<tr>
<td>circumstances of place</td>
<td>6</td>
<td>3</td>
<td>3</td>
<td>8</td>
<td>5</td>
</tr>
<tr>
<td>circumstances of means</td>
<td>Ø</td>
<td>Ø</td>
<td>2</td>
<td>Ø</td>
<td>1</td>
</tr>
<tr>
<td>timeless present</td>
<td>✓</td>
<td>×</td>
<td>×</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>passive</td>
<td>×</td>
<td>×</td>
<td>×</td>
<td>×</td>
<td>×</td>
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<tr>
<td>nominalizations</td>
<td>1</td>
<td>Ø</td>
<td>2</td>
<td>Ø</td>
<td>4</td>
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<tr>
<td>causal conjunctions</td>
<td>1</td>
<td>Ø</td>
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<td>dependent clauses of cause</td>
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<td>processes of causation</td>
<td>2</td>
<td>1</td>
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<tr>
<td>definition of terms</td>
<td>1</td>
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<td>3</td>
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<tr>
<td>introduction of technical terms</td>
<td>Ø</td>
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<tr>
<td>events (sequence of happenings)</td>
<td>5</td>
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<td>actions</td>
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</table>

Focus on causality does not automatically result in a higher level of sophistication. If that were the case, the following would be considered adequate:

Sun heat water up then water boil and gose up became cloud and maks rain gose down to ground.

Although this short description contains a process of causality word, makes, and actions such as *sun heats water* and *water makes rain*, the writer's overall ability to manipulate the
lexicogrammar of the language is minimal, resulting in a poorly constructed line of meaning. Proficiency in the use of the language features is therefore crucial to a well-constructed line of meaning.

E1 and G2 were native speakers of English, and E2’s linguistic ability was the same as someone whose first language was English, yet the differences in quality of the descriptions of the water cycle was considerable and certainly noticeable by the focus group members who were making intuitive judgements. E1’s discourse reflected a well-developed but primarily sequential line of meaning which was similar to Halliday’s expression of “a happens; so x happens.” E2’s composition was also well developed, but he built his to illustrate an explicitly causal line of meaning, resulting in a construction which more closely resembled Halliday’s “happening a causes happening x.” This produced discourse which suggested a much higher level of sophistication and knowledge. G2, although also a native speaker of English, was perhaps too young to demonstrate proficiency in both the content and the language needed to construct a solid explanation of the water cycle.

Just as a comparison of the three more proficient speakers of English showed that E1’s and G2’s discourse appeared simpler and less scientific than E2’s causal construction, G1’s composition seemed less advanced than G3’s when looking at the writing of those who were in the process of acquiring English as an additional language. Both G1 and G3 likely understood the causal nature of the water cycle, but lacked the language ability to express it competently. G1 chose to construct his line using language features which focused on temporal events, and even though G3’s ability to manipulate the lexicogrammar of English was considerably lower than E2’s, her attempt to make the line of meaning explicitly causal elevated the level of her discourse to one that made her writing appear more advanced and
scientific than G1’s. G3 did not mirror Halliday’s and Martin’s construction of “happening a causes happening x,” but she came much closer than G1 did, and as a result, her writing appeared to be more advanced.

A strong, well written, causal line which reflects Halliday’s and Martin’s “happening a causes happening x” requires the use of a wide variety of language features characteristic of causal discourse. Being able to use these features proficiently depends on the writer’s familiarity with the topic being described and his or her ability to use all the resources of the language to construct the line of meaning. The analysis of these five samples of text has supported the notion that Halliday’s and Martin’s dimensions exist in both the discourse of native speakers and that of speakers of English as an additional language. It also suggests that discourse which is constructed to reflect a strong and explicit causal line reflects a greater command of the lexicogrammar of English than discourse which is primarily sequential, yet there are levels of quality which are apparent within the sequential and causal lines. These observations suggest that how the writer constructs a line of meaning through lexicogrammatical elaboration should be examined for its potential usefulness in assessing differences in quality in academic writing.

Section Two: Water Cycle Accounts and the “Coding” of the Water Cycle

It was noted in chapter four that the first two focus groups put a heavy emphasis on whether the writer followed the visual prompt adequately. The readers wanted to “see the cycle” in the discourse, and they wanted the text to give them the whole picture. Some writers were faulted because they failed to use the guidelines set by the visual prompt and instead provided expositions about the water cycle. Others provided only “part of the picture.” Yet the genre and content were not the only types of variation that revolved around
the use of the visual prompt. Writers also varied in the way they used the lexicogrammar to construct the verbal line so that it mirrored the visual line of the water cycle.

One way that writers established textual cohesion and reflected the visual line was by using a strategy of given and new information, or theme and rheme. As mentioned in section one of this chapter, both G1 and E2 used this strategy. In G1’s writing, he made the statement You can see clouds in the sky, but where does rain come from? His explanation sequence attempted to answer this question, although as it was pointed out earlier, it failed to explain exactly where rain comes from and left the reader to infer that it comes from the clouds. The circular pattern he created using words from his phenomenon identification and explanation sequence, however, mirrors the circular pattern of visual prompt, as figure 5.2 clearly shows. G1 missed reporting on the “cool air” section of the graphic, an oversight which resulted in his failure to show where rain comes from. G1’s visual line was further

Figure 5.2: G1’s strategy of given and new information
supported by his use of circumstances of place. According to his account, water, in its various states, drops on the land from the sky, goes through a river to the ocean, and finally returns to the sky, once again creating the circular pattern of the cycle (see figure 5.3). G1 made no connection between the sun, which was displayed in the upper left corner, and the water cycle.

Figure 5.3: G1’s use of circumstances of place

![Diagram showing the water cycle]

E2 also used a strategy of given and new information to establish cohesion, resulting in a visual line which reflected the cycle and resembled G1’s pattern. E2’s use of circumstances of place—in the atmosphere, in the clouds, into rivers, to the ocean—also supported the visual line of the cycle. E2’s focus on cause and effect, however, illustrated the cycle in a way that G1’s could not. In section one of this chapter, an analysis was done on part of one of E2’s sentences, parsing it into agent, effect, result, and means. While this strategy is similar to one which uses given and new information, or theme and rheme, it goes
Figure 5.4: E2's strategy of given and new information

one step beyond to show the cause and effect chain of the cycle. In the first sentence, agent A (the sun) causes an effect (the ocean heats up), and this effect, through the means of evaporation, produces result A (water vapor). The resulting water vapor, which becomes the agent of sentence two, produces another result, clouds. A new agent, cool air, is introduced to cause an effect (condensation) on the water vapor in the clouds (agent B, result B), and the consequence is rain. The rain becomes the agent of the fourth sentence which flows to the oceans and allows for the continuation of the water cycle. The visual representation of E2's causal chain, as shown in figure 5.5, resembles closely the line of the graphic.

E2 referred to all the words and arrows in the graphic, thereby including all the necessary content to provide an adequate description of the water cycle. In other words, he took advantage of the visual code to write his verbal account. G1, on the other hand, missed the "step" in which water vapor and dust combined to form clouds as well as the step in which cool air caused condensation.
Figure 5.5: E1's causal chain showing the visual line

1. Sun (agent A) heats ocean, causes effect.
2. Sun vapor (from result A) produces result A.
3. Cool air (agent) causes effect on agent B, which is now result B.
4. Rain (agent C) produces result C.
5. Rain (from result C) causes effect.
6. Water vapor (by means of condensation) produces result B.
7. Continuation of cycle causes effect.
Whereas E2 demonstrated three ways of coding the visual into words and G1 used two methods, E1 depended entirely on circumstances of place to express the visual line in her discourse, as shown in figure 5.6. Her account of the water cycle included eight such phrases, three of which—mountains, glaciers, and watersheds—appear to have come from background knowledge rather than from the graphic, although this may have been the result of an interpretation of the white area in the lower right of the visual as snow or ice. Her use of circumstances of place not only established the visual line of the cycle, it added to the cohesion of the text which otherwise relied heavily on the numbering of the steps, numbers which did not appear in the graphic. In spite of the clarity with which this strategy mirrors the circular pattern of the cycle, E1 made no mention in her text of dust or cool air, words which were written on the graphic and accompanied by arrows.

Figure 5.6: E1’s use of circumstances of place to show the visual line

![Figure 5.6: E1’s use of circumstances of place to show the visual line](image)
In chapter four, G2’s brief text was criticized for its lack of content, and this can easily be seen when her text is recoded into visual form. The few circumstances of place she used concerned only the lower part of the visual: *from lakes and oceans, from streams and ponds, and into lakes and oceans*. She did not consider the entire graphic in her description of the content, relying instead on the reader’s knowledge to fill the gaps. She did not, for example, make a connection between the rain and the water which flows, leaving the reader to wonder if the water she referred to was the rainwater which had fallen or the water which usually flows through streams and ponds. Even ignoring the gaps in cohesion, signified in figure 5.7 by broken lines and question marks, the visual pattern of the cycle G2 described appears more triangular than circular, a situation which reflects the brevity of her paragraph and the limitations of her lexicogrammatical ability.

*Figure 5.7: G2’s explanation visualized*
Like G1 and E2, G3 used a strategy of given and new information to establish cohesion, and similarly this strategy led to the visualization of the cycle, as shown in figure 5.8. She used only three circumstances of place to support her line: *from the sky*, *to the soil*, and *to the sea*. Although she constructed what is primarily a causal line of meaning, the “drawing” of this line is not straightforward because of her difficulties in manipulating the lexicogrammar, as shown in section one. The line can be clearly visualized, however, if the reader looks at the meaning of the message rather than simply at the syntax.

*Figure 5.8: G3’s use of given and new information*

Another variation which occurred among the five discourse samples concerned the area of the visual where the writer began the account. G1 chose to start with the rain, E1 began her description with the snow melting from glaciers, E2 started with the sun, and G2 and G3 began with the evaporation of sea water. Based on information collected from interviews...
conducted immediately after the writing task, the rationale for starting the water cycle
description at any given point varied with the individual. Many people admitted that
because of its cyclic nature, they could begin anywhere, but most people chose to begin with
the large body of water because it was the "biggest" or "most open space" and their "eyes
were drawn to it." Others chose the rain because they felt that the rain was more real and
observable. G1 chose to start with the rain because he could easily see the clouds in the
picture and connected them to his experiences of rain.

Martin (1993) suggested that the real test as to whether the discourse includes all the
content of the visual is to recreate the visual from the text, which was done in this section.
The strategies used to redraw the visual line in this study were primarily given and new
information, circumstances of place, and the causal chain. Whether the writer included all
the information which the visual offered them also played a role in how the adequacy of the
discourse was judged by the focus groups. Some writers failed to account for all the
available information, most noticeably dust and cool air, and some added content which
was not presented in the graphic, such as numbers and mountains. Finally, starting places
in the descriptions differed to some extent among individuals. By contrast with the
lexicogrammatical strategies, which may help determine differences in discourse quality,
these factors need to be considered by test development researchers when selecting a visual
prompt and preparing the instructions for the examinees so that misinterpretations can be
kept to a minimum. These factors offer a much-needed research basis for this phase of test
development research. At present, a research basis such as this appears to be lacking.
Chapter Six: Conclusions

The theoretical framework of communicative competence, developed by Canale and Swain (1979, 1980), suggested that by considering the content and boundaries present in the framework, one could assess in an integrative manner a learner's ability to communicate using both verbal and non-verbal modes of communication. Canale and Swain defined communicative competence as the relationship and interaction between grammatical competence, sociolinguistic competence, and strategic competence, yet the framework they offered is basically a taxonomy of the components of language, and "a taxonomy is not in itself a theory or explanation, though it may conceal or suggest one" (Hymes, 1986, p. 43). Canale and Swain offered no clear indication as to how the elements in their taxonomy could be integrated.

In contrast to this approach, Halliday has maintained over the years that language cannot be examined by looking at its parts. Language can only be assessed by examining what the language user does with it. A discourse analysis done through a functional grammar approach would therefore illustrate how linguistic features are combined to construct meaning in the text as a whole.

The research presented here was designed to examine the assumptions made by Canale and Swain by applying their framework to a test case of discourse samples. It also aimed to see how a functional analysis would account for differences in the quality of text. A further goal was to investigate the link between the verbal text and the visual prompt which elicited it, and to see the ways in which writers use language features to convey the visual line.

The first task of this research was to find examples of discourse which would show how the various components of the Canale and Swain framework could be integrated. This was
accomplished through the concept of the storyline (Longacre, 1990). Longacre stated that storylines in narratives can be represented verbally using various language features and visually using a graphic time line, thereby offering an obvious example of integration. Furthermore, because there are dimensions in causal discourse, described by Halliday and Martin (1993) and Veel (forthcoming), writers could have a wide choice of language features—both simple and complex—to choose from in the construction of a causal line of meaning. The initial data collection in this research, therefore, required the language user to write an account of the water cycle, using a visual prompt which clearly showed the cycle.

The later, and most important, tasks in this research revolved around the assessment of these accounts, and three questions were initially posed concerning this assessment. These questions are restated here:

1. Can readers intuitively detect differences in the quality of descriptions written using a visual prompt, and can they notice the relationship between the discourse and the visual prompt?

2. Can readers using an assessment instrument based on the Canale and Swain theoretical framework assess the quality of descriptions written using a visual prompt, and can they notice the relationship between the discourse and the visual prompt?

3. Can a Hallidayan functional analysis illuminate the quality of the descriptions and address the relationship between the discourse and the visual prompt?

The first two questions can be addressed by examining the discourse produced during the discussions held by small focus groups. The third question concerns the discourse analysis presented in chapter five.
Question One: The Intuitive Judgements

Based on the transcripts of the discussions held by the three focus groups, differences between and among accounts of the water cycle were easily noticed by those readers who were judging the discourse intuitively. There were no sets which were considered equally adequate; each set allowed the readers to rank the samples from best to worst, although the differences at times were minimal and difficult to articulate. In the first two focus groups, consisting of readers who judged twelve sets of discourse samples, the differences in quality were attributed to various factors, but the most common themes to surface in the discussions were as follows:

• differences in the completeness of the content based on the visual information, and
• differences in audience, and
• differences between a sequence or list of events and a causal chain.

These factors were interrelated in that audience differences usually depended on differences between sequence and cause/effect, and the choice of writing the account as sequence or cause and effect may have been influenced by the way the examinee interpreted the graphic.

The first factor was interesting in light of the problems with misinterpretation that have been encountered through the use of visuals in language testing. The fact that the first two focus group readers put great emphasis on the closeness in content and organization of the discourse to the graphic representation of the water cycle demonstrated that they were attending to the relationship between the two. The readers wanted to see all the information from the visual presented in logically connected discourse so that they could visualize the cycle from the words. If, for example, the visual had not played a major role, the assessment of Set H, the set which contained expositions instead of explanations, might have been
different, an observation which was supported by reader two, who stated that “if it's just a
drill on the use of tenses or whatever, I'd say yeah, you all get great marks.” This
assumption was further supported by the same reader's suggestion that if a picture is used as
a visual prompt for writing, as it was in this study, the content of the visual should be
reflected in the text, but if the picture is simply chosen as an elicitation device to check for
the examinee's ability to use grammar correctly, the connections between the verbal and the
visual are not at all important and the content of the text should not be a factor in the
assessment. As discussed in the section on visuals in chapter two, however, the ability of an
examinee to use grammar correctly may well depend on his or her interpretation of the visual
prompt.

If readers are putting so much emphasis on the connection between the verbal and the
visual in assessing the discourse, the selection of a visual prompt for testing becomes an
issue which must be examined carefully. In this study, where the visual prompt was chosen
for its assumed clarity, difficulties with interpretation still surfaced, suggesting that if this
were a testing situation rather than a discourse collection, the instructions needed for the
participants to complete the task as intended would have been inadequate.

The topic of audience surfaced as being important in judging the adequacy of the
explanation, and readers generally chose a text which sounded “academic” or “scientific”
over one that sounded as it were written for a younger, less knowledgeable reader. The
elements that made a text sound more academic or scientific, however, were tied closely to
the lexicogrammar: academic texts were credited with having a greater variety of sentence
structures and greater syntactic complexity whereas texts which were more “elementary”
were frequently described as sounding conversational or storylike. Furthermore, texts
labeled as more academic also tended to show more explicit causal connections rather than listing events temporally.

According to Veel (forthcoming), students who are able to write explanation sequences which move beyond the common-sense language expressed through sequence to discourse which shows the more abstract notions of causality are usually credited with sounding more intelligent and more scientific. Veel’s observations about the progression from everyday, observable events ordered sequentially on a time line to the more abstract nature of causal discourse mirrors those of Halliday and Martin (1993) who showed how the language of science has reflected the evolution of scientific knowledge. Both Veel (forthcoming) and Halliday and Martin (1993) have interesting parallels with the concept of basic interpersonal communicative skills (BICS) and cognitive/academic language proficiency (CALP) as proposed by Cummins (1984). Cummins claimed that whereas immigrant students were able to engage in everyday conversation with their peers within about two years of arrival, they typically required five to seven years to acquire the language needed for academic study. Cummins suggested that “conversational and academic aspects of language proficiency need to be distinguished” (1984, p. 149).

In the research reported here, the discourse which contained explicit cause and effect relationships, considered by Veel to represent abstract thinking skills, were considered better than those which used the everyday, common-sense language of sequence. In other words, E2’s explicitly causal account sounded more academic and was judged as being higher than E1’s sequential description, and G3’s focus on cause was judged as being better than G1’s or G2’s descriptions. This intuitive ranking of the discourse supports Veel’s observations as well as those of Cummins (1984), both of whom suggested that academic language is more
challenging than everyday discourse. Readers making intuitive judgements found it easy to
distinguish between texts which were conversational and those which represented academic
discourse, yet as it was shown in chapter four, it was unclear whether the assessment
instrument based on the Canale and Swain framework could do the same.

Question Two: The Judgements Using the Assessment Instrument

Whereas the intuitive judgements revolved around audience, sequential or causal
dimensions, and the match between the verbal and the visual, an analysis of the discourse
produced by raters as they used an assessment instrument based on the Canale and Swain
framework to rate five texts suggested that the evaluation of the discourse samples primarily
concerned the violation of rules, or “errors,” linguistic and otherwise, in the texts and how
these errors should be categorized.

Although it must be remembered that only one focus group did an assessment using
an instrument based on the framework, the differences between the focus of these raters’
discussion with that of the other two groups, combined with the difficulties these raters
encountered trying to categorize the errors suggested that the assessment instrument was
only able to detect differences in the quality of discourse if the judgement of quality
depended on the presence of errors in the categories established by the assessment
instrument. This was shown through the raters’ discourse by observations such as the
following:

“Definitely a problem of vocabulary everywhere.”
“Isn’t watershed one word?”
“Notice the switch from present to past?”
“It’s the construction.”
“There’s a comma missing.”
“That’s the wrong preposition... you don’t fall down to.”
This concentration on placing errors into categories left no room for judging the quality of writing between texts which had errors in the same number of competencies or which contained no errors. This inability to detect differences in quality surfaced when equal scores were awarded to E1 and E2, and equal but lower scores to those written by G1 and G3. The assessment instrument was not able to explain the differences between sequential explanations and causal chains, even though these differences played a major role in the intuitive judgements of the readers, because there was no category in the rating guide established for this dimension. Considering Veel's observations concerning the connections between sequential discourse and the observable, everyday, common-sense view of science, and Martin's (1990) strong assertion that common-sense language is inadequate for explaining or understanding science, however, the fact that an instrument based on a framework which purports to be able to judge the communicative competence of language users did not seem able to determine the differences between simpler, less academic writing and more complex accounts of the water cycle points to the possibility that the framework is missing out on an important aspect of communicative competence. In fact, these findings suggest that learners who can use the simpler forms of explanation are communicatively competent, and further distinction is unnecessary.

Not only did the assessment instrument seem unable to detect differences in quality between E1's and E2's texts or between G1's and G3's samples, it appeared to have very little use for the visual prompt. The graphic was referred to only twice in the discussion, and on both occasions, the raters were using it to question whether the writer had chosen the correct vocabulary. When trying to determine the missing thoughts in G2's discourse, the raters concluded that the links were not there, yet they did not refer to the graphic to
comment on which events might be missing. Although it must be kept in mind that this assessment instrument has not yet made use of a visual prompt and therefore the rating guide had not developed a “category” for this, it was mentioned by the raters that the prompts which were used in their assessment instrument also contained information which needed to be addressed by the writer, so it can only be assumed that the raters paid the same attention to the visual prompt as they would normally have paid to the verbal instructions. Certainly the analysis of the discussion discourse strongly indicated that the visual did not play a major role in the evaluation of the texts; moreover, the relationship between the visual and the verbal, according to the assessment instrument, was not critical to the evaluation of the writer’s communicative competence because the primary focus was on linguistic errors. Given the problems that can be associated with the use of visuals as prompts, the question which arises is why a visual should be used at all if the assessment procedure is not interested in its connection to the verbal. Its use only introduces a possible confounding factor into the results of the evaluation through problems with misinterpretation of the illustration and of the intended genre.

**Question Three: The Functional Analysis**

To see if a functional analysis of the five texts offers a rationale for the intuitive judgements of the readers and a potential framework for assessing the differences in quality of this type of discourse, a comparison of the ways writers used the various language features needed to be undertaken. E2’s and G3’s texts were primarily causal compared to the others, and according to Veel (forthcoming), causal explanations tend to require a more sophisticated use of language. E2’s and G3’s causality is most clearly shown through the number of actions in each text. This division between sequence and causality was easy to
notice, as indicated by the intuitive judgements, but the simple listing of numbers and language features does not explain why E2’s discourse was judged better than G3’s or why E1’s was rated more highly than G3’s.

The clues to why E2’s text reflects a higher level of ability than G3’s lies in the difficulties G3 had with the causal lexicogrammar of English. Although she included a high number of causal actions and processes of causation, her causal chain was not linked together correctly in two of her five sentences, as was shown in chapter five. She had trouble identifying the agent of the causal actions in these two sentences, incorrectly naming them as circumstances of means. In the second of the two sentences, this difficulty affected the dependent clause of time, and the resulting sentence became awkward, a problem which was identified by the raters using the assessment instrument as a problem with both grammar and vocabulary. The difficulties with causality in these two sentences, combined with her inconsistent use of verb tense, prevented G2 from developing a well-constructed line of meaning. Both E2’s and E1’s discourse samples, on the other hand, were well constructed. E2’s was primarily causal, and E1’s was mainly sequential, yet both writers were able to manipulate the lexicogrammar well enough to prevent the types of difficulties that G3 had. The result was that both E2 and E1 were rated more highly than G3.

When G3’s discourse was compared to G1’s, however, her ability to construct a causal line of meaning, even with its difficulties, made her writing appear more academic and sophisticated than his, reflecting Veel’s observations that causal language makes the writer appear more academic and knowledgeable. G3 used five actions compared to G1’s one, and she introduced and defined more terms through her writing than G1 did. She also tried to use more complex syntactic structures, as indicated by her attempt to use a dependent clause of
time. Had G1 been more proficient in the manipulation of the lexicogrammar of sequence, the quality of his text would likely have been judged as being more similar to the quality of E1’s sequential text, discourse which was judged a higher quality than G3’s causal account. This implies that it is not simply the presence of causal language features which allows the reader to judge quality in this type of academic discourse; the correct use of these features in the construction of the line of meaning also plays a crucial role.

G3, who was rated the lowest in language level of the five by the intuitive judgements of the readers, offered the least amount of lexicogrammatical elaboration. She used the fewest sequence words and the least variety of language features. On top of this, she failed to use the timeless present consistently and offered the least number of causal actions of the five writers. She was further faulted by the same readers for not considering the full content of the visual, an oversight that also resulted in negative evaluations by the raters using the assessment instrument because she lacked the links between her thoughts.

The functional analysis also shed light on how writers used language features to “draw” the visual line in their discourse, lending further support to the intuitive judgements of the readers whose discussions suggested that the visual prompt played an important role in the construction of the text. Some writers used a basic strategy of given and new information to draw the line, while others depended on circumstances of place. The creation of a visual chain of causality was also a possibility for writers who were proficient enough in the use of advanced causal lexicogrammar.

The fullness of the content and the connections between each event pictured in the visual, both of which the readers considered important in their intuitive judgements, could be captured from the visual prompt and placed in the verbal line of meaning by analyzing the
discourse as well. Martin (1990) claimed that the reader should be able to redraw the visual line from the information given in the text, and some writers made this easier than others. E2, for example, was the only writer from which an exclusively causal chain with all the steps could be graphically represented.

It appears, then, as though a functional analysis of the discourse offers a rationale to explain the intuitive judgements of the readers and a potential framework for assessing discourse in an integrative manner. Furthermore, the wide range of possibilities that exist in language use between simple sequential accounts of the water cycle and complex causal accounts indicates that causal discourse may offer an area of academic writing which can be exploited by test designers using this functional framework.

Implications of the Study

The examination of the Canale and Swain theoretical framework of communicative competence (1979, 1980) brings two concerns to the surface, and both point to the need to reexamine the framework’s usefulness for assessing discourse in an integrative manner. The first concern refers to the definition of communicative competence. The observation was made in chapter four that focus group three seemed to be operating with a different definition of the concept than that held by the first two focus groups. This difference in definitions was not confined to this research, as the review of the literature in chapter two indicated. Widdowson (1989) aptly observed that communicative competence is “a fuzzy concept” (p. 134), a sentiment later reiterated by Larsen-Freeman and Long (1991). Canale and Swain define communicative competence as “the relationship and interaction between grammatical competence... and sociolinguistic competence” (1980, p. 6), and propose that strategic competence be included as well, yet the authors do not explain how these competencies
interact. This raises an important issue in assessment. Spolsky (1989) stated that it is impossible to develop a sound language test without knowing what it is that is being measured. The Canale and Swain framework offers all the discrete elements of language, and the authors acknowledge that these elements are easily and reliably tested, yet until it is shown how the elements are integrated, the concept of integration remains vague, and the ability to measure it therefore remains questionable.

The second concern is that the Canale and Swain framework may not be able to account for differences in the quality of academic discourse because it is targeting the discrete elements of language rather than the construction of discourse as an integrated whole. The analysis of the raters' discourse suggested that an instrument based on the framework relies heavily on the "content and boundaries" (Canale and Swain, 1980, p. 1) established by the framework. This is not surprising in light of Harrison's observation that "for assessment purposes language has to be chunked in one way or another, and whether the chunks make sense or not has an important influence on the assessor's approach" (1986, p. 15). The raters in the current study used the categories established by their instrument as a checklist for the assessment procedure, yet they frequently had trouble determining which category the error should be placed in. This trouble is compounded in those areas where the categories appear twice, as they do in the Canale and Swain framework. Further difficulties arise when the assessment procedure uses a binary system, as it did in this study, because the raters become focussed exclusively on the errors which surface in each category rather than allowing for an elaboration of the lexicogrammar.

To assess the quality of scientific discourse such as the type presented in this study, however, a rater cannot depend on a simple taxonomic view of assessment. The functional
discourse analysis in chapter five demonstrated how the features which characterize causal discourse were not confined to categories such as vocabulary, morphology, cohesion, or strategic competence. A writer uses all the resources of the language to construct meaning, and so the discourse needs to be "chunked" differently for assessment purposes. Raters cannot simply look for causal conjunctions such as so, therefore, or consequently, because these conjunctions are only a small part of causal discourse—E2’s text contained none of these, yet showed the causal connections clearly. Similarly, raters cannot simply check for the presence of words such as evaporate or condense, because these causal words are also only a small part of the construction of causal meaning. As Halliday and Martin (1993) stated:

Whenever we interpret a text as ‘scientific English’, we are responding to clusters of features.... But it is the combined effect of a number of such related features, and the relations they contract throughout the text as a whole, rather than the obligatory presence of any particular ones, that tell us that what is being constructed is the discourse of science. (p. 56)

A checklist for an assessment instrument based on the Canale and Swain framework would therefore need to consider not only all the possible process verbs which could be used in the discourse and rank them from simplest to most complex, but how these verbs are used by the writer. This checklist would also need to distinguish between other subtleties involved in lexicogrammatical elaboration, such as nominalizations and complex nominalizations, causal actions and sequential events, and the construction of knowledge through the introduction and definition of technical terms. In essence, the assessment instrument would need to become a discourse analysis tool based on functional grammar.

An assessment instrument based on the Canale and Swain framework could likely be designed to account for the use of a visual prompt if this prompt became a category for the
raters to look for in their assessment, although it is not clear how the visual would interact with the other components. The binary system of grading, however, does not account for those writers who followed the visual line more closely than others. Judgement of the quality of the line which the writer constructed based on the visual prompt would continue to remain an issue with the Canale and Swain framework.

Although the Canale and Swain framework raises questions about its ability to assess scientific discourse, a systemic functional approach to assessment offers potential for this type of assessment. There are still several issues that would need to be addressed, though. The first concerns the visual prompt. Given the difficulties associated with this practice, as discussed in chapter two, and the specific problems uncovered with the visual prompt in this study, as outlined in chapter three, a close examination and extensive testing of the visual prompt would need to be done to ensure that all examinees would be able to interpret the task and the prompt as intended. In any case, the findings of this study suggest that test designers need to be aware of the potential difficulties and discrepancies which surface when visuals are used in language testing, just as they need to be aware of the types of language features typically used to verbally code the visual line of meaning.

Another issue that needs to be addressed in the adoption of a functional approach to assessment is the development of guidelines which would enable the assessment to proceed quickly, accurately, and reliably. Completing a full discourse analysis on each text submitted is time-consuming and therefore costly, but the high level of agreement among the intuitive judgements indicate that readers are looking for some of these language features already, an important consideration in reliably assessing the quality of discourse. Morrow (1986), in fact, suggests that
when ‘quality is defined in a way that relates to the assessors’ experience there seems no difficulty in making consistent judgements.... It is suggested that reliability can only be achieved if the assessment criteria are based in the assessors’ experience of language use. (p. 12)

Closely connected to the last point and perhaps the most important from a teaching perspective is the need to determine how these language features can best be taught. The differences in quality noted in this study suggest that students need to be made aware of lexicogrammatical elaboration, and it would seem that not all students can “pick up” academic discourse simply through exposure to it. Cummins (1984) asserted that conversational language is relatively easy to acquire, yet the acquisition of academic language proficiency can take several years longer, an observation that supports the notion that lexicogrammatical elaboration is not something that can be acquired easily. Veel (forthcoming) supports this idea by claiming that certain language features require a more sophisticated use of language. A close examination of the ways in which writers use various language features to construct different types of written discourse, looking particularly at how these could be taught and tested, would help curriculum developers, teachers, test designers, and most importantly, the students.

**Limitations of the Study**

As in any research project, decisions need to be made during the design and implementation processes, and these decisions may at times put limitations on the way the study is conducted or received. In chapter three, for example, the difficulties encountered by using a visual prompt were reviewed, the decision was made to use the visual prompt, and the discourse samples which became the focus on the study were chosen with these difficulties addressed. Other limitations exist as well. The first is the question of audience.
In chapter three, the rationale for not specifying audience was presented, indicating that this was done so that a wide sample of discourse could be collected. Not having an audience specified, though, prevented the raters from discussing sociolinguistic competence. As a consequence, this appeared to increase the emphasis that they put on linguistic competence, simply because the cancellation of sociolinguistic competence as a category reduced the number of non-linguistic categories. In spite of this, however, the fact that the raters needed the categories to do their assessment supported the notion that they were focussing on the language elements from a checklist. It would be interesting to replicate this study, specifying an audience, a role for the writer, and a context, to see if a similar range of discourse samples were written and to see if this helped bring the emphasis off the linguistic form.

A further limitation to the study was the small number of focus groups used to gather intuitive judgements and the even smaller number of raters using the assessment instrument. Although this is not a quantitative study depending on sample size, it is possible that the individuals in these groups had biases which may not be apparent in other groups and therefore not be indicative of what readers are intuitively judging. Although a larger number of focus group interviews may not change the implications of this study as they related to the adequacy of the Canale and Swain framework, it would be revealing to replicate the study with different focus group members, both professionals in the field of language education as well as non-professionals, to see if they would assess quality differences in the same way and whether they would notice the relationship between the visual and the verbal.

Finally, if the study were to be replicated, it would be useful to re-code the categories in the rating guide of the assessment instrument to make them more related to the task at hand. Creating a category for matching the content to the visual prompt and categories for explicit
causal lexis, for example, would attempt to satisfy Spolsky's (1989) assertion that it is crucial to know what it is you are measuring before setting out to measure it. Using an assessment instrument designed for rating academic writing as communicative competence would allow the researcher to make stronger claims about the suitability of the Canale and Swain theoretical framework for the assessment of scientific writing of this type.

**Final Words and Future Directions**

This research raises some questions as to whether the Canale and Swain theoretical framework of communicative competence (1979, 1980) can adequately assess differences in quality in scientific writing. The lack of information about the integration of the various elements in the framework makes the assessment of this integration questionable, and the focus of categories causes problems with determining the area in which an error should be classified. A Hallidayan functional approach, on the other hand, accounts for the quality of the discourse by looking at how the writer constructs meaning in the text. This approach also accounts for the relationship between the verbal and the visual.

The complexity of the lexicogrammar used to construct causal scientific writing needs to be taught so that students can access the scientific knowledge that exists and build on it. As Halliday and Martin (1993) emphasize, the language of science is not easy and common sense, an observation that is supported by research into the length of time it takes to acquire academic proficiency. Learning how to access and manipulate the lexicogrammar is a crucial step in increasing the quality of academic writing. The findings in this study raises questions about the suitability of the Canale and Swain framework as an adequate model for assessing these differences in quality. In the future, consideration should perhaps be put on research which uses a functional approach to teaching and assessing academic language.
Bibliography


Appendix A: Graphic Representation of the Water Cycle

Appendix B: The Assignment Sheet for the Writing Task

Please write a composition which explains what is happening in the above graphic. If you need more space to write, you can use the back of this page or attach another sheet. Thank you for your participation!

Appendix C: List of Textbooks Examined

Ten Textbooks and Reference Books Examined for Accounts of the Water Cycle


Appendix D: The Five Writing Samples (E1, E2, G1, G2, G3)

E1.
The water cycle.
What are the processes that “water” goes through?
1) Initially, the water cycle begins as snow melts from the glaciers.
2) The water then meanders through various water sheds until it reaches rivers and lakes.
   Water eventually reaches the oceans.
3) Water, then, becomes water vapour (it evaporates into the air) and accumulates in what we call clouds.
4) The “clouds” then distribute water in the form of rain, snow, or sleet back to the mountains where the cycle begins again.

E2.
The water cycle: The sun is the source of our water. The water, or hydrological, cycle begins when the sun heats up the ocean to produce water vapour through evaporation. This water vapour mixes with dust in the atmosphere and forms clouds. Cool air causes condensation of water droplets in the clouds, bringing about precipitation, or rain. This rain then falls into rivers, streams and lakes and eventually returns to the ocean, where the cycle begins again.

G1.
You can see clouds in the sky. But where is rain come from? First, rain drops on the land from the sky and that rain water get together. Second, water that get together flow through a river and goes down to the ocean. Third, the ocean water vapours and goes up to the sky and that makes clouds. Thus, water cycle is characterized through this process.

G2.
This is a diagram of how it rains. The water from lakes and oceans rises and forms clouds. Eventually it would start to rain. The water would flow from streams and pond back into lakes and oceans and the cycle would start again.

G3.
The sea water evaporates by the sun heat and it becomes mist and produces a cloud. When it was cooled by the cold air, a cloud makes rain. The rain is falling down from the sky to the soil. The soil absorbs the rain and it attributes to the sea. It is called water cycle.