PRODUCTION FACTORS FOR WRITTEN EXPOSITORY TEXTS

by

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Abstract

Expository text writing is a task that demands high-level cognitive and linguistic skill in order to produce well-written texts. Individuals who have cognitive-communicative impairments following mild closed head injury often display difficulty in organization, recall and attention when writing texts. The purpose of this study was to investigate factors that facilitate production of coherent expository texts by two unimpaired adults, with the ultimate goal of applying the results to work with head-injured individuals. These factors were: type of texts and type of support found in the text elicitation context.

It was hypothesized that Description texts would be easiest to produce, followed by Comparison, Sequence, and Response texts. It was also hypothesized that texts that were supported in the elicitation context by explicit information regarding text structure would result in more coherent texts than those written without such support. Furthermore, texts that were supported by structure plus content information were hypothesized to result in texts that were most coherent. Finally, it was questioned whether texts that were produced in the absence of support, but after the two support conditions had been completed, would exhibit a learning effect. Therefore, the effect of four elicitation contexts and four text types were examined. Each subject wrote sixteen texts.

Text adequacy was measured using cohesive harmony analysis (Hasan, 1984, 1985) and a reader rating scale that was intended to measure perceived coherence.

Results from Subject One were consistent with the hypothesized order of text difficulty. As well, the conditions in which text structure was provided generally resulted in more coherent texts than the texts produced without support. Evidence for a learning effect in the last condition

was not found. Because the addition of content did not appear to increase text coherence when compared to texts produced with structural support alone, particularly for easier text types, it was suggested that a ceiling effect may have occurred for this subject, so that additional reduction of processing demands did not result in improved text production. The results from Subject Two were inconclusive, particularly for the effect of elicitation context. Order of text type difficulty differed from the expected order for this subject's texts. This demonstrates the variability that occurs among unimpaired writers in both text coherence and how writing tasks are approached, as well as the need for further studies using larger samples.

Text ratings by a group of Speech-Langauge Pathologists did not match the results of the cohesive harmony analysis for text type. It was suggested that this disparity may be due to: inadequacies in cohesive harmony analysis that make it insensitive to features of texts readers use in order to determine coherence; or differences among texts in the readers' ability to construct text structure as they read. Texts produced in contexts with support generally received higher perceived coherence ratings than those written without such support. Inter-rater variability was marked, especially for texts low in cohesive harmony.

Modifications to the procedures used in this study for both further research and clinical application are discussed.

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CHAPTER 1

REVIEW OF THE LITERATURE

Introduction

The purpose of this study is to examine the production of written expository text by unimpaired adults. It is intended as a control study, the results of which can be utilized for future research with communicatively impaired adults, particularly those who have suffered closed head injury (CHI). As with all research on the assessment and treatment of disordered populations, it is vital to obtain a picture of normal performance, because this is the standard against which impaired persons are judged, at least in part.

Expository text writing is a complex task that requires the use of high-level cognitive and linguistic functioning. The writing process involves recalling information, evaluating and selecting relevant information, organization, sentence construction, and word finding. In professionals and activities that require the production of expository text, these skills are vital for competent communication. Even a minimal impairment may have devastating consequences for the person who must perform demanding language tasks such as expository text writing. Therefore, writing tasks may be adequately sophisticated to detect subtle deficits that are associated with mild head injury.

The tasks were progressively structured, in an attempt to discover whether altering task conditions improves performance by decreasing cognitive load. Tasks also varied with respect

to text type, as determined by proposed taxonomies of expository prose. It was unknown whether expository text type required in tasks affects how well a text can be produced.

Performance was measured using a number of analyses which have been used with varying degrees of success with several different populations. Overall text adequacy was evaluated through perceived coherence, as judged by a group of Speech-Language clinicians and students of Speech-Language Pathology who were naive to the objectives and hypotheses of this study. The perceptions of communicative effectiveness were related to a quantitative mode of evaluation. This technique, called Cohesive Harmony analysis (Hasan, 1984, 1985), is relatively new but has strong theoretical and experimental support as a way of characterizing textual coherence

Chapter One will review theories of discourse and how it may be measured. In addition, studies that have applied methods of discourse analysis to the texts produced by different populations will be examined, in particular texts produced by adults with closed head injury. Finally, possible factors affecting text production, and how these factors may be especially significant for persons with cognitive deficits, will be discussed. These include expository text type and the amount and nature of support found in the text production context.

Chapter Two describes the method which was used in this study. The tasks are described, and a summary of the tasks were presented to both the writing and the reading subjects is provided. Last, the procedure used when analyzing the texts for cohesive harmony is given.

Chapter Three reports the results of both the perceived coherence measure and the cohesive harmony analysis.

In Chapter Four, these results are discussed with reference to the hypotheses raised in Chapter One. Additionally, problems with the analyses will be raised and potential solutions to some of these problems will be offered. Suggestions will be offered regarding how this study could be modified and expanded to answer questions about the nature of texts and text production. Finally, implications for therapy with communicatively impaired persons will be discussed.

Discourse

Sentences, words, affixes and sounds are the basic units humans use to express ideas, and constitute the foci of most intervention practices. However, communication takes place not only within sentences, but across them as well, in larger units referred to as discourse. Discourse has been defined as the process whereby a producer of language (i.e., a speaker or writer) attempts to convey a message to a recipient (listener or reader) using words, phrases and sentences to make up texts (Brown & Yule, 1988). Thus, a text may consist of only one word, or it may be composed of several pages, chapters or volumes. In order to effectively represent the meaning its producer intended, a text must be relevant to the situation in which it is produced and to itself. That is, the elements must fit together, or cohere, in some way (Halliday & Hasan, 1976).

Successful communication depends on both the linguistic resources of the participants and the cognitive powers which allow the participants to attend to, organize, and relate the meanings carried by and among the linguistic units. When producing text, the individual must decide what the overall message to be conveyed will be, organize elements of the message according to an appropriate structure, decide how and to what degree elements of the message will be

elaborated, relate elements to each other sequentially and hierarchically, construct sentences, choose words and make revisions as required by the needs of the audience (Calfee & Curley, 1984). Discourse is therefore an appropriate area of investigation with persons who are believed to have deficiencies in cognitive functioning, because it allows examination of language use in naturalistic situations that are more cognitively demanding than those provided by methods of testing that focus exclusively on the sentence level or lower. The effects of acquired cognitive impairment, particularly a decline in organizational skills and ability to handle multiple processing demands, are more likely to affect meaning across sentences than within them.

Numerous variables may contribute to the success of a communication attempt by a speaker or writer. These range from affective characteristics of the producer, which may interfere with efficient cognitive processing, to the familiarity of the text content, to the inherent features of the type of text to be produced. Another important variable is the context in which the texts are produced. All of these factors place varying loads on the cognitive skills utilized in discourse.

Closed Head Injury

Closed head injury often results in a broad array of cognitive deficits that may affect the individual's ability to effectively communicate at the discourse level. Traditional assessments of language use focus on aspects of language at the sentence level and lower. That is, they examine syntax, morphology, semantic knowledge and phonology. Head injured persons typically receive scores on these measures that indicate normal linguistic processing (Liles, Coelho, Duffy & Rigdon-Zalagens, 1989). A widely cited study by Heilman, Safran &

Geschwind (1971) reported that only 13 of 750 adults with closed head injury who were examined exhibited features of language use that fit traditional criteria for aphasia (see Wyckoff, 1984). These tests, however, were developed for use with persons with focal brain damage to the left hemisphere, rather than the diffuse damage caused by head injury. Because of widespread trauma to all portions of the brain, and particularly the frontal lobes, the sequelae of closed head injury tend to reflect general cognitive impairments. Typical cognitive characteristics of the head injured population include: impaired attention, perception and/or memory; inflexibility, impulsivity and/or disorganized thinking and acting; inefficient processing of information; difficulty processing abstract information; difficulty learning new information, rules and procedures; inefficient retrieval of old or stored information; ineffective problem solving and judgment; inappropriate or unconventional social behaviour; impaired executive functioning such as self-awareness of strengths and weaknesses, goal setting, planning, self-initiating, self-inhibiting, self-monitoring, and self-evaluating (ASHA Subcommittee on Language and Cognition, 1987).

Regardless of their apparently normal linguistic ability, it is clear from anecdotal reports and descriptive comments made in the literature concerning persons with closed head injury that these individuals do not communicate normally. Adjectives used to describe the verbal output of affected individuals include: disorganized, confused, tangential, empty, poorly sequenced and confabulatory (Hagen, 1984; Wyckoff, 1984; Sohlberg & Mateer, 1989). These features of communication by persons with closed head injury are due, to a large degree, to the effects of the cognitive impairments listed above.

For persons who experience any or all of the difficulties that commonly result from traumatic brain damage, these variables can contribute to the subjective impressions of disorganization, tangentiality and so on that mark their discourse. As interesting as these observations are, they have limited utility when a Speech-Language Pathologist attempts to systematically assess, characterize and treat these communication disorders. Before appropriate rehabilitation procedures for communication impairment seen in closed head injured individuals can be designed, we must be able to identify and define precisely what factors contribute to the subjective impressions so widely reported. Articles and books describing treatment for communication difficulties associated with closed head injury appear to recognize that breakdowns generally occur during functional situations in which the individual's discourse skills are required (e.g. Sohlberg & Mateer, 1989; Hartley & Griffith, 1989). However, they are unable to precisely characterize:

1.   what a clinician should be looking for during assessment;

2.   how to structure tasks in order to maximize and build upon the performance of persons with closed head injury;

3.   how to systematically assess change in communicative ability.

It is hoped that findings of this study will provide a detailed, systematic characterization of normal performance in one area of discourse, the writing of expository texts. Once an adequate description of text produced by unimpaired persons is obtained, these data can be used as a basis for comparison when the writing ability of impaired persons is investigated.

Written expository text was chosen as an area for study because it is a highly sophisticated language task that may be sensitive to the subtle deficits found in survivors of

closed head injury who are minimally impaired. Although mildly head-injured persons may appear fully recovered, deficits may persist that prevent them from returning to previous levels of functioning (Sohlberg & Mateer, 1989). Our society is heavily information dependent, and most of our communication, whether as producers or recipients, takes the shape of expository text. This is particularly true for those professions associated with high levels of education, as well as for students. According to some researchers, our society is increasingly literate, especially with the advent of computers. Knowledge has become more and more organized, with discourse being formalized to suit particular domains of knowledge. Therefore, ability to use these specific structures precisely and appropriately is not only desirable, but necessary for many people (Calfee & Curley, 1984).

Despite the clear utility of systematically studying the discourse produced by individuals with cognitive-communication impairment, very few studies have done so to date. Those done (Wyckoff, 1984; Mentis & Prutting, 1987; Liles, Coelho, Duffy & Rigdon-Zalagens, 1989; Mentis & Prutting, 1991) have shown that the suprasentential characteristics of discourse by persons with head injury differ significantly from those of the communication of unimpaired persons. These studies will be discussed in more detail following a brief discussion of one method of discourse analysis that has been used extensively in previous studies of communication by closed head-injured and other communicatively impaired populations.

Approaches to Discourse Analysis

Cohesion Analysis

Intersentential features of texts have been the primary measure of text adequacy in studies of the discourse of individuals with closed head injury, as well as discourse studies of other communicatively impaired populations, such as fluent aphasics (Glosser & Deser, 1990), schizophrenics (Alverson & Rosenberg, 1990) and elderly with Alzheimer's type dementia (Ripich & Terrell, 1988). These features have been measured using Halliday & Hasan's (1976) notions of cohesion and coherence, and the theories and models proposed by these authors continue to be widely accepted and used in research literature (Hasan, 1984, 1985).

Cohesion corresponds to the semantic relationships among sentences that determine whether a set of sentences constitute a text. Cohesive ties are the explicit expressions of the relations among elements in a text. Devices that create cohesion consist of five types: reference, lexical cohesion, substitution and ellipsis. Reference refers to when items in a text are dependent on referents elsewhere in the text for their interpretation. This is achieved through the use of pronouns, demonstratives, definite articles and comparatives. An example using a pronoun is given in Example 1.1

Example 1.1 *Dogs* are fun animals. *They* come in all shapes and sizes.

Semantic relationships among words in a text are the source of lexical cohesion. These relationships include reiteration, in which the same entity or event is referred to repeatedly using repetition of the same word, use of the same word, or use of a superordinate term.

Example 1.2 I like *dogs*. *Dogs* are fun *animals*.

A second type of lexical cohesion is collocation. This refers to the way in which words in a text

are related, but they are not necessarily a reiteration of the same word. Collocational relations

which are used in texts include synonymy, antonymy, meronyms, and causally related words.

Hasan (1984) points out that what qualifies as a collocational relationship is often subjective.

For example, one person may feel that the words *dog* and *leash* form a lexical tie, while another

may not, and there is no objective manner in which to decide who is correct.

In substitution, a word or phrase in a text takes the place of another word or phrase. Substitution

is different, however, from reference and lexical cohesion.

Example 1.3   The *thought* of harming any animal is a sad *one*.

Ellipsis occurs when a word or phrase which has already been mentioned is omitted, but its

presence is implied.

Example 1.4   She wants to go on Monday, but I don't want to *go on Monday*.

In Example 1.4, the phrase *go on Monday* can be excluded from the second clause without

affecting interpretation of what the speaker doesn't want to do.

Cohesive devices fall into three general categories of semantic relationships that they can

fulfil, coreference, coclassification and coextension. These relations are what tie the members

of the tie. <u>Coreferentiality</u> occurs when the situational referents of two words or phrases in the

text are the same thing (Hasan, 1985), as in Example 1.1. <u>Coclassification</u> is different from

coreference, in that each event or entity in the tie belong to the same class, but they are also

distinct members of that class. In Example 1.4, the *going* that *she* does is not the same event

as the *going* that *I* do. Lastly, in <u>coextension</u>, the two members of the tie are related in that they

belong to the same general field of meaning. Thus, the lexical cohesive devices, including

collocation, manifest this type of semantic relationship between words. By using cohesive

devices, the producer establishes the unity of meaning in a text.

Coherence is a perceptual quality of texts, and as such is a somewhat more difficult notion to define (Brown & Yule, 1983). Furthermore, recent studies have shown that the presence of cohesion is not causally related to a text's coherence (Brown & Yule, 1983; Mosenthal & Tierney, 1984; Hasan, 1984; Yang 1989). Brown & Yule (1983) emphasize that the underlying meaning relations in a text are present regardless of whether they are overtly signalled text by cohesive markers. Interpropositional relations that contribute to text coherence may be marked by linguistic forms (cohesive ties), but the presence of cohesive ties does not necessarily cause a reader to interpret a group of sentences to be one text, nor will it cause a text to be coherent (see Brown & Yule, 1983, pp. 195-199 for a detailed discussion).

Text is viewed as a semantic entity, formed by meaning rather than structure. Halliday and Hasan reject the notion that structure exists above the sentence level, if by structure one means that sentences fulfil roles or functions according to some higher unit. According to Halliday and Hasan, the structure of a particular piece of discourse can only be specified after it already exists. Generalized relationships in which sentences form mutually defining structural roles do not exist for sentences in texts as they do for words in sentences. Sentences are related by how their meanings are interpreted with respect to each other. Structurally, however, they are independent.

It is important to note that many researchers would disagree with Halliday and Hasan's view of discourse, particularly researchers who have investigated story grammars. According to these investigators, (for example, Stein & Glenn, 1979), narratives are composed of a set of obligatory elements. Each of these elements plays a role in a story and therefore the story must

contain all the elements in order for it to be considered well-formed. The presence of an underlying grammar or structure to which all well-formed narratives comply has been widely supported, especially in the literature concerning narrative development (see Pappas, 1985).

Research Criticizing Cohesion Analysis

Mosenthal & Tierney (1984) cite two production studies with non-neurologically impaired subjects which criticize the ability of cohesion analysis to characterize text quality. In the first, Pritchard (1980) found that less coherent sections of poor writers' texts were characterized by more, rather than less, cohesive tie use. In the second study, Mosenthal & Tierney (1981) found that cohesion analysis could not distinguish between texts that had been rated differently for comprehensibility by readers. Therefore, if persons with cognitive-communication difficulties use cohesive devices with a frequency and pattern that do not affect how effectively they are able to communicate their message, then cohesion analysis is very limited in its therapeutic utility beyond providing another aspect of a linguistic description of discourse by closed head injured persons. Interestingly, none of the previously cited discourse studies have employed unimpaired listeners in order to judge communicative effectiveness or to evaluate how the texts are interpreted. Therefore, it is unknown how the patterns of cohesive tie use are related, if at all, to a persons's ability to make him/herself understood at the level of discourse. Furthermore, it is not known whether it is necessary for impaired persons to use cohesive devices in the same ways normals do in order to be coherent. Listener perception is a vital component of evaluation, because effective communication -- not necessarily normality -- is the ultimate goal in communication intervention.

Research with Closed Head Injured Subjects Using Cohesion Analysis

What follows is a brief critical review of the three available studies that have attempted to examine discourse abilities of subjects with closed head injury in detail using cohesion analysis. Generally, studies of communicatively disordered populations have measured cohesion by examining the frequency and pattern of cohesive tie use compared to those of normal subjects. The differences in cohesive tie use have then been used to make statements regarding the adequacy of these populations' ability to communicate effectively, that is, to produce coherent text. Typical findings show less overall cohesive tie use among the head-injured subjects when compared to unimpaired control subjects (Wyckoff, 1984; Mentis & Prutting, 1987; Liles et. al., 1989). This result is then coupled with subjective listener impressions of disorganization and confusion, and interpreted to mean that the relatively less frequent use of cohesive ties is directly related to, if not the cause of, these impressions. The above discussion has attempted to show that these frequency data are not supported sufficiently to make generalizations of this sort.

Wyckoff (1984) examined the ability of thirteen subjects with closed head injury to orally produce two different types of text and compared their performance to that of a matched group of normal subjects on the same three tasks. The tasks were:

    1. production of a narrative based on a comic strip

    2. retelling a narrative presented auditorally

    3. generation of a procedure for shopping in a typical American supermarket

The data were examined for productivity, content, cohesive tie use, variation among task types, correlations between language ability and discourse, and correlation between memory ability and discourse.

Compared to the normal subjects, the head-injured subjects produced fewer cohesive ties per communication unit in both narrative and procedural discourse conditions. This is taken as evidence by Wyckoff that their discourse "lacks continuity" (p. 150) and presumably is less communicatively effective. Here, Wyckoff equates cohesive tie use with coherence, which, as was discussed earlier, has been strongly questioned as an appropriate measure of text adequacy. While the differences in cohesive tie use are undoubtedly real, there is no evidence to suggest that they are sufficient to characterize the organizational and communicative "goodness" of discourse produced by persons with closed head injury. That is, because cohesive ties are a reflection and not a cause of coherence, one cannot say that it is because of these differences that people find discourse produced by head injured individuals difficult to follow.

Other findings are also of interest. Wyckoff notes that both unimpaired and impaired subjects produced fewer cohesive ties in the procedural condition; thus she concludes that this discourse genre is more difficult than the narrative genre. Besides the theoretical objections to the use of cohesive ties as a measure of text adequacy, there are other problems with this conclusion. First, the previously mentioned Tierney & Mosenthal (1981) and Pritchard (1980) (see Mosenthal & Tierney, 1984) studies found that increased cohesive tie use was more likely to be related to decreased comprehensibility and more difficulty with text production rather than the opposite. Witte & Faigley (1981) obtained results showing that college essays judged to be of better quality had higher cohesive density scores than did lower rated ones (see Yang, 1989). Since Wyckoff gave no indication of how well the subjects could be understood, the significance of these data is questionable. Second, the tasks of narrative and procedure production varied along more variables than simply genre. Both narratives were produced following a structured

stimulus: for the first, there was a comic strip present, which could be referred to at any time during the generation of the narrative. For the second, the subjects first listened to a story and then were asked to recall it. These contexts may have served to support the narratives, since the structure and the content of what was to be produced was provided. The procedural text, however, was produced with no supportive context. The subjects had to recall pertinent information from memory, select which aspects were to be included, and organize them logically. Given the number and nature of the cognitive impairments that may affect language use, it seems logical that external structure provided by the elicitation procedure would significantly affect the performance of persons with head injury. It is also possible that the performance of unimpaired subjects would be affected. If this type of text was in fact more difficult to generate, Wyckoff's study does not make clear whether it was due to inherent properties of the genre, or to the elicitation procedure.

A second variable Wyckoff (1984) did not hold constant was familiarity of text content. Grocery shopping is much more likely to be part of the subjects' world knowledge than either of the two stories. This hypothesis is supported by the finding that the procedure task contained fewer inaccurate content units than the narratives. Horowitz (1985a) suggests that cohesive tie use decreases with familiar topics. An increased use of cohesive ties may be observed with unfamiliar topics because they aid writers/speakers in organizing the logical relations for themselves, rather than make the text more comprehensible for readers/listeners. If this is the case, then procedural texts may, in fact, be easier than narratives. The present study will manipulate text genre and elicitation procedure as experimental variables, and control content familiarity, in order to clarify the effects and interactions of these variables.

Mentis & Prutting's (1987) study endeavoured to describe the cohesion abilities of three head-injured persons in conversation and narrative discourse, and to relate these abilities to their communicative and syntactic abilities. The emphasis on communicative ability is of particular interest in this discussion. All the subjects were required to participate in an unstructured conversation, produce one description of the work or rehabilitation program they were presently involved in, and two procedures (how to play a favourite sport and how to change a tire or bake a cake). Mentis & Prutting's use the term "narrative" in its broadest sense, so that it includes both descriptive and procedural texts. For the purposes of this paper, descriptive and procedural texts are considered types of expository text. "Narrative" is reserved to refer to texts meant to conform to story grammar (such as in Stein & Glenn, 1977). Mentis & Prutting do not specify what the structural differences are between conversation and the expository texts, although they claim they have differing structures and organization. More importantly, they provide no explanation regarding why they chose the description and procedure texts, what their structures are, or why they were analyzed together. Data analysis consisted of counting the number of different cohesive ties (using the Halliday & Hasan [1976] method) in obligatory contexts. An obligatory context was defined as: "a measure by which the subject either supplies the required linguistic element or fails in some way by violating this requirement" (p. 90); however, the authors demonstrate no rigorous way of determining what "linguistic element" is required in what place.

Overall, Mentis & Prutting's findings support those of Wyckoff: the subjects with head injury used fewer cohesive ties than the non-impaired subjects. Additionally, like Wyckoff's subjects, the head-injured adults in this study used a higher percentage of lexical ties than other

types compared to normal subjects. The same objections raised in previous portions of this paper regarding the application of cohesion analysis as an appropriate measure of discourse ability apply here, and will not be reiterated. Mentis & Prutting do, however, make an interesting observation. They say that the pattern of cohesive tie use by the subjects with head injury "resulted in semantic confusions and ambiguities in their texts which, in turn resulted in requests for revision by their communication partners" (p. 93). This gives an indication of the overall comprehensibility of the head-injured subjects' texts. More information regarding the location and frequency of the communication breakdowns, listener variables and so on are necessary, however, before statements regarding the relation between comprehensibility and cohesion can be made.

Liles, Coelho, Duffy & Rigdon-Zalagens (1989) investigated the effect of elicitation procedure on the ability of persons with closed head injury to produce oral narratives. As in the previous two studies, these authors utilized Halliday & Hasan's cohesion analysis and failed to draw the distinction between cohesive tie use and coherence, stressed in the discussion above by Brown & Yule (1988) and Mosenthal & Tierney (1984). They state that different discourse types need different patterns of "cohesive use in order to instantiate the underlying rules or structure appropriate to the creation of coherent text" (p. 356). The authors appear, by using the word "instantiate," to imply that cohesive use (presumably cohesive tie use, although this is not made clear) is necessary for the creation of coherent, well-structured text. They further hypothesize that cohesive use may change with the context of text production.

Although Liles et al. used narratives in their investigation, the manipulation of elicitation procedure is relevant to the present study. Two procedures were used. In the first, the subjects

were shown a filmstrip and then were asked to retell the story to the experimenter, who had also seen the filmstrip. The second procedure was a generation task, in which the subject was shown a picture and asked to tell a story about it. In this case, the picture was present during the story-telling and in full view of the listener. The stories were scored according to measures of productivity, intersentential cohesion, adequacy of cohesive ties and adherence to story grammar structure. When the number of cohesive ties used by head-injured subjects was compared to that of normal subjects, no differences were found for either task. Both groups tended to use more ties in the generation than the retell task, implying that this context was more demanding than the retell procedure, if we accept Horowitz's (1985a) hypothesis reported earlier that producers of complex text use more explicit signals in order to aid their own organization. If, however, one believes that a larger number of cohesive ties indicates less difficulty, then the generation task is less cognitively demanding than the retell task, even though the retell task provides more structure, since it supplies the subject with the content and the structure. In the second task, both must be generated simultaneously.

As in the other two studies, Liles et al. do not provide any indication of how the measures of cohesive patterns or cohesive adequacy reflect the communication difficulties of the subjects who were head-injured, nor how these measures translate into features to be targeted in treatment. For both the retell and the generation tasks, the range of scores achieved by the normal subjects often included the scores of the head-injured subjects who fell outside the 1.65 Z-score criterion for normalcy. In other words, some unimpaired subjects performed more poorly than the impaired subjects on these measures! This result indicates that we must either be very careful

whom we include in experimental control groups, or that if all normals are qualitatively different from the head-injured subjects, then cohesion analysis does not differentiate them in all cases.

Examination of adherence to story grammar showed that in the retell task, there was no significant difference between the two groups. For the generation task, however, three of the four head-injured subjects produced no complete episodes, while one produced three. While this tells us that some persons with closed head injury show an impairment in using text structure, cohesion analysis gives us no information regarding what they were producing instead.

Other types of analysis, such as cohesive harmony and text structure analyses, however, are designed to do precisely that. Therefore, these techniques may be more productive that cohesion analysis or simply using a story grammar checklist, because they provide a more complete picture of what individuals can do in addition to what they cannot. These alternative analyses will be described in the sections that follow.

Cohesive Harmony Analysis

Background

More recently, Hasan (1984, 1985) has expanded and modified cohesion analysis in an attempt to find a more complete representation of the characteristics of coherent texts. A coherent text is defined as one that exhibits the property of "unity" to some degree. Because coherence is a relative notion, one can say that one text possesses more unity than another, so that it is possible for listeners/readers to rank order texts according to perceived coherence.

Hasan determined coherence of the texts she used in her investigations by asking naive subjects to rank two or three texts according to coherence.[1]

Hasan responds to criticism such as Brown & Yule's (1984) -- that cohesive ties are merely a reflection of the underlying meaning being conveyed by the speaker/writer -- by stating that patterns and signs of language, including cohesive devices, realize meanings because that is their fundamental nature, not because a speaker intends them to do so. Words have meaning that are separate from the intent of the speaker. In other words, Hasan believes that so-called surface phenomena such as the lexical and grammatical categories of cohesive devices identified in Halliday & Hasan (1976) cannot be held apart from "deep," or semantic, phenomena. Cohesive devices may be explicit surface realizations of underlying meaning relations between words, but Hasan does not accept the conclusion that they are therefore irrelevant to the underlying relations. Although words and patterns represent meaning, it is not possible to remove them entirely and examine meaning alone. Hasan states that those who object to the ability of cohesion analysis to characterize texts on the grounds that it deals "only" with surface phenomena are artificially separating linguistic form from meaning. This separation, in her view, is not possible.

Hasan states that nonstructural, that is, semantic, relations are critical if coherence is to be established in a text. Hasan views text as a semantic entity rather than a structural one akin to a "supersentence." While structure is recognized as a useful integrative device, alone it is an

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[1]Some other studies of discourse have included measures for perceived coherence. Yang (1989) used subjective judgements to differentiate "good" from "poor" texts. Ulatowska and her colleagues (Ulatowska, North and Macaluso-Haynes, 1981; Ulatowska, Weiss-Doyle, Freedman-Stern, Macaluso-Haynes and North, 1983; Ulatowska, Freedman-Stern, Weiss-Doyle, Macaluso-Haynes and North, 1983) have used rating schemes in which readers assign numbers to texts according to how well produced they were.

insufficient explanation for coherence. For Hasan, a text's structure is only recognizable if the text possesses unity. If coherence were dependent on structure, then the only parameter accountable for variation in textual coherence would be text length. Hasan illustrates that a one-to-one correlation between length and coherence is easily disproved. It must be noted, however, that researchers who analyze text structure (e.g. Meyer, 1984; Mentis & Prutting, 1991) do not equate length with the value of a text either. Hasan does not consider the possibility that some patterns of text organization and delivery may be more communicatively effective or appropriate than others, without differing markedly on semantic measures of coherence. That texts do vary according to organizational properties and that these properties affect communication and learning, have been demonstrated (e.g. Meyer, 1985, 1989; Rothstein, 1990). Possible relations between semantic and structural analyses will be discussed in a later section.

To summarize thus far, coherence is a necessary property of texts, for only if a set of sentences "hang together" will they be considered text-forming by the listener/reader. "Textness" can vary because coherence is relative, not absolute, and listeners/readers are sensitive to variations in coherence. Although texts (which are by definition coherent) necessarily possess structure, structure is insufficient to guarantee coherence. It follows (although Hasan does not say so) that if a piece of discourse can vary in terms of coherence, or how easily it is perceived to be a text, then it can likewise vary in terms of structural adequacy. The relationship among semantic analysis, structural analysis and perceived coherence will be further explored in the course of this study.

Hasan's Cohesive Harmony Analysis

In her analysis, Hasan utilizes the categories of cohesive devices first set out by Halliday & Hasan (1976), with some modifications. The devices, such as reference, substitution, ellipsis and lexical cohesion, are only capable of realizing parts of messages. The integration between messages is produced by the cohesion created through the use of these devices.

In the first set of studies Hasan undertook, she hypothesized that the degree of coherence in a text would correspond directly with the frequency of occurrence of cohesive ties. This was assumed in three of the studies of discourse following closed head injury reviewed in this paper (Wyckoff, 1984; Mentis & Prutting, 1987; Liles et al., 1989). She found that this assumption was invalid, since neither raw scores of cohesive tie number nor a tie-clause ratio differed significantly among three texts which had been ranked in terms of perceived coherence. Hence, this finding supports previous research (Mosenthal & Tierney, 1984) that criticized the relationship between coherence and cohesion as traditionally defined. Furthermore, although unresolved ambiguity frequently co-occurred with higher ratings of textual incoherence, the relationship was not one to one. Hasan found texts that lacked coherence but had little unresolved ambiguity[2].

Hasan (1984) also hypothesized that if two texts were equivalent in terms of tie density but differed in perceived coherence, then this would correlate with the proportion of ties that combined to form a chain. While investigating this second hypothesis, Hasan discovered that, in separating lexical and grammatical chains, aspects of texts' semantic organization became less

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[2]An ambiguous grammatical device can be interpreted in more that one way in a text (Hasan, 1985). For example, in the sentence "Jason and Jeff are both nice guys, but I like *him* better," it is impossible to determine to whom *him* refers.

evident. This lead Hasan to develop a method of analysis which kept lexicogrammatical categories in alignment in order to better demonstrate the semantic unity of a given text.

Hasan revised the 1976 lexical cohesive categories by proposing two types of lexical ties. General ties consist of supratextual semantic bonds that have language-wide validity. Their meanings are "experiential" and consist of the following relations (Hasan, 1984, p. 202):

1. synonymy   e.g. leave, depart

2. antonymy   e.g. leave, arrive

3. hyponymy   e.g. travel, leave (also co-hyponyms such as leave, arrive)
    (superordinate/subordinate)

4. meronymy   e.g. hand, finger (also co-meronyms such as finger,
    (part/whole)   thumb)

5. repetition   e.g. leave, leaving, left

In contrast, instantial lexical relations are text bound and valid only within the text itself. Categories of this type of bond are:

1. equivalence   e.g. the *sailor* was their *daddy*

2. naming   e.g. the *dog* is called *Toto*

3. semblance   e.g. the *deck* was like a *pool*

Hasan (1984) excluded the relation of collocation due to difficulty in operationalizing it consistently for analysis. However, many of the relations previously subsumed under this type of lexical cohesion were found to be included in the above categories (see Halliday and Hasan, 1976). Hasan (1984) recognized that not allowing for collocation might result in the loss of relations which actually do exist in the text. However, she stated that the uncertainty regarding what could be included as collocational and what could not forced her to abandon this category.

Other researchers, for example Yang (1989), have included collocational items only if the association between them was judged to be very strong. How strength of collocation was determined, however, was not specified.

Ties in a text form <u>chains</u>. Chains are formed by a set of tokens which are related to each other by coreference, coclassification and/or coextension (Hasan, 1985). A lexical chain is the set of tokens in which the members of any possible pair are related by one of the means in the general category of lexical ties. Chain construction of this type is related to the topic development of the text, much like grammatical cohesive chains are. Grammatical cohesive ties are like instantial lexical ties, in that their interpretation is text bound. In the analysis procedures, grammatical cohesive ties such as pronominals are replaced in chains with the lexical tokens to which they refer. This process is termed <u>lexical rendering</u>. Example 1.5 gives an example of how a text would look after it had been lexically rendered.

Example 1.5   a. I like *dogs*. *They* are fun. *They* are playful.

b. I like *dogs*. *Dogs* are fun. *Dogs* are playful.

Analysis of the text is carried out on the lexically rendered version. In this way, how lexical and grammatical cohesive devices operate together and support each other can be observed.

Hasan proposed two types of chains. In <u>identity</u> chains, the bond is one of coreferentiality. Identity chains are always text bound since interpretation of specific items is situationally and text-specifically determined. As such, the tokens in identity chains are grammatical devices, instantial lexical devices and repetition of generic. These chains are necessary to text construction because the entities, events and circumstances being discussed must be stated initially and made specific before they can be mentioned repeatedly.

The second type of chain is the <u>similarity chain</u>. These chains are not text bound in interpretation, and consist of two types of bonds:

1.   coclassification, which is realized by the devices of:

   a) substitution e.g. I asked Susan to *write* a note. Did she *do* it?

   b) ellipsis   e.g. She wants me to *wash the car*, but I can't *(wash the car)*.

   c) repetition   e.g. She told me to *wash* the car, but I *washed* it last week.

2.   coextension, which is realized by general lexical ties (see above for examples)

Similarity chains function to reflect the generic aspects of the text at the same time as contributing to its individuality.

Tokens in a text which are subsumed in chains are termed <u>relevant tokens</u>, while those that are not are called <u>peripheral tokens</u>. For example, in the following text, the italicized words are relevant tokens because they participate in cohesive ties. In this example, instances of conjunctive and instantial lexical cohesion were ignored for the purposes of clarity and space. The tokens that are not italicized, such as "once upon a time" and "cuddled", do not participate in identity or similarity chains and therefore are peripheral tokens. Relevant tokens earn their label because they are relevant to each other by cohesion and they are relevant to the text's topical development. Peripheral tokens are not vital to the organization of meanings in the text; the nature of the information they provide is likely to be unrelated to the topic. While this conception of chains allows the integration of lexical and grammatical cohesive patterns to characterize the degree of perceived coherence, the manner in which the chains are related to each other must also be examined.

According to Hasan, <u>chain interaction</u> is vital to the overall unity of a text. Interaction occurs when two or more tokens in a chain participate in the same functional relation to two or more members of another chain. The requirement that two or more tokens in each chain be involved in an interaction is important. If only one token were required, then the difference between chain formation and chain interaction would disappear, since every member of the chains would interact with another member. In effect, then, clauses would be responsible for cohesion. As Hasan points out, random lists of clauses are not necessarily coherent. Furthermore, as research (Hasan, 1984, 1985; Yang, 1989) has shown, the mere existence of chains is not

Example 1.6

1. once upon a time there was a *little girl*
2. and *she went* out for a *walk*
3. and *she* saw a *lovely little teddybear*
4. and so *she* took *it home*
5. and when *she got it home she washed it*
6. and when *she took it to bed* with *her she* cuddled *it*
7. and *she fell straight to sleep*
8. and when *she got up* and *combed it* with a *little* wire*brush* the *teddybear opened his eyes*
9. and started to *speak* to *her*
10. and *she had* the *teddybear* for *many many weeks* and *years*
11. and so when the *teddybear* got *dirty she* used to *wash it*
12. and every time *she brushed it it* used to *say some new words* from a *different* country
13. and that's how *she* used to know how to *speak English, Scottish* and *all the rest*   (Hasan, 1985, p. 72)

sufficient for coherence. Textual unity is derived from the fact that the same or similar things are said about the same or similar entities, events, ideas and so on. Figure 1.1 on the following page illustrates the interactions among the chains in Example 1.5 (adapted from Hasan, 1985, p.92).
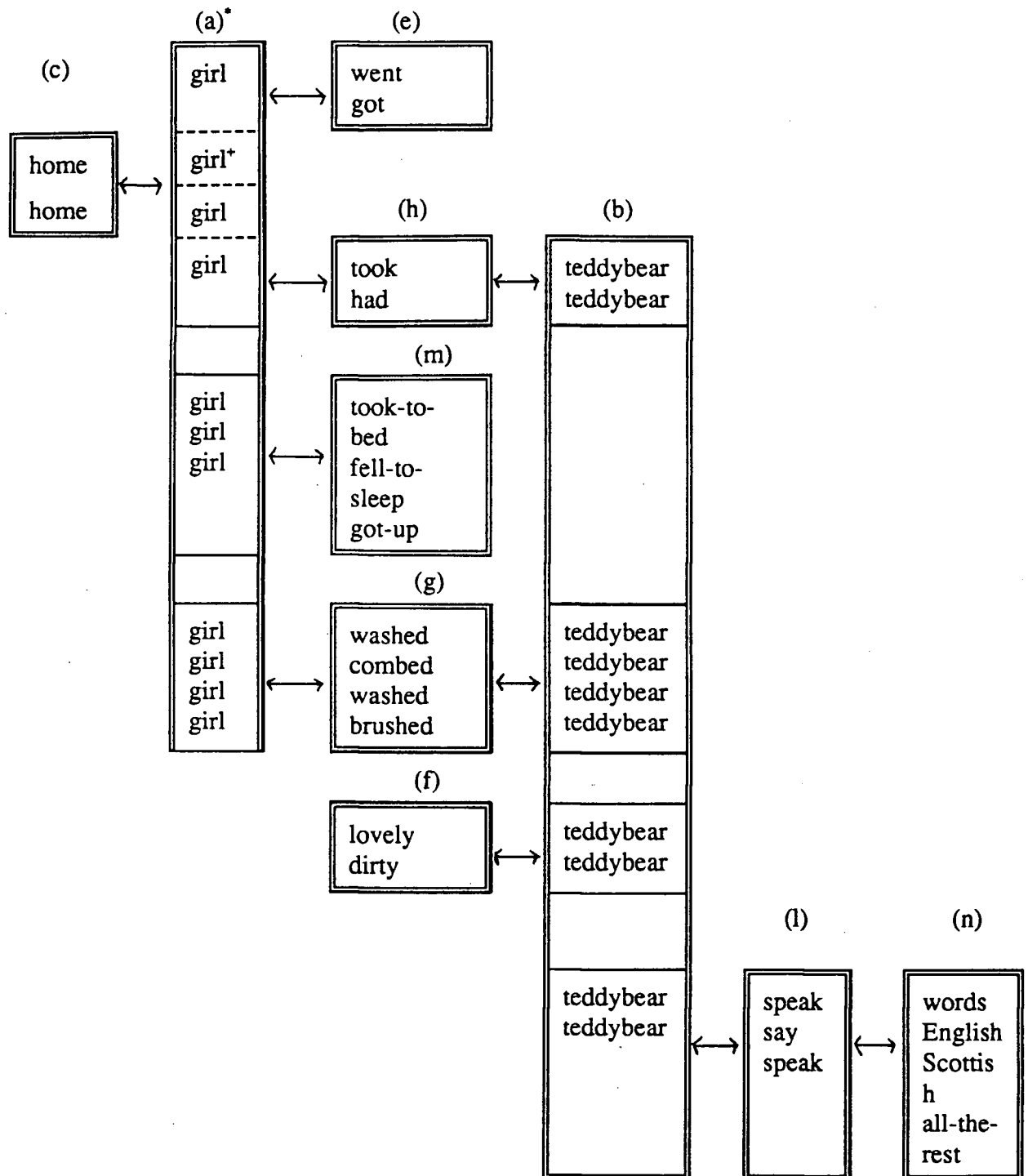
Figure 1.1. Cohesive chains and chain interactions in the Teddy Bear text, based on Hasan (1985, p. 92).

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*words in double outlined boxes are chains. Words within chains that are
enclosed within single lines are separated in order to show which members
of each chain interact with another chain. Tokens separated by dashed
lines in chain (a) are in staggered interaction, as the second instance of
"girl" interacts with chains (c) & (e). The third "girl" interacts with (c)
and (h).      +Note that the tokens are taken from the lexically rendered
text in Example 1.5.
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Functional relations possible for chain interaction are essentially grammatical, and include (Hasan, 1985, p.93):

1.   actor - action   e.g. *girl went*

2.   action - acted upon   e.g. *took teddybear*

3.   action and/or action - location   e.g. *girl got home*

4.   'saying text'   e.g. *said words*

5.   attribute - attribuand   e.g. *lovely teddybear*

Chains may interact with each other in two ways. An interaction may be <u>simultaneous</u>, where the same two members of a chain interact with members of two or more other chains. In the Figure 1.1, chain (c) participates in a simultaneous interaction with chain (a), since all the members in chain (c) are involved in the interaction with chain (a). Alternatively, an interaction may be <u>staggered</u>, in which different members of a chain interact with members of two or more other chains. Different members of chain (a) interact with chains (c) and (e). Thus, chain (a)'s interaction with chains (c) and (e) is staggered. Staggering is necessary for multiple chain interaction and is found more frequently than simultaneous interaction. Furthermore, chains (a) and (b) act as <u>focal chains</u> in this text, since each interacts with a large number of other chains. Not all tokens in chains (relevant tokens) participate in chain interactions, however. Those that do are called <u>central tokens,</u> and are directly relevant to the coherent development of topic.

The formation of identity and similarity chains, plus interactions among these chains, are the basis for <u>cohesive harmony.</u> The degree of chain interaction is proposed to be directly related to the degree of perceived coherence in a text. Therefore, as cohesive harmony increases, so will

perceived coherence. Cohesive harmony is expressed by two indices that Hasan found to correspond to readers' ranking of texts. The first is the number of central tokens divided by the number of total tokens, expressed as a percentage. Because central tokens are vital to topic development through chain interaction, it follows that the larger proportion of central tokens a chain has, the more interactions will be found. Hence, this text will be high in cohesive harmony. Hasan states that in order for a text to be perceived as coherent, at least half of all tokens must participate in chain interaction. Hasan found that texts that readers ranked highest in terms of coherence had the highest cohesive harmony scores. The second index is the ratio of central tokens to peripheral tokens, that is, the number of tokens that do contribute to text unity by participating in interactions compared with those not relevant to text unity. Other measures, such as ratio of peripheral tokens to relevant tokens, or peripheral tokens to total tokens, were not found to be associated with coherence.

In addition, Hasan found that if two texts are found to be equivalent in terms of cohesive harmony but differ in perceived coherence, then the most coherent text will be that with the fewest <u>gaps</u> in chain interaction. Gaps occur when a proportionately large number of peripheral tokens exist in text, compared to central tokens. In Hasan's study (1984), the most coherent text had a central token to peripheral token ratio of 10:1, while the least coherent text had a ratio of 1:1 (p. 217). In the latter case, peripheral tokens disrupt the interactive pattern, so that step by step interactions between chains are not possible. In Figure One, which represents the chain interactions in a coherent text, the chains are inter-related through the series of interactions in which they take part. Figure Two is a schematic example of a text with less coherence, and containing a gap. There is no way in which chains (a) and (b) can be connected to chains (c)

(a)   (b)

(c)   (d)
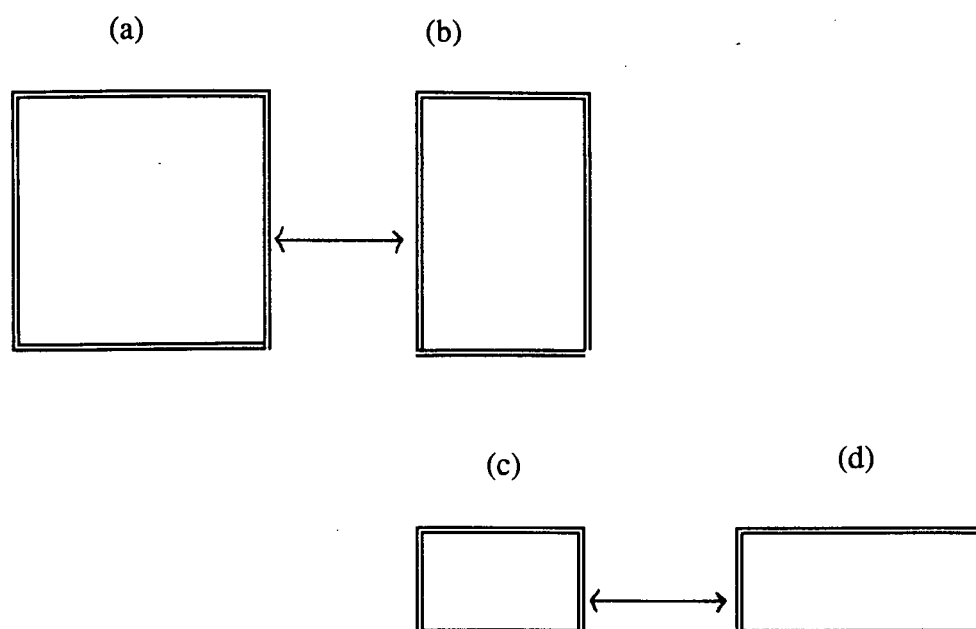
Figure 1.2. Schematic representation of a text with low coherence due to gap. (adapted from Hasan, 1984, p. 215)

and (d). This disruption contributes to lower perceived coherence. Again, the double-outlined

boxes represent chains, and the arrows connect chains at points where they interact in the text.

Cohesive harmony analysis is a promising method of quantitatively evaluating text

coherence that supplements subjective reporting. It not only gives information regarding

deficiencies in text unity, but also provides useful data regarding an individual's strategies and

functional strengths. In this way, cohesive harmony analysis is a valuable technique for diagnosis

and treatment of persons with discourse level communicative disorders (Armstrong, 1991).

Hasan (1984) notes, however, that difficulties with the method persist. Most pertinent to the

present study is the problem of how to deal with metatextual devices that establish text reference,

as in Example 1.6.

Example 1.6   The term "Communism" has been defined in this paper many different ways. *From now on* it will refer to the one party system established after 1917 ...

The words *from now on* are a metatextual signal to the reader that establish a condition which will be assumed in the text that follows.

Studies Using Cohesive Harmony Analysis

Although cohesive harmony analysis is relatively new, a few researchers have applied it to texts produced by various populations.

Pappas (1985) studied the utility of cohesive harmony analysis in the examination of coherence in children's narratives. Previous studies analyzed how well children's stories conform to story structure, but Pappas was interested in how well cohesive harmony analysis could characterize topic development. She states that cohesive harmony provides a means of capturing the semantic relevance of principles that underlie narrative form. Furthermore, it relates the characters, objects and places in narratives to the states and events that occur. Thus, aspects of macrostructure, in addition to sematic properties, are tapped.

Pappas found that some children, who produce adequate stories when analyzed according to structure alone, show insufficiencies in coherent story production only detectable by semantic analysis. This study thereby points out the value of examining and comparing the results gained by these two types of analysis. Another important result confirms previous statements regarding the relation between cohesion and coherence. Pappas reports that different patterns of cohesive tie density and cohesive harmony were found across the study's conditions. The cohesive harmony index was highest for the retelling context, followed by the dictation context. This

context in turn resulted in a cohesive harmony index that was significantly higher than that of the writing context. In contrast, the cohesive density index was higher in the retelling context than it was in the writing context, but no differences were found between the cohesive density scores of the retelling and dictation contexts, or between the dictation and writing contexts. Therefore, it is important to keep the notions of coherence, as shown by cohesive harmony, and cohesive density distinct.

In a second study, Yang (1989) examined how the use of cohesive chains is related to the quality of college students' writing. Variables included among potential factors characterizing poor and good quality texts were: number of chains; chain density (total number of items in chains and number of sentences in which relevant tokens occurred); chain length; word types in chains; and interactions between chains. Yang hypothesized that:

1. in revised versions of text (which were considered to be of better quality than original versions), cohesive chains would be longer but fewer in number than in original versions;

2. word variety would be greater in revised versions;

3. the revised versions would contain more chain interaction.

Yang found that none of chain number, length and density differentiated the poor from good quality texts. The most significant factor was the amount of chain interaction, especially among dominant chains, which contained more items and conveyed more important information. The finding that there was such a core of chains points to the value of this analysis to characterize topic development. Greater frequency of chain interaction was associated with more

coherence in the revised texts. Yang observed that structural changes in text organization resulted in improved continuity and interaction among some chains. With these findings, Yang's study supports the theoretical validity of the relationship between cohesive harmony and coherence. In addition, it further demonstrates the practical utility of Hasan's (1984) method for characterizing text adequacy.

Most recently, Armstrong (1991) investigated the usefulness of Halliday & Hasan's (1976) and Hasan's (1984) analyses with respect to the treatment of aphasic discourse. In this study, oral descriptions of pictures produced by aphasic subjects and unimpaired subjects were compared using these two analyses. Chain interaction was the variable found to best distinguish between normal and disordered discourse, supporting Yang's findings with college students. Other variables, such as number of cohesive ties and amount of chaining, did not vary significantly with population. Furthermore, aphasics tended to produce more repetitive chains with less variation in the types of lexical relations among the members. Additionally, they produced many more ambiguous items.

Armstrong stresses that this analysis allows the clinician to observe not only deficiencies in aphasic discourse, but areas of potential strength as well. She states that the goal of the Speech-Language Pathologist is not so much to help disordered persons to achieve normal patterns of chain interaction as it is to help them communicate effectively. By focusing treatment on aspects of cohesion the patient can use well, clinicians may find the text more coherent, even though an unimpaired person might be unlikely to produce the text in the same way. The success of such an approach would depend on how important a particular aspect of cohesion was for coherence for a listener. Thus, the clinician must check therapeutic efficacy through both

analytic means and listener perception. Techniques in therapy for mildly impaired persons may be as simple as drawing the individual's attention to and increasing his/her awareness of cohesion errors. Written transcripts of oral discourse may also be used to teach the individual about discourse skills. One may also focus on chains and interactions visually by mapping out a discourse, then working on words in chains and how they interact, in order to create textual meaning.

Mentis & Prutting (1991) again investigated discourse ability, but the focus of analysis was on topic management, not cohesion. Their analysis is not based on Hasan's (1984, 1985) theory, but it is useful to examine their methods and findings in light of cohesive harmony.

In order for a text to be coherent, various aspects of topic manipulation must be accomplished, including establishment, closing, shifts, embedding and side sequences. Mentis & Prutting state that cohesion, as examined in their previous work (Mentis & Prutting, 1987), may reflect topic management, but is not sufficient for topic management to be done successfully. They implicitly support the idea that cohesion analysis alone is not enough to characterize the communicative adequacy of text. In its place, they have proposed a structural analysis of discourse according to considerations of topic. This differs from Hasan (1984), who views text as a semantic entity and therefore demands a semantic, relational type of analysis. In my view, these two analyses are complementary.

Topic is a construct that is not well defined in the theoretical literature. However, topic can loosely be stated to be what the text is about, what overall meaning the producer of the text is attempting to convey. Mentis & Prutting operationally define topic as a clause or noun phrase that identifies the question of concern and that gives an overall description of the content of a

sequence of utterances. In order for an utterance to be considered part of a topic sequence, it must express a concept or concepts that can be directly subsumed under the topic label. This definition calls to mind the hierarchical, top-level/macropropositional type of analysis proposed by Meyer (1985)[3]. From Hasan's viewpoint, it could be argued that we can only decide whether an utterance can be subsumed under a topic label by interpreting its meaning in relation to other utterances in the text, and that the topic label can only be derived from our ability to discern the semantic relations present. Hasan's analysis focuses on lexicogrammatical relations, whereas the structural analyses of Mentis & Prutting (1991) and Meyer (1985) deal with relationships among concepts and propositions. This difference is not so much one of concentration on different levels of discourse (i.e., surface in Hasan's case, deep in the others'), but of interpretation as to where meaning lies in text. It seems to me that both types of analyses are potentially valuable. The structural analyses can provide an overall picture of how ideas are being organized or managed by the producer, given the main idea to be expressed. Hasan's cohesive harmony analysis can show what means the producer is using (i.e., cohesive ties, chaining and chain interaction) to create textual meaning. Each type of analysis will reflect the other. For example, in Mentis & Prutting's (1991) analysis, a tally is made of unrelated issues introduced, that is, of utterances which could not be subsumed under an identifiable topic label. A high number of these issues would indicate that the overall topic was not being managed effectively by the speaker, and hence the text would seem to be less (by some degree) easy to follow. That is, the text would be less coherent. In the cohesive harmony analysis, unrelated issues would be observed in the form of nonrelevant tokens, or chains of tokens which did not participate in

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[3]This analysis will be discussed in the next section of this chapter.

interactions with other chains in the text. There may be a core of chains that interact a great deal (see the discussion of Yang, 1989), but the chains containing tokens expressing the unrelated issues would exist at the periphery. This would affect the cohesive harmony index (central tokens over total tokens) and quite plainly show that the text lacked coherence. A comparison of a number of different coherence measures to identify which is most appropriate in the examination of written text is an interesting area for further study.

Mentis & Prutting (1991) identify two major components of coherence with respect to topic: topic introduction and topic maintenance. Furthermore, an indication of the complexity or degree of elaboration of topic development can be gained through the number of embedded subtopics present. These subtopics must also be adequately introduced and maintained, and hence their success also impacts on coherence. Thus, analysis of the discourse samples collected examined the types and manners in which topics and subtopics were introduced and maintained.

Two discourse genres were elicited from one head-injured and one unimpaired subject: conversation and monologue. For each genre, two abstract and two concrete topics were supplied, plus two topic-unspecified samples for the conversation condition. The monologue condition applies more closely to the present study than does the conversation. In the monologue condition, the subject was simply instructed to tell his partner everything he could about a preselected topic. Mentis & Prutting did not separate the topics into type of text, such as description, sequence and so on, nor did they provide a list of the actual topics used. Because texts are proposed to be organized according to topic and not text type, it is understandable the investigators paid no attention to this detail. For them, this was not a consideration that needed to be dealt with explicitly. However, their results may be applicable in a general way to the

results of this study, particularly the "production without support" conditions.

Mentis & Prutting (1991) found that the subject with closed head injury demonstrated topic management abilities that were reduced and disrupted in comparison to the unimpaired control subject. The head-injured subject's failure to structure his discourse was evident, in that he produced more noncoherent topic changes, ambiguous and unrelated ideational units, and false starts than the unimpaired subject. Specifically, the head-injured subject more frequently referred to objects or entities whose referent could not be interpreted from the context or co-textual utterances. That is, he omitted referents which would have specified the relationship between portions of the text, and used ideational units which were neither clear nor specific enough to establish how items in the discourse were related. This finding is very important for the characterization of coherence of texts, particularly texts produced by persons with the cognitive-communication difficulties associated with head injury. The authors state that the identification of referents, and of the semantic relations among them, is crucial for the establishment of discourse topic. In Hasan's cohesive harmony analysis, this feature would be evident through a large number of peripheral or ambiguous tokens, which would lower the cohesive harmony index, pointing to a lack of coherence.

Breakdowns in topic maintenance were also frequently observed due to the increased production of ideational units unrelated to the topic. This was especially noticed in the monologue tasks. Mentis & Prutting hypothesize that this condition was more difficult than conversation because:

1.   less structure was available, since topic development was the sole responsibility of the speaker;

2.   the topics were clearly defined, thus restricting allowable content.

A cohesive harmony analysis would likely find that the unrelated issues manifest themselves as chains (assuming no ambiguity within the sequence) that do not interact with a core of chains which are related to the topic.   Finally, the head-injured subject produced significantly more incomplete utterances. While false starts and cut off words and phrases also occur in normal discourse, their frequent presence may add to impressions of textual discontinuity and a reduction in clarity and precision of expression.

As in the other studies of discourse produced by head-injured persons which have been reviewed, Mentis & Prutting do not provide any indication of perceived coherence. That is, they do not relate the measures of topical coherence and adherence to discourse structure to any impressions of communicative adequacy as judged by the listener/partner in the interactions. Because communication necessarily involves two participants, a producer and a recipient, it is insufficient to characterize the efficacy of the producer without respect to the experience of the audience. This raises the question of what kind of numbers must result from an analysis before a text can be considered to be lacking coherence? It would be a mistake, in my opinion, to apply an analysis of this or any other type blindly. The utility of these measures is not such much in their ability to decide whether discourse is incoherent, because this is easily done simply by listening to or reading a sample text.

Coherence is perceptual, qualitative and relative. Naturally, the analyses must naturally correlate with coherence, but their value lies in their ability to identify what aspects of language use in discourse are contributing to the subjective impressions. These aspects include such things as topic management and intersentential semantic relations. This information is absolutely necessary for effective assessment and remediation. Armstrong (1991), for example, gives suggestions regarding how chaining and chain interactions can be remediated in aphasics. The difficulty prior to the development of these techniques was that we knew some persons were "incoherent," and that we wanted them to be "less incoherent," but since we did not know why they sounded the way they did, we did not know how to change it.

Text Structure

It is clear that an alternate means of examining discourse is necessary, because subjective descriptions are limited in information value and measures of cohesion (Halliday & Hasan, 1976) are of questionable utility. Cohesive harmony analysis is one alternative. Another is text analysis focusing on structure. Mosenthal & Tierney (1984) advocate the use of top-down text structure analyses because they impose "coherence measures on text as a consequence of the reader's and writer's notions of how a text can and should function in communication" (p. 240), rather than simply counting cohesive ties.

There are at least three methodological reasons why specification of text structure is useful for writing research: First, existing models of various text types give an indication of their inherent structures and underlying semantic relations. Second, the models can be used to analyze text produced by both normal persons as well as special populations believed to show impaired

ability in producing texts. Third, analyses of text produced by communicatively impaired persons can be compared to texts produced by a standard population and thereby provide an assessment metric.

Meyer's Approach to Text Structure

Meyer and her colleagues (Meyer, 1975; Meyer, 1985; Meyer, Young & Bartlett, 1989) have developed a description and method of analysis for five basic text types, based on Grimes (1975). These are similar to those employed in studies examining text effects on the writing of(non-neurologically impaired) students (Taylor & Beach, 1984; Hiebert, Englert & Brennan, 1984). The focus of Meyer's technique is the logical relations among propositions in a given text. Because the present study examines the ability of individuals to convey meaning in written texts, this method may be appropriate for examining suprasentential organization in the texts produced by the subjects. A comprehensive application of structural analysis to the texts is beyond the scope of this study.

Production of text requires the ability to produce appropriate linguistic forms while also attending to overall structure of text in order to convey the entire meaning of the intended message. Because different text types have different underlying structures and demands, they may also vary in the cognitive load they place on the text producer. Therefore, it is hypothesized that performance may vary according to text type.

Meyer (1985) states that there are three levels at which a text can be examined. The highest, or top, level, is the overarching structure under which the majority of subordinate propositions can be subsumed. The top-level relationship among ideas in a given text serves as

the overall plan for writing the text. It is this plan to which the writer must adhere if he/she wishes his/her meaning to be communicated. Five text structures are identified by Meyer (1985):

1. Collection: Ideas or events are related together into a group on the basis of some commonality. Grouping can be done by association, simultaneity or sequence in time.

2. Causation: A causal relation exists between ideas where one idea is the antecedent, or cause, and the other is the consequent, or effect. The grouping is in terms of temporal relations and the ideas are causally related.

3. Response: This type is also known as problem/solution, remark/reply and question/answer. It is similar to the causal structure type, because the problem/cause is antecedent to the solution/effect. However, there must be, in addition, some overlap in the topic content between the problem and the solution. That is, some aspect of the solution must match the problem.

4. Comparison: This type points out the differences and similarities between two or more topics. Usually, there is an evaluation component, in which one alternative is argued to be more desirable than the other.

5. Description: This type gives more information about a topic by presenting attributes, manners or settings. The grouping is often hierarchical.

Although Meyer and her colleagues have not applied these structure types to original writing, some clues are provided as to the relative difficulty of each of these types. Collection, causation and response are said to lie on a continuum that specifies how constrained the producer

is. Collection is the least constrained because criteria regarding how the information should be related is loosely defined. Within this category there is a continuum of constraint. A group of ideas or propositions that are simply associated along some unspecified feature can be presented randomly. However, events or ideas related by sequence in time must be presented sequentially in logical order to convey that meaning. Procedural discourse, studied by Wyckoff (1984) and Mentis & Prutting (1987), falls into the category of Sequence, although it is arguable that some aspects of procedures are causally related. Structures within the category of collection do not demand logical reasoning as complex as required by other text types. If little stress is placed on cognitive abilities of the writer, then it should be more easily adequately produced than text types that place more stress on cognitive abilities. The next category on the continuum is causation. Causation requires not only a temporal relationship between ideas, but a causal one as well. This may result in increased cognitive demand, and contribute to poorer performance by the individual with closed head injury. The last type on the continuum is Response. This type requires the additional cognitive demand that the propositions which are related also possess overlapping content. Therefore, according to Meyer, it may be expected that performance will be poorest on this type. Of the other two types of text, Descriptions are simpler than comparison texts, essentially being collections. Typically, descriptions begin with superordinate information which becomes more specific in subsequent sentences. Thus, their simple structure may lend themselves to greater ease in production. However, it is also possible that descriptions will cause head-injured persons difficulty because of the hierarchical nature of the organization. However, Meyer reports that subjects who had difficulty recalling information presented in other text types tended to use descriptive structure in their recollections, pointing to the relative simplicity of this

structure. This is supported by Horowitz (1985a). <u>Comparison</u> texts require the writer to organize the text around two ideas, which must be both described and evaluated. The relative difficulty of this text structure is uncertain. While the evaluation component may cause increased cognitive stress, there are fewer temporal, causal and content constraints.

Four types of text will be examined in this study: Description, Sequence, Comparison, and Response. In order to reduce the expectations of participant involvement in the study, cause-effect was eliminated because of its close relationship to both sequence and response. Coherence measures were hypothesized to be highest for description texts, and lowest for the response type. The relative difficulty of sequence and comparison, as demonstrated by amount of coherence, is unclear.

The second level at which texts can be examined is the macropropositional level. Macropropositions are the relationships among ideas represented in complexes of propositions. The relationships follow the same classification as for top-level structures. A text may contain a number of different macroproposition types, even though one structure dominates it. For example, a Response text discussing the problem of racism may include a description of racist ideas, relate the origin of the ideas to some cause, and compare racist and antiracist ideologies. Text structure analysis was not used in this study. However, as Chapter 4 will discuss, there may be a place for it in the evaluation of texts produced by communicatively impaired adults.

Mohan's Knowledge Framework

Mohan (1986) provides a detailed discussion of the treatment of knowledge and how it is conveyed through language. Like Meyer, he states that information regarding certain topics

falls into certain structures dictated by the overall meaning the author wishes to convey. These knowledge structures are conveyed by a generally applicable framework which is divided into two parts.

In my view, text structure is not just a frame onto which one hangs sentences and, lo and behold, we have a "cause and effect" or "comparison-contrast" text. For example, a causal conjunction may signal that a text may be a cause and effect text, but this does not necessarily mean that a cause and effect relation actually exists. The structure of text is motivated by the meaning the producer wishes to convey. The structure is necessary for the meaning to be expressed successfully, so the structure is a part of the message, not simply its form. Text topic, therefore, dictates not only what the person wishes to speak or write about, but also what aspect of the content is to be emphasized, what it is about the content he/she wishes to leave you with. For example, the subject of an essay may be expressed in a noun phrase such as "the dandelion," but this title does not indicate whether the essay is merely a description of its appearance, or a description of how it is formed (a sequence), or an argument that pesticides be used in order to eradicate it from public parks.

Mohan's framework may be appropriate for evaluating how adequately the texts conveyed the content requested in the tasks, as it more readily integrates text meaning with text structure. In my view, text structure is not just a frame onto which one hangs sentences and, lo and behold, we have a "cause-and-effect" or "comparison-contrast" text. For example, a causal conjunction may signal that a text may be a cause-and-effect text, but this does not necessarily mean that a cause-and-effect relation actually exists. The structure of text is motivated by the meaning the producer wishes to convey. The structure is necessary for the meaning to be expressed

successfully, so the structure is a part of the message, not simply its form.

Table 1.1, adapted from Mohan (1986, p. 40), is a schematic of his framework. The specific, practical side is comprised of the particular examples and cases existing at a specific time and place within a topic. This information can be examined at three levels: description, which provides answers to the questions of who? what? and where?; sequence, which demonstrates the order of events, and the processes, procedures and routines involved; and choice, which is concerned with the choices, conflicts, alternatives and decisions associated with the topic. The second side of the framework is the general or theoretical aspect, which is divided

Table 1.1--Representation of Mohan's (1986) Knowledge Framework

ACTIVITY

	Practical	Theoretical	
Description	State of affairs A at T_1*	State of affairs A includes or excludes state of affairs B	Concepts and Classification
Sequence	State A at T_1 is followed by state B at T_2	State A is necessary or sufficient for state B	Principles
Choice	State A and state B are alternative futures at T_1	State A is preferable to state B	Evaluation

*T_{1-n} = different points in time

into three components corresponding to those for the specific aspect, but focusing on features that are generally applicable to all topics. These are: <u>classification and concepts</u>; <u>principles</u> that specify how concepts are related, such as cause-effect, methods and techniques, means-end, strategies, rules and norms; and <u>evaluation</u> using values, standards, and reasoning.

As is evident from the table, these components are related, in that they build upon each other. For example, it is possible for a text topic to be purely descriptive, thereby dealing only with the first level of concepts and classification. However, a Sequence text necessitates the use of description in addition to principles. A text that evaluates information must first describe the alternatives and outcomes and explain by what principles they are related before a choice can be made and supported. This layered framework would then lead to predictions regarding text difficulty that differ slightly from those derived from Meyer's. Description and Comparison texts would be equally simple, with Sequence being comparatively more complex because it involves an additional principles component. An evaluative text, or Response text, would be most difficult. In Meyer's taxonomy, the relative difficulty of comparison/contrast was not clear. Note, however, that for Meyer, this type of text does involve some evaluation component. In this study, the participants will not be asked to evaluate the two concepts/objects to be compared and contrasted. The evaluation text will necessarily involve some comparison however, as at least two alternative views will need to be discussed in order to respond to the questions posed.

While using this framework in order to examine the quality of the texts produced by the subjects is beyond the scope of the present investigation, the framework was used in order to construct the information given to the subjects in two of the elicitation contexts. Because Mohan's representations of knowledge reflect how knowledge is organized, it should be easy for

a writer to produce a text if the content of the text was presented in accordance to its underlying structure. However, Meyer's taxonomy provided the categories for the present study because text difficulty was arranged on a continuum.

Table 1.2 is an example of one of comparison-contrast tasks used in this study. The two entities (house and apartment) to be compared are placed beside each other at the top of the table. The features along which they are to be compared and contrasted are listed down the side of the table. The features are organized so that the writer merely has to fill in the appropriate content for each entity as he goes down the table. Assuming the structure is followed, and that the

Table 1.2--Comparison Writing Task in which Structure was Provided.

	Choice #1	Choice #2
	Apartment	House

1. Space
    a) number of rooms
    b) indoor living space
    c) outdoor living space
    d) storage space		

2. Cost
    a) monthly
    b) maintenance/repairs
    c) utilities		

3. Other
    a) ownership
    b) pets
    c) children
    d) noise
    e) neighbours		

subject is able to supply the requisite content, the resulting text should be a unified discussion of the similarities and differences between houses and apartments. Because, however, the writer must provide the actual content of the text, this elicitation text was expected to result in texts that were less coherent than those written in response to the second type of elicitation context described below.

Table 1.3 is a shortened version of a task in which both structure and content are provided. This task required the writers to produce a sequenced description of how to transplant plants. Since the writer does not have to scan memory for knowledge, and since the knowledge is provided in a structurally appropriate way, the coherence of the text written on the basis of this task should be high. Again, the effect of this type of presentation depends on how well the writer is able to interpret and use the structure.

If providing structure with or without content is expected to make the writing task easy, then the most challenging context would be to write a text with neither content nor support provided. In other words, the writers would be asked to produce a text about a specified topic, but no other information would be given. Thus, the cognitive demands would be heaviest for this task. It was hypothesized that this elicitation context would therefore result in the least coherent texts.

The tasks and task presentation will be discussed more fully in Chapter 2.

Table 1.3--Sequence Writing Task in which Structure and Content were Provided

Step	How to Transplant Plants
#1	Remove all the weeds from the soil.
#2	Rake the surface of the soil, make the surface level, remove any rocks and large clods of dirt.
#3	Remove the plants from the package. If in flats, use a spatula. If in a cell pack, push on the bottom.
#4	Separate the matted roots. If the roots are coiled in a pad on the bottom, cut the pad off.
#5	Dig a hole in the soil deep enough to hold the plant. Leave enough room between holes to allow for spreading.
#6	Place a plant in the hole.
#7	Fill in soil around the plant.

Writing

Flower (1979) discusses cognitive based problems in the writing of college students and provides insight into the possible origins of communication difficulty associated with closed head injury and what characteristics writing by head-injured persons may have. Poor writing, according to Flower, is organized according to the internal structure of the information to be conveyed, which is usually not communicatively effective structure.[4] As writers produce text,

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[4]This is in contrast to Mohan (1986), who demonstrates that the structure of knowledge can be directly translated into language which does communicate meaning effectively. In fact, it is possible that the "associative" mode in which data are recalled may comply with the knowledge structure inherent in the information. The breakdown in communication, in this case, may still have disorganization as its roots, but not because of the nature of the knowledge recall itself.

they survey available memory on the topic without adapting it to the purpose of the text. This free-association type method, or "survey," is easy to produce because writers do not have to reorganize or reconceptualize the data at the same time as recalling it. The organization of the sentences reflects the shifting attention of the writer. Flower notes that short-term memory limits how effectively a writer produces text. By simply surveying memory, and listing ideas as they occur, the writer does not have to deal with the additional demand of relating the ideas logically.

Flower terms this type of prose "writer-based," because much of the meaning is still in the writer's mind. The structure of writer-based prose typically resembles a list, since the writer has not made complex connections between the ideas. Furthermore, writer-based prose does not take into consideration the perspective of the reader. That is, it does not select information or present it in ways that take into account the knowledge and needs of the audience. Flower states that this is a difficult task in itself. Additionally, writing involves complex cognitive activities, such as evaluation, elaboration and relation of all the information on a given topic, and then composing sentences and selecting words.

Given the cognitive deficits which may be result from even mild head injury, it is not unlikely that writing expository texts would pose considerable cognitive challenge to head-injured writers. The quality of the text may resemble the "writer-based" prose described by Flower. If this is the case, then we would need to be certain that the characteristics of texts produced by head-injured persons are not simply the effects of the use of this strategy, since unimpaired persons also produce list type prose. One way of doing so is to make the content to be discussed familiar, so that it is less likely that the writer-based strategy would be adopted. Alternatively,

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have disorganization as its roots, but not because of the nature of the knowledge recall itself.

the content of the text could be supplied so that the author's energies could be focused on organizational concerns rather than recall. Another possibility is to allow the writing subjects to revise their texts, so that they could transform them to suit a reader. Unimpaired writers would be expected to have less difficulty, and produce more adequate texts, if allowed to revise than would the head-injured writer. Last, one could motivate the writers to consider the audience from the outset, by emphasizing that their texts will be read by a number of naive readers. This would hopefully force reader-based prose and reveal difficulties encountered by a subject with closed head injury.

Conclusion

In this chapter, discourse and how it may be affected by the cognitive-communication deficits associated with closed head injury were discussed. Then, questions regarding the validity and utility of cohesion analysis as a method of examining CHI discourse have been raised. Specifically, the interpretations investigators made on the basis of their findings have been debated. It is not necessary to use cohesive ties in order to be coherent, although unimpaired persons do use them extensively. Normal speakers may use more cohesive devices, and use them effectively, out of awareness for listener processing demands rather than any cognitive/linguistic ability to use structure.[5] One cannot say that someone is more coherent, or is having less difficulty communicating, because he/she is using a larger number of ties than another person. Granted, a lower number of ties does not necessarily imply that a person is more effectively

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[5]This raises the interesting possibility that aspects of discourse ability may be improved by focusing treatment on features of communicative contexts (e.g. listener needs) in which language is used.

communicating or having less difficulty. It is simply that no one-to-one correspondence has been established between cohesion and coherence.

Issues not addressed include:

1.   why the discourse studies of communication disorders associated with closed head injury have gained the results they have,

2.   why persons with whom individuals with closed head injury are attempting to communicate often find these individuals difficult to follow.

The common finding among the studies is that the head-injured subjects tend to use fewer cohesive ties overall than the unimpaired subjects. A possible explanation for this finding is that the structures of the texts they are producing do not motivate use of cohesive ties. That is, rather than producing a procedural text, for example, as an unimpaired subject might, the head-injured subject may be producing a collection of events associated with a topic, but not relating them in a structurally logical manner. Persons with closed head injury may resort to this structure because it is less cognitively demanding and allows them to concentrate on what information is going to be conveyed, rather than how it is conveyed. Thus, more burden is placed upon the listener to organize the information logically, since head-injured individuals are unable to do so. Being forced to organize is not what a listener expects to do, as this is the role of the speaker, and hence the listener has difficulty understanding.

Not only might use of a collection type structure be simpler for head-injured persons to produce, it may also inherently motivate a different pattern and/or frequency of cohesive tie use. Certain types of words may be predicted from the type of text being produced (e.g. causal conjunction for cause-effect texts, temporal conjunctions for sequence texts). Therefore,

differences in cohesive tie use observed in discourse studies may simply be a symptom of a structure strategy used, purposefully or not, by individuals with closed head injury (Gill, 1989, notes that information regarding the relationship between cohesive harmony and text genre has yet to be gathered). This is one reason it is important to gain data regarding normal performance. Speech-Language Pathologists who attempt to treat a communication deficit by having a head-injured person change cohesive tie use, may find themselves and their clients very frustrated because the treatment is not addressing the actual problem. Cohesive ties are explicit markers of underlying structure; they do not provide it. If the structure is in some way deficient, then cohesive ties are not going to improve communication.

A final note must be added regarding text content. If topic content is familiar to the reader, then organization while reading may be easier, and the adequacy of the structure being produced by the writer is less important. Horowitz (1985b) found that students' recall of poorly structured texts was not affected if the content was simple or familiar for the students with high text structure awareness. Low ability students, however, were more reliant on structure for recall. Presumably this was because the high ability students were able to structure the information for themselves. These findings indicate that head-injured persons' audience is an important factor when examining how effectively they communicate. In this study the texts will be read by unimpaired subjects who will be asked to rate them for coherence. The previous discourse studies did not provide information regarding how effective their head-injured subjects were at actually communicating the required content. The present study will include experimentally naive

readers, to obtain this information systematically.[6] This procedure is, at least at this stage, primarily intended for use by clinicians. Therefore, a group of clinicians was recruited to provide ratings of the texts.

Hypotheses investigated in this study were:

1. Texts produced by unimpaired individuals will vary in terms of coherence (as measured by cohesive harmony analysis and perceived coherence measures) depending on the type of expository text to be produced. Specifically, Description texts were proposed to be most coherent, followed by Comparison, Sequence, and Response texts.

2. Texts will vary in terms of coherence depending upon the information which is given to the writer as part of the task itself. Three conditions were used for each type of text. These were:

   a) production without support

   b) production with text structure provided

   c) production with text structure and content provided

   Specifically, the condition in which both text structure and content were provided was hypothesized to result in the most coherent texts, followed by the structure-only provided and the no-structure provided conditions.

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[6]Because of possible confounding effects due to reader ability, it would be interesting to form two groups of readers on the basis of text-structure awareness, and compare their evaluations of the texts.

Chapter Two will describe the subjects who participated in this study, as well the tasks and how the tasks were presented. Additionally, it will provide a detailed description of cohesive harmony analysis, including the modifications made to the procedure for this study.

CHAPTER 2

METHOD

Subjects

Writing Subjects

Two adult subjects were recruited from the community. Both individuals reflected the

general educational status of the head-injured population, that is, little more than completion of

secondary school (Sohlberg & Mateer, 1988). Neither subject was involved in an occupation or

regular activities that use writing extensively. Survivors of closed head injury, especially those

with minimal residual impairments, frequently wish to continue formal education as part of their

rehabilitation. Therefore, it is important to know if any deficiencies in their writing ability are

related to head injury or if they are related to level of education. The subjects were native

speakers of English. No history of neurological impairment or communication problems were

reported. Table 2.1 summarizes characteristics of the writing participants.

Table 2.1.--Age, Education and Occupation of Writing Subjects

	Age	Highest Level of Education	Occupation
#1	24 years	1 year community college	Sales representative
#2	26 years	Grade 12 (Alberta)	Courier (driver)

Reading Subjects

The reading subjects were recruited from a graduate program in Speech-Language Pathology. All had completed at least one year of a graduate degree in Speech-Language Pathology. They were asked to read the texts and rate them according to organization, clarity and accuracy of content. As practice, each was given two texts to read and rate for coherence prior to rating the texts produced by the writing subjects. One of the practice texts was designed to be rated as being low in coherence, while the other was designed to be rated as high in coherence. All the subjects rated the practice texts as expected, and all went on to perform the reading task.

Procedure

Writing Tasks

Text Types

Four types of top-level text structures were elicited: Description (coded as D); Sequence (coded as S); Comparison (coded as C); and Response (coded as R). Defining features of each of these text types were discussed in Chapter One. To review briefly, Description texts are simplest, and can be characterized as a collection of associated ideas which identify the nature of the entity being described. Sequence texts are more complex than description texts, since not only may entities be described, but the time order in which events involving such entities must be shown. Thus, difficulties recalling and organizing information may be more detrimental to the coherence of a sequence text than the coherence of a description text. Comparison-contrast texts are also more complex than description texts because features of two or more entities must

not only be described, but the features of one must be relevant to those of the other. Assessing the difficulty of this text type relative to sequence texts is problematic. First, these texts may be seen as simply descriptions of two (or more) things, but no principle such as sequencing must be followed. On the other hand, comparison-contrast texts may be more demanding to produce than sequence texts. It may be more difficult to supply and competently demonstrate shared and distinguishing features of two entities than to relate a sequence of events. Finally, Response texts are expected to be most sensitive to organizational difficulty. In this study, response topics asked the writers to discuss two opposing views regarding some issue, then come to a conclusion based on their arguments. Thus, each alternative must be described with reference to the other and evaluated and then one choice must be supported.

The type of text to be produced was both implied by the topic supplied to the writers, as well as made explicit in the wording of the instructions. For example, the instructions for Item 2C (Comparison) stated, "Compare and contrast living in an apartment versus living in a house." Appendix 1 contains the tasks and task instructions.

Text Topics

The topic of each task was chosen on the basis of flexibility and familiarity to the subjects, so that each subject would have some knowledge to use when producing the text. This was especially true for the tasks in which subjects were not provided with content (see Task type Three, below). Clearly, ensuring that each subject had exactly an equal amount of knowledge regarding each topic, and was equally familiar with each topic was impossible. Topic flexibility and familiarity were therefore important.

Choosing the topics to be used in this study turned out to be a difficult task. Mentis & Prutting (1991), who manipulated degree of abstraction in the topics given to their subjects for oral monologues, found that the more abstract the topic, the more likely a poor performance would result. Response texts are more likely to be abstract in nature than Description texts, because ideas, principles, morals and ethics cannot be sensed physically, as can many factors utilized for description. While one may be certain that *love* is more abstract than *dogs*, the relative abstraction of *dogs* and *dogs on a leash versus off a leash*, or even *love* and *dogs on a leash versus off a leash*, is harder to pin down. Although abstraction was recognized as a potentially significant factor, it was extremely difficult to be sure that equal degrees of abstraction existed across all tasks. Therefore, familiarity and flexibility were the focus when choosing topics; the contribution of topic abstraction to writing performance must be left to another study.

Elicitation Contexts

The following elicitation contexts were used:

1. No Support. In this context, the writer was instructed to write on a specified topic, but was given no additional information. This condition was expected to be the most difficult because writers must recall, select, organize, and present the information with no external support. As a method of detecting a practice effect, this condition was done twice, as both the first and last task for each text type. The topic, however, was different for each of the tasks. Tasks of this elicitation type were coded as contexts 1 and 4. Thus, the first Sequence text written was coded as 1S, whereas the first Response text was coded as 1R, and so on.

2. <u>Structure Only</u>. In this condition, the subject was given a topic about which to write, as well as an outline which was intended to help him organize the ideas pertinent to the topic. However, the content to be discussed was provided by the subject. This task support condition was hypothesized to result in more coherent texts than the first condition, but less coherent texts than the third condition. Generation with structural support tasks were coded as context 2.

3. <u>Structure and Content</u>. In this context, the task was given with the content presented in a manner which was appropriate for the underlying knowledge structure(s) involved . This organization was intended to make the content readily convertible into written, paragraph form. This manner of presenting information is based on methods described in Mohan (1986), Lawrence (1972; 1975) and reviewed in Rothstein (1990). This task was hypothesized to be the simplest from the writer's perspective across tasks, and was predicted to result in the most coherent, well-structured texts. This condition was coded as context 3.

<u>Pilot Study</u>

Prior to undertaking the study reported in this paper, a pilot study was done in order to work out details of the tasks. Two adults wrote ten different texts. Included in the pilot was a fourth elicitation context condition, -structure/+content. The information relevant to the topic was supplied. Provision of content was expected to reduce the cognitive load since recall of information simultaneously with text organization is not required. However, the subjects did not organize the information according to the text structure requested. Results of the pilot study led to the omission of this condition from the present study.

In the attempt to reduce structure in the presentation of content, the information was

supplied in a fragmented, random way. This presentation proved to be distracting, in that the subjects found it extremely difficult to incorporate all the material into any kind of coherent representation prior to writing. When writing, the subjects often omitted items due to oversight, then added them later. Thus, while cognitive load may have been reduced because recall was unnecessary, a component of confusion was added. The fragmented presentation may have been counterproductive, because when people scan memory, facts are recalled in association with each other (Flower, 1979). The random presentation may not have been in alignment with how the writer might have recalled the information, therefore making the task confusing. Until an alternate means of presenting data is developed, I decided to omit this particular condition from this project.

Task Sequence

Order of task presentation was not completely random. Each text type was elicited in the No Support condition first (context 1). Then, each text type was elicited in the Structure Only condition (context 2), followed by the Structure and Content condition (context 3). The reason for this order was that a carry over effect was believed to be possible if the No Support condition was presented after the structure-supported conditions. No effect other than practice was expected due to this ordering, as the structure and content provided was specific to each item. The provision of structure, which is by its very nature general (Mohan, 1986), might have affected subsequent tasks. Therefore, each text type was elicited with No Support as the final task type, in order to see if any improvement was observable.

To summarize, texts were elicited in four stages, in which all text types were

requested with the same elicitation context before moving to the next elicitation context. Within each stage, the order of elicitation of text type was randomized, using a random numbers table.

Task Orientation and Procedure

In addition to the tasks, the writers were given a list of words which were appropriate to the type of text requested. For example, the list given with the comparison texts included: *but, like, similarly, whereas, in contrast*, and so on. Because the lists were available in all tasks, their effect on writing quality cannot be ascertained. Similar lists used in writing education programs for adults (Lawrence, 1972, 1975) were found to facilitate writing, and so were considered appropriate for inclusion in the tasks. The subjects were told that the list was provided as a reference only; they were free to use it to any extent they wished. Thus, it was not possible to measure how beneficial these lists were. When asked, however, both subjects reported that they did not refer to the lists at any time other than an initial reading at the beginning of the study.

The procedure required the writers to produce 16 different texts. Although no absolute maximum or minimum length was stipulated, they were encouraged to write about ten sentences per text, if possible. Length was expected to be influenced (at least in part) by the amount of information supplied by the task (contexts 2 and 3 only). Every attempt was made to ensure that the amount of information supplied was roughly equivalent across tasks.

In an attempt to motivate explicit, rather than writer-based, prose, the verbal instructions also included the following statement:

> What you write is going to be read by another group of participants. These people will know nothing about the materials you have or the instructions; they will be given only the paragraph you write. Keep this in mind as you write.

If a writer wished to revise a word or sentence, he was permitted to do so as long as the original was not erased. If he wished to rewrite portions of the text, he was asked to complete the text as it stood, and then rewrite it in its entirety when the first draft was complete. Neither of the writing subjects wished to rewrite whole texts. In the analysis, only the final version of the text was used. Words and sentences which had been deleted by the writers were ignored for the purposes of this study.

It was unknown how long it would take to write the texts. No time limit was be imposed. Data was kept regarding time necessary to complete each task, as this may have been indicative of task difficulty.

Reading Task

Reading and rating the texts would have been a lengthy procedure if every reader had read every text. Therefore, each reader read only a selected subset of 12 texts. Texts were assigned so that each reader read six texts from each subject. Additionally, three examples of each text type and each elicitation context were included in the subset. No subject had the identical set of texts to read, and no subset included multiple copies of the same text. Furthermore, in order to avoid direct comparison between writers for any text, there was no duplication of text type and elicitation context within any subset of texts. For example, if a reader had Text 1R written by Subject One, she did not have Text 1R written by Subject Two as well. Each text, therefore, was rated by three different readers.

Minor grammatical, punctuation and spelling errors in the texts were corrected before they were presented to the readers, in order to reduce possible distraction. However, the texts given

to the readers were not presented as independent clause units. Thus, conjoined and "run-on" sentences were left as originally produced by the writers.

Order of presentation was determined randomly. Each text was presented individually to the reader, with no information identifying the writer, text type or elicitation context provided. After she had read the text, she was given four questions which were related to the clarity, organization and accuracy of the text. Each question was answered according to a four point scale. The questions for each text type are given in Appendix 2. The rating criteria were based on Ulatowska, Weiss Doyle, Freedman Stern, Macaluso Haynes & North (1983), and wording varied as appropriate to the text type. Additionally, the readers were asked to indicate where breakdowns in comprehension, if any, occurred, and why.

No time limit was stipulated. Because this measure was intended to be subjective and impressionistic, the readers were told to read each text carefully, but not to the extent of analyzing them in any sort of detail.

Data was collected by performing the following analyses on each text:

1. Perceived coherence, based on scores given by Speech-Language Pathology students and Speech-Language Pathologists

2. Cohesive harmony analysis, following Hasan (1984, 1985)

3. Time required to produce each text

4. Relationships among the above measures

Analyses

Perceived Coherence

Scores for perceived coherence were determined by adding the ratings the readers gave each text, then obtaining an average score for the text. The ratings were then used to rank the texts in order of perceived coherence. Rankings of each text were examined in terms of the effect of text type and the effect of elicitation context on perceived coherence. Then, these rankings were compared with those obtained by cohesive harmony analysis.

Cohesive Harmony Analysis Procedure

The following procedure was used in the cohesive harmony analysis. Note that Hasan's description was not always strictly followed. In these cases, the change is noted and the rationale for the change is provided. Some aspects of the procedure were taken from other studies using cohesive harmony (i.e. Yang, 1989; Armstrong, 1991). Examples are taken from the data from this study.

Step I

Independent clause units were identified. An independent clause unit is a sentence or portion of a sentence that can exist on its own as a declarative, imperative, interrogative or exclamatory structure (Ruthven, 1990). Sentences were segmented into these units for two reasons. First, some measure of text length which would not be dependent on sentence complexity or number of words seemed desirable. Second, independent clause units were used in order to avoid penalizing writers for using conjoining conjunctions. Hasan's analysis requires

that the elements of cohesive chains be constituents of different sentences, since coherence depends on semantic unity across the text. However, this causes some ties and chains to be excluded, because the writer has incorporated them into a complex sentence. If Hasan's rule regarding intrasentential chain formation was strictly followed, the words *dog, animals* and *they* in Example 2.1 could not form a chain because they are all contained within a complex sentence

Example 2.1   Dogs are fun animals and they come in all shapes and sizes.

consisting of two clauses conjoined by *and*. However, if the author had chosen to write two shorter sentences, the chain would have been recognized:

Example 2.2 a. Dogs are fun animals.

b. They come in all shapes and sizes.

Clearly, adhering strictly to Hasan's requirement is potentially damaging to the analysis, particularly for shorter chains and texts.

The procedure for segmenting sentences into independent clause units was taken from Ruthven (1990). Independent clauses consist of one independent clause as traditionally defined, along with any subordinate clauses grammatically related to it. Relative, complement and adverbial clauses are all subordinate clauses. Examples from my data are given below.

Example 2.3 a. Magpies are intelligent birds that live in pairs. (relative)

b. They feel that there is no need to subject any animal to pain and death. (complement)

c. After you place the plant in the hole, fill in soil around the plant. (adverbial)

In Text 2R, Subject Two produced a subordinate clause as an independent sentence. In this case,

the fragment was attached to the preceding sentence, to which it was grammatically related.[7]

Dialogue in which the speaker was identified was also analyzed as one unit:

> Example 2.4   At some point my mother says, "Well I think we all did quite well this year".

Finally, sentences conjoined with subject ellipsis were considered one unit, since the second verb is dependent on the explicit subject of the first verb for mood.

> Example 2.5   a.   This dog stands about three feet tall and weighs between 50 and 70 pounds.

Elided subjects were inserted during lexical rendering for the purposes of cohesive harmony analysis.   All other conjoined structures were analyzed into separate independent units. The symbol / marks clause unit boundaries.

> Example 2.6 a.   Now there are hundreds of kinds of dogs / and I don't really want to pick a breed / so I'm going to generalize.
>
> b.   An apartment will have only two to four rooms / whereas a house will usually have more than four rooms.

Occasionally, the writers produced "run-on" sentences.   Some long sentences were in fact a number of shorter sentences combined using inappropriate punctuation. These were also divided into independent clause units, as shown below.   Example 2.7 was originally produced as one sentence. The / symbols show where it was analyzed into separate units.

---

[7]Original: "The argument on whether people should be allowed to smoke in the work place is a very heated one. Mainly because neither side is willing to compromise in any way and feels that their rights are being violated." The revised version which was used in the analysis simply joined the two sentences, so the "mainly because ..." clause was subordinate to the first sentence.

Example 2.7   One the right side we have the forks / the closest fork to the plate will be the dinner fork the biggest one / it has four points / the next would be your salad fork / it has three points / and lastly you would have an appetizer fork / two points, providing you were having an appetizer.

Each independent clause was numbered, and independent clauses derived from originally conjoined structures were referenced to the original sentence. For example, in 2.7 above, the first clause would be 1a, the second would be 1b, the third would be 1c and so on.

Step II

All instances of grammatical cohesion were identified. Grammatical cohesive devices are listed below (Halliday & Hasan, 1976):

1. Reference
   a. pronominal   (Rp)
   b. definite article (Rdf)
   c. demonstrative   (Rd)
   d. comparative   (Rc)

2. Substitution
   a. nominal   (Sn)
   b. verbal   (Sv)
   c. clausal   (Sc)

3. Ellipsis
   a. nominal   (En)
   b. verbal   (Ev)
   c. clausal   (Ec)

Examples of each of the above types of grammatical ties were given in Chapter 1; please refer to that chapter for examples.

When a comparative relation was explicitly marked in the text, but the second item tow which the first was being compared was not provided, this was counted as an instance of Ellipsis. When comparative forms are used, the second member of the comparison is

understood, even if it is not explicitly stated. Not recognizing this fact, and neglecting to add

in the ellided items would be damaging to the analysis, and underestimate the cohesive harmony

of the text. Explicit markers of comparative relations included: use of the -er suffix; phrases

such as *as much as*, *more/less than* and *just as*. An example is given below.

> Example 2.8 Security is somewhat bettER in a properly maintained apartment than
> <u>security is good in a house</u>[Ec].

Therefore, although explicit markers were not counted as tokens (see Step VI), they were

important for identifying chains.

A second instance in which ellipsis was identified was subject ellipsis in clause containing

multi-verb constructions. An example of this is in given below, which is the same sentence as

Example 2.5, but with the ellided subject of the second verb *weighs* included. This was done in

order to avoid penalizing the writer for using complex constructions. Failure to recognize this

type of ellipsis would have severely damaged the estimations of coherence gained by the analysis

procedures.

> Example 2.9 This dog stands about three feet tall and <u>dog</u>[En] weighs between 50 and 70
> pounds.

It is possible, however, that excessive use of comparative and multi-verb constructions with

ellided elements would affect readers' impressions of coherence, as they would be required to

make many inferences rather than having elements explicitly stated for them.

Because pattern of grammatical device usage was not found to be significant for text

coherence in earlier studies (Hasan, 1984, 1985; Yang, 1989), data of this type were not pursued

for the present study. However, examination of grammatical ties is a possible future area of

research, as we have little data regarding how cohesion and cohesive harmony vary with text genre (Gill, 1989).

<u>Step III</u>

Lexical rendering was performed. Each grammatical device was replaced with its precise referent. Tokens were coded so that the grammatical devices from which they were derived could be kept in focus. Tokens interpreted from <u>reference,</u> <u>substitution</u> or <u>ellipsis</u> are double underlined, and the code for type of grammatical cohesion (in brackets above) is given in superscript.

Example 2.10 a. Original   Dig holes and space them out to avoid crowding.

b. Lexically   Dig holes and space <u><u>holes</u></u>[RP] out to avoid crowding.
rendered

Nouns modified by *the* are single underlined:

Example 2.11 a. Original   Don't make the holes too deep.

b. Lexically   Don't make <u>holes</u> too deep.
rendered

Exophorically interpreted *the* is noted with a '+', even if the original referent was found in the instructions for the task. Because the subjects were told that the readers would not have access to the instructions, the instructions are considered part of the extratextual environment. Therefore, any reference to any part of the instructions was considered exophoric.

Nouns interpreted to be generic but modified by *the* are italicized.

Example 2.12 a. Original   Leaves change colour in the fall.

b. Lexically   Leaves change colour in *fall*
rendered

Items whose referent could not be determined from the text were considered ambiguous, and had a question mark (?) placed beside them. Ambiguous tokens were included in the analysis, but not assigned to chains. Therefore, all ambiguous tokens were counted as peripheral tokens.

Step IV

All instances of instantial lexical devices were identified. These were discussed in Chapter 1. A list of these devices is given below.

1. Equivalence: (Ie)
2. Naming: (In)
3. Semblance: (Is)

Again, examples of each of these devices in given in Chapter 1; please refer to that chapter.

Step V

Identify all instances of general lexical devices, as given below.

1. Repetition   (Gr)
2. Synonymy   (Gs)
3. Antonymy   (Ga)
4. Hyponymy   (Gh)
5. Meronymy   (Gm)

Please refer to Chapter One for examples.

As with grammatical cohesive devices, previous research (Hasan, 1985; Yang 1989) has found no relationship between coherence as pattern of lexical device usage. For this reason, data regarding this parameter of text unity was not used in the present study. However, as in the case grammatical devices, there is no published data which related cohesive patterns to text genre. Thus, this is a possible area for future research with expository texts.

<u>Step VI</u>

All non-tokens were eliminated from the text. Using Armstrong's (1991) definition, a token is a lexical item that carries content. In order for a word to qualify as a token, must potentially be able to enter into one of the grammatical relations which are involved in chain interaction. These relations are restated in Step VII of this chapter. Therefore, words such as modal verbs, conjoining and subordinating conjunctions, auxiliary *is*, articles, determiners, and modifiers such as *very* were all deleted from the texts. The remaining words constituted the <u>total tokens</u> for the text. Because conjunctions were not considered tokens, there contribution to text unity could not be examined using cohesive harmony analysis. An example of a portion of a lexically rendered text is given below. Non-tokens are between curly brackets { }.

> Example 2.13 {There are} many things {to} consider {when} trying {to} decide on {whether to} live in {an} apartment {or a} house. Size {is} {a} major point / {an} apartment {will} have {only} two {to} four rooms / {whereas} {a} house {will} {usually} have {more than} four rooms^{En}.

Some single tokens were composed of more than one word. Examples from the present study include: *get tickets*, *check baggage* and *take a nap*, as well as verb + particle constructions such as *wake up* and *give up*.

<u>Step VII</u>

Identity and similarity chains were identified. Contrary to Hasan's rule that states that chains may only be formed by tokens contained in different independent clauses or sentences, in this study when two items met the criteria for cohesive semantic relations as defined by Halliday & Hasan (1976) and Hasan (1984, 1985), then these items were included in such chains. This change was motivated by the writers' use of multiverb sentences that could not be

separated into independent clause units due to ellided subjects. Additionally, in some cases writers produced lists of related items which were pertinent to the overall meaning of the text, but which were not mentioned again. If the writers had used simpler sentences, then tokens could have been incorporated into chains in compliance with Hasan's method.

> Example 2.14 The smokers feel that it is within smokers'[Rp] rights to smoke wherever smokers[Rp] work because it is smokers'[Rp] space.

In Example 2.14, the four instances of *smokers* are related by coreference, and hence form an identity chain. Using Hasan's rules strictly, however, these items would not be considered one chain, and interactions with other chains could have potentially been lost.

The relation that underlies identity chains is coreference. Identity chains are formed by pronominal reference, instantial lexical devices, and repetition. As discussed in Chapter 1, identity chains are text specific, since the identity relation among the members holds only for a that particular text.

As in the case of identity chains, any two or more items within a clause or across clauses that met the criteria for cohesive semantic relations were included in similarity chains. Example 2.15 is a complex sentence in which a similarity chain of tokens would have been disregarded had Hasan's rule been strictly followed.

> Example 2.15 a. He was wearing black pants and black shoes as well as a white shirt and a wild tie.
>
> b. He was wearing black pants and black shoes. He was also wearing a white shirt. The tie he was wearing was wild. It had a floral pattern.

In sentence 2.15a, the coextension relationship among the items of clothing causes them to form a chain. The number of peripheral tokens would have artificially increased had this chain been excluded. A series of shorter sentences, as in 2.15b, would have allowed the tokens to participate

in a chain under Hasan's criteria, but may have been inappropriate to the style and purpose of the writer.

The semantic relations that are the basis of similarity chain formation are coclassification and coextension. Substitution, ellipsis, and general lexical devices are used to form similarity chains. Please refer to Chapter 1 for examples.

Chains were coded by Roman numeral. Chain number was not indicative of where in the text the chain occurred. When two (or more) items of the same class or category participated in independent chains and chain interactions (although that may also share some), they were coded by Roman numeral followed by lower case letter.

Example 2.16 a. My brother and sister are very different family members.
                          Ia   Ib   I

b. He is strong, but she is sympathetic. Both contribute to the family.
    Ia   Ib   Ia/Ib   I

Similarly, when two (or more) items are members of a list of items/issues related to the topic and participate in independent chains and chain interactions (although they may also share interactions), they are coded by Roman numeral followed by lower case letter.

Example 2.17 a. Many issues must be examined when purchasing a house.
                     I

b. Cost is one point, but size and location are also important.
    Ia   I   Ib   Ic

By coding in this manner, the unifying relation among all the *issues* is not lost, even though they do not relate to each other by any of the lexical or grammatical means set

out by Hasan. In Example 2.17, *cost, size* and *location* are related to the overall topic of *house*

purchasing. Each of the issues may be discussed in the text in more detail, and form chains in their own right. Thus, *issues* is the superordinate chain in which *cost*, *size* and *location* are embedded. Texts may appear to be disjointed in analysis if this superordinate relation is ignored. This was particularly true for items which were mentioned only once in a text, but which were related to the overall topic. For example, in Text 2C, in which living in a house and living in an apartment were compared, Subject One produced the following series of sentences :

> Example 2.18 a. Other points that weigh in the decision can be if you want pets / this is limited to a house for some. Neighbours and noise are a bigger concern in an apartment due to the close proximity. As well children are sometimes not as welcome in apartments. Security is somewhat better in a properly maintained apartment.

Even though *pets*, *neighbours*, *noise*, *children* and *security* are not related through general lexical ties, they form a chain on the basis of co-extension of *points*.

A problem in the analysis occurred when the writer did not use explicit markers such as *issues*, *things* and *points* in order to signal listing. In some cases the listing was implied, possibly due to text structure. However, for the purpose of this analysis, only explicit signals allowed chain formation based on co-extension of this type to be recognized. This way, the effect of using explicit lexical markers of text structure on coherence and cohesive harmony could be examined.

Step VIII

Interactions among chains was determined. Chains are said to interact when two or more members of one chain are functionally related to two or more members of another chain by the

same relation. As stated in Chapter 1, these relations are (from Hasan, 1985):

1. actor - action

2. action - acted upon

3. action and/or actor - location

4. saying *text*

5. attribute - attribuand

Step IX

The types of tokens in the text were counted. All tokens that participate in chain interaction are <u>central tokens.</u> All tokens contained in chains, which may or may not participate in interactions, are <u>relevant tokens.</u> Remaining tokens in the text, which are not relevant tokens, are <u>peripheral tokens</u>.

Step X

Degree of cohesive harmony was determined on the basis of the following indices. The factor which is most associated with text coherence is the amount of chain interaction (Hasan, 1984, 1985; Yang, 1989; Pappas, 1981). Two ratios have been used in previous research to indicate this. In Hasan (1984), the ratio of central tokens to total tokens, termed the <u>cohesive harmony index,</u> was used. However, in Hasan (1985) and Pappas (1981), the ratio of central tokens to relevant tokens was used. The first measure provides a means of assessing how many of all the tokens in a text interact with each other; therefore, the effect of peripheral tokens on coherence may be seen in this measure. In the second, only the number of tokens subsumed in

chains that interact with each other are accounted for. Thus, peripheral tokens are not a factor in determining coherence with this measure. This second measure does, however, allow the difference between amount of chaining and amount of interaction to be directly observed. Hasan does not address why these two different ratios were used. In this study, both indices were used in order to rank texts for cohesive harmony.

Cohesive density, as determined by the ratio of relevant tokens to total tokens, was also computed. This is a measure of the amount of chaining that occurs in a text. Previous studies (Yang, 1989; Pappas, 1981; Hasan, 1984) have shown no relationship between the amount of chaining or cohesive tie use and coherence. Hasan (1985), however, found that the texts that were higher in cohesive density also tended to have higher cohesive harmony scores (as measured by the central token to relevant token ratio).

In addition, Hasan (1984) found the ratio of peripheral to central tokens to significantly associated with the ratio of central to total tokens. The lower this ratio is, the more coherent the text is likely to be, all else being assumed equal.

All of the ratios described above were expressed as percentages. Then, each text was ranked according to the scores they received relative to either texts of the same type written in different elicitation contexts, or texts written in the same elicitation context but of different types.

The results of this analysis were then compared to the ratings provided by the readers in the perceived coherence task.

In addition to the above data, information regarding the length of time required by each writer to produce each text, and the length of each text in independent clause units, was also gathered. The findings are presented and discussed in Chapter 3.

CHAPTER 3

RESULTS AND DISCUSSION

Introduction

In this chapter, the subjects' performance will be discussed separately, because there are

only two, and their performances appear to be quite different. First, the effect of text type on

coherence, as measured by cohesive harmony analysis, will be discussed, followed by a

discussion of the effect of elicitation context. Then, the effect of these two factors will be

discussed in terms of perceived coherence, as measured by reader ratings. Within these sections,

relationships between the variables as seen in individual texts will also be discussed. Coherence

as measured by cohesive harmony and coherence as measured by perceived coherence will be

compared in the next section. Last, some data regarding the production factors of text length and

time taken to produce the texts will be presented.

Parametric tests of significance between scores were not possible due to the small sample

size. Thus, results and conclusions are discussed in terms of trends.

Effect of Text Type on Cohesive Harmony

Restatement of the Hypothesis Regarding Text Type

Text types were hypothesized to vary in difficulty. This difficulty was expected to be

reflected in the cohesive harmony of the different text types. Predicted ranking of texts according

to cohesive harmony scores was (from high to low): Description texts; Comparison and Sequence

texts; Response texts.

Subject One

Table 3.1 provides the mean cohesive harmony and cohesive density scores for each text

type. The trend evident in these scores is consistent with the hypothesized order of text

difficulty. For all indices of cohesive harmony (CT/TT; CT/RT; PT/CT), the Description texts

were highest in cohesive harmony, followed by the Comparison texts. The difference between

the Sequence and Response texts for these scores is slight and not always in the predicted

direction. While the Sequence texts were ranked higher when the index was central tokens as

a percentage of relevant tokens, the order was reversed for the other two indices. The difference

between the Description text and the two texts that scored lowest indicates a trend.

Cohesive density scores, represented by the percentage of total tokens that are relevant

tokens (RT/TT), are consistent with the trend observed for the cohesive harmony indicators.

However, the difference among the scores for the text types is small. For example, the cohesive

density of the Description ·and the Response texts are nearly identical, yet the amount of chain

interaction which took place in each of these text types differs by approximately 10%. Hence,

Table 3.1--Means for Cohesive Harmony and Cohesive Density Indicators Expressed as Percentage and Rank for Texts Written by Subject One, by Text Type

Text Type	CT / TT[a] %	(rank)[b]	CT / RT %	(rank)	PT / CT %	(rank)	RT / TT %	(rank)
Description	72	(1)	86	(1)	22	(1)	84	(1)
Comparison	69	(2)	82	(2)	28	(2)	83	(3.5)
Sequence	62	(4)	76	(3)	35	(4)	81	(4)
Response	63	(3)	75	(4)	33	(3)	83	(3.5)

[a]CT=central Tokens; TT=Total Tokens; RT=Relevant Tokens; PT=Peripheral Tokens
[b]Scores are ranked from highest=1 to lowest=4

amount of chaining in a text is not predictive of the amount of cohesive harmony. This result is similar to that found by Pappas (1981), who found that patterns of cohesive harmony and cohesive density varied in children's narratives.

The scores for individual texts are given in Table 3.2. This table allows the range of scores obtained for each text type in each elicitation context to be observed. As is evident from examining the table, the range of scores for the texts within a text type varied with the elicitation context. The ranges of central token to total token (CT/TT) and central token to relevant token (CT/RT) scores were largest for the Response and Sequence texts, and smallest for the Description texts. The reduction in the range of performance on the Description texts may be because this text type is already relatively easy; therefore the addition of structure and/or content does not noticeably affect the writer's ability to produce the text.

For more difficult text types, the presence of structure and/or content in the elicitation context may be more important to the production of coherent texts. For example, for the Response texts, the difference between the highest score, achieved in context 2 (Structure Only), and the lowest score, obtained in condition 1 (No Support), is over 40% when the CT/TT ratio is used. A similar difference is seen for the Sequence texts, which had cohesive harmony means similar to the Response texts. However, for the Description texts, the difference between the highest and lowest scores was only 14%. For easier text types, a ceiling effect may occur, so that the provision of additional facilitative information does not appreciably improve scores on measures of coherence. A statistical test would be necessary, showing that the differences between the texts in the Description group are nonsignificant, in order to demonstrate this.

Table 3.2--Cohesive Harmony Indicators, Expressed as Percentages and Ranks for Texts Written by Subject One, by Text Type[a]

Text	CT / TT[b]		CT / RT		PT / CT		RT / TT	
	%	(rank)[c]	%	(rank)	%	(rank)	%	(rank)
1D	64	(4)	79	(4)	29	(3.5)	81	(3)
2D	71	(3)	89	(2)	29	(3.5)	79	(4)
3D	78	(1)	90	(1)	18	(2)	86	(2)
4D	77	(2)	85	(3)	12	(1)	91	(1)
1C	56	(4)	67	(4)	31	(3)	83	(2.5)
2C	62	(3)	75	(3)	26	(2)	83	(2.5)
3C	82	(1)	91	(1)	20	(1)	88	(1)
4C	67	(2)	87	(2)	34	(4)	77	(4)
1S	44	(4)	59	(4)	59	(4)	74	(4)
2S	66	(2)	78	(2)	24	(2)	84	(2)
3S	80	(1)	93	(1)	17	(1)	86	(1)
4S	53	(3)	68	(3)	41	(3)	78	(3)
1R	39	(4)	53	(4)	67	(4)	74	(4)
2R	80	(1)	91	(1)	14	(1)	88	(1)
3R	72	(2)	85	(2)	21	(2)	85	(2.5)
4R	60	(3)	70	(3)	30	(3)	85	(2.5)

[a]Elicitation contexts are: 1=No Support; 2=Structure only; 3=Structure & Content; 4=No Support
Text Types are: D=Description; C=Comparison; S=Sequence; R=Response
[b]CT=Central Tokens; TT=Total Tokens; RT=Relevant Tokens; PT=Peripheral Tokens
[c]Scores are ranked from highest=1 to lowest=4

Subject Two

Table 3.3 provides the mean scores for Subject Two's cohesive harmony and cohesive density. The expected order of text difficulty was not reflected by cohesive harmony scores observed in the texts written by this subject. The Response text achieved the highest ranking for cohesive harmony for both the central token of total token (CT/TT) and the central token of relevant token (CT/RT) percentages. It was followed by the Description, Comparison, and Sequence texts, in that order.

It is interesting to note, however, that for the third index of coherence, the ratio of peripheral tokens to central tokens, the Response text was ranked third, behind the Description and Comparison texts. Therefore, although this text type had a relatively high proportion of peripheral to central tokens, it still held the highest degree of cohesive harmony.

Table 3.4, which provides the cohesive harmony and cohesive density scores for each text according to text type, demonstrates the range of scores obtained within each text type group. A wide range in the cohesive harmony scores is evident for all the text types, including the

Table 3.3--Means for Cohesive Harmony Indicators Expressed as Percentage and Rank for Texts Written by Subject Two, by Text Type

Text Type	CT / TT[a] %	(rank)[b]	CT / RT %	(rank)	PT / CT %	(rank)	RT / TT %	(rank)
Description	49	(3.5)	58	(4)	34	(1.5)	84	(1.5)
Comparison	54	(2)	64	(2)	34	(1.5)	84	(1.5)
Sequence	49	(3.5)	59	(3)	59	(4)	80	(4)
Response	60	(1)	72	(1)	39	(3)	82	(3)

[a]CT=Central Tokens; TT=Total Tokens; RT=Relevant Tokens; PT=Peripheral Tokens
[b]Scores are ranked from highest=1 to lowest=4

Table 3.4.--Cohesive Harmony Indicators Expressed as Percentage and Rank for Texts Written by Subject Two, by Text Type[a]

Text	CT / TT[b] %	(rank)[c]	CT / RT %	(rank)	PT / CT %	(rank)	RT / TT %	(rank)
1D	54	(2)	61	(2)	21	(2)	88	(2)
2D	62	(1)	70	(1)	17	(1)	89	(1)
3D	39	(4)	50	(4)	58	(4)	76	(4)
4D	43	(3)	52	(3)	41	(3)	82	(3)
1C	56	(3)	73	(1)	41	(3)	77	(4))
2C	64	(2)	70	(3)	13	(1)	92	(1)
3C	60	(1)	71	(2)	25	(2)	85	(2)
4C	34	(3)	43	(4)	57	(4)	80	(3)
1S	16	(4)	24	(4)	193	(4)	68	(4)
2S	74	(1)	84	(1)	13	(1)	92	(1)
3S	40	(2)	56	(3)	14	(2.5)	70	(3)
4S	66	(3)	73	(2)	14	(2.5)	91	(2)
1R	55	(3)	69	(3)	36	(3)	80	(2)
2R	76	(1)	84	(1)	12	(1)	91	(1)
3R	71	(2)	81	(2)	17	(2)	88	(2)
4R	36	(4)	54	(4)	92	(4)	67	(4)

[a]Text Types are: D=Description; C=Comparison; S=Sequence; R=Response
  Elicitation Contexts are: 1=No Support; 2=Structure Only; 3=Structure & Content; 4=No Support
[b]CT=Central Tokens; TT=Total Tokens; RT=Relevant Tokens; PT=Peripheral Tokens
[c]Scores are ranked from highest=1 to lowest=4

Response type. It is clear that the addition of structure did improve this subject's performance for Response texts. This contrasts with Subject One, for whom the range of scores for the most coherent text type (Description) was relatively small.

A possible explanation for this result lies the length of the Response texts Subject Two wrote. Table 3.5 shows that the Response texts were only seven independent clause units in length on average, whereas the next longest text type, Comparison, averaged 16 units per text. Interestingly, the rank order of text length follows the rank order for cohesive harmony for this writer. If a writer is to get any meaning across in a short text, it is necessary to make as many words "count" as possible. If this was true, then one would expect a lower proportion of peripheral tokens in these texts than in longer texts. As Table 3.4 shows, however, this

Table 3.5--Number of Independent Clauses and Cohesive Chains for Each Text for Subject Two, by Text Type[a]

Text	Independent Clauses	Cohesive Chains	Text	Independent Clauses	Cohesive Chains
1D	33	27	1S	14	17
2D	19	12	2S	22	9
3D	5	10	3S	14	12
4D	13	11	4S	29	22
Mean	18	15	Mean	20	15
1C	16	17	1R	15	15
2C	16	19	2R	13	10
3C	19	21	3R	5	12
4C	11	11	4R	5	8
Mean	16	17	Mean	7	11

[a]Elicitation contexts are: 1=No Support; 2=Structure only; 3=Structure & Content; 4=No Support
Text Types are: D=Description; C=Comparison; S=Sequence; R=Response

explanation is not supported by this subject's scores. Although the Response texts were shorter than the other three types of texts, the ratio of peripheral to central tokens was third highest among the types.

Another possible explanation for this pattern of results lies in the way in which the texts were analyzed. Description texts were described in Chapter 1 as being essentially collections of attributes surrounding the topic of the text. Thus, texts of this sort may take the form of lists. In Chapter 2, however, a problem associated with listing in texts was raised. Specifically, in Hasan's method, lexical chains may be composed of only those words whose relations are derived from facts of the language (General lexical devices) or they may be formed if the text-bound relation is equivalence, semblance, or naming (Instantial lexical ties). Attributes listed in a Description text, however, may not fall into any of these categories. For example, task 4D required the writers to produce a text describing an acquaintance. Task 4D, as written by Subject Two, is reproduced in Appendix 3. In it, the physical and personal attributes of the person being described are listed, and it is clear that each attribute is related to that person (the perceived coherence score of this text, as can be seen from Table 3.13, was near perfect, higher than any of the perceived coherence scores assigned to Response texts). Many of the attributes are not related by any of the lexical relations used by Hasan, nor are they repeated or elaborated enough to make chains themselves that could interact with the focal chain *guy.* Therefore, many of the attributes were either counted as peripheral, or made into very short chains that did not interact with any other chain. It may be argued that many attributes, such as *wearing a white shirt, giving orders,* and *doing paperwork* are related, in that they are reasons why the writer thinks

the guy is the manager. This relation, however, is collocation, which is disallowed by Hasan's analysis.

In Chapter 2, a modification to Hasan's method regarding collocation was introduced. Words that could only be subsumed in chains through collocation were included in such chains only if that relation was signalled explicitly in the text. Therefore, had Subject Two included a statement such as *The reasons I think he is the manager...* the chain could have been recognized in the analysis. This would have increased the scores for that text as follows: ratio of central tokens to total tokens, 66%; central tokens to relevant tokens, 74%; peripheral tokens to central tokens, 16% and relevant tokens to total tokens, 90%. This increase in the scores for 4D are sufficient to change the status of the Description texts with respect to the others, so that it becomes ranked second rather than fourth. This example points out that the analysis could underestimate cohesive harmony for some text types.

In terms of cohesive density, the scores among the text types varied little. As was found for Subject One, the amount of cohesive chaining in a text was not indicative of the amount of chain interaction.

It is difficult to make any statements regarding the effect of elicitation context within each text type. A note regarding Subject Two's performance with respect to elicitation context is important, because affects the validity of the results for this subject, and the interpretations that can be drawn from them. This concerns his lack of use of the supportive information provided; it will be discussed in further detail in the next section, which is concerned with the effect of elicitation context on cohesive harmony.

The Effect of Elicitation Context on Cohesive Harmony

Four elicitation contexts were utilized in the tasks, which differed with respect to the type of support provided in the task. The first context provided no information other than the topic about which the subjects were asked to write. It was expected to result in texts with the lowest cohesive harmony scores. Context 2, in which structure but not content was provided, was expected to result in texts which demonstrated more cohesive harmony than the first context, but less than context 3. Context 3, in which both text structure and content were provided, was expected to be most facilitative, and therefore result in texts that demonstrated the most cohesive harmony. The last condition did not include supportive information. However, it differed form context 1 in that it was given to the writers after they had written in response to the support providing two contexts. Therefore, the fourth context was included in order to determine if a learning effect had occurred.

Subject One

Table 3.6 provides the means for the indicators of cohesive harmony and cohesive density across text types. The results are consistent with the hypothesis stated above. Context 3, in which the subject was given information regarding both how to organize the texts and what information should be included, resulted in texts with the most cohesive harmony according to the indicators. This context was followed by context 2, in which structure but not content was provided. Some carryover may have occurred for the fourth context, because these texts had lower cohesive harmony scores than contexts 2 and 3, but higher scores than texts produced in context 1. Context 1 resulted in the lowest scores, as expected.

Table 3.6.--Means for Cohesive Harmony Indicators Expressed as Percentage and Rank for Texts Written by Subject One, by Elicitation Context

Elicitation Context	CT / TT[a] %	(rank)[b]	CT / RT %	(rank)	PT / CT %	(rank)	RT / TT %	(rank)
1. No Support	51	(4)	65	(4)	47	(4)	78	(4)
2. Structure	72	(2)	86	(2)	23	(2)	84	(2)
3. Structure & Content	79	(1)	91	(1)	17	(1)	87	(1)
4. No Support	64	(3)	78	(3)	29	(3)	83	(3)

[a]CT=Central Tokens; TT=Total Tokens; RT=Relevant Tokens; PT=Peripheral Tokens
[b]Scores are ranked from highest=1 to lowest=4

Again, the trend demonstrated by these scores supports the hypothesis regarding elicitation context. The differences among the scores, particularly between the gains for the contexts that provided support compared to those that did not, are particularly encouraging.

The mean cohesive density scores (RT/TT) vary considerably less than the cohesive harmony scores, and no clear relationship between cohesive density and cohesive harmony can be discerned for elicitation context. This is consistent with the findings for text type, as well as the findings of previous studies (Pappas, 1981).

Table 3.7 provides the cohesive harmony and cohesive density scores for each text in each elicitation context. Because context 3 was expected to be most facilitative, it seemed reasonable to ask if the effect for text type would be reduced within that group of texts. That is, would it be possible for elicitation context to reduce the impact of text type difficulty? If this was true, then we would expect the text type scores to vary less in context 3, while they would vary most in context 1. The data from Table 3.7 was used to compile the ranges shown

Table 3.7.--Cohesive Harmony Indicators Expressed as Percentage and Rank for Subject One, by Elicitation Context[a]

Text	CT / TT[b]		CT / RT		PT / CT		RT / TT	
	%	(rank)	%	(rank)	%	(rank)	%	(rank)
1D	64	(1)	79	(1)	29	(1)	81	(2)
1C	56	(2)	67	(2)	31	(2)	83	(1)
1S	44	(3)	59	(3)	59	(3)	74	(3.5)
1R	39	(4)	53	(4)	67	(4)	74	(3.5)
2D	71	(2)	89	(2)	29	(4)	79	(4)
2C	62	(4)	75	(4)	26	(3)	83	(3)
2S	66	(3)	78	(3)	24	(2)	84	(2)
2R	80	(1)	91	(1)	14	(1)	89	(1)
3D	78	(3)	90	(3)	18	(2)	86	(1.5)
3C	82	(1)	92	(2)	14	(3)	88	(2.5)
3S	80	(2)	93	(1)	17	(1)	86	(1.5)
3R	72	(4)	85	(4)	21	(4)	85	(2.5)
4D	77	(1)	85	(2)	12	(1)	91	(1)
4C	67	(2)	87	(1)	34	(3)	77	(4)
4S	53	(4)	68	(4)	41	(4)	78	(3)
4R	60	(3)	70	(3)	30	(2)	85	(2)

[a]Text Types are: D=Description; C=Comparison-contrast; S=Sequence; R=Response
Elicitation Contexts are: 1=No Support; 2=Structure only; 3=Structure & Support; 4=No Support
[b]CT=Central Tokens; TT=Total Tokens; RT=Relevant Tokens; PT=Peripheral Tokens
[c]Scores are ranked from highest=1 to lowest=4

in Table 3.8, simply by subtracting the lowest score of each measure from the largest score.For all the measures, the contexts in which structure was provided resulted in the lowest range of scores. The addition of text content, however, appears to be a less important factor, since only

for one measure (CT/TT) does the difference in the ranges for contexts 2 and 3 appear to be large.

From Table 3.8, we can see that the average ratio of peripheral tokens to central tokens for context 2 is 25%, whereas for context 3 it is 7%. This means there are more peripheral tokens in contexts in which content is not given. The writer would not need to think of many words on his own, making him less likely to produce tangential information, which would result in a larger number of words unrelated to the majority of words in the text. However, the ratio of peripheral tokens is less in context 2 than it is in context 1, again pointing to the possibility that writers are more likely to produce words unrelated to the main topic of the text if they are not guided by structure. Although writers must find the words themselves, the structure limits the possibilities. If structure increases cohesive harmony by reducing the proportion of peripheral tokens in a text, then, the CT/RT ratio would have to be significantly larger than the CT/TT ratio,

Table 3.8--Range of Cohesive Harmony and Cohesive Density Scores Across Text Types Written by Subject One, by Elicitation Context

Elicitation Context	CT / TT[a] %	CT / RT %	PT / CT %	RT /TT %
1. No Support	25	26	36	9
2. Structure Only	14	13	25	10
3. Content & Structure	5	12	7	3
4. No Support	24	17	29	14

[a]CT=Central Tokens; TT=Total Tokens; RT=Relevant Tokens; PT=Peripheral Tokens

since the former is not affected by peripheral tokens. That is, if the effect of providing structure and/or content is to reduce peripheral tokens, thereby improving coherence, then once the effect of peripheral tokens is eliminated, the difference between the contexts should be reduced. The data in Table 3.6, which shows the mean scores for elicitation context, may support this hypothesis. Studies with a larger group of subjects, in which tests for significance could be used, would be useful in order to test this possibility. However, the small amount of difference among the cohesive density scores, especially when compared to differences for the other measures among text types, does not appear to be consistent with this explanation. The ways in which elicitation context acts in order to produce higher degrees of cohesive harmony may not be detectable using cohesive harmony analysis. For example, an analysis that examines structural components of the texts may be helpful, especially since the elicitation contexts varied with respect to the structural support they provided.

The general trend for text type difficulty is not followed precisely when individual text scores in Table 3.7 are examined within each elicitation context. Recall that overall, Description resulted in the highest cohesive harmony scores, followed by Comparison, Sequence and Response, in that order. This order is replicated for context 1, which was expected, since supportive information that might have lessened the impact of text type difficulty was not supplied. In context 4, which also provided no support, the order of text difficulty changed with the measure examined. Neither was the order of text difficulty maintained in contexts 2 and 3. However, because the scores varied less from text type to text type within each of these contexts than they did in the contexts without support, it is possible that the provision of structure was an important factor in reducing the differences in text difficulty.

Subject Two

A note about Subject Two is relevant before the effect of elicitation context on cohesive harmony is reported. In two of the elicitation contexts, a structure was provided to serve as a guide for the writers. It was hypothesized that an explicit representation of text structure would aid the writers in producing coherent texts. This facilitation, however, is only possible if the writers actually use the structure supplied. It is evident from reading texts produced by Subject Two in these two conditions that he only sporadically referred to the structures provided. There was little correspondence between what was given and what was produced, in terms of both content and organization. This points to the conclusion that he did not use what was given to him to an extent that would have allowed the effect of elicitation context to be reliably observed in the texts he wrote. In fact, Subject Two remarked after completing task 3C that he did not like what the instructions requested, so he did his "own thing." Appendix 3 contains a copy of text 3C by Subject Two. For task instructions see Appendix 1. This result, although disappointing and unfortunate, highlights two important factors about tasks of this type.

First, providing structure, and especially structure plus content, places a restriction on the range of subtopics writers can explore and determines how these subtopics will be presented. Although the structure may seem helpful to the experimenter, writers may choose simply to ignore it since it does not match what they wish to discuss. Because the discourse was preselected by the experimenter, deviations from the narrow focus become more obvious. Mentis & Prutting (1991) found that both the head-injured and the unimpaired subject in their study of

oral discourse committed more deviations from the topic and produced less coherent monologues when the topic was narrowly defined.

Second, it is difficult to know exactly how much a writer uses a structure that is presented. In the case of Subject Two, some overlap is evident between what he wrote and what he was given, but it is impossible to know whether the overlap is due to coincidence or conscious use of the provided information. Subject One also deviated from the provided information, but the majority of what he wrote corresponded to what was given in terms of both content and overall organization.

Table 3.9 provides the means for the cohesive harmony and cohesive density indicators for the texts written by Subject Two. From this table, it is evident that the contexts in which no structure was provided, contexts 1 and 4, resulted in texts that scored lowest for cohesive harmony. The near identical scores for these contexts for the two measures of chain interaction (CT/TT and CT/RT) suggest that there was little carryover or learning effect in context 4 from having been exposed to structure in contexts 2 and 3. Context 2 resulted in texts that obtained the highest mean cohesive harmony scores, followed by context 3. The mean of the scores from context 3 were closer to those of contexts 1 and 4 than context 2, suggesting that performance on this task was more similar to conditions in which no support was provided than the condition in which information regarding text structure was provided. This result was not predicted by the hypothesis regarding elicitation context.

A possible explanation for this result may be that the subject felt restricted by the information given and chose not to use it. Once the content was disregarded, it is likely that the structural aspect of the provided information would not be used either. Thus, this task would

Table 3.9--Means for Cohesive Harmony Indicators Expressed as Percentage and Rank for Texts Written by Subject Two*, by Elicitation Context

Elicitation Context	CT / TT[a] % (rank)[b]		CT / RT % (rank)		PT / CT % (rank)		RT / TT % (rank)	
1. No Support	45	(3.5)	57	(3)	73	(4)	78	(4)
2. Structure Only	69	(1)	77	(1)	14	(1)	91	(1)
3. Structure & Content	53	(2)	65	(2)	44	(2)	80	(3)
4. No Support	45	(3.5)	56	(4)	51	(3)	80	(2)

[a]CT=Central Tokens; TT=Total Tokens; RT=Relevant Tokens; PT=Peripheral Tokens
[b]Scores are ranked from highest=1 to lowest=4
*Please see the discussion regarding Subject Two's performance across Elicitation Contexts. Because it is evident he did not use the provided structures to write his texts, the results in this table are not conclusive.

result in texts that resembled those produced in conditions 1 and 4. Some of the texts, most notably texts 3D and 3S did overlap with the information provided in terms of content. It is possible that the subject read the information, decided not to use it, but recalled some of it while writing the task.

An alternate explanation is that the task presentation was inadequate for this subject to use in order to write a coherent text. A number of factors may have influenced this subject's ability to use the information provided. First, at no time were the subjects oriented to the way in which the information was to be read or interpreted. It is possible that this subject would have benefitted from a brief instruction regarding how the information was to be utilized. Although the tasks were developed so that the knowledge structures were self-evident, it is possible that training is still required for some persons, or that the task presentation did not fulfill its goal. Tasks 3C and 3R in particular contained a great deal of information, and at some points it was

densely presented. The subject may have found the information too difficult to use. Reading the texts for these two tasks (provided in Appendix 3) makes it clear that the subject used very little of the information they provided. Interestingly, however, the scores for these texts produced in condition 3 for the Comparison and Response texts were higher than the scores for Description and Sequence texts. For these two texts, there is overlap in content, suggesting that Subject Two attempted to use the information provided. Yet, these resulted in low cohesive harmony scores.

Table 3.10 provides the scores for the cohesive harmony and cohesive density indicators. For context 3, the table also shows that texts 3D and 3S contained a high ratio of peripheral tokens to central tokens when compared to the other two text types in that group. This result can not be blamed entirely on the task itself, as Subject One did produce a coherent text for both of these tasks. Last, it is possible that Subject Two's texts, although different from what was hypothesized, are within the limits of normal performance. Because no large group data are available for tasks of this type, it is not possible to know whether this is the case. Note, however, that studies that have compared the discourse performance of unimpaired and impaired populations have found that the range of normal performance is wide (Liles et al., 1989; Yorkston, Zeches & Farrier 1991).

Turning to the elicitation contexts, other interesting and problematic data are observed. For context 1, the Sequence text obtained very low cohesive harmony and density scores compared to all the other texts. The severity of this score was due, in part, to the analysis which was applied. Because it was not possible to find relationships among the words in the texts which corresponded to Hasan's categories, and because the subject did not explicitly signal that a sequence of events was going to be described so that they could have been subsumed in

Table 3.10--Cohesive Harmony Indicators Expressed as Percentage and Rank for Subject Two, by Elicitation Context[a]

Text	CT / TT[b] %	(rank)[c]	CT / RT %	(rank)	PT / CT %	(rank)	RT / TT %	(rank)
1D	54	(3)	61	(3)	21	(1)	88	(1)
1C	56	(1)	73	(1)	41	(3)	77	(3)
1S	16	(4)	24	(4)	193	(4)	68	(4)
1R	55	(2.5)	69	(2)	36	(2)	80	(2)
2D	62	(4)	70	(3.5)	17	(4)	89	(4)
2C	64	(3)	70	(3.5)	13	(2.5)	92	(1)
2S	74	(2)	82	(2)	13	(2.5)	90	(3)
2R	76	(1)	84	(1)	12	(1)	91	(2)
3D	39	(4)	50	(4)	58	(3)	76	(3)
3C	60	(2)	71	(2)	25	(2)	85	(2)
3S	40	(3)	56	(3)	74	(4)	70	(4)
3R	71	(1)	81	(1)	17	(1)	88	(1)
4D	64	(2)	73	(1.5)	20	(2)	87	(2)
4C	34	(4)	43	(4)	57	(3)	80	(3)
4S	66	(1)	73	(1.5)	14	(1)	91	(1)
4R	36	(3)	54	(3)	92	(4)	67	(4)

[a]Text Types are: D=Description; C=Comparison; S=Sequence; R=Response
Elicitation contexts are: 1=No Support; 2=Structure Only; 3=Structure & Content; 4=No Support
[b]CT=Central Tokens; TT=Total Tokens; RT=Relevant Tokens; PT=Peripheral Tokens
[c]Scores are ranked from highest=1 to lowest=4

collocational chain, a large number of peripheral tokens resulted. In fact, there were nearly twice as many peripheral tokens in this text as there were central tokens. It should be noted, however, that this does not completely account for the low cohesive harmony score, because even if the events could have been recognized in a collocational chain, they were difficult to relate to each

other during the analysis process. When the text was analyzed allowing for collocation, the scores improved only minimally: CT / TT, 28%; CT / RT, 36%; PT / CT, 79%; RT/ TT, 77%.

For context 4, the Sequence text has the highest cohesive harmony scores of the four texts. Recall that contexts 1 and 4 are the same, except that context 4 occurred after the subjects had experience with structure. Why the Sequence text should show so little chain interaction and cohesive harmony in the first context, and then score so much higher in the fourth is not known. Furthermore, the topics of each of the texts should have been equally familiar, since both dealt with person experience: the topic for task 1S was to describe the sequence of events on Christmas Day for his family, while the topic of task 4S was to describe the events in a typical working day. Again, one possibility is that this difference in scores falls within the range of normal variability.

In the discussion of Subject One's scores, it was suggested that a highly supportive

Table 3.11--Range of Cohesive Harmony and Cohesive Density Scores Across Text
Types   Written by Subject Two, by Elicitation Context

Elicitation Context	CT / TT[a] %	CT / RT %	PT / CT %	RT / TT %
1. No Support	40	49	21	20
2. Structure Only	12	14	5	3
3. Content & Structure	32	31	57	18
4. No Support	32	40	78	24

[a]CT=Central Tokens; TT=Total Tokens; RT=Relevant Tokens; PT=Peripheral Tokens

elicitation context would negate the effect of text type, so that a smaller range in scores would be observed for contexts 2 and 3 than for contexts 1 and 4. Table 3.11 provides the range between scores for each of the measures.

As the table shows, the range of scores was lowest for the texts produced in context two, the context that showed the highest average cohesive harmony scores. Therefore, structure, at least for these texts, appears to have been facilitative. For the other three contexts, however, the range is notably higher, suggesting that the relative difficulty of text type, if an order exists for Subject Two, was not reduced by either structure (context 3) or previous exposure to structure (context 4). However, since it is uncertain how much the information in context 3 was utilised, it is not surprising that the range of scores for this context resembles those for the contexts in which no support was provided.

Effect of Text Type on Perceived Coherence

Before the perceived coherence ratings are discussed, problems with this type of measure must be recognized. First, there is no way of standardizing or even measuring the internal criteria each reader uses to assign a rating to the text. In several cases, a writer commented that a text was unclear, poorly organized or difficult to follow, but then gave the text a "3" or "4" rating for organization and clarity. Second, not only could criteria vary from reader to reader, but they might also have changed for a single reader as she read more texts.

These problems are unavoidable and very difficult to solve completely. An alternative method to rating texts would be to have the readers *rank* them according to perceived coherence (see Hasan, 1984). This may be a more sensitive measure, as the reader would have to evaluate

each of the compared texts on an equivalent set of criteria, and she would not have the option of rating texts as equally coherent. However, shifting criteria would still be a potential problem with this method across ranking tasks. As well, ranking might be difficult to do across text types, because topic as well as text structure would change.

The rating task, although problematic, was still considered to provide valuable information for the purposes of this study. It was hypothesized that some texts would be obtain higher ratings for perceived coherence, in the following order: Description, followed by Comparison and Sequence texts, followed by Response texts.

Subject One

Table 3.12 provides the average perceived coherence scores for each text type across elicitation contexts, as well as the range of scores. The order of perceived coherence for the texts written by Subject One is: Sequence, Description, Comparison, and Response. The order of the first three types differs from the hypothesized order. Again, the significance of the differences between the scores attained for this measure cannot be determined. The only text ranked according to the expectations of the hypothesis is Response.

Table 3.12--Average Scores, Ranks and Score Ranges for Perceived Coherence for the Texts Written by Subject One, by Text Type

Text Type	Average	(rank)	Range	Text Type	Average	(rank)	Range
Description	14.4	(2)	2.7	Sequence	14.9	(1)	0.6
Comparison	14.3	(3)	3.7	Response	13.8	(4)	3.7

In Table 3.13 all three scores are given, as well as the average score, in order to demonstrate the range of scores. Since there was a four point response rating scale, and each text had four questions, the maximum text score possible was 16. The average score was obtained by dividing the total score by the number of scores. Hence, maximum average score possible was also 16. Texts were then ranked for perceived coherence according to the average score they received.

Because the range of scores was wide in some cases, and in recognition of the subjectivity involved in applying the rating scheme, some of the comments provided by the readers are also included. Where no comment is provided in the tables, none of the readers offered a comment. Commenting occurred less frequently for the highly rated texts than those rated lower. Sometimes more than one reader made the same observation; in these cases only a representative comment was selected for inclusion in the table.

Table 3.13 provides the perceived coherence scores, ranks and reader comments for the texts written by Subject One. Within this table the inter-reader variability in applying the rating scheme can be easily observed. For example, for text 4R, one reader gave it a near perfect score of 15, but another reader gave it an overall score of 6. Because of this variability, the scores and rankings are interpreted cautiously.

Generally, the readers commented on a wide range of difficulties in the texts. The majority concerned the organization of content, and the degree to which elements in the texts were elaborated. Occasionally, remarks were made regarding sentence structure and word choice. The readers also commented on how well the writers achieved their intents (as instructed in the task directions). For example, for text 4C, one reader gave the text a perfect score for

organization, but commented that the text did not provide a sufficient amount of contrastive information.[8] The readers' comments deal not only with content and organizational issues. For the Comparison and Response texts in particular, the readers refer to elements of the texts which were missing or inadequate. This type of criticism was relatively rare for Subject One. The next section, which examines the perceived coherence scores for Subject Two's texts, will discuss this issue in more detail.

For the Description texts, elicitation context 2 was judged to most coherent, followed by contexts 3, 1 and 4 respectively. While the expected order was not found for contexts 2 and 3, the fact that the conditions in which structure was provided resulted in the most coherent texts is important. The comments offered by the readers fit the expected results.

A similar result was seen for the Comparison and Response texts, for which the structure-supported contexts resulted in perceived coherence scores that were higher than the scores assigned to texts produced without support. Again, the comments generally matched the scores. Also, differences between the average scores for texts produced with structure provided and those produced without structure were large.

The results from the Sequence text did not fit the expected results. Although context 2, in which structure was provided, did result in a text which was judged to be high in coherence, contexts 3 and 4 resulted in texts rated identically. Note, however, that the difference between the highest and lowest average score for this group of texts is only 0.6 points.

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[8]This reader's comment also underlines the importance of raters' internal criteria. While she noted that the text did not really accomplish the goal of comparing and contrasting two entities, she still gave it a perfect score.

Table 3.13.--Perceived Coherence Scores, Ranks and Reader Comments for Texts Written by Subject One, by Text Type

Text	Scores	Average	Rank	Reader Comments
1D	16 14 13	14.3	3	Some important aspects missing
2D	16 16 15	15.7	1	Seems okay enough
3D	16 16 12	14.7	2	Order is smooth and flowing
4D	14 13 12	13	4	Overemphasis on some details while lack of elaboration for others; Discussion does not match introduction
1C	14 14 12	13.3	3	Insufficient detail; Some sentences needed to be reread before they were understood due to poorly used reference
2C	16 16 15	15.7	2	Too much generalization; Clear and made sense by rather stilted and lacking integration of pros and cons
3C	16 16 16	16	1	Well written paragraph from a knowledgeable [writer]
4C	16 11 10	12.3	4	Jumping back and forth; Characteristics discussed not evenly matched; Insufficient amount of contrast; Characteristics being discussed not always clear
1S	16 15 14	15	2	
2S	16 16 14	15.3	1	Ordering of some steps out of place
3S	16 16 12	14.7	3.5	Some awkwardness in ordering; Great temporal markers; Sequence fine but too much shared knowledge assumed
4S	16 14 14	14.7	3.5	Discussion does not exactly match introductory sentences
1R	16 12 8	12	3.5	
2R	16 16 15	15.7	1	Solution does not match the issues most elaborated in the discussion
3R	16 15 15	15.3	2	
4R	15 15 6	12	3.5	Specific topic unclear, therefore adequacy of solution also unclear (2); Organization arguments odd; Match between pros and cons of each side inadequate;

Subject Two

Table 3.14 provides the average score, rank and range of scores for each text type.
For Subject Two, the Description and Comparison texts received the same average score for
perceived coherence across elicitation contexts. These were followed by the Sequence text type,
which was in turn followed by Response. This order is consistent with the hypothesized order.
Note, however, that the difference between the score for the first three types of text are very
similar, while the score from the Response text differs notably from the rest.

As for Subject One, the subjectivity involved in rating the texts is evident in the scores
obtained for Subject Two's texts. Table 3.15 contains the actual scores for each text, as well as
some reader comments, in order to demonstrate this variability in rating. The largest difference
in rating an individual text occurred for text 3R, for which one reader assigned a score of 15, but
another gave it a score of only 5. Notably, the least amount of agreement across readers appears
to have occurred for the Response texts, which were also the texts that received the lowest
average score.

Unlike the scores for Subject One, no pattern of perceived coherence within each text type
is discernible. This result is not entirely surprising, given the finding that order of difficulty

Table 3.14--Average Scores, Ranks and Average Score Ranges[a] for Perceived Coherence for the
Texts Written by Subject Two, by Text Type

Text Type	Average	(rank)	Range	Text Type	Average	(rank)	Range
Description	14.2	(1.5)	2.3	Sequence	13.8	(3)	2.4
Comparison	14.2	(1.5)	1.3	Response	10.9	(4)	2.6

[a]The range reported here was computed by subtracting the lowest from the highest average score for each individual
text. See Table 3.16 for the average text scores

according to text type was also difficult to ascertain for cohesive harmony scores. What is most striking in this set of data is the variability among readers in terms of the ratings they assigned to the texts.

Reader comments, when they were supplied, focused on a number of different features of the texts. A common observation these readers made was that the writer mismanaged details. In some texts insufficient detail was provided in order to fulfil the purpose of the text (see texts 1D, 4D, 3C, 4C, 1S). Other texts were criticized for containing too many irrelevant or extraneous details. In others, the details were not presented in a manner that made the meaning of the text clear to the readers.

This was particularly noticeable for the Comparison and Response texts (see comments for texts 1C, 3C, 4C, 1R, 3R, 4R). Readers noted that for the Comparison texts, the writer failed to present an evenly matched set of attributes against which to compare and contrast the entities being discussed. In order for a text to pass as a Comparison text, the readers required more than a list of attributes for one entity and a list of attributes for the second entity unrelated or partly related to the first. Similarly, for the Response texts, the readers stated that the writer failed to produce an adequate Response type of text. Arguments were frequently judged to be insufficiently developed for the texts to qualify as discussions and solutions of problems. In other texts the arguments presented were not judged to be related to the overall topic, or to the solution. Comments regarding the nature of details and text organization were also noted.

Table 3.15--Perceived Coherence Scores, Ranks and Reader Comments for Texts Written by Subject Two, by Text Type

Text	Scores			Average	Rank	Reader Comments
1D	14	14	10	12.7	4	Assumes a lot of familiarity; insufficient explanation; rambling; details unorganized;
2D	16	14	11	13.7	3	Awkward
3D	16	16	12	14.7	2	--
4D	16	15	14	15.0	1	Inadequate elaboration; reordering needed; meaning gets across despite poor writing style
1C	16	14	14	14.7	1	Not clear what specific attributes are being contrasted; took effort to follow
2C	15	14	10	13.0	3	Topic sentence didn't match text; conjunctions inaccurate; text "jumpy"; shifting focus
3C	14	12	9	11.7	4	Several sentences don't make sense, but can guess what he means; one sided; jumped from one point to another; some points inadequately explained; contrasts not matched
4C	16	13	12	13.7	2	More details required; insufficient contrasting; lists attributes without clearly comparing/contrasting; information not clearly presented
1S	16	16	8	13.3	3	Missing details; extraneous details interfere with flow; jumps forth and back
2S	14	13	10	12.3	4	Introduction too vague; use of "the" when first introducing nouns confusing; disjointed due to distance between repeated mentions of some words
3S	16	14	14	14.7	1	Last sentence unclear
4S	16	14	13	14.3	2	Too much extraneous detail
1R	15	8	6	9.7	4	Flow of ideas poor; ambiguous; irrelevant arguments; needs better division of pros/cons
2R	15	13	9	12.3	1	Jumping from one argument to next confusing; solution is not well supported; vague references made text hard to follow
3R	15	14	5	11.3	2	Arguments undeveloped (2); opening sentence did not introduce topic; no clear response to problem; arguments do not fit what seemed to be the topic
4R	13	10	8	10.3	3	Doesn't stick to original argument; goes off topic in conclusion; some contradiction in arguments

For the Description and Sequence tasks, the comments focused almost exclusively on text ordering and the adequacy of the details provided. None of the comments questioned the texts' fulfilment of the meaning that was to be conveyed. That is, none of the readers said that any of the Description or Sequence texts did not qualify as a text of that type. Readers may have more stringent requirements for what elements must be part of Response and Comparison texts. These elements are similar to the ones described by Meyer (1985), which were discussed in Chapter 1.

Occasionally, readers made comments which are directly related to the cohesiveness of the texts. For example, for text 2S, one reader noted that some nouns were introduced by *the*, while another found that the distance between repeated mentions of some words made the text disjointed.

One last subjective feature of Subject Two's performance is worth mentioning. One reader, upon finishing her task, remarked that she could "certainly tell the head-injured writer from the normal one." The belief that there were two types of subjects, one unimpaired and one impaired, was shared by three readers. When asked to identify the texts they believed to have been produced by the impaired writer, all consistently chose texts written by Subject Two. This finding shows that Speech-Language pathologists need to be aware of the variability of normal performance, and that problems may not be directly related to cognitive impairment. This does not mean that the texts produced by Subject Two were necessarily poor; it simply points out that even people with no history of neurological damage may perform poorly on these tasks, as judged by highly educated individuals engaged in highly literate professions.

Effect of Elicitation Context on Perceived Coherence

The provision of support and/or content was hypothesized to affect the coherence of the texts. Order of perceived coherence scores, from highest to lowest, was expected to be: structure plus content support (context 3); structural support only (context 2); no support following exposure to structure (context 4); no support (context 1).

Subject One

Table 3.16 provides the average perceived coherence scores for the texts produced in each elicitation context, across text types. As the table shows, the average perceived coherence scores for conditions 1 and 4 are ranked third and fourth most coherent according to this measure. The result that context 4 achieved lower perceived coherence scores than context 1 was not consistent with the expectation that previous exposure to explicit representations of text structure in contexts 2 and 3 would result in improved performance in context 4.

Table 3.16--Average Scores, Ranks and Average Score Ranges[a] for perceived Coherence for the Texts Written by Subject One, by Elicitation Context

Elicitation Context	Average	(rank)	Range	Elicitation Context	Average	(rank)	Range
1. No Support	13.7	(3)	3.0	3. Structure & Content	15.2	(2)	1.3
2. Structure Only	15.2	(2)	0.4	4. No Support	13.0	(4)	2.7

[a]The range reported here was computed by subtracting the lowest from the highest average score for each individual text. See Table 3.17 for the average individual text scores

Furthermore, the range of scores was wider for contexts 1 and 4 than for contexts 2 and 3, suggesting that effects of text type are stronger in the absence of structural support in the text elicitation context.

Contexts 2 and 3 received identical average perceived coherence scores, suggesting that the provision of structure affected the coherence of the texts as perceived by this group of readers. Providing content in the elicitation context as well, however, did not enhance the perceived coherence scores more than providing structure alone. This suggests that the elicitation context factor most associated with perceived coherence is structure, and that providing content as well is not additively facilitative.

Table 3.17 gives the perceived coherence scores and average scores for each text within each elicitation context. Again, inter-reader variability in the scoring of each text is quite evident in this table. The most inter-reader agreement occurred for texts produced in contexts 3. Due to the limited range of scores in both these contexts, it is likely that the difficulty effects of text type are reduced when structure is supplied. It is interesting to note that for 2 and contexts 1 and 4, not only is the range of the average scores for among the texts within each context larger than for contexts 2 and 3, but the range of scores for each individual text within these contexts is also larger than the range of scores for texts in contexts 2 and 3. In other words, the readers were more in agreement regarding coherence of the texts produced in contexts 2 and 3 than they were in contexts 1 and 4. Generally, readers could agree on what was "good", but had different criteria for what was not good. The implications for treatment is that subjective clinical impressions, although valuable, may not be reliable.

Table 3.17--Perceived Coherence Scores and Ranks for Texts
Written by Subject One, by Elicitation Context[a]

Text	Scores			Average	Rank[b]
1D	16	14	13	14.3	2
1C	14	14	12	13.3	3
1S	16	15	14	15	1
1R	16	12	8	12	4
2D	16	16	15	15.7	2
2C	16	16	15	15.7	2
2S	16	16	14	15.3	4
2R	16	16	15	15.7	2
3D	16	16	12	14.7	3.5
3C	16	16	16	16	1
3S	16	16	12	14.7	3.5
3R	16	15	15	15.3	2
4D	14	13	12	13	2
4C	16	11	10	12.3	3
4S	16	14	14	14.7	1
4R	15	15	6	12	4

[a]Text Types are: D=Description; C=Comparison-contrast; S=Sequence; R=Response
Elicitation Contexts are: 1=No Support; 2=Structure Only; 3=Structure &Content; 4=No
Support
[b]Scores are ranked highest=1 to lowest=4

Within contexts 1 and 4, the overall ranking of texts according to type was maintained.
This results strengthens the likelihood that the provision of structure reduces the effect of text
type, since for both contexts in which no structural support is supplied, the overall order of text
adequacy is maintained.

The range of scores within each of contexts 2 and 3 is smaller than the ranges observed in the no support contexts. This is consistent with the hypothesis that the provision of structure may reduce the effects of text type on perceived coherence. Note, however, that the range of scores for context 3 was larger than the range for context 2. This suggests that structure is more important for this effect than content.

Subject Two

Table 3.18 shows that the expected order of perceived coherence scores was not obtained for the texts written by Subject Two. Recall, however, that there were difficulties in the interpretation of context 3 in particular, since it is questionable to what extent Subject Two utilized the information given. Because this is the case, it is not surprising that contexts 3 and 4 resulted in similar perceived coherence scores. The scores of these two contexts were highest among the 4, followed by contexts 2 and 1. The relatively low average score achieved for texts in condition 2 was unexpected, since the provision of structural support in the elicitation context was hypothesized to facilitate the writing process and result in texts that would be perceived as more coherent than texts produced without such support.

Table 3.18--Average Scores, Ranks and Average Score Ranges[a] for Perceived Coherence for the Texts Written by Subject Two, by Elicitation Context

Elicitation Context	Average	(rank)	Range	Elicitation Context	Average	(rank)	Range
1. No Support	12.6	(4)	5.0	3. Structure & Content	13.4	(1.5)	3.4
2. Structure Only	12.8	(3)	1.4	4. No Support	13.4	(1.5)	4.7

[a]The range reported here was computed by subtracting the lowest from the highest average score for each individual text. See Table 3.19 for the average individual text scores

In previous discussions of elicitation context effect in this discussion, it was stated that for the texts with highest indicators of coherence, the range of scores was smaller than for texts with lower indicators of coherence. This result was not found for the perceived coherence scores obtained for the texts written by Subject Two. Elicitation contexts 3 and 4, which resulted in the highest perceived coherence scores, also showed the widest range of variability in the scores. However, for context 2, which received a comparatively low perceived coherence score, the range was smallest. Data from this subject, therefore, suggest that the readers were more consistent with each other when judging poorly written texts then when judging well written texts.

Table 3.19 displays the range of scores for each individual text by the three readers who read them. Again, the subjectivity involved in applying the rating scheme and evaluating the texts is evident from the scores given to each of the texts. In the discussion of the texts written by Subject One, it was noted that there was less inter-reader variability for highly rated texts than for texts given lower scores. This pattern is not clear in the texts written by Subject Two, however, as wide ranges of scores can be found for texts in all the elicitation contexts.

Table 3.19--Perceived Coherence Scores and Ranks
for Texts Written by Subject Two, by Elicitation Context[a]

Text	Scores			Average	Rank[b]
1D	14	14	11	12.7	3
1C	16	14	14	14.7	1
1S	16	16	8	13.3	2
1R	15	8	6	9.7	4
2D	16	14	11	13.7	1
2C	15	14	10	13.0	2
2S	14	13	10	12.3	3.5
2R	15	13	9	12.3	3.5
3D	16	16	12	14.7	1.5
3C	14	12	9	13.0	3
3S	16	14	14	14.7	1.5
3R	15	14	5	11.3	4
4D	16	15	14	15.0	1
4C	16	13	12	13.7	3
4S	16	14	14	14.7	2
4R	13	10	8	10.3	4

[a]Elicitation contexts are: D=Description; C=Comparison-contrast;
S=Sequence; R=Response
Text Types are: 1=No Support; 2=Structure Only; 3=Structure & Content;
4=No Support
[b]Scores are ranked highest=1 to lowest=4

Furthermore, no clear pattern of text type difficulty within each elicitation context can be

detected from this data. A closer examination of the texts, as well as other variables which may

have affected the performance of the subjects, is beyond the scope of the present study.

<u>Relationship Between Scores from Cohesive Harmony and Perceived Coherence</u>

Prior research indicates that cohesive harmony analysis is highly predictive of text coherence (Hasan, 1984, 1985; pappas, 1981; Yang, 1989; Armstrong, 1991). This study used a reader rating task in which perceived coherence scores were assigned to the texts based on reader judgements of organization and clarity. If the findings from both procedures validly assessed the coherence of the texts produced by the subjects, then the rankings for coherence obtained for the two methods should be in agreement.

Subject One: Text Type

Table 3.20 provides a summary of the average scores and ranks from the perceived coherence procedure and compares them to the average percentages and ranks obtained for each text type from the cohesive harmony analysis. Ignoring the Sequence text, the order of text difficulty as shown by cohesive harmony and perceived coherence is similar. That is, the Response texts are associated with the least amount of coherence, while the Description text is associated with the most, followed by Comparison texts. However, the perceived coherence ranking for Sequence texts places this text type first, while the cohesive harmony analysis ranks this text type after the Comparison texts. This difference may stem from a number of sources.

First, cohesive harmony analysis may underestimate the coherence of these texts since they can take the form of lists of events. Words describing the events may not fit into the categories of lexical cohesion defined by Hasan (1984, 1985). Hence, the cohesive harmony indicator would indicate a low degree of harmony. Hasan states that the reason why cohesive harmony analysis is sensitive to coherence is that in coherent texts, "one says similar kinds of

Table 3.20--Summary Table Comparing Average Perceived Coherence Scores and Ranks to Average Cohesive Harmony and Cohesive Density Indicators, Expressed in Percentage and Rank, for Texts Written by Subject One, by Text Type

| Text Type | Perceived Coherence | | CT / TT | | CT / RT | | PT / CT | | RT / TT | |
	Score	(rank)	%	(rank)	%	(rank)	%	(rank)	%	(rank)
Description	14.4	(2)	72	(1)	86	(1)	22	(1)	84	(1)
Comparison	14.3	(3)	69	(2)	82	(2)	28	(2)	83	(3.5)
Sequence	14.9	(1)	62	(4)	76	(3)	35	(4)	81	(4)
Response	13.8	(4)	63	(3)	75	(4)	33	(3)	83	(3.5)

of things about similar phenomena" (Hasan, 1985, p.92). In a sequence task in which a series of events or steps in a procedure is described, however, it is possible that very different things occur, and the only relation that binds them is chronological sequence. The sequence may be signalled by temporal conjunctives, such as *then, before, during, following*. This signalling, provided that it was structurally and semantically appropriate, may be sufficient for a reader to understand the sequence and find it coherent. Therefore, while the text may be perceived to be coherent by a reader, the demands of cohesive harmony analysis may be too strict. It would be interesting to compare the semantic and structural characteristics of a text that received a high perceived coherence score, but a low cohesive harmony index, an analysis that is beyond the scope of this study.

A second potential explanation for the disparity between the cohesive harmony and perceived coherence measures is applicable to all cases in which a difference between the two may exist. The variability among readers has already been discussed. The procedure used in this study required that each text be evaluated by three different readers. However, the same three readers did not judge all the texts. Therefore, the texts were judged by different readers who had different internal criteria when applying the rating system. If a text happened to be read by a group of readers who all tended to rate texts highly, and another text was read by people who tended to be more strict, then the first text would receive a higher score than the second. The difference in scores would be due to the readers, not the relative coherence of the texts themselves. Using a larger group of readers would alleviate this potentially confounding variable.

Subject Two: Text Type

Table 3.21 compares the perceived coherence scores and the cohesive harmony indicators for the texts written by Subject Two. Like many of the findings pertaining to this subject, it is difficult to find a consistent pattern that supports or does not support the expectations for coherence proposed in this study. While the readers found the Response texts this subject produced least coherent, the analysis found that they contained the most chain interaction and therefore should be most coherent. Such a dramatic disparity between the results of the cohesive harmony analysis and the subjective ratings suggests that the analysis is failing to capture an important feature of texts which is significant for coherence. Ultimately, it is the analysis that must fit the subjective perceptions of coherence. Although procedural difficulties with the rating task may be partially accountable for the results found here, this particular result points to the need to thoroughly evaluate cohesive harmony analysis with respect to various discourse types as well. A structural type of analysis may be useful for characterizing the communicative adequacy of texts. However, such an analysis is beyond the scope of this study.

Table 3.21--Summary Table Comparing Average Perceived Coherence Scores and Ranks to Average Cohesive Harmony and Cohesive Density Indicators, Expressed in Percentage and Rank, for Texts Written by Subject Two, by Text Type

Text Type	Perceived Coherence		CT / TT		CT / RT		PT / CT		RT / TT	
	Score	(rank)	%	(rank)	%	(rank)	%	(rank)	%	(rank)
Description	14.2	(1.5)	55	(2)	64	(2)	29	(1)	85	(1)
Comparison	14.2	(1.5)	54	(3)	64	(3)	34	(2)	84	(2)
Sequence	13.8	(3)	49	(4)	59	(4)	59	(4)	80	(4)
Response	10.9	(4)	60	(1)	72	(1)	39	(3)	82	(3)

Subject One: Elicitation Context

The rankings derived from cohesive harmony analysis and perceived coherence with regard to elicitation context, while not in perfect alignment, appear to indicate a trend. Table 3.22 is a summary table of all the average scores arranged by elicitation context. The readers' scores ranked the texts produced with support of both structure and content highest (context 3), followed by the texts produced in the context 2. The rankings for the cohesive harmony indicators reversed that order. Note, however, that the difference between the conditions ranked first and second for both these measures are smaller than the difference which separates them from the scores achieved for contexts 1 and 4. In other words, it is possible that the differences between contexts 2 and 3 for both measures is less important than the difference between contexts 2 and 3 and contexts 1 and 4. If this is the case, contexts 2 and 3 can be treated like a unit. If so, then the rankings for the texts according to elicitation context are similar for the perceived coherence and the cohesive harmony analyses. If this is true, then the provision of structure is important to the production of expository texts. While it is tempting to conclude that adding content is not important, this conclusion is not justified by this data. First, it is possible that the provision of structure produced a "ceiling effect" for the coherence of this writer's texts. Any additional help content might have given would not be detectable. However, if a person with cognitive impairment was given structure support, his performance might improve over a condition in which no structure was provided. Performance might improve more if content was also provided for this individual, since he has more deficits to overcome than the unimpaired writer. Also, since there was no condition in which content alone was provided, any increase in coherence due to the addition of content in the presence of structure may be due to an interaction.

Table 3.22.--Summary Table Comparing perceived Coherence Scores and Average Cohesive Harmony and Cohesive Density Indicator Scores, Expressed as Percentage, Range of Scores and Rank, for Texts Written by Subject One, by Elicitation Context

Elicitation Context	Perceived Coherence			CT / TT			CT / RT			PT / CT			RT / TT		
	%	Range	(rank)	%	Range	(rank)	%	Range	(rank)	%	Range	(rank)	%	Range	(rank)
1. No Support	13.7	3.0	(3)	51	25	(4)	65	26	(4)	47	36	(4)	78	9	(4)
2. Structure Only	15.6	0.4	(1)	72	14	(2)	86	13	(2)	23	15	(2)	84	10	(2)
3. Structure & Content	15.2	1.3	(2)	79	5	(1)	91	12	(1)	17	15	(1)	87	3	(1)
4. No Support	13.0	2.7	(4)	64	24	(3)	78	17	(3)	29	29	(3)	83	14	(3)

[a]Cohesive Harmony Indicators are: CT/TT; CT/RT; PT/CT
[b]Cohesive Density Indicator is: RT/TT
[c]Scores are ranked: 1=highest; 4=lowest
[d]CT=Central Tokens; TT=Total tokens; RT=Relevant Tokens; PT=Peripheral Tokens

Subject Two

Comparing the perceived coherence scores and the scores obtained by cohesive harmony analysis, given in Table 3.23, it is evident that there is little agreement between the scores for the texts written by Subject Two. As was discussed in the previous section examining the results for Subject One, there are two potential sources of this disparity. First, the inter-reader variability may have affected the average scores for perceived coherence so that the scores obtained were more a function of the readers than the coherence of the texts. Alternatively, it is possible that cohesive harmony analysis does not adequately characterize the features of texts readers use when evaluating them. Therefore, an alternate means of objectively assessing the texts may be required, or analyses in addition to cohesive harmony must be used.

It is important to ascertain the reasons behind the difference in rankings achieved between the cohesive harmony and perceived coherence procedures. Clinical judgments of coherence of the discourse produced by communicatively impaired individuals are typically subjective. This subjectivity leaves the impressions of clinicians open to challenge by others who disagree about the communicative ability of a communicatively impaired person. The variation among the readers who participated in this study was demonstrated. However, if clinicians could be shown to be generally consistent with an objective measure of coherence, then they would be less vulnerable to questions of clinical validity.

Table 3.23.--Summary Table Comparing Average perceived Coherence Scores Average Cohesive Harmony[a] and Cohesive Density[b] Indicator Scores, Expressed as percentage, Range of Scores and Rank[c], for Texts Written by Subject Two, by Elicitation Context

Elicitation Context	Perceived Coherence			CT / TT[d]			CT / RT			PT / CT			RT / TT		
	%	Range	(rank)	%	Range	(rank)	%	Range	(rank)	%	Range	(rank)	%	Range	(rank)
1. No Support	12.6	5.0	(4)	45	40	(3.5)	57	49	(3)	57	21	(3)	78	21	(4)
2. Structure Only	12.8	1.4	(3)	69	12	(1)	77	14	(1)	77	5	(1)	91	3	(1)
3. Structure & Content	13.4	3.4	(1.5)	53	32	(2)	65	31	(2)	44	57	(2)	80	18	(3)
4. No Support	13.4	4.7	(1.5)	45	32	(3.5)	56	40	(4)	51	78	(4)	80	24	(2)

[a]Cohesive Harmony Indicators are: CT/TT; CT/RT; PT/CT
[b]Cohesive Density Indicator is: RT/TT
[c]Scores are ranked: 1=highest; 4=lowest
[d]CT=Central Tokens; TT=Total Tokens; RT=Relevant Tokens; PT=Peripheral Tokens

Effect of Text Type and Elicitation Context on Productivity

In addition to cohesive harmony analysis scores and the perceived coherence measure, a record of the time taken to write each text and the length of each text was also kept, as these may be associated with task difficulty. It seems reasonable to expect that texts which are easier to produce, either due to text type or elicitation context, would also take less time to produce. The number of independent clause units, rather than sentences, was used as the measure of productivity in order to avoid penalizing writers for using complex sentence constructions.

Subject One

Table 3.24 shows that the number of clauses per minute Subject One produced for each text. If time taken to produce a text indicates the difficulty writers have when producing texts, then the Sequence texts are easiest to produce, followed by the Comparison, Description and Response texts. While these data do not give a indication of how well written the texts are, it may be useful information for therapeutic purposes. If a head-injured person takes a very long time to produce a short Sequence text, then it maybe possible that the writer is having difficulty with the task. Even if the resulting text is judged to be coherent, if an individual requires an extended period to write the text, then this may be indicative of processing problems due to cognitive impairment.

Table 3.24.--Number of Clauses per Text, Time Taken to Write Each Text and Number of Clauses per Minute for Texts Written by Subject One, by Text Type.

Text	Clauses	Time (minutes)	Clauses per Minute	Text	Clauses	Time (minutes)	Clauses per Minute
1D	9	20	0.5	1S	10	20	0.5
2D	10	15	0.7	2S	11	18	0.6
3D	8	15	0.5	3S	18	14	1.3
4D	8	10	0.8	4S	14	15	0.9
Mean	9	15	0.6	Mean	13.3	16.8	0.8
1C.	11	23	0.5	1R	8	25	0.3
2C	15	15	1.0	2R	11	25	0.4
3C	13	16	0.8	3R	12	23	0.5
4C	7	12	0.6	4R	9	15	0.6
Mean	11.5	16.5	0.7	Mean	10	22	0.5

Subject Two

Table 3.25 shows the number of clauses per minute Subject One produced for each text. Again if number of clauses produced per minute is an indication of how easily writers can produce each text, then the Sequence texts are easiest, followed by the Description and Comparison texts, while the response texts are most difficult.

The results for Subject Two are similar to those for Subject One in terms of which texts took longest to produce. Description texts tended to be shortest, followed by the Comparison, Response, and Sequence texts. It is interesting that although the Sequence texts were produced more quickly than the others, they were longest in terms of clause units. Perhaps because the

Table 3.25.--Number of Clauses per Text, Time Taken to Write Each Text and Number of Clauses per minute for Texts Written by Subject Two, by Text Type.

Text	Clauses	Time (minutes)	Clauses per Minute	Text	Clauses	Time (minutes)	Clauses per Minute
1D	33	28	1.2	1S	14	18	0.8
2D	19	15	1.3	2S	22	20	1.1
3D	5	12	0.4	3S	14	12	1.2
4D	13	16	0.8	4S	29	28	1.0
Mean	17.5	17.8	0.8	Mean	19.8	19.5	1.0
1C	16	19	0.8	1R	15	24	0.6
2C	16	22	0.7	2R	13	25	0.5
3C	19	20	1.0	3R	5	12	0.4
4C	11	22	0.5	4R	5	15	0.3
Mean	15.5	20.8	0.8	Mean	9.5	19	0.5

subject found them easier to produce, he was inclined to want to write more for tasks requesting this text type.

Subject One

Table 3.26 shows the average scores for the productivity measures within each elicitation context. Data for individual texts were given in Table 3.24, so they will not be repeated here. Since contexts 2 and 3 were expected to facilitate text production, it was predicted that these would be written more quickly than the texts that were written without support. For Subject One, this expectation was fulfilled. Interestingly, the number of clauses per minute measure was the same for contexts 2 and 3. Therefore, the content present in context 3 did not help the subject to produce the texts any more quickly. The addition of content was expected to be facilitative

Table 3.26--Average Number of Independent Clauses, Time Taken to Write Texts and Clauses per Minute for Texts Written by Subject One, by Elicitation Context

Elicitation Context	Time (Minutes)	Independent Clauses	Clauses per Minute
1. No Support	22	9.5	0.5
2. Structure Only	18.3	8.3	0.8
3. Structure & Content	17	12.8	0.8
4. No Support	13	9.5	0.7

because the subject would not be required to recall information. For Subject One, however, this did not appear to be the case. Again, the productivity measures do not give an indication of how well the texts are produced. However, this data may be useful information for therapy. For example, if individuals consistently took the same amount of time to produce texts in the context of structural support provided as they did when no support was provided, then perhaps they are having problems with interpreting or using the information (assuming all else is equal).

Because text length may have been affected by the amount of information provided in contexts 2 and 3, it is not possible to make any generalizations regarding this aspect of productivity with respect to elicitation context.

Subject Two

Table 3.27 shows the average scores for the productivity measures within each elicitation context. Data for individual texts were given in Table 3.25, so they will not be repeated here. For Subject Two, there is little difference among the productivity measures when compared in terms of elicitation context. Context 1, in which no support was provided, resulted in texts that were produced more quickly than texts in context 3, followed by contexts 2 and 4.

Table 3.27--Average Number of Independent Clauses, Time
Taken to Write Texts and Clauses per Minute for Texts
Written by Subject Two, by Elicitation Context

Elicitation Context	Time (Minutes)	Independent Clauses	Clauses per Minute
1. No Support	22.3	19.5	0.9
2. Structure Only	20.5	17.5	0.7
3. Structure & Content	14	10.8	0.8
4. No Support	20.3	19.3	0.7

Chapter 4 will summarize the results reported in this chapter, offer some suggestions for future research, and briefly discuss implications this study has the evaluation and remediation of expository texts written by persons with head injury.

CHAPTER 4

CONCLUSIONS

Review of the Study

The purpose of this study was to identify the conditions under which writers are able to produce coherent expository texts. The results of this study are intended to inform Speech-Language Pathologists working with persons who have suffered closed head injury. Because expository text writing is a demanding cognitive and linguistic task, persons who demonstrate the cognitive-communicative deficits associated with closed head injury find text writing extremely challenging. The goal of therapy is to aid individuals to achieve competent levels of performance. This is done by using and modifying tasks so that optimal performance is achieved.

This project investigated the effect of two variables -- text type and elicitation context -- on the coherence of written expository texts produced by two unimpaired adults. The subjects were similar to the general population of closed head injured adults with respect to sex, age and education level. The performance of two individuals clearly cannot represent the performance of everyone, but results from this study are a beginning to our understanding of how text writing is affected by production variables.

The variables investigated in this study were text type and elicitation context. Text types were chosen from prose types generally used in the education and research literature. These types were: Description, Comparison, Sequence and Response. Definitions of each text type were taken from Meyer (1985). Based on these definitions and previous studies investigating text

comprehension (Meyer, 1984, 1985; Horowitz, 1985a, 1985b), it was hypothesized that Description texts would be most easily produced, followed by the Comparison, Sequence and Response texts.

In addition, the effects of four elicitation contexts were examined. Because the sequelae of closed head-injury include disorganization, tangentiality, inattention and memory difficulties during discourse production, the amount of structural and informational support in the text production environment was hypothesized to affect how adequately texts were produced. The conditions investigated were: (1) No Support, (2) Structure Only, (3) Structure and Content, (4) No Support. The No Support condition was presented as both the first and last condition in order to see if a learning effect would result from having been exposed to explicit representations of structure in contexts 2 and 3. Context 3 was expected to result in the most coherent texts, followed by context 2. Contexts 1 and 4 were hypothesized to result in texts with the lowest amount of coherence, although context 4 texts would score higher than context 1 texts if a learning effect occurred.

The texts were evaluated using cohesive harmony analysis (Hasan, 1984, 1985), which purports to measure the semantic unity, or coherence, of texts. Previous research (Hasan, 1984, 1985; Pappas, 1981; Yang, 1989; Armstrong, 1991) has found that scores for cohesive harmony are related to degree of perceived coherence. A measure of perceived coherence was also used in this study, in order to examine if cohesive harmony scores were in fact associated with how Speech-Language Pathologists' judgments. Because many clinical evaluations of discourse are subjective, it is important to know how reliable these judgements are.

Review of the Results and Suggestions for Future Research

The two subjects performed very differently from each other, highlighting the importance of recognizing that the range of normal performance on all discourse tasks, not just text writing, is substantial (see Liles et al., 1989; Yorkston et al., 1991).

Subject One

The results from Subject One were generally consistent with the hypotheses of this investigation. For text type, the cohesive harmony scores were highest for the Description texts, followed by the Comparison, Sequence, and Response texts, in that order. This result is consistent with the predictions based on Mohan's (1986) knowledge framework. Meyer's (1985) definitions predicted that Comparison texts would be more difficult than Sequence texts, which was not found for Subject One. For elicitation context, the conditions in which no support was provided resulted in texts with lower cohesive harmony scores than texts produced in contexts that did provide support. Overall, the addition of content in context 3 appeared to improve Subject One's performance. However, this trend did not occur within all text types. The addition of content tended to improve scores for text types that received lower overall cohesive harmony scores (Sequence and Comparison texts). For the text type associated with higher cohesive harmony scores (Description), elicitation context had less effect. This result may be attributable to a "ceiling" effect for text production. That is, there may be a limit as to how coherent a writer's texts can be, and any additional help will not effectively change that limit. Note, however, that this effect was not observed for the Response texts, which had the lowest cohesive harmony scores.

For Response texts, the texts written in contexts 2 and 3 had higher scores than the texts in contexts 1 and 4. However the text written in context 3 actually had a lower score than the text from context 2. Therefore, it was suggested that provision of structure was a more important factor for the improvement of Subject One's texts than the provision of content. However, this conclusion cannot be generalized to all persons, since someone with cognitive deficits may find the addition of content more facilitative than Subject One did.

The question was asked whether elicitation context could reduce the effect of text difficulty. If this was true, then one would expect less difference between the scores for the texts written in context 3 than those written in contexts 2, 4 and 1 (in that order). For this subject, this expectation was not supported. The range of scores for texts written in contexts 2 and 3 were very similar. Again, this suggests that the addition of content was less than the provision of structure helpful in improving the overall quality of Subject One's texts .

With respect to a potential learning effect in condition 4, the results appear to support the possibility that the subject benefitted from previous exposure to explicit representations of structure in contexts 2 and 3. However, this effect was not observed in all text types.

The perceived coherence scores did not match the cohesive harmony scores in terms of ranking the difficulty of text type. This is contrasts with previous studies, in which that cohesive harmony scores coincided with subjective impressions of coherence. The readers rated the Sequence texts as most coherent, followed by the Description, Comparison, and Response texts, in that order. Recall that the order determined by cohesive harmony analysis was similar to this order, except that the Sequence texts were ranked third, having similar scores to the Response texts.

Two explanations for this difference were suggested. First, cohesive harmony analysis may be insensitive to some features of texts that readers use in order to make judgements regarding coherence. For example, the restrictiveness of Hasan's criteria regarding what could be subsumed in a chain may have resulted in fewer chains than the readers recognized. Another possible way in which cohesive harmony analysis may fall short when characterizing expository texts is that is does not recognize structural features of the texts. Reader comments regarding the texts they rated lower (Comparison and Response texts) tended to focus on whether the texts qualified as the type they were intended to be. That is, readers commented when the Comparison texts did not evenly match features being compared, or when the solutions in Response texts did not directly address the problems.

An additional analysis in which structural features of the text are examined may be able to supply more information regarding what features contribute to well-written texts. It would be particularly interesting to compare a text that received high cohesive harmony scores and low reader ratings to one that had low cohesive harmony scores and high reader ratings. Readers may give high ratings to a text that fulfilled structural criteria for well-formedness even if the amount of chain interaction was low. How much readers depend on structure, and how much they rely on semantic relations in order to understand texts is not well understood. An analysis comparing structural and semantic features of texts would be helpful.

The results of such a study would also have important clinical implications. If a text's perceived coherence can be increased by improving its structural characteristics, this would give a clinician working with a head-injured individual the option of focusing on text structure in therapy. However, if structure is unable to compensate for poorly mapped semantic relations,

then the clinician would have to address cohesive harmony. Naturally, the focus of therapeutic activities depends on what characteristics a head-injured individual demonstrates. However, information regarding how structural and semantic features texts effect reader comprehension would give the clinician more flexibility when planning intervention.

A second reason why the perceived coherence scores and the cohesive analysis scores did not rank the texts in the same order may be reader variables. All the readers in this study had graduate education. Investigators have found that good readers are better able to compensate for inadequacies in poorly written texts than poor readers (Horowitz, 1985a), since they reconstruct the text as they read. This may be easier to do for Sequence and Description texts than Comparison and Response texts, since in both the Sequence and Description texts, readers can reconstruct them through either time order or association. These relations may be easier to pick out than the comparative, causal and evaluative types of relations that exist in Comparison and Response texts. Therefore, it may be easier to for readers to compensate for difficulties in Sequence texts than difficulties in Comparison and Response texts. Alternatively, readers may feel more confident about making judgments about sequences than, for example, solutions to problems. Either reason would result in higher perceived coherence scores for Sequence and Description texts, as was found in this study for Subject One.

Subject Two

The results from the analysis of Subject Two's texts were difficult to interpret. For the most part, they were not consistent with the hypotheses. The Response texts received the highest cohesive harmony scores, followed by the Comparison, Description, and Sequence texts. The

reason for this result is unclear. It is possible that since the Response texts were shorter than the others, it was easier for Subject Two to maintain coherence throughout them. However, it was also noted that Response texts had a higher peripheral token to central token (PT/CT) ratio than the Description and the Comparison texts, suggesting that text length was not necessarily responsible for the cohesive harmony score. In addition, Hasan (1984) has shown that text coherence is not related to text length.

At this point, it is also interesting to note that the perceived coherence scores for Subject Two's texts ranked the Response texts last. Cohesive harmony analysis may not be sensitive to features in texts that readers use when evaluating them. A text may show coherence, but it may not fit a reader's criteria for what a text of a particular type should be like. Readers of these texts were highly critical when problems and solutions were inadequately presented. Until the relationships between semantic and structural features of texts are worked out, as well as how they individually and together affect reader judgement, evaluations of texts in both research and clinical settings need to take both into account.

For elicitation context, the results from Subject Two provide limited information. Cohesive harmony scores did increase for the texts written in condition 2, in which structural support was provided. This result is in agreement with the hypothesized effect of this elicitation context. However, the scores from texts written in condition 3, the structure plus content condition, achieved lower cohesive harmony scores than the texts in condition 2. In fact, the scores for context 3 texts were midway between those for contexts 2 and contexts 1 and 4. For some measures used in this study, the texts produced in context 3 more closely resembled those written in contexts with no support than context 2, even though the context 3 texts were ranked

just behind the context 2 texts. Reading the texts produced in this context made it evident that Subject Two only sporadically used the information that was given to him. Therefore, making generalizations about the effects of context 3 on this subject's texts in not possible.

The behaviour of this subject towards context 3, although not helpful with respect to examining the effect of elicitation context, does provide relevant information for clinical application. It is not possible to be certain to what extent writers use provided information. A writer may feel restricted by the information presented, and choose to deviate from it. The deviation from the narrowly focused information provided in the task is easily detected. However, once the writer abandons the information, he/she no longer uses the structure and content, and so any facilitative effect they may have is lost. Alternatively, a writer may be unable to use the information, especially if it is densely presented or he/she does not have experience with using the type of information provided. In this study, the subjects were not given any information regarding how to use the materiel provided. Clinically, it may be beneficial to instruct individuals regarding how knowledge structures represent content, and how to translate that content into texts.

The reader judgments of Subject Two's texts did not completely coincide with the cohesive harmony scores with respect to elicitation context. As discussed in Chapter 2, the disparity between objective and subjective measures of text adequacy must be reconciled. While analytic means of characterizing coherence must match subjective judgments, we must also be certain that impressions of text coherence are based upon identifiable features of texts. Therefore, further research is needed to define these features.

Other Areas for Future Research

This study raised a number of interesting questions, not all of which can be investigated here or discussed at the length they deserve. The features to which cohesive harmony analysis is sensitive and those to which readers are sensitive need to be identified, as the above sections discussed. The lack of correspondence between the rankings of texts by these two measures indicates that differences exist. Analysis of text structure is one possibility.

Other features of the texts were noticed during the analysis but were beyond the scope of the present study to explore further. First, patterns of cohesion and cohesive harmony appear to vary among the texts. For example, Comparison texts appeared to employ a great deal of ellipsis, since in comparative statements it is not necessary to explicitly indicate both entities involved in the comparison. However, often both are supplied so that the reader does not lose focus of what is being compared. If a writer uses ellipsis a great deal, readers may find the text more difficult to follow because they must constantly fill in the missing element(s). The use of excessive ellipsis may not, however, affect either the structural adequacy or the cohesive harmony of a text. It would be interesting to examine how patterns of cohesion and cohesive harmony vary with different types of text, and if mismanagement of these features affects coherence in the presence of high cohesive harmony scores.

Another feature of the texts that was observed was the extent to which they contained focal chains. These chains were identified by Hasan (1985) as being those which interacted with many other chains, and whose tokens were central to topic development. Description texts typically contained one focal chain that contained tokens referring to the entity being described, and the remaining chains interacted in a step by step fashion down the chain. In Sequence texts,

however, focal chains were not as obvious, unless the writer employed an agent who performed the actions in the text.

The nature of the focal chains may also be important to text coherence. Subject Two tended to use phrases such as *I think, I believe, you see* and so on in his texts. These chains may bind the text together in that most of what the text contains is personally relevant to the author (see Schiffrin, 1987, for argument that such discourse marker are an essential element of coherence). However, the relations among the ideas may not be clear. Chains such as these may be peripheral to meaning, and artificially increase a text's cohesive harmony index (but see Schiffrin, 1987).

Other issues also arose while this project was being carried out, but which will not be discussed here. These include the effect of topic flexibility and topic familiarity. Although these variables were controlled to the greatest extent possible, it was impossible to measure how well the tasks fulfilled the criteria of flexibility and familiarity. Related to this, it was also not known if these features of topics are equally significant for all elicitation contexts. Another aspect of text production that may affect coherence is the use of words that signal textual meaning. For example, Comparison texts utilize words such as *in contrast, similarly, just as,* and so on. While the underlying semantic relations among words in a text may exist without them, words such as these make the meaning relations more explicit (again, see Schiffrin, 1987). Appropriate usage of these kinds of words, in conjunction with cohesive harmony and structure, may contribute to the coherence of texts.

Clinical Implications of the Findings

Measurement

The perceived coherence measure demonstrated that judgements of coherence of the same text can vary a great deal, even within a group of similarly educated Speech-Langauge Pathologists. The variability in subjective impressions of discourse has implications for the assessment and treatment of persons who have cognitive-communicative deficits. While listener/reader perceptions of coherence are important in evaluating discourse adequacy, it is clear that a clinician who uses subjective means must be sensitive to this variability. Clinicians' judgments may not coincide with the judgments of people with whom the cognitive-communicatively impaired person typically communicates. Clinicians may be more tolerant of problems with discourse due to lowered expectations of impaired persons, and not provide intervention when it is needed. Or, they may have expectations that exceed even the capabilities of people who are unimpaired, thereby "creating" an impairment where none exists.

If an objective and reliable means of assessing expository texts is developed, the problem of diagnosing impairment and documenting improvement still exists. That is, what kind of score would an individual need to achieve in order to be judged as performing "normally"? The results of this study demonstrated that the range scores obtained by texts produced by unimpaired persons is large. What is "normal" for one person may be markedly poor for another. It would be unfair to expect a mildly head-injured person to be satisfied with the performance of the norm, when prior to the injury he/she was capable of much more. This is particularly true for people who engage in professional, educational or leisure activities that require high level language skills. Rather than comparing the performance of these individuals to some norm, it would be

more appropriate to find out at what level they were functioning prior to the injury, and what they expect to be able to do. This can be done by obtaining samples of writing produced prior to the injury, and using them as the criterion against which to measure impairment and improvement.

Assessment and Treatment

The information in the present study can be used in order to assess and treat deficits in expository text writing by persons with cognitive-communicative impairment. Of course, decisions regarding treatment will vary, as the population of head-injured individuals is far from homogeneous. However, a basic sequence could be followed. For example, an initial baseline measure can be obtained by having an individual write one text of each type to be targeted. Choosing types to be targeted may be based on the interests and needs of the individual, as well as relative ease of production. Results with regard to text type from this study were inconclusive, since the two subjects performed differently. A clinician may wish to give four or five types, and assess them in order to determine which type is easiest for that individual to write. Types that are produced adequately without support of any kind in the elicitation context would likely not be targeted in therapy. Therapy could initially focus on texts considered to be best but not within the desired range of performance.

Activities may deal with teaching how information presented in different text types is structured and how to organize texts in accordance with that structure. The clinician may initially provide the structure for the patient, and ask the patient to fill in the content to be discussed. Then, the patient could produce a text based on that information. Later, the clinician could

require that the patient generate a structure on his/her own and provide the content before beginning to write. At a subsequent stage, the patient may be able to write texts just from structure without filling in the content first. Later stages of treatment may have the patient writing longer texts, or combining different types of text into longer pieces of prose.

Cohesive harmony analysis is time-consuming and quite detailed. If this analysis is chosen as the objective means by which to evaluate texts, some compromise must be made. Most clinicians would not be able to perform a full analysis on every text a patient produced. A useful compromise may be to do a full analysis on the baseline texts in order to identify what specific aspects of the texts are contributing to incoherence. If, for a example, a patient consistently uses extensive chaining but insufficient chain interaction, then subsequent analyses could disregard other features such as the presence of peripheral tokens and focus on just the amount of interaction taking place in the texts.

Cohesive harmony analysis may also be useful in treatment. Suggestions for treatment with aphasics were made by Armstrong (1991) may also be useful in therapy with persons with head injury. For example, a text written by the head-injured person may be analyzed by the clinician, and the chains and chain interactions presented visually, much like the example in Chapter 1 of this paper. This would allow the patient to see where he/she failed to make underlying meaning relations in the text explicit. Then, words may be inserted into the visually presented chains that allow the connections to be seen. Then, the original text can be revised based on the supplemented chains.

Summary

This study is only a small step in the investigation of expository text writing, meant to inform those working with cognitive-communicatively impaired individuals. More research needs to be done regarding the factors that contribute to text coherence, particularly semantic and structural factors and the relation, if any, between them.

Certainly, a similar study must be carried out with persons who have suffered closed head injury and who exhibit deficits in highly demanding tasks such as expository text writing. Studies done on unimpaired persons are limited in their application to impaired populations, because we do not know if the characteristics that facilitate text writing in one group will necessarily do the same for the other. However, the study reported in this paper provides a direction from which continue. Based on this study, it is evident that type of text does have an effect on how well individuals write. Furthermore, the elicitation context can also influence performance. Therefore, both of these factors may be manipulated during treatment in order to maximize the coherence of texts produced by head-injured persons.

Finally, this study highlights the need for objective ways to measure performance. Inter-reader judgements of the texts examined in this paper varied considerably. Clinical judgements must be reliable in order for appropriate assessment and intervention decisions to be made. Cohesive harmony analysis may provide useful information for both these purposes, but it also leaves many questions unanswered.

BIBLIOGRAPHY

Adamovich, Brenda B., Henderson, Jennifer A. and Auerbach, Sanford. Cognitive Rehabilitation of Closed Head Injured Patients. San Diego: College Hill Press, 1985.

Alverson, H. and Rosenberg, S. (1990). Discourse analysis of schizophrenic speech: A critique and proposal. Applied Psycholinguistics, 11(2), 167 - 184.

Armstrong, Elizabeth M. (1991). The potential of cohesion analysis in the analysis and treatment of aphasic discourse. Clinical Linguistics and Phonetics, 5(1), 39 - 51.

ASHA Subcommittee on Language and Cognition. (1987). The role of the speech-language pathologist in the habilitation and rehabilitation of cognitively impaired individuals. ASHA, 53 - 55.

Brown, Gillian and Yule, George. (1988). Discourse Analysis. New York: Cambridge University Press.

Flower, Linda. (1979). Writer-based prose: A cognitive basis for problems in writing. College English, 41(1), 19-37.

Francis, Gill. (1989). Thematic selection and distribution in written discourse. Word, 40(1-2), 201 - 221.

Gloser, Guila and Deser, Toni. (1990). Patterns of discourse production among neurological patients with fluent language disorders. Brain and Language, 40, 67 - 88.

Hagen, Chris. (1984). Language disorders in head trauma. In Language Disorders in Adults: Recent Advances, Audrey Holland (Ed.). San Diego: College Hill Press, 245 - 281.

Halliday, M.A.K. and Hasan, R. (1976). Cohesion in English. London: Longman.

Hartley, Leila L. and Griffith, Amy. (1989). A functional approach to the cognitive-communication deficits of closed head-injured clients. JSLPA, 13(2), 51 - 57.

Hasan, Ruqaiya. (1984). Coherence and cohesive harmony. In James Flood (Ed.) Understanding Reading Comprehension. Newark: International Reading Association, pp. 181 - 219.

Hasan, Ruqaiya. (1985). The texture of a text. In M.A.K. Halliday and R. Hasan (Eds.), Language, Context and Text: Aspects of Language in a Social-Semiotic Perspective. Melbourne: Deakin University Press.

Hiebert, Elfrieda H., Englert, Carol Sue and Brennan, Sharon. (1983). Awareness of text structure in recognition and production of expository discourse. Journal of Reading Behaviour, 15(4), 63 - 79.

Horowitz, Rosalind. (1985a). Text patterns: Part I. Journal of Reading. 448 - 454.

Horowitz, Rosalind. (1985b). Text patterns: Part II. Journal of Reading. 534 - 541.

Lawrence, Mary S. Writing as a Thinking Process. Ann Arbor: The University of Michigan Press, 1972.

Lawrence, Mary S. Reading, Thinking, Writing. Ann Arbor: The University of Michigan Press, 1975.

Liles, Betty Z., Coelho, Carl A., Duffy, Robert J. and Rigdon-Zalagens, Mary. (1989). Effects of elicitation procedures on the narratives of normal and closed head-injured adults. Journal of Speecha and Hearing Disorders, 54, 356 - 366.

Mentis, Michelle and Prutting, Carol. (1987). Cohesion in the discourse of normal and head-injured adults. Journal of Speech and Hearing Research, 30, 88 - 98.

Mentis, Michelle and Prutting, Carol. (1991). Analysis of topic as illustrated in a head-injured and a normal adult. Journal of Speech and Hearing Research, 34, 583 - 595.

Meyer, B.J.F. (1975). The Organization of Prose and its Effects on Memory. Amsterdam: North Holland.

Meyer, B.J.F. (1985). Prose analysis: Purposes, procedures and problems. Understanding Expository Text. Bruce K. Britton and John B. Black (Eds.). London: Lawrence Erlbaum Associates, Publishers, pp. 11 - 64.

Meyer, B.J.F. , Young, Carol J., Bartlett, Brendan J. (1989). Memory Improved. Hillsdale, N.J.: Lawrence Erlbaum Associates, Inc.

Mohan, Bernard. Language and Content. Don Mills, Ont.: Addison-Wesley Co., 1986.

Mosenthal, James H. and Tierney, Robert J. (1984). Cohesion: Problems with talking about text. Reading Research Quarterly. 240 - 244.

Pappas, C. (1981). The cohesive harmony and cohesive density of children's oral and written stories. In J. Benson and W. Greaves (Eds.), Systemic Perspectives on Discourse, vol. 2. Norwood: Ablex Publishing Corp.

Prigatano, G. Neuropsychological Rehabilitation After Brain Injury. Baltimore: Johns Hopkins University Press, 1986.

Ripich, Danielle and Terrell, Brenda Y. (1988). Patterns of discourse cohesion and coherence in Alzheimer's disease. Journal of Speech and Hearing Disorders, 53, 8 - 15.

Rothstein, Vicki. Expository text: Structures and Strategies. Unpublished manuscript.

Schiffrin,, D. (1987). Discourse Markers. Cambridge: Cambridge University Press.

Sohlberg, M. and Mateer, C. Introduction to Cognitive Rehabilitation: Theory and Practice. New York: Guildford Press, 1989.

Taylor, Barbara M. and Beach, Richard W. (1984). The effects of text structure instruction on middle-grade students' comprehension and production of expository text. Reading Research Quarterly, 134 - 146.

Ulatowska, Hanna K., North, Alvin J. and Macaluso-Haynes, Sara. (1981). Production of narrative and procedural discourse in aphasia. Brain and Language, 13, 345 - 371.

Ulatowska, Hanna K., Weiss Doyle, Alice, Freedman Stern, Renee, Macaluso Haynes, Sara and North, Alvin J. (1983). Production of procedural discourse in aphasia. Brain and Language, 18, 315 - 341.

Ulatowska, Hanna K., Freedman-Stern, Renee, Weiss Doyle, Alice, Macaluso-Haynes, Sara and North, Alvin J. (1983). Production of narrative discourse in aphasia. Brain and Language, 19, 317 - 334.

Ulatowska, Hanna K. and Chapman, Sandra. (1989). Discourse considerations for aphasia management. Seminars in Speech and Language, 10(4), 298 - 314.

Wyckoff, Leila L. (1984). Narrative and procedural discourse following closed head injury. Unpublished doctoral dissertation, University of Florida.

Yang, Agnes Weiyun. (1989). Cohesive chains and writing quality. Word, 40(1-2), 235 - 254.

Yorkston, Kathryn M., Zeches, Jane and Farrier, Lynn D. (1991). Formulation of story morals: Traumatically brain injured versus control subjects. Technical paper presented at ASHA, 1991.

APPENDIX 1

TASKS

Description[9]

The words on this page may be useful to you as you write your paragraph. Using them is not mandatory or important to the study, they are given simply as an additional aid to writing.

Structure Vocabulary:
Description

this, that, these, those

verbs such as: be, have, seem, appear, look etc.

amount words such as: some, part, many, few etc.

possessive terms such as: his, hers, its, ours, yours, my, etc.

unit words such as: peice, lump, section, area, etc.

spatial terms such as: in, on, around, under, beside, etc.

Task type: No Support (1D)

Topic: Write a paragraph describing an airport. Assume your audience is someone who has never seen or been to an airport, and wants to know what one is like.

Task type: No Support (4D)

Topic 4D: Write a paragraph describing a stranger you have recently met (such as a salesperson, receptionist or waitress/waiter), or an acquaintance.

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[9]Tasks are given in order to text type. The vocabulary lists and task types 1 and 4 are given on the same page in order to conserve space. Each task was presented individually to the subjects.

Task type: Structure only (2D)

Topic: Write a paragraph describing your favourite animal. The chart below is intended to serve as an outline, to help you organize your information. The actual content, however, you must supply.

| body | ears | tail | | hair | eyes |

size/shape   colour

KIND OF ANIMAL   APPEARANCE

FAVOURITE ANIMAL

HABITAT   SPECIAL CHARACTERISTICS

| geographic location | kind of home | | food they eat | social behaviour |
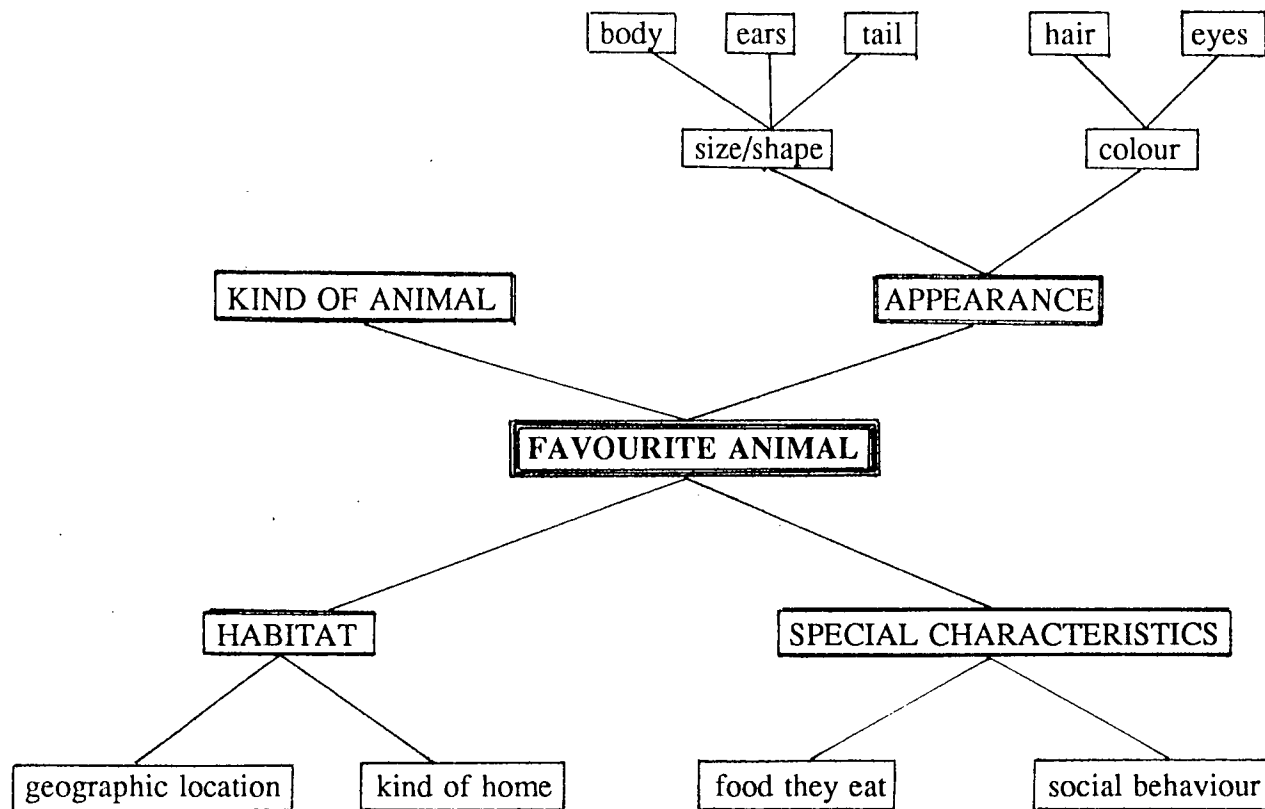
Task type: Content and Structure (3D)

Topic: Using the information provided below, write a description of a magpie. Assume your audience is someone who has no knowledge of magpies.

white markings

colour

black

APPEARANCE

long

tail

forked

MAGPIES

DIET

ticks
rats
mice
snakes
snails

helpful

eggs stolen
from other
birds

pest

CROW FAMILY

lives
in pairs

intelligent

BUILDS
NESTS

mud
hay
hair
twigs
branches

strong
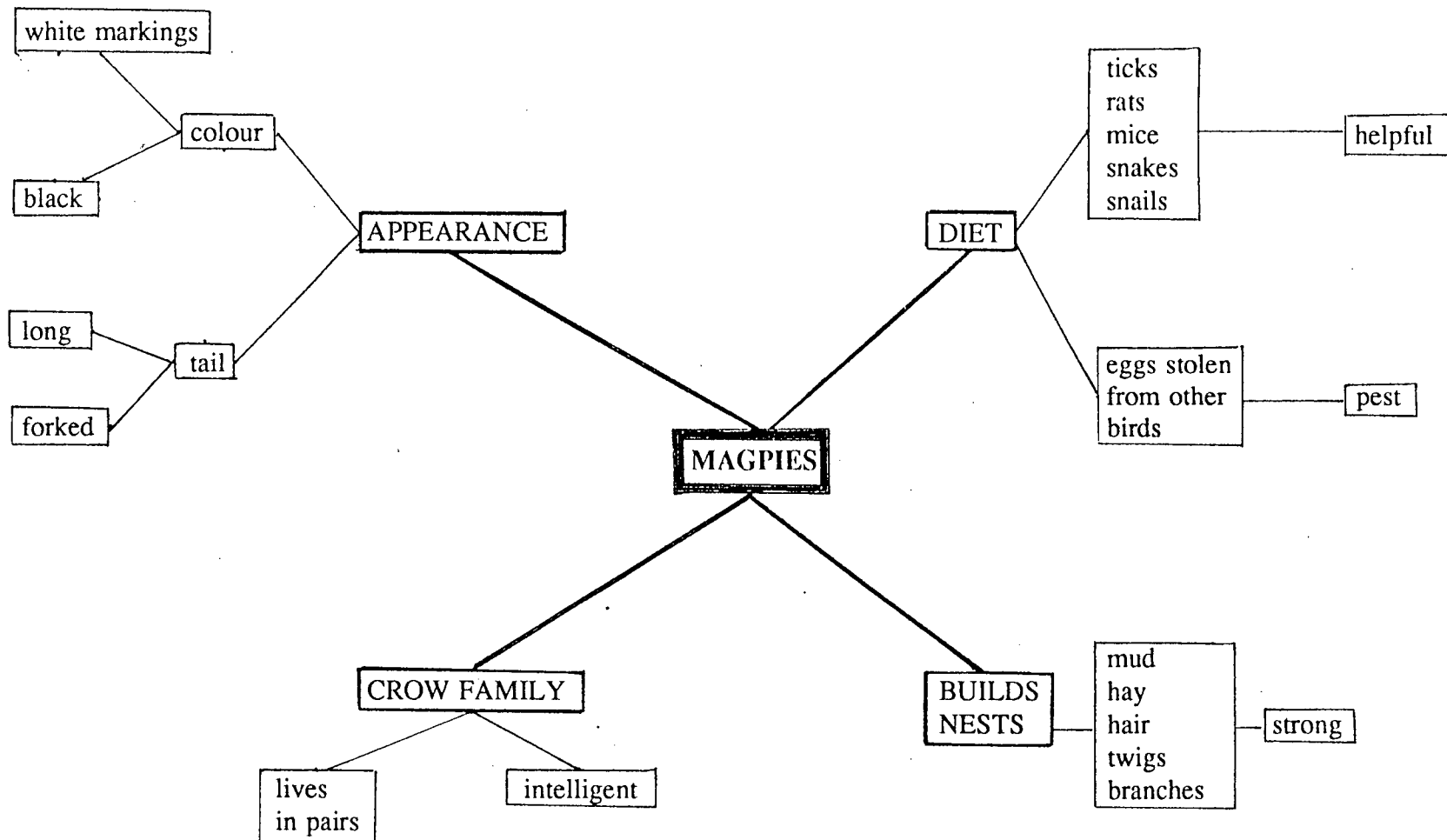
Comparison

The list of words below contains some vocabulary which may be used in your paragraphs.

Structure Vocabulary: similar to, same as   differ from
                        like, alike   however
                        likewise   unlike
                        correspond to   still
                        resemble   nevertheless
                        just as   different
                        parallel to   more/less than
                        similarly   in contrast
                        also   in opposition to
                        although
                        while

Task type: No support (1C)

Topic: Write a paragraph comparing and contrasting two restaurants you have patronized recently. Assume your audience knows nothing about either restaurant and wants to have more information. It is not necessary to express a preference.

Task type: No support (4C)

Topic: Select two members of your family and compare and contrast their attributes. Assume your audience knows neither of the two persons you compare. It is not necessary to express a preference.

Task type: Structure only (2C)

Task: Write a paragraph in which you compare and contrast living in an apartment and living in a house. The chart below is intended to help you organize what you write, by giving you some aspects to use as a basis for discussing what is similar and what is different about the two. Feel free to add other points, or elaborate on those given. Assume your audience is unfamiliar with the similarities and differences between the two types of housing. It is not necessary to express a preference.

	Choice #1	Choice #2
	Apartment	House

1. Space
    a) number of rooms
    b) indoor living space
    c) outdoor living space
    d) storage space		

2. Cost
    a) monthly
    b) maintenance/repairs
    c) utilities		

3. Other
    a) ownership
    b) pets
    c) children
    d) noise
    e) neighbours		

Task Type: Content and structure (3C)

Topic: Write a paragraph comparing and contrasting the two cities of Edmonton and Calgary. The table below is intended to help you with this task. Feel free to add more points or elaborate on those given. Assume your audience is a visitor who knows nothing about either city and wishes to have more information.

(information from: The Canadian Encyclopedia, 1, 1988 pp. 315-317.)

		Calgary	Edmonton
Size	Population (approx.)	670,000	785,000
	Population growth (1981-86)	+7.3%	+5.9%
	Land area	1189.4 km^2	669.95 km^2
Geography	Location	southern Alberta in Bow River valley	central Alberta in N. Saskatchewan River valley
	Features	in Rocky Mountain foothills, 3 major rivers	close to forest region, 1 river
Climate	Average daily temperature	July: 16.4 C January: -11.0 C	July: 17.4 C Jan: -15.0 C
	Average yearly rainfall	423.8 mm	466.1 mm
	Hours of sunshine per year	2314.4	2263.7
Employment	Per capita income	Above national average	Above national average
	Unemployment	Below national average	Below national average
	Major industries	livestock farming oil and natural gas transportation	government administration manufacturing transportation

Sequence

The words on this page may be useful to you as you write your paragraph. Using them is not mandatory or important to the study, they are given simply as an additional aid to writing.

Structure Vocabulary:

when	before
after	while
during	between ____ and ____
in ____	since
later	earlier
every ____	simultaneously
at the same time	previously
prior to	first, second, etc.
next	then
subsequently	at last
finally	lastly
following	preceding
in advance of	

Task type: No Support (1S)

Topic: Describe what occurs at your home on Christmas Day, beginning in the morning. Think of all the events that occur, and write a paragraph which tells the reader about them in chronological order.

Task type: No Support (4S)

Topic: Describe what you do in a typical day on your job, starting in the morning. Think of everything you do, where you go, and so on, and write a paragraph which tells the reader about them in chronological order.

Task type: Structure Only (2S)

Topic: Write a paragraph, using sentences, describing all the steps it takes to set the table for a formal dinner. Assume your audience needas a detailed description in order to be able to set a table on their own. The chart below is intended as a guide to help you organize what you write. However, the content is not supplied. You may have more or fewer steps than is given below. Think of all the things you need to have, where they go on the table, and in what order.

Beginning: Step 1

               Step 2

               Step 3

               Step 4

               Step 5

               Step 6

               Step 7

               Step 8: End.

Task type: Content with structure (3S)

Topic: Write a paragraph, based on the information given below, which describes the steps for transplanting plants sold in containers. For the purposes of this task, write in complete sentences. Assume your audience has a basic understanding of vocabulary and concepts.

Step	How to Transplant Plants
#1	Remove all the weeds from the soil.
#2	Rake the surface of the soil, make the surface level, remove any rocks and large clods of dirt.
#3	Remove the plants from the package. If in flats, use a spatula. If in a cell pack, push on the bottom.
#4	Separate the matted roots. If the roots are coiled in a pad on the bottom, cut the pad off.
#5	Dig a hole in the soil deep enough to hold the plant. Leave enough room between holes to allow for spreading.
#6	Place a plant in the hole.
#7	Fill in soil around the plant.
#8	Form a basin around each new plant. Do not squeeze the roots.
#9	Water each plant separately.
#10	Spread a mulch of shredded bark, compost or peat moss around the plants.
	(1 or 2 weeks)
#11	Pinch the plants back.
	(1 month)
#12	Fertilize plants.
	(Plants bloom)
#13	Fertilize plants.

Response

The words on this page may be useful to you as you write your paragraph. Using them is not mandatory or important to the study, they are given simply as an additional aid to writing.

Structure Vocabulary:
Response

true	oppose
false	in opposition
imply	infer
contrary	consistent
approve	disapprove
prefer	rather
like/dislike	view/viewpoint
alternative	opinion
because	however
if	then
while	think/believe
right	wrong

Task type: No Support (1R)

Topic: Write a paragraph discussing the problem of allowing dogs to run leashless versus wearing a leash in public parks. Your paragraphs should come to some conclusion regarding this issue

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Task type: No Support (4R)

Topic: Write a paragraph discussing the problem of sending one's child to a private rather than a public school. Your paragraph should come to some conclusion regarding this issue

Task type: Structure Only (2R)

Topic: Write a paragraph discussing the issue of whether people should be allowed to smoke in the workplace. The outline below is intended to help you with this task. The outline gives you an idea of what issues could be discussed, but you must supply the content. Your paragraph should <u>come to some conclusion regarding this issue</u>.

I.   What is the issue?

II.   Arguments supporting smoking in the workplace

         a) Why do they smoke?

         b) What are their rights?

III.   Arguments against smoking in the workplace

         a) How does smoking affect non-smokers?

         b) What are their rights?

IV.   Consequences

         a) on smokers if smoking was banned from the workplace

         b) on non-smokers if smoking was banned from the workplace

V.   Evaluation

         a) Which side of the issue has the most valuable argument?

         b) What is the best solution?

Task type: Structure & Content (3R)

Topic: Write a paragraph that discusses the issues surrounding the use of animals in medical research. The information below is intended to help you with this task. An evaluation of the choices is also given. Use the material to write your paragraph(s) and come to some conclusion regarding this issue.

		Choice #1: Use animals for medical research
Arguments:		-Average life expectancy of humans in 20.8 years longer according to the Foundation Of Biomedical Research
		-Vaccines/cures for diseases fist tested on animals include: polio, mumps, rubella
		-Procedures first developed with animals include: blood transfusions, organ transplants, cataract removal
		-Drugs not tested on animals properly may lead to harm to humans, such as thalidomide
		-Scientists are searching for more humane ways to use animals
Evaluation:	Good	-Potentially harmful drugs and procedures can first be tested on animals to decrease risk to humans -Many lifesaving and life extending drugs and procedures have been developed using animals
	Bad	-Involves killing animals and subjecting them to less than ideal living conditions
		Choice #2: Abolish medical testing
Arguments		-Tests on animals include: Force feeding lethal drug dosages, bullet wounds, electric shock, surgery, slow death
		-Often no painkiller are given
		-Conditions are often crowded and physically restrictive
		-Veterinary care is often not available
		-Alternate texts exist, such as egg membranes, human tumour cells, donated organs, tissue cultures
		-Drugs & procedures have been developed without using animals such as X-rays, penicillin, yellow fever vaccine
Evaluation	Good	-Numerous animals will be spared pain and death
		-Promotes development of alternate testing methods
	Bad	-Advancements that would benefit human lives may be impossible without using animal subjects
		-Humans may be placed at risk using drugs and procedures not tested on animals first

APPENDIX 2

RATING FORMS

Description

Reader #_____   Paragraph # _____

Date _____   DESCRIPTION

Please read the given paragraph. When you have finished, please rate it according to the system given below, in response to the questions.

RATING

_____   1. This paragraph was intended to be a description. Is what is being described clear? That is, did it accomplish its goal?

_____   2. Is the description complete, ie, do you think everything important is present?

_____   3. Are all of the details included accurate (as far as you know)?

_____   4. Does the way in which the details are presented make sense to you?

Rating system: 1 = no
                              2 = not for the most part
                              3 = for the most part
                              4 = yes

If you answered anything other than "yes" to any of the above questions, please indicate where in the paragraph there was a problem, and what kind of problem there was.

Comments?

Comparison

Reader # _____   Paragraph # _____

Date _____   COMPARISON

Please read the given paragraph. When you have finished, please rate it according to the system given below, in response to the questions given.

RATING

_____   1. This paragraph was intended to be a comparison/contrast of two entities. Is it clear to you what is being compared and contrasted?

_____   2. Were all the important details present?

_____   3. Were all of the details included accurate (as far as you know)?

_____   4. Did the way in which the information was presented make sense to you?

Rating system: 1 = no
                  2 = not for the most part
                  3 = for the most part
                  4 = yes

If you answered anything other than "yes" to any of the above questions, please indicate where in the paragraph there was a problem, and what kind of problem there was.

Comments?

Sequence

Reader # _____   Paragraph # _____

Date _____   SEQUENCE

Please read the given paragraph. When you have finished, please rate it according to the system given below, in response to the questions given.

RATING

_____   1. This paragraph was intended to be a sequence of events. Could you follow this sequence easily?

_____   2. Was the sequence complete, ie, were all the important details present?

_____   3. Were all of the details which were included accurate (as far as you know)?

_____   4. Did the way in which the steps were presented make sense to you?

Rating system: 1 = no
                        2 = not for the most part
                        3 = for the most part
                        4 = yes

If you answered anything other than "yes" to any of the above questions, please indicate where in the paragraph there was a problem, and what kind of problem there was.

Comments?

Response

Reader # _____   Paragraph # _____

Date _____   RESPONSE

Please read the given paragraph. When you have finished, please rate it according to the system given below, in response to the questions.

RATING

_____   1. This paragraph was intended as a discussion and response to a problem. Was this goal accomplished clearly?

_____   2. Did the arguments make sense, ie, did they fit the problem?

_____   3. Did the solution offered make sense, given the way in which the problem was presented?

_____   4. Did the way in which the information was presented make sense to you?

Rating system: 1 = no
                  2 = not for the most part
                  3 = for the most part
                  4 = yes

If you answered anything other than "yes" to any of the above questions, please indicate where in the paragraph there was a problem, and what kind of problem there was.

Comments?

APPENDIX 3

SAMPLE TEXTS

Subject One

<u>Text 1R</u>

Dogs are drawing public scrutiny now more than ever before. This is most likely due to the recent problems with the dogs known as Pit Bulls. Controlling measures aimed at this particular breed must also be imposed on all dogs. One such control is not allowing dogs to run free in public parks without a leash. I think that this has both good and bad points. It is a punishment for both dog and handler who enjoyed a walk in the park without a leash under the old guidelines/bylaw (This was that a dog could be off leash if under complete control). However the fact that most dogs were not under their masters control and running around aimlessly or bothering people and especially other dogs makes the control an overall positive one.

<u>Text 2D</u>

My favourite animal is a dog known as a Doberman Pinscher. This dog stands about 3 feet tall and weighs between 50 and 70 pounds. At birth these dogs have big floppy ears and a long tail but these are both cropped. The tail is brought down to a few inches long and the ears are cut into a point. With the ears cropped like that they can lay flat and close to the dogs head in "excited" situations. Dobermans are usually black with tan markings on their feet, chest, cheeks and eyebrows but sometimes the base colour is a reddish brown or a dark shade called blue. Doberman Pinschers are a breed that was developed in Germany but are found all over the world. They are a domestic animal kept in homes and kennels because being a short haired dog

they do not winter well. They are very social animals and if brought up properly, a loving family member and loyal friend.

Text 3C

If you are coming to Alberta for the first time and would like to know more about the two major cities, the following general information should give you a brief understanding of what they are like. Edmonton, the capital city of Alberta, is located in the centre of the province in the N. Saskatchewan river valley. It has a population of approximately 785,000 covering 669.15 km². The major industries include government, manufacturing, transportation, as well as oil and gas production. Calgary, located in the southern part of the province is also in a river valley; the Bow River valley. This city has a slightly lower population, 670,000, but covers more area than Edmonton, 1189.4 km². The major industries of Calgary are farming, transportation and oil and natural gas. Oil and natural gas are an industry for both cities but the difference is that Calgary is mainly the administration or white collar sector of the business while Edmonton is the production and service labour force for the industry. Both cities are well above the national average when it comes to per capita income and well below the national average in unemployment. Both Calgary and Edmonton have great tourist attractions. They both have good zoos and old fashioned theme parks. Edmonton has the world's biggest mall and Calgary has the world's most beautiful mountains.

Text 4S

A typical day on the job? For me there really isn't one so I will describe a recent day

on the job. First thing in the morning I go into the office and we have a meeting. This will usually take 2 - 2 1/2 hours. After the meeting I answer any phone messages that came in during the meeting. Following that I go to an appointment made with a buyer to discuss a future promotion and advertising for one of the products my company represents. In that meeting we discuss how long the promotion should last and how much product should be ordered to cover the promotion. After that meeting it's time for lunch. Lunch is taken with someone else in the company doing the merchandising for the promotion, just to make sure that everything will go smoothly. After lunch I go back to the office and return any phone messages that were taken while I was out. Then I send the order taken that morning off to the manufacturer for delivery. The rest of the afternoon is spent doing paperwork related to setting up future promotions and sending other orders to various manufacturers. While in the office I am constantly getting phone calls, so between the paperwork and the phone calls the day ends quickly.

Subject Two

Text 2S

It is important to first make sure you have everything you need for the dinner. We can do this as we go through all the steps. First make sure that the table is big enough or do we need to add the leaf to make table longer. Next would be to place the table cloth on the table. From here we would add either candles or any other table decorations to the middle of the table. Folding the napkins in a fancy pattern or putting them in napkin rings makes things look nice, one napkin can be placed at each seat. Now at each place we should add the silverware. On the right side we have the forks, the closest fork to the plate will be the dinner for (it has four

points) the next would be your salad fork (it has three points) and lastly you would have an appetizer fork (two points, providing you were having an appetizer). On the left side of the plate we would put your dinner knife closest to the plate, followed by a soup spoon and lastly a dessert spoon. Just above your forks you cold put a wine glass and possible a water glass beside it. On the opposite side you would put a salad plate. Now place the napkin, either folded or in a napkin ring between your salad plate and wine glass just above you dinner plate. Salt and pepper shakers should be placed at both ends so that they are easily accessible to al people seated. Serve the food and chow down.

Text 3C

It's hard for a Calgarian (in particular) to write a biased comparison between Calgary and Edmonton. Calgary is obviously the better of the two cities but this is not fair to Edmonton. Edmonton, being further north is colder although the city does look pretty in the fall as the trees in the river valley change colour. Mosquitos are really bad in Edmonton but then again they do have West Edmonton Mall which is large enough to shelter the entire city from the pests. Edmonton, I will say, is probably a better sports town simply because the fans there don't jump on and off the bandwagon as much as Calgarians do, but that might change soon. But that's about it, Calgary is closer to the mountains and all that they offer and the city is beautiful. Plus our winters don't seem as long when we get several chinooks throughout the winter. The people are friendly, except when they talk about Edmonton of course. Besides, if you really need to see Edmonton its only 2 1/2 hours north, but why would you leave a city that can offer you things like, the Calgary Stampede, the Calgary Flames, districts like Kensington, 17th Ave, Princess

Island, the Elbow River, Canada Olympic Park and Olympic Plaza not to mention what downtown offers or the fact that all of this is an hour away from Kananaskis country 1 1/2 from Banff (Millarville is pretty close too). Edmonton is ok but where do you go once you've seen Calgary?

Text 3R

After reading both choices I found myself agreeing with each, but since I can't do that and that is somewhat wish washy I had to reach an opinion. Although the using of animals as research "guinea pigs" is not very humane I believe that if methods can be developed and used to ensure the animals the least amount of grief I think it can be beneficial to humans and animals as well. There have been many medicines and medical procedures first tested on animals, that are commonly used today. I really believe that we would not be as medically advanced today as we would have if we hadn't used animals in research.

Text 4D

There is this guy I think he is the manager, that I see every morning at the 7-11 that I get my coffee at. He is about six feet tall, maybe taller, skinny though. He has black hair that is kept short and I think his ears stick out. I think he is the manager because he wears a white shirt and is usually doing paper work and giving orders. He is really friendly and a bit hyper, he might be gay but that's irrelevant. The only reason I think this is because I have known some gay guys before and their mannerisms are similar. Still he's a nice guy and always asks me how I'm doing even though I think he can tell that I'm still half asleep.