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ABSTRACT

AN ASSESSMENT OF DIFFICULTY IN JAPANESE TEXT IN RELATION TO COMPUTER-MEDIATED TEXT

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The main purpose of this pilot study was to examine the effect of syntactic variables on the reading of Japanese as a second language. This study addressed the following two hypotheses: 1) grammatical variables affect the difficulty of the reading of a Japanese text by native speakers of English; and 2) computer-mediated text can facilitate the comprehension of a passage more than ordinary text.

In considering the first hypothesis, this pilot study focused on the effects of grammatical structure on passage difficulty. As a part of the study, the contributions of rhetorical structure, vocabulary, and culture to textual difficulty were also considered in order to enlarge the total picture of the major factors that affect the level of difficulty of Japanese text. All these factors help contribute to the difficulty that faces the reader of Japanese as a second language. This pilot study considered a list of 20 categories by which passage difficulty can be measured. This list is an enumeration of 20 possible

variables that are hypothesized to influence passage difficulty. In order to explore the second hypothesis, computer software was designed with the 20 variables in mind in order to determine whether the software can be used to 1) measure quantitatively the contribution these factors make to passage difficulty and 2) actually facilitate the reading of Japanese text. This software was tested on human subjects in order to measure its effectiveness in measuring textual difficulty and its power to facilitate the comprehension of Japanese written text.

Based upon the results of this study, syntactic variables used in the research, such as tense, subordination, passive, causative, quotations, and relative clauses, were shown to affect the difficulty involved in reading Japanese text by native speakers of English, thus confirming the first hypothesis. However, computer-mediated text was not shown to facilitate the comprehension of Japanese text more than ordinary text, thus leaving the second hypothesis unconfirmed.

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CHAPTER 1
Introduction

1.0. Purpose. This pilot study attempts to assess difficulty in Japanese texts in relation to reading comprehension. Most current models of reading comprehension take an interactive point of view. The interaction comes from the active participation of the reader in negotiating both top-down and bottom-up reading strategies. Top-down reading strategies start with the knowledge the reader brings to the reading task including a knowledge of the world, the domain of discourse, and grammar. The reader uses this knowledge in actively engaging the text, which is perceived through the use of bottom-up reading strategies involving the identification of the distinctive patterns of letters, lexical items, grammatical structure, and rhetorical organization. These patterns are interpreted through the use of the reader's given knowledge which he or she brings to the task. Thus, through the use of top-down and bottom-up reading strategies, the reader actively negotiates the meaning of a text.

The purpose of this dissertation is to consider the contribution of the structure of written text to the reading process, in particular to the level of difficulty that it poses. The level of difficulty involved in reading a

particular text is an interaction of many different factors. One set of factors involves the implementation of top-down reading strategies. Knowledge of the universe of discourse is certainly one important factor in determining the level of difficulty of a text. It is impossible to fully understand a reading on *sumo* wrestling in Japanese without a cultural understanding of this sport. Furthermore, a knowledge of rhetorical structures which a reader brings to a reading task facilitates the comprehension process. Knowing the typical structure of a personal or business letter, newspaper article, or postcard aids in their comprehension. Also, in addition to this, without a firm grounding in syntactic structure, the reader cannot comprehend text. As can be seen from these examples, the knowledge the reader brings to a reading passage is crucial in interpreting text.

Another set of factors involves the implementation of bottom-up strategies, which relate to the identification of textual cues. Once the textual cues are recognized through bottom-up strategies, top-down strategies interpret these cues to bring meaning to the text. In this process, textual structure is interpreted in light of the a priori knowledge the reader brings to the comprehension task.

1.1. Grammatical Considerations. This pilot study focuses the contribution of linguistic features, such as nominalization, anaphora, tense, embedding, and case grammar,

to overall textual difficulty. Other factors that contribute to textual difficulty are considered in this study, such as world knowledge, knowledge of vocabulary, or knowledge of rhetorical structure, but the relationship between the linguistic features mentioned above and readability is the main consideration of this study. Linguistic structure has not been taken into account by readability formulas, such as the Flesch Index and the Dale-Chall Index (Rude, 1986, p. 129). The base for the calculation of readability should be expanded to include linguistic structure in the measurement of textual complexity since this structure contributes to reading difficulty. This study is an attempt to expand this base.

1.2. Other Considerations. Discourse structure also has a bearing on the comprehensibility of Japanese text. The main data for this study is expository discourse. Japanese expository discourse has a basic organization called the *ki-shoo-ten-ketsu* where *ki* means 'beginning', *shoo* 'development', *ten* 'change', and *ketsu* 'conclusion' (Hinds, 1983a, p. 188). The basic pattern of Japanese expository discourse is to have a beginning, a development, a change to a related theme, and a return to a conclusion. English expository rhetorical structure does not always have a *ten* structure where there is a change to a subtopic that has an indirect relationship with the original topic. As a result,

an English-speaking reader may view Japanese expository text as having a lack of coherence, which would help to impede understanding. In view of these considerations, Japanese rhetorical structure can be seen as a source of problems for comprehension on the part of English-speaking readers of Japanese.

Another consideration in evaluating textual difficulty for readers of Japanese as a second language is the difficulty of the Japanese writing system. Written Japanese is a mixture of a system called *kana*, consisting of both *hiragana* and *katakana* subsystems, and Chinese characters, called *kanji*. The more difficult the Chinese characters used in a text, the more difficult the text becomes. The level of difficulty of Chinese characters is primarily measured in terms of frequency of use. The more frequently readers are exposed to particular Chinese characters the easier they are to learn. The difficulty of Chinese characters is certainly a factor in determining general textual difficulty.

According to the literature (Anderson and Freebody, 1981; Coleman, 1971; Freebody and Anderson, 1981; Klare, 1974-1975; Lado, 1972; Marks, Doctorow, and Wittrock, 1974; Thorndike, 1973), vocabulary difficulty is a strong predictor of overall textual difficulty. The main means of measuring vocabulary difficulty is through the estimate of word frequency. However, the reliability of word frequency

estimates is an important issue in the accuracy of predictions with regard to difficult vocabulary items (see section 2.2). In considering overall textual difficulty, vocabulary difficulty is an important consideration, but needs to be balanced against other considerations, such as linguistic and rhetorical structure.

Another important factor in determining textual difficulty is the general background of the passage, which includes knowledge of the subject content behind the passage and also the cultural matrix into which the passage fits. The content of a passage is the subject matter which is being written about. To understand a car repair manual, it is necessary to understand the component parts that make up an automobile and how they work together. In addition, each model of a car has its own idiosyncrasies. Without a background knowledge of how cars work, it is very difficult to understand a manual on how to repair them. A more global consideration is the culture which forms the matrix into which a passage fits. The example of *sumo* wrestling has already been mentioned as an example of the importance of cultural understanding. Barnitz (1986, p. 100-101) discussed the research by Andersson (1981), Andersson and Gipe (1983) and Reynolds, Taylor, Steffenson, Shirey, and Anderson (1981) which shows that when subjects read texts related to their own culture, they exhibit greater recall and inferencing

power. Both the content of text and the culture expressed in it add difficulty through the concepts conveyed by the vocabulary.

As can be seen, there are a number factors involved in the consideration of textual difficulty in Japanese: the linguistic structure, the rhetorical structure, the Chinese characters, the vocabulary, and the background of the text including the subject matter and cultural setting. As stated before, the focus of this pilot study is on linguistic difficulty, but this is not to say that other factors are neglected. They, too, are considered. As it turns out, vocabulary and Chinese characters are important considerations in the evaluation of textual difficulty for L2 readers of Japanese. It is important that a focused but balanced consideration of the factors involved in textual difficulty be given. This is the purpose of this pilot study.

1.3. The Contribution of the Computer to this Pilot Study.

The computer can present text on a screen which is linked to on-line help resources through a hypertext environment. The hypertext utilized in this study enables an L2 reader of Japanese text to choose a word, a phrase, a sentence, or a larger unit on the screen and have it defined, translated, or explained. Such an environment constitutes computer-mediated text. The resources that are available facilitate the

understanding of the text. These resources are presented on a help menu, and the reader merely chooses the kind of help that is needed to understand a textual element. The purpose of computer-mediated text is to provide the most appropriate help to the user.

The help menu presents certain choices to facilitate comprehension. It provides assistance in the following areas: 1) vocabulary, 2) Chinese characters, 3) grammar, 4) rhetorical structure, and 5) culture. The grammatical information given in the program is the most complete since grammar was the focus of this study. Predicted areas of textual difficulty are underlined in the presentation of computer-mediated text, so they can be selected to provide the exact help needed. Computer-mediated text makes appropriate help available in order to facilitate textual understanding.

The computer is also used as a monitor of the kind of information the reader accesses to understand the text while reading a passage. It can keep track of how often and how much information on vocabulary, Chinese characters, grammar, rhetoric, and culture is used. An analysis was made of this information to determine what part of the text seems to cause the most difficulty. It is assumed that the more difficult a certain textual element is, the more often information on that element might be expected to be accessed in order to

understand it; thus, difficulty can be measured by the number of times information on certain textual elements is accessed. This information can be used to understand the sources of textual difficulty.

Basically, this pilot study uses the computer as a means of instruction in two traditional modes: 1) the inquiry mode and 2) the tutorial mode. In the inquiry mode, the interaction with the computer is user-initiated. The information stored in the computer is accessed as the user works his or her way through the computer lesson. This information is available on request. A menu of available assistance is on the screen to help the student if he or she should run into trouble while working his or her way through a computer lesson, . All the user need do is make an enquiry by selecting options on the screen that provide the needed information. In this mode, the user has a degree of freedom in the interaction with the computer in that the user can decide whether or not to query the computer for specific information.

In the tutorial mode, there is no such freedom. The computer asks the questions which the user must answer or makes the requests which the user must respond to. Then the computer checks the answers or responses and branches appropriately. In this mode, the user has little control

over the computer, which decides what is to be studied and how it is to be taught.

As stated above, the program written for this pilot study contains elements of both these modes. First of all, the text is presented in the inquiry mode because the passages that form the reading material in this program are presented in a hypertext environment, in which, the user can choose a word or larger unit on the screen and have the program define, translate, or explain it. The information on these words or larger units has been placed into a kind of data base which the user can access when needed. In this kind of environment, the interaction with the computer is user-initiated. Because of this, the user can move through the learning material at his or her own pace making it ideal for presenting reading materials. The user can also choose the order in which material is covered. If the user is having trouble with certain words, phrases, and clauses in the text, he or she can choose the information necessary to receive definitions, explanations, and other forms of help at the appropriate time. The hypertext system gives the user power to choose the appropriate help needed to understand textual material. Hypertext can provide help that is convenient and easily-accessible. The user just needs to choose the help that is necessary to understand the text. This is the essence of the inquiry mode. Secondly, the

tutorial mode in this program is present in the on-line tests that are given after each respective text is read by the user. The computer presents the questions which then the user answers. At this point, there is no opportunity to make queries in order to gain further help or information. The only appropriate response on the part of the user is to answer the questions. In this case, the computer decides what is to be studied and how the user is to respond. Both the inquiry and the tutorial modes work together in the program written for this pilot study to form a learning environment where the user is both given the opportunity to get the assistance necessary to understand Japanese text but also is tested to see how well he or she understood the text. This creates a learning environment that is both supportive and challenging.

1.4. Summary. This was a pilot study involving an on-going project to study how linguistic complexity affects the difficulty of Japanese text when it is read by native speakers of English. Along with linguistic complexity, the role of vocabulary, rhetorical structure, Chinese characters, and culture were considered as to their contribution to passage difficulty. The role of computer-mediated text in facilitating textual comprehension was also considered in light of how it can help the reader understand linguistic complexity by providing explanations of the structure of

Japanese sentences. This information can help the reader parse the sentences he or she is processing so that with the aid of information on vocabulary, rhetorical structure, Chinese characters, and culture, he or she can understand the text. The next chapter is a discussion of the relevant literature that forms a background for this pilot study.

CHAPTER 2
Review of Literature

2.0. Reading Theory. Passage difficulty is related to the knowledge that the reader brings to the task of comprehending a text. According to James (1987, p. 177), this knowledge is expressed in the form of schemata. Schemata represent a nested system of cues which enable the reader to get the maximum amount of processing from the smallest amount of information. These schemata incorporate grammatical, lexical, rhetorical, or cultural information (ibid., pp. 177-181). Linguistic schemata relate to the knowledge of the grammar the text is written in. Lexical schemata represent the structure of vocabulary and the shape of characters used for writing. Content schemata reflect the knowledge about the topic the reader brings to the reading task. Formal schemata characterize the knowledge the reader has of rhetorical structures. Cultural schemata represent the knowledge the reader has about the culture expressed in the text. Based upon the analysis of James, the difficulty of reading a passage can be seen to vary in proportion to the knowledge the reader has of its grammatical structure, vocabulary, graphemic structure, content, rhetorical structure, and cultural content. Furthermore, Eskey (1986, p. 13) organizes the knowledge brought to the reading task

into higher-level and lower-level cognitive skills involving higher-level and lower-level schemata. Upper level schemata involve a general knowledge of the world including culture and the subject matter of the passage. Lower level schemata have to do with the knowledge of form necessary for textual recognition involving grammatical features and lexical meanings. These schemata are matched with the textual features in order to facilitate interpretation.

Most current models of reading comprehension take an interactive point of view (Eskey, 1986; Mitchell, 1982; Pearson, 1984). First of all, "reading is an interactive process between reader and text" (Carrell, 1987, p. 2). Secondly, there is an "interaction of the reader's several kinds of knowledge" as contained in the schematic structure of his or her background knowledge (Eskey, 1986, p. 16). This interaction comes from the active participation of the reader in negotiating between top-down and bottom-up reading strategies. With data-driven bottom-up processing, the incoming data activate the lower level schemata having to do with grapho-phonemic, lexical, grammatical, and rhetorical recognition (Eskey, 1986, p. 18). According to Carrell and Eisterhold (1983, p. 557), since "schemata are hierarchically organized, from most general at the top to most specific at the bottom", the "bottom-level schemata converge into higher-level, more general schemata" which "too become activated".

Bottom-up strategies have to do with a knowledge of form and the recognition of visual cues in the text. Conceptually-driven top-down reading strategies start with the knowledge the reader brings to the reading task including a knowledge of the world, the domain of discourse, the culture, and pragmatics. The reader "makes general predictions based on higher level, general schemata and then searches the input for information to fit into these partially satisfied, higher order schemata" (ibid.). According to Rumelhart (1980, p. 42), this processing can occur "in both directions", either top-down or bottom-up. The reader uses his knowledge of the world, the domain of discourse, the culture, and pragmatics in actively engaging the text, which is perceived through the use of bottom-up reading strategies involving the recognition of the distinctive patterns of letters, vocabulary, syntax, and rhetoric. These patterns are interpreted though the use of the knowledge the reader brings to the task. Goodman (1967, p. 108) describes the top-down process as a "psycholinguistic guessing game" which "involves an interaction between thought and language". This interaction is described as follows:

> Reading is a selective process. It involves partial use of available minimal language cues selected from perceptual input on the basis of the reader's expectation. As this partial information is processed, tentative decisions are made, to be confirmed, rejected or refined as reading progresses. More simply stated, reading is a psycholinguistic guessing game. It involves an interaction between thought and language.

> Efficient reading does not result from precise perception and identification of all elements, but from skill in selecting the fewest, most productive cues necessary to produce guesses which are right the first time.

According to a contemporary of Goodman, Smith (1971, 1982), what happens behind the eye is more important than what the eye does during the reading process. Smith supports Goodman in asserting that the reader is actively involved in interpreting a set of visual cues in order to get the maximum amount of information from the text.

Through the simultaneous processing of top-down and bottom-up reading strategies, the reader actively constructs the meaning of a text. It is through this interaction that information is conveyed from the text to the reader. It is important to note that the expressions, "top-down" and "bottom-up", refer to the reading strategies and not to the linguistic structures themselves.

2.1. Contrastive Rhetoric. The expository style used in Japanese rhetoric is different from the expository style in English. Discourse constraints involving discourse style also affect the comprehensibility of a Japanese text. The texts discussed in this dissertation are expository in nature. As mentioned in chapter 1, John Hinds (1983a, p. 188) has stated that the basic organization used for rhetorical structure in Japanese is *ki-shoo-ten-ketsu* where *ki* means 'beginning', *shoo* 'support', *ten* 'change', and *ketsu* 'conclusion'. The *ki* begins the topic, the *shoo* develops it,

the *ten* moves off the track of the topic to a related area, and the *ketsu* ties everything together in the form of a conclusion. However, this is not a conclusion in the shape of a summary but in terms of a global statement that brings the argument to a new level. This style of expository writing is highly valued by native Japanese speakers (Hinds, 1983a, p. 194).

According to Hinds (1990, p. 89), there are basically two styles of writing in English: deductive and inductive. Deductive writing has the thesis statement in the initial position of a composition while inductive writing has the thesis in the final position. In English, expository compositions that follow these basic models are seen as having unity, focus, and coherence; in other words, they are considered well-organized. However, according to Hinds (ibid, p. 98), other languages may have other forms of expository writing that appear logical and coherent to native speakers of those languages but to speakers of English appear to lack organization. The forms of expository writing in other languages may appear to be inductive since they do not appear to have a clear thesis statement at the beginning of the exposition. Hinds (ibid., p. 99) states that this is because native speakers of English tend to think that anything that is not deductive must be inductive since they operate on this basic dichotomy. From this, Hinds (ibid.,

pp. 99-100) concludes that in order to understand forms of writing in other languages, it is important for the English-speaking reader to realize that other languages may not operate on the basis of the deductive-inductive dichotomy. This is because good expository writing in languages other than English may be ordered along different lines.

Expository writing in many Asian languages, such as Japanese, Chinese, Korean, and Thai, are organized in style according to a different principle, according to Hinds (1990, p. 98). This style is neither deductive (a thesis statement followed by arguments to back it up) nor inductive (a series of arguments leading up to a thesis statement), but rather quasi-inductive which "has as its purpose the task of getting readers to think for themselves, to consider the observations made, and to draw their own conclusions" (ibid., pp. 99-100). The nature of this kind of writing in these Asiatic languages he states, is reader-oriented in that the reader is supposed to make a greater contribution in understanding a passage than is an English-speaking reader; however, an English-speaking reader who reads one of these Asiatic languages may find it incoherent. Ebbit and Ebbit (1982, p. 393) as quoted in Hinds (1990, p. 98) define coherence in English exposition as follows:

> Coherence--the traditional name for relationship, connection, consecutiveness--is essential in expository writing. It's essential because you can't count on the minds of others working the same way as your mind works.

> You must guide your readers from one idea, from one sentence, to another. To make a coherent presentation you have to arrange your ideas so that others can understand them.

According to Hinds (1990, p. 99), for the English-speaking reader, this means that if an expository text is deductive, he or she expects the thesis to be stated clearly and then justified clearly point-by-point in a logical sequence of supporting material. Hinds (ibid.) further states that if the material is not presented in a deductive fashion, then the English-speaking reader assumes that the text that he or she is reading is inductive and that the sentences arranged are arranged in a clear logical order of reasons leading to a final conclusion. Hinds (ibid.) says the English-speaking reader expects that the arguments will support the conclusion in a focused and coherent fashion. Based upon the analysis of Hinds, it can be seen that when an English-speaking reader is confronted with more loosely organized texts (as found in Asiatic languages) where the reader is expected to make more of a contribution in drawing the loose ends together, the reader will naturally be confused. Thus, according to Hinds (ibid., p. 90), the quasi-inductive style in Japanese appears to lack coherence to a reader from an English-background although to the Japanese native speaker it is perfectly coherent. Hinds (ibid., pp. 99-100) finally concludes that the quasi-inductive approach merely assumes that the reader will take

more of an active role in getting comprehensible meaning out of a passage. In fact, Hinds (1987, p. 143), makes the following proposal about writer and reader responsibility:

> I suggest a typology that is based on speaker and/or writer responsibility as opposed to listener and/or reader responsibility. What this means is that in some languages, such as English, the person primarily responsible for effective communication is the speaker, while in other languages, such as Japanese, the person primarily responsible for effective communication is the listener.

Because of this typology, the English-speaking reader needs to take what seems to the Western reader a more active role while reading Japanese because in Japanese and in other languages (e.g., Korean), at times, "the conclusions do not seem to follow from the reasons that lead up to them" (Hinds, 1990, p. 99). According to Hinds (ibid.), whether an expository composition is deductive or inductive, the English-speaking reader expects each reason presented to support the conclusion; however, this expectation is not met in these Asiatic languages. Hinds (ibid., pp. 99-100) further states that with respect to these languages, the reader needs to recognize that a set of observations will be organized around a loosely defined topic and that he or she is expected to sort out these observations, make sense of them, and make his or her own inferences. Hinds (ibid., p. 100) concludes by observing that with respect to these Asiatic languages, the author's job is not to argue persuasively or to "convince", but to suggest and persuade

the reader to consider the issues involved and to come to his or her own opinion. In this point of view, the reader assumes more responsibility in coming to grips with the topic put forth by the text.

From these observations, it is evident that one's own expectations and assumptions as to logic, audience, and the responsibilities of the reader come from one's own native language and culture. This is a problem with the identity fostered by one's own language and culture. When an English-speaking person reads a second language, such as Japanese, or Korean, he or she needs to be aware of the fact that the material was written by people with a different cultural identity which also determines how exposition is written and presented (Shen, 1989, pp. 459-466). Contrastive rhetoric is concerned with the knowledge that makes up the identity of the writer in order to help the L2 reader know what to expect. Among the kinds of knowledge the reader needs to be aware of are (Grabe and Kaplan, 1989, pp. 271-272):

1) "knowledge of rhetorical patterns of arrangement and the relative frequency of various patterns"; 2) "knowledge of the morphosyntax of the target language, particularly as it applies at the intersentential level"; 3) "knowledge of the coherence-creating mechanisms of the target language" (target language = L2); 4) "knowledge of the writing conventions of the target language in the sense of both frequency and

distribution of types and text appearance (e.g., letter, essay, report, etc.)"; 5) "knowledge of audience characteristics and expectations in the target culture"; and 6) "knowledge of the subject to be discussed, including both "what everybody knows" in the target culture and specialist knowledge. When the L2 reader is aware of these kinds of knowledge, the expectations of the reader will more closely coincide with the intentions of the writer, thus facilitating understanding and lowering the level of frustration. Eggington (1987, p. 166) relates the importance of expectations to the reading theory expressed by Goodman (1967, p. 108) in his description of the reading process as a psycholinguistic guessing game. Eggington states that if reading is a psycholinguistic guessing game, "then readers and writers have certain built-in expectations about the ordering of ideas in any stretch of discourse" (1987, p. 166). The closer the reader's expectations of what comes next match those of the writer, the more the communication process is enhanced. The purpose of contrastive rhetoric is to tailor this knowledge to the needs of the L2 reader to aid in his or her comprehension of the text.

2.2. Readability Formulas. This dissertation focuses on the structural aspects of texts as these aspects make an overall contribution to the general difficulty of a text. Readability estimates have been created to determine whether

textual material is at an appropriate level for the reader. Typically, readability formulas that have been discussed in the literature have not taken into account linguistic structure. A list of readability formulas is given by Rude (1986, p. 130):

1. The Flesch Index--designed to analyze material from fifth-grade through college graduate level. Uses a syllable per sentence average to determine grade level.
2. The Fog Index--designed to analyze grade 6 through graduate-level reading material. It is based on the number of words of three syllables or more as an indicator of difficulty.
3. The Dale-Chall Index--designed to measure fourth-grade through college materials. It is based on two types of counts: average sentence length and percentage of unfamiliar words (i.e., those words that do not appear on the Dale List of 3,000 Commonly Used Words).
4. The SMOG Index--an estimate of grade level that a person must attain to comprehend the text that is being analyzed. This analysis assumes that ten consecutive sentences will be used in the computation.
5. The Wheeler-Smith Index--a primary-grade analysis that is based on the number of polysyllabic words (i.e., three or more syllables).
6. The Spache Index--based on the number of words and sentences and affected by words not on Stone's revision of the Dale-Chall 769 Easy Word List.

Geoffrion and Geoffrion (1983, p. 104) also characterize the Spache and Dale-Chall formulas as combining "average sentence length with the percentage of rare words". They also mention the Fry Formula, which like the Flesch Count utilizes sentence length and the number of syllables in 100 words of text (ibid.). These formulas are very limited in scope ignoring very important linguistic elements that determine

readability of text. According to Rude (1986, p. 129), these formulas ignore "factors such as figurative use of language, technical terms, sentence structure, the coherence of topics, and connectives used between clauses and sentences". When determining difficulty, textual features, such as coherence of the ideas in a text and their density and connectives, also need to be considered (Singer and Donlan, 1985, p. 195). Also, reader-related factors need to be considered in assessing difficulty, such as "the reader's prior knowledge, vocabulary ability, reasoning processes, purposes, and goals in reading the text" (ibid.). Reading difficulty depends on factors both in the reader and the text. According to Singer and Donlan (ibid.), "reading difficulty for a particular individual depends upon an interaction between the text and the individual."

Despite the limitations of readability formulas, they have one strength in their favor, their stress on the importance of vocabulary in determining the level of readability. Coady (1987, p. 102) points out that "in attempting to measure the readability or difficulty of a given text, it has long been known that vocabulary load is the most significant predictor." To reinforce this, Coady quotes Chall (1958, p. 157) who says that "once a vocabulary measure is included in a prediction formula, sentence structure does not add very much to the prediction."

Sentence structure certainly does affect readability, but the readability formulas as given above do not include data on the internal structure of sentences, including the depth of embedding involved, so with respect to grammatical structure their results seem to be rather superficial. Sentence length can provide only a rough estimate of grammatical difficulty. Research on the effects of syntactic variables on readability is an area that needs further research (Coady, 1987, p. 103). As a result, we cannot be dogmatic.

As far as the contribution of linguistics to reading is concerned, there is a hierarchy of several different levels in operation during reading: "textual, syntactic, morphemic, lexical, graphophonemic, or graphemic, which have been experimentally evidenced in reading" (Ulijn, 1984, p. 67). The question is how do all these factors work together to make reading possible? The way that Ulijn (ibid., p. 68) would handle this "is to suppose an interaction between all linguistic levels in reading; i.e., that they are operating without a strict bottom-up or top-down order". In order to sort out this interaction, "even though there is interaction among these linguistic factors, there is the need to isolate the individual factors which contribute to problems with reading comprehension (Strother and Ulijn, 1987, p. 91).

The assumption behind readability formulas is that readability is determined by word frequency. According to

Anderson and Freebody (1981, p. 77), "an assessment of the number of meanings a reader knows enables a remarkably accurate prediction of this individual's ability to comprehend discourse." Furthermore, they add that "an equally consistent finding has been that word knowledge is strongly related to reading comprehension" (ibid., p. 78). The authors cite a number of studies to illustrate the importance of vocabulary in reading comprehension. In a study by Thorndike (1973), data was collected on at least 100,000 students in 15 countries and grouped into three age groups. According to Anderson and Freebody (1981, p. 78), Thorndike "found median correlations between vocabulary knowledge and reading comprehension, corrected for test reliability, of .71 (10-year-olds), .75 (14-year-olds), and .66 (17-18-year olds)." Anderson and Freebody (1981, p. 78) also cited a study by Coleman (1971) on reading difficulty of prose. Coleman (1971, p. 184) found that although sentence complexity had some importance as a variable, "word complexity (number of letters, morphemes, or syllables; frequency of usage) will account for about 80 percent of the predicted variance". Finally, Anderson and Freebody (1981, page 80) cited a study by Klare (1974-1975) in saying that an adequate readability formula need only have two variables, one of word difficulty and one of syntactic difficulty.

Readability formulas are highly dependent on word frequency in determining the degree of comprehensibility of a passage. In a study by Marks, Doctorow, and Wittrock (1974), increased use of high-frequency words was shown to improve reading comprehension. Two different versions of five stories were given to sixth-grade children. In the two versions, 15% of the words were altered in frequency with one version containing high-frequency and the other low-frequency equivalents. The frequency counts were obtained from Carroll, Davies, and Richman (1971). The authors summarized the results of the experiment as follows:

> ...the magnitude of the increase in reading comprehension due to the 15 percent increase in high frequency words was marked. The average increase in reading comprehension from the less meaningful to the more meaningful treatment across all comprehension tests at all reading levels was 25 percent...(Marks, Doctorow, and Wittrock, 1974, pp. 261-262).

Such a study shows the importance of word frequency in readability formulas. However, these formulas are as accurate as the word frequency counts. In referring to the dependence of readability formulas on word frequency counts, Wardhaugh (1969, p. 88) warns that "any research based on the use of the formulae may be invalid if the counts themselves are inadequate". Word frequency needs to be balanced with other considerations, such as linguistic and rhetorical structure.

A further study investigating the effect of difficult vocabulary on comprehension as measured by 1) free recall, 2) summary recall, and 3) sentence recognition was conducted by Freebody and Anderson (1981). For the first experiment, the effect of difficult vocabulary was studied under three experimental conditions:

> The "easy" condition comprised the high word-frequency form of the passage; the "medium" condition entailed the substitution of approximately 1 substance word in 6 in the easy condition with a low-frequency synonym; the "difficult" condition entailed such substitutions for 1 substance word in 3 (ibid., p. 7).

The study used 105 sixth-grade students in order to study five passages under the three experimental conditions. In a surprise result in this experiment, it took a high density of low-frequency vocabulary to achieve a deterioration in performance. The authors (ibid., p. 27) said that "only when one substance word in three was changed to a low-frequency synonym did performance deteriorate reliably across the passages used in Experiment 1". For the second experiment, "difficult vocabulary was placed in important text elements in one form of the passages, and in unimportant elements in another" (ibid., p. 1). The effect in comprehension was only seen in the summary measure. The authors explained the results of this experiment by use of the "minimal effort principle" where the reader spends as little effort as possible on the processing of the text as long as the main themes are understood. However, if difficult vocabulary is

found in important propositions in a text, these words must be processed, and if they are not understood, understanding of the text would be impeded. If difficult vocabulary occurs in unimportant propositions, the vocabulary can merely be skipped with little effect on comprehension. In summary, readers use strategies to avoid difficult words.

2.3. Culture and Reading Comprehension. Barnitz (1986) did a literature survey on the relationship between culture as expressed in content schemata and second language reading comprehension. Historically, an early study of the effects of cultural schemata was conducted by Bartlett (1932). When subjects from England in the experiment read American Indian folk stories, the effects of processing text based on different cultural traditions were evident. Later both a study by Kintsch and Green (1978) who had college students in America read stories in the Apache folk tradition and stories written by Grimm and a study by Steffenson, Joag-Dev, and Anderson (1979) who had students in American and Indian universities read letters about weddings in India and America further corroborated the findings of Bartlett through more sophisticated studies which showed that cultural schemata affected comprehension (Barnitz, 1986, p. 99).

Barnitz (1986, p. 101) discusses a study by Johnson (1981) which examined the effect of cultural schemata on reading English as a second language. The subjects were

intermediate and advanced students who were studying English as a Second Language and students who were native speakers. They read two versions of American and Iranian folk stories: one had simple syntax and the other had complicated syntax. One of the conclusions was that syntax did not have as important an effect on readability for the Iranian subjects as did the cultural background of the text. For the American subjects, readability was influenced both by the grammatical difficulty and culture assumed by the text. Finally, the subjects in both groups could reason better in recollecting text with a cultural background that matches their own.

Johnson (1982) conducted a further experiment on the importance of background knowledge. The subjects were 72 ESL students at the advanced level. They read a passage about Halloween containing both familiar and unfamiliar information (Johnson, 1982, p. 503). There were four treatment conditions (ibid., p. 507):

Group 1: reading the passage without a vocabulary list to study before reading or to refer to while reading.
Group 2: studying the definitions of the target words before reading but not being able to refer to this list while reading.
Group 3: reading the passage with the target words glossed in the passage.
Group 4: studying the target vocabulary words before reading with the definitions of the target words glossed in the passage.

The subjects were asked to recall the story and to recognize information about the story. According to Johnson (ibid., p.

508), "prior experience in the American culture seemed to affect ESL students' comprehension of a passage on the topic of an American custom, Halloween". As a result, there was "a significantly better written recall of the familiar information in the passage than of the unfamiliar information" (ibid.).

Barnitz (1986, p. 105) also discussed psychological processing studies. He noted that there has been little research "on cross-cultural discourse processing" (ibid.). He does, however, describe research done by Hinds (1983b):

> Hinds conducted research on Japanese and English readers who read texts in their own language. The experimental texts in both languages conformed to Japanese rhetorical patterns. Recall protocols indicated that English readers processed the Japanese discourse with far more difficulty than did the Japanese readers. The differences in Japanese and English discourse patterns were found to affect the processing strategies of English readers (Barnitz, 1986, p. 105).

This research indicates that readers use the discourse patterns of their L1 in processing L2 discourse.

2.4. Computers and Computer-mediated Text. Computer-mediated text provides manipulations for text in order to supply help and remediation to the reader while the text is being processed. Reinking and Schreiner (1985) and Reinking (1988) investigated the interaction of the reader with computer-mediated text. These studies have shown positive effects on reading comprehension of English text which is computer-mediated.

Reinking and Schreiner (1985, p. 536) described the potential of the computer-mediated text as follows:

> The options for interacting with text displayed on the printed page are limited by conventional print and the reader's internal strategies. Hypothetically, computer technology might influence these processes by manipulating text in ways not available or feasible in printed pages.

To test out this potential, 104 fifth-graders and sixth-graders were presented with 6 passages that were expository in nature under four experimental conditions. The four experimental conditions were as follows:

1. Subjects read passages off line (on printed pages). No textual manipulations were available (off-line group).
2. Subjects read passages on line (displayed by the computer). No textual manipulations were available (test-only group).
3. Subjects read passages on line and were free to choose from among several textual manipulations which were deemed useful for enhancing comprehension of the passages (select-options group).
4. Subjects read passages on line and then were required by the computer program to view all available manipulations before being allowed to continue (all-options group) (ibid., p. 540).

An analysis of variance showed "that computer-mediated text can influence reading comprehension and that comprehension was most consistently increased when manipulations of the text were under computer control" (ibid., p. 536).

Reinking (1988) did a further study to confirm the results of the previous study. He employed the same experimental conditions as in the previous study. Along with confirming that computer-mediated text actually improved

reading comprehension, the purpose of this study was to measure the time taken to read the texts and to determine whether that affected the comprehension. Further, Reinking (1988, p. 484) wanted to learn whether computer-mediated text "would affect passage preference" and the estimation of learning on the part of the subjects. Thirty-three fifth-grade and sixth-grade students read the passages employing the same options as the previous study (ibid., p. 488). They were also asked two additional questions after they had completed the reading (ibid., p. 489):

1. How much did you like this passage?
2. How much did you learn from reading this passage?

The result of this study was that the conclusion of the previous study was confirmed. The comprehension of the subjects using computer-mediated text increased. Also, the subjects took more time to read computer-mediated text. However, "even after the effect of reading time was removed statistically, comprehension scores remained significantly higher for readers of the computer-mediated texts that offered computer assistance" (ibid. p. 484). The response to questions 1 and 2 above indicated that the computer presentation of text did not affect the passage preference for the readers nor their estimation of the amount of learning they felt they had achieved (ibid. pp. 493-494).

One way computer-mediated text can be presented to learners is through hypertext. Hypertext itself refers to

"non-sequential text" (Last, 1989, p. 146). Hypertext allows the user to choose a word or larger unit on the screen and have the program define, translate, or explain it. In a hypertext-based program, a database is created where each entry is called a node and contains at most one screenful of data or text. Non-sequential associative links between nodes allow the user to go in any direction. This process is referred to as navigation. Since orientation is one of the problems with this system, a utility, called a browser, has been developed to tell the user where he or she has been, what the current positions is, and what the options are for the next move. In this way, a lesson can be created by piecing it together in any way desired. When audio, video, and graphics are interfaced with hypertext, then it becomes hypermedia so that images and sound can be used to reinforce text. Adding a mouse makes the system even easier to interact with. The student can move through the learning material at the pace and ordering of his or her own choosing. This kind of set-up is ideal for presenting reading materials because the student can control the rate of his or her own learning. The student can choose the order in which material is covered. If the student is having trouble in understanding certain words or sections of the text, he or she can use the mouse to click these sections on the screen in order to receive definitions, explanations, and other

forms of help. The hypertext system is designed to give the student power to choose what help is appropriate and needed to understand textual material. Hypertext can provide all the help needed to understand a text in a convenient and easily-accessible form.

An example of a hypermedia approach to learning Chinese characters used in Japanese is KanjiCard developed by Kazuko Nakajima (1988). The program uses Hypercard, Apple's implementation of a hypermedia environment. KanjiCard uses text, graphics, animation, and sound in a self-tutorial program to teach the use of 300 Chinese characters in Japanese. According to Nakajima (1988, p. 80) in reference to her program, "a variety of information on individual Kanji is organized hierarchically into four major categories: (1) graphic, (2) sound, (3) semantic, and (4) usage." A user can access this information by utilizing the directory which is a map of all the information that is available. When the user chooses the graphics section on the menu, a 2-inch by 2-inch image of the Chinese character is drawn (ibid., p 81). An option to draw the stroke order shows the Chinese character drawn stroke-by-stroke. When the sound section is chosen, the user can hear the Chinese character pronounced (ibid. p. 82). The section on semantics provides information as to the origin of the Chinese character and discusses its meaning (ibid.). Finally, when the usage section is chosen, the user

gets information on Chinese compounds and related Chinese characters (ibid., p. 83). Furthermore, example sentences are given to illustrate the use of a particular Chinese character in context. The main advantage of this program is that a lot of information related to Chinese characters is readily available in an easily accessible format. Learning is accomplished in an interactive format through the integration of sound, graphics, and text.

On February 3, 1991, Thurn (1991) gave a demonstration at The Third Conference of the Lower Lake Erie Teachers of Japanese at the University of Pittsburgh. The demonstration featured an introduction to *Interactive Japanese: Understanding Written Japanese*, a program that teaches the reading of Japanese using a hypertext environment. The program provides help for the user with the aid of an on-line dictionary, access to information on words, phrases, and sentences, and provision of background information on the text.

2.5. Japanese Textual Variables. Grabe (1987, p. 118) in his attempt to define expository prose as a discourse genre used a variety of grammatical variables which were then counted to discriminate expository text types. The text variables were as follows (ibid.):

Syntactic Variables

1. Prepositions (by, of, with...)
2. Nominalizations (-tion, -ity, -ment...)

3. 1st/2nd person pronouns
4. 3rd singular pronoun
5. Singular pro-verb DO
6. Past tense
7. Present tense
8. Words per sentence
9. Adjectives
10. General conjuncts (and, but, or...)
11. Precise conjuncts (namely, thus...)
12. Subordinators (because, since...)
13. Passive
14. Infinitives
15. WH-clauses (following verbs like tell, remember...)
16. THAT-clauses (following verbs like know, say...)
17. Relative clauses.
18. Pied piping (prep. relative cl.)
19. General hedges (maybe, around...)
20. THAT-deletion (in complement clauses)
21. Relative pronoun deletion
22. Contractions (aren't...)
23. All attitude adverbs (surely, truly...)
24. All clefting constructions
25. Split auxiliary/infinitives
26. All questions
27. All locative adverbs (e.g., of time, place)

Cohesion Variables

28. Definite article reference
29. Deictic reference
30. All repetition
31. Lexical inclusion
32. Lexical comparatives
33. Lexical synonymy/antonymy

This present study used a parallel set of textual variables for Japanese based upon the syntactic analyses of Japanese of Alfonso (1966), Martin (1975), and Kuno (1973), the rhetorical analysis of Hinds (1983a, 1983b, 1987, 1990) and Grabe and Kaplan (1989), the lexical analysis of Lado (1972), and the cultural analysis of Barnitz (1986). This parallel list of textual variables for Japanese is used to measure textual difficulty in the reading of Japanese.

2.6. The Gap in Japanese L2 Reading Research. There is a gap in the reading research of Japanese as a second language with respect to the effect that textual variables have on the readability of Japanese text (for a discussion of the textual variables for Japanese used in this study, see Chapter 3, section 3.1). Although I have found no study in this area, I think that it is an area that certainly needs to be explored. Even in the area of L2 English reading comprehension, Coady (1987, p. 103) states that more research is needed on how individual syntactic variables, such as passives and nominalizations, affect comprehension. The same is certainly true for L2 reading of Japanese. The main purpose here is to study the effect of syntactic variables on L2 reading of Japanese. The following are the hypotheses that this present study will address:

1. Grammatical variables affect the difficulty of the reading of a Japanese text by native speakers of English.

2. Computer-mediated text can facilitate the comprehension of a passage more than ordinary text.

CHAPTER 3

Method

3.0. Purpose. The purpose of this dissertation is two-fold:

1) firstly to assess difficulty in Japanese text in relation to reading comprehension.

2) secondly to show that computer software that has been designed to meet the expected difficulty in a Japanese text can facilitate reading comprehension.

In order to fulfill this dual purpose, this pilot study focuses on the relationship of grammatical structure to passage difficulty. Along the way, the effect of rhetorical structure, vocabulary, and culture on textual difficulty is also considered in order to fill out the total picture of the major factors that affect the level of difficulty of Japanese text. All these factors help determine the burden that faces the reader of Japanese as a second language. In this study, computer software is designed around these factors in order to determine 1) whether it can assist in measuring quantitatively the contribution these factors make to passage difficulty and 2) whether it can actually facilitate the reading of Japanese text. This software is tested on human subjects in order to measure its effectiveness in measuring textual difficulty and its power to facilitate the comprehension of Japanese written text.

3.1. Variables in this Study. This dissertation considers a list of 20 categories as possible variables in passage difficulty. This list is really an enumeration of 20 possible variables that are hypothesized to influence passage difficulty. These variables are mainly syntactic in nature and are the main focus of this study; however, consideration is also given to variables that are rhetorical, lexical, and cultural in nature. The following are the variables which are hypothesized to affect passage difficulty (Alfonso, 1966; Grabe, 1987, p. 118; Kuno, 1973; Martin, 1975: as discussed in chapter 2, section 2.4):

Syntax.

1. Homophonous particles.
    a. *ni* marking benefit, goal, locative, purpose, result, the agent, or the indirect object.
    b. *to* marking the conjunctive or the comitative.
    c. *o* marking the direct object or the place traversed.
    d. *no* indicating the locative genitive or the objective genitive.
    e. *mo* meaning 'also', 'even', or 'as much as'.
2. Nominalizers -- *koto* and *no*.
3. Anaphora.
4. Tense.
5. Words per sentence.
6. Noun head modification.
7. Conjunctions.

8. Subordination.

9. Passive.

10. Causative.

11. Verb complexes -- verb compounding.

12. Quotations -- Quoted material comes before the quotation particle *to*.

13. Relative clauses.

14. Hedges.

    a. *kamoshirenai* 'maybe'.

    b. *daroo* 'perhaps, probably'.

15. Further embeddings.

16. Comparatives.

Discourse.

17. Rhetorical structures.

Vocabulary.

18. The percentage of *kanji* in a passage.

19. Vocabulary.

    a. Form-meaning relationships between English and Japanese.

        1) Words similar in form and meaning.

        2) Words similar in form but different in meaning.

        3) Words different in form but similar in meaning.

    b. Idioms.

Culture.

20. Cultural assumptions.

Items 1 through 16 relate to grammatical structure in keeping with the primary hypothesis of this dissertation:

> Syntactic variables affect the difficulty of the reading of a Japanese text by native speakers of English.

In particular, embedding, case marking, and other forms of sentence complexity are considered in the determination of passage difficulty.

3.2. The Evaluation of Difficulty in Two Texts. Two Japanese texts are evaluated from the viewpoint of the effect of grammatical, rhetorical, lexical, and cultural features on textual difficulty. Most of the features used in the evaluation are grammatical in nature, so the constructions in these passages which contribute to grammatical complexity are focused on in order to illustrate some of the issues involved in passage difficulty. Each of the features involves a specific hypothesis as to what contributes to passage difficulty in reading comprehension. Specific examples in these passages that illustrate the relation between these hypotheses and passage difficulty are considered. After the two passages are considered in the light of the 20 variables, the difficulty level of each passage is calculated to determine which of the two is more difficult.

The two passages are chosen so that neither is too difficult for the subjects. Yet there needs to be a clear distinction in the difficulty level of these two passages in order to test the validity of the 20 variables as features of

textual difficulty. The more difficult passage is an article that originally came from the Asahi Shinbun newspaper column, called "Tensei Jingo". This newspaper also publishes an evening English newspaper, called The Asahi Evening News, in which English translations of the articles appear. In The Asahi Evening News, a translation of the "Tensei Jingo" column appears, which is called "Vox Dei, Vox Populi". The article used in this study, called "*Aruke Orinpikku*" (translated "The Walking Olympics"), appears in a collection of these articles published by the Asahi Shinbun editorial staff (Asahi Shinbun Ronsetsu Iinshitsu, 1985, pp. 40-41). The easier passage is taken from an elementary school reader for the 4th grade, called Shoogaku Shinkokugo (Ishimori, 1977, pp. 42-43), which is translated as 'Elementary New Japanese'. This passage is still quite challenging for university-level readers of Japanese as a second language. Any selection of reading passages must take into account the reading level of the subjects of the experiment. With the on-line help provided by computer-meditated text, these readings should be within the reading capabilities of the subjects.

3.3. An Experiment Assessing Difficulty in the Two Texts. These two Japanese texts, one rated difficult and the other easy with regard to the 20 variables, were investigated with respect to the actual difficulty they present to English

speaking students who are reading Japanese as a second language. The readers in this study were presented with these texts and were asked to circle or underline the parts of the texts they thought were difficult. The purpose of this task was to critique the validity of the assessment of difficulty presumed by the 20 criteria as listed above. If the students could clearly indicate that, in fact, one text is easier than the other, then the validity of the criteria as indicators of textual difficulty would be indirectly confirmed. The actual analysis of the validity of the predictive ability of 20 variables was based on two calculations: 1) the percentage of predictions that were correct and 2) the actual problem areas as determined by this experiment that were successfully predicted. Furthermore, the determination of which passage was more difficult was a function of the number of total marks in that passage. These calculations are further explained in chapter 5.

The subjects that participated in this study were members of intermediate level Japanese classes at a large Midwestern University. They were 3rd- and 4th-year students who had studied the fundamentals of grammatical structure and could recognize at least 800 Chinese characters. The fact that all the subjects were English-speaking has certain implications for the evaluation of passage difficulty because clearly the issues of textual difficulty involved in reading

Japanese as a second language are related to the L1 background of the reader. These implications are a part of this pilot study.

3.4. Computer-mediated Text. Based upon both the results of the experiment assessing the difficulty in both texts and the linguistic analysis, a computer program was written focusing on the potential problem areas in the reading comprehension of these two passages. The program focused on the areas of difficulty that were indicated by the linguistic analysis and the experimental evaluation of the performance of the target population during the experiment assessing the difficulty in both texts. The computer program provided help in these areas of anticipated difficulty for the target population. The goal was to provide the most appropriate help to intermediate-level Japanese students.

In this computer program, computer-mediated text is manipulated in a variety of ways. A passage is placed on the computer screen in a text window which the reader interacts with. At any point during the reading process, the reader has certain resources available which can be used to facilitate understanding of the text. These resources are in the form of a help menu which presents certain choices to facilitate comprehension. On the help menu, the reader can receive help in the following areas: 1) Information on vocabulary, 2) information on Chinese characters (*kanji*), 3)

information on grammar, 4) information on rhetorical structure, and 5) information on culture. The grammatical information given by the help facility is the most complete since this is the focus of this study. The assistance provided by this program incorporates the textual analysis and assessment described in sections 3.2 and 3.3. The user gets help in the areas indicated as difficult by this analysis and assessment. These predicted difficult areas in the text are underlined in the computer-mediated text, so they can be chosen by the reader in order to provide special help to understand the text. Since analysis and assessment were done on the texts before they were presented as computer-mediated text, it is possible to anticipate certain problems in the text for reading comprehension so that remedial explanations can be prepared in advance for these potential problem areas. These explanations are part of the facilities available for computer-mediated text. That is, through the use of textual analysis and assessment described in sections 3.2 and 3.3, computer-mediated text can be targeted to a certain group of users in order to give them the appropriate help they need to comprehend text.

Also in this computer program, the kind of information the reader uses while doing the lesson is monitored. It keeps track of the number of times information on vocabulary, Chinese characters, grammar, rhetoric, and culture is

accessed by the reader. An analysis can then be made of this information over a group of users to determine what was difficult in the texts. The assumption is that the more difficult a certain element of text is, the more the users will need information to explain that element, and therefore, there is a proportional relationship between the number of times information about a textual element is accessed and the difficulty of that element. Thus, difficulty can be determined by the number of times information on certain textual elements is accessed. This sort of information was used to provide an overall picture of the sources of textual difficulty; thus, the computer can function as a tool for linguistic study.

3.5. A Test of the Software. The software developed for this pilot study was assessed under two treatment conditions. The first treatment condition presented text in conventional print on a piece of paper, and the second presented text on the computer screen with the freedom to choose options on the help menu to aid in comprehension. Students read the two passages under one of the two treatment conditions. One group of students read the texts in the off-line treatment condition (condition 1) and the other group in the on-line treatment condition (condition 2). Following the passages in both treatment conditions, there were a series of six multiple-choice comprehension questions giving four options

with three distractors and one correct answer. Without looking at the passages, the subjects in both treatment groups answered these questions in order to test their reading comprehension. Along with keeping track of the comprehension score, the program kept track of the reading time from when the subject started to read a passage until he or she decided to answer the questions. Also, the amount of time needed to complete the comprehension questions was recorded. Furthermore, a record was kept of the options provided by the help menu which were used by the subjects in the on-line treatment group in order to determine which options they preferred to use in increasing their knowledge of the text.

3.6. Summary. This pilot study was carried out to investigate the causes of difficulty in Japanese texts and the possible contributions computer-mediated text can make to the comprehension of text. The method described above attempted to empirically measure the extent to which variables of textual difficulty, particularly syntactic variables, affected the overall difficulty of a text. In conjunction with this, the role of the computer in quantifying the contribution of these variables to textual difficulty and in facilitating the comprehension of text was considered. This pilot study attempted to confirm the hypotheses of this investigation on an empirical basis. From

this perspective, reliable conclusions can be drawn about the validity and relevance of these hypotheses.

CHAPTER 4

Assessment of Difficulty in Japanese Text

4.0. Introduction. This chapter will assess difficulty in two Japanese texts according to twenty features. Most of these features are grammatical in nature and are related to hypotheses as to what contributes to passage difficulty in reading comprehension. Each feature will be introduced, explained with examples from the reading passages "*Aruke Orinpikku*" ("Walking Olympics") and "*Hoogen to Kyootsuugo*" ("Dialects and the Common Language"), and examined in light of its impact on reading comprehension. These two texts were examined in light of these features through the use of a system of quantification where each appearance of a feature was worth one point (except for feature number 5 as will be explained later). This point system is just a rough way to predict difficulty in these passages and is based on the assumption of a null hypothesis that each feature contributes an equal amount to passage difficulty. That is, the assumption is made that the impact of each feature on reading difficulty is the same. In reality, different problem areas in a passage may contribute to difficulty in different degrees. For example, a rhetorical or cultural problem may have more impact in determining reading difficulty than a

grammatical problem. The assignment of a uniform one point to each problem area is rough estimate of each problem's contribution to total textual difficulty. The assumption of the null hypothesis is made in order to begin the research and certainly evens the features out too much in terms of impact on difficulty but does constitute an approach to make some rough estimates of reading difficulty. In future research, the focus should be on the relative contribution of each feature to overall passage difficulty. All of the points that were accumulated in evalulating all the sentences in a passage were added up, and to that was added the average sentence sentence length to create an estimate of passage difficulty. This estimate was then divided by the number of words in the passage in order to factor in passage length into the readability estimation. The formula is as follows:

$$\text{readability} = \frac{\text{passage difficulty points}}{\text{passage length in number of words}}$$

This readability score is an estimate of the difficulty in comprehending a reading passage. It is only meant as a general heuristic of reading passage difficulty to guide in the estimation of readability. Later in chapter five, a report will be given on how these features were empirically tested as accurate predictors of passage difficulty.

4.1. Features Counted in the Estimation of Reading Difficulty. The following is a discussion of each of the features which contribute to reading difficulty. Each feature is explained and accompanying examples are provided.

4.1.1. Homophonous Particles.

4.1.1.1. The Particle *ni*. The particle *ni* can mark the dative, locative, or the agent along with other cases (Martin, 1988, pp. 40-41). This homophony can be a potential source of confusion. An example of the use of *ni* to mark the agent of a passive would be the following:

(1) *John ga sensei ni homeraremashita.*

'John was praised by the teacher.'

In this sentence, *ni* marks the agent *sensei* 'teacher'. However, in a passive sentence, the particle *ni* may not mark the agent and may be a source of confusion. An example of this is sentence number 6 from "*Aruke Orinpikku*" (see Appendix A for the passage):

(2) *Yokkakan arukitooshita mono ni kanpo*

Four days walk-continued people to completion of walking

no shoosho to medaru ga

possessive particle certificate and medal nom particle

ataerareru dake da.

be given only are

'It's just that a certificate of completion and a medal are given to those who last the distance over

four days.'

The phrase *Yokkakan arukitooshita mono ni* 'to those who walk four days' functions as the dative of benefit and not as the agent with respect to the verb.

Sentence 2 of "*Hoogen to Kyootsuugo*" ("Dialects and the Common Language") is a further example of this sort of confusion.

(3) *Nihon no* *chisei* *wa* *yama* *ya*

Japan possessive particle typography topic particle mountains and

kawa *ga* *ooku,* *motomoto* *kootsuu*

rivers nom. particle a lot of formerly transportation

ni *fuben* *de aru ue,* *mukashi*

dative of reference inconvenient be in addition to in previous times

wa, *nihyaku suujuu mo* *no*

contrastive particle 200 10, 20, 30, etc. (approximately) attributive genitive

daimyoo no *ryoochi* *ni*

feudal lord possessive particle property, fief particle indicating dative of benefit

wakarete *seiji* *ga* *okonawarete ita.*

be divided administration nom. particle was being carried out

'As for Japan's physical geography, in addition to there being a lot of mountains and rivers naturally making it difficult for transportation, in former times, Japan was divided into 200 to 300 fiefs, owned and administered by feudal lords.'

The phrase *nihyaku suujuu mo no daimyoo no ryoochi ni* 'into 200 to 300 fiefs owned by feudal lords' does not indicate the agent with respect to the passive verb *wakarete* 'be divided' but the result.

This brings us to an important question: how should points be awarded to indicate passage difficulty based upon the potential confusion above? Normally when one comes to a passive accompanied by the particle *ni* while reading, the assumption is made that the agent is indicated since that is what one would expect. It is, in other words, the unmarked case. Anything that is unexpected is the marked case and therefore should cost something. In this case, the cost is increased difficulty which results in the awarding of a difficulty point of one. In sentences (2) and (3) above, since the particle, *ni*, does not mark the agent, it is assigned the value one.

4.1.1.2. The Particle *to*. Not only can the particle *to* be used in the conjunctive and comitative sense (ibid., p. 44), but also it can indicate an impressionistic modifier. In the conjunctive sense, this particle functions as a conjunction indicating "and", and in the comitative, it has the meaning of "with". An example of the conjunctive use of the particle *to* is in sentence 6 of "*Aruke Orinpikku*" which was discussed above. The sentence in its unanalyzed form is repeated here (refer to the analysis above, if necessary):

(2) *Yokkakan arukitooshita mono ni kanpo no shoosho to medaru ga ataerareru dake da.*

'It's just that a certificate of completion and a medal are given to those who last the distance over four days.'

The particle *to* joins *kanpo no shoosho* 'certificate of completion' and *medaru* 'medal'.

However, in sentence number 11 of "*Hoogen to Kyootsuugo*", *to* functions as the comitative:

(4) *Nazenara, hoogen wa, sono tochi no seikatsu ya rekishi to fukai tsunagari ga ari, kazokudooshi, tomodachidooshi, tochi no hitodooshi ga kutsuroida hanashi o suru toki ni wa,shizen ni kuchi o tsuite dete kite, tagai ni yoku kimochi o tsuujiau koto ga dekiru mono dakara de aru.*

'The reason for this is a dialect has a close relation with the life and history of the local area, so when family, friends, and people of that region engage in relaxed conversation, the dialect just rushes out naturally and is able to mutually convey emotion.'

The analysis of the first part of the sentence is as follows:

Nazenara,	*hoogen*	*wa,*	*sono tochi*	*no*
because	dialect	topic particle	that region	possessive genitive

seikatsu	*ya*	*rekishi*	*to*	*fukai*	*tsunagari*	*ga*	*ari*
life	and	history	with	deep	connection	nom. part.	exists

The phrase *sono tochi no seikatsu ya rekishi to fukai tsunagari* 'a deep connection with the life and history of that region' contains the particle *to* which expresses the comitative meaning, 'with'.

An example of the use of *to* to indicate an impressionistic modifier is sentence 6 of "*Hoogen to Kyootsuugo*":

(5) *Konnichi de mo, sono tochitochi no hoogen*

today even that each area possessive genitive dialect

wa, mainichi no seikatsu no

topic particle everyday attributive genitive life locative genitive

naka de ikiiki to tsukawarete iru.

middle place of action particle vividly is being used

'Even today, the dialect of each area is being used vividly in the middle of everyday life.'

The phrase *ikiiki to* 'vividly' is an impressionistic modifier of the verb *tsukawarete iru* 'is being used'. Such a use resembles the comitative in that the meaning is 'with vividness'. This use of *to* in impressionistic modifiers adds difficulty to a text and thus is worth one point.

Clearly, the comitative form of the particle *to* is the marked case, so it receives one point. The conjunctive *to* also receives a point but for a different reason relating to the complexity of the noun head. See feature 6, explained in section 4.1.6.

4.1.1.3. The Particle *o*. Another case of confusion can be caused by the particle *o*. In this case, *o* can indicate either the direct object or the place traversed. The

following example of the direct object marking property of *o* is number 7 from "*Hoogen to Kyootsuugo*":

(6) *Fudan yoku tsukau aisatsu no*

ordinarily often use greeting possessive genitive

kotoba o mite miyoo.

words acc. particle look let's investigate

'Let's look at words that are ordinarily well-used for greetings.'

Here *fudan yoku tsukau aisatsu no kotoba* 'words that are ordinarily well-used for greetings' is the object of *mite* 'see'. This is the expected case, so a difficulty point is not awarded.

Passage difficulty is increased when the particle *o* indicates the place traversed and not the object of the verb. This construction is used with verbs of motion. Sentences 15 and 16 of "*Aruke Orinpikku*" are examples of this usage:

(7) *Midori no oka o aruku.*

green attributive genitive hill place of motion particle walk.

'They walked over green hills.'

(8) *Ungazoi no michi o aruku.*

canal-along locative genitive road place of motion particle walk

'They walk on roads alongside canals.'

The phrases *midori no oka o* 'on or over the green hills' and *ungazoi no michi o* 'alongside canals' indicate the place traversed and not the object of the verb, and for that reason add difficulty to the passage.

Another example of a verb of motion is *koeru* 'pass over or beyond', which appears in sentence 3 of "*Aruke Orinpikku*":

(9) *Nimannin o koeru sekai kakkoku no hitobito ga kono machi Neimeehen ni atsumatte, aruku.*

'More than 20,000 people from various countries throughout the world gather in the town of Nijmegen and walk.'

In the relative clause *nimannin o koeru* 'pass beyond 20,000 people', *nimannin* is something being exceeded or passed beyond. Thus *o* indicates the place traversed, and so adds to the difficulty of this sentence. As a result, a point is added here.

4.1.1.4. The Particle *no*. The particle *no*, the genitive, can also give rise to varying interpretations based on the context, which perhaps can lead to reading difficulty. Compare the use of the particle *no* in sentences 1 and 14 of "*Aruke Orinpikku*":

(10) *Mainen oranda no chiisa na machi de*

every year Holland locative (genitive) small town at

ooki na moyooshi ga okonawareru.

big event nom. particle is held

'In a small town in Holland, a big event is held

every year.'

(11) *Aruku koto* *no* *daisuki* *na*

walk nominalizer objective genitive like very much attributive form of the copulative

hitobito ga *atsumatte, aruku koto*

people nom. particle gather walk nominalizer

o *tanoshimu.*

acc. particle enjoy

'People who really like to walk gather and enjoy their walking.'

The *no* in sentence (10) is the locative genitive indicating where the big event is located: *oranda* *no* '(in) Holland'. In sentence (11), the *no* is the objective genitive indicating that *aruku koto* 'walking' is the object of *daisuki* 'like very much'. In these two sentences, a point is added for *no*. (Nominalized forms like *aruku koto* will be discussed in section 4.1.2.)

4.1.1.5. The Particle *mo*. The particle *mo* generally means 'also' An example of this meaning is sentence 4 of "*Hoogen to Kyootsuugo*":

(13) *Sono tame,* *kotoba* *mo,* *hitotsuhitotsu*

for this reason language also each one

no *chihoogoto* *ni wakareru*

attributive genitive every region in be divided

yoo ni natta no *de aru.*

came to be nominalizer be

'For this reason, language, too, came to be divided into individual geographical areas.'

In this case, *mo* is best translated as 'also' or 'even'. However, *mo* have another meaning as illustrated in the sentence 2 of "*Hoogen to Kyootsuugo*":

(3) *Nihon no chisei wa yama ya kawa ga ooku, motomoto kootsuu ni fuben de aru ue, mukashi wa, nihyaku suujuu mo no daimyoo no ryoochi ni wakarete seiji ga okonawarete ita.*

'As for Japan's physical geography, in addition to there being a lot of mountains and rivers naturally making it difficult for transportation, in former former times, Japan was divided into 200 to 300 fiefs owned by feudal lords and administered.'

In the phrase *nihyaku suujuu mo* 'about 200, 210, 220, and so on', *mo* does not mean 'also' but 'as much as'. This reading for *mo* adds difficulty and is worth 1 point.

4.1.2. Nominalizations.

The nominalizers *no* and *koto* are used to nominalize clauses. Martin (1988, p. 841) defines *koto* as a "general nominalization that is abstract, habitual, or remote" and describes *no* as "a specific or definite nominalization that is single, immediate, concrete, or directly perceivable". The passage "*Aruke Orinpikku*" has two sentences (number 14 and number 32 in the passage) with *koto*:

(11) *Aruku koto no daisuki na hitobito ga atsumatte, aruku koto o tanoshimu.*

'People who really like to walk, gather and enjoy

their walking.'

(14) *Arukitsuzukeru riyuu wa samazama da ga, aruki no shinzui wa yahari, aruku koto o tanoshimu koto daroo.*

'There are various reasons for continuing to walk, but the essence of walking is in its enjoyment.'

Both sentences employ the nominalization *aruku koto* 'walking'. This nominalization contributes to difficulty in two ways. First of all, the form of the nominalization is different from that found in English. Secondly, this nominalization contributes to the embedding process. Because of the increased difficulty, 1 point is added for *koto* in these sentences.

4.1.3. Anaphora.

There are differences in English and Japanese in the utilization of personal pronouns and demonstrative adjectives and pronouns. An example that contrasts English usage and Japanese non-usage of pronouns is the following sequence of sentences 14, 15, and 16 from "*Aruke Orinpikku*":

(11) *Aruku koto no daisuki na hitobito ga atsmatte, aruku koto o tanoshimu.*

'People who really like to walk, gather and enjoy their walking.'

(7) *Midori no oka o aruku.*

'They walked over green hills.'

(8) *Ungazoi no michi o aruku.*

'They walk on roads alongside canals.'

In both (7) and (8), the subject *aruku koto no daisuki na hitobito* 'people who really like to walk' does not appear in the Japanese text while it appears as the pronoun "they" in the English version. The very assumption behind the non-specification of the subject in Japanese sentences (7) and (8) is that the subject is the same as that of (11). This section of the passage is not so difficult since the context makes the intended meaning very clear. When the context is not as clear, there can be problems in understanding.

Perhaps, a source of difficulty can be found in the anaphoric element *konna* 'this kind of' which is located in sentence 8 of "*Aruke Orinpikku*":

(15) *Sanka* *kyuukai* *no* *Kaneko Tomokazu*

participation nine times temporal (name)
genitive

san (nihon aruke aruke kyookaichoo ni wa

Mr. Japan walk walk society-head for topic particle

konna *omoide* *ga* *aru.*

this kind of recollection nom. exists
particle

'Tomokazu Kaneko, chairman of the Japan Walk-Walk Society, who has participated nine times, has the following recollection.'

The anaphoric element *konna* refers to the story which follows about the argument with the woman. The reader needs to figure out that *konna* refers to what follows and not to what precedes.

The plural form of a demonstrative pronoun can also refer to previous material in a passage. An example of this is contained in sentences 8, 9 and 10 of "*Hoogen to Kyootsuugo*":

(16) *"Konban wa" to iu yoru no aisatsu o, "Oban de gozaimasu" "Oban ni narimashita" aruiwa, tada "Oban" to iu tochi ga aru.*

'There is a region where the evening greeting *Konban wa* 'Good Evening' becomes *Oban de gozaimasu* or *Oban ni narimasu*.'

(17) *Mata, "Arigotoo" no kawari ni, "Ookini" to ka "Dandan" o tsukau chihoo ga aru.*

"Again, there is a district which uses *Ookini* and *Dandan* instead of *Arigatoo* 'Thank you.'.

(18) *Korera no aisatsu kotoba ni wa, sono tochi sono tochi no aji ga komotte iru.*

'As for these words of greeting, they are full of the flavor of each particular region.'

In the phrase *korera no aisatsu kotoba* 'these words of greeting', *korera* is the plural form of *kore* 'this' referring to the various forms of greeting: *Oban de gozaimasu, ookini,* etc. Normally, an inanimate noun, like *kotoba,* in Japanese does not pluralize, so the plural suffix *-ra* is added to a preceding demonstrative pronoun (Martin, 1988, p. 144). In this case, *kore* is pluralized into *korera* and refers to each separate greeting. This process adds some difficulty to the reading process and therefore receives one difficulty point.

4.1.4. Tense.

Kuno (1973, p. 261) observed that there is a rule for tense agreement in English. Consider the following examples:

(19) When I asked him last year, he said, "I'll be finished soon.

In the reported form, this sentence would be:

(20) When I asked him last year, he said he would be finished soon.

It would not be:

(21) *When I asked him last year, he said he will be finished soon.

The same is true for relative clauses. Consider the following pair of sentences:

(22) John turned off the T.V. the children were watching.

(23) *John turned off the T.V. the children are watching.

Clearly the first sentence is grammatical but the second is not. According to Kuno (ibid.), such rules for tense agreement do not apply in Japanese. In Japanese, if the tense of a relative clause is present, then it is possible that the action of the verb in this clause takes place at the same time as that in the main clause (see sentence (9) below). If the tense of the relative is past, then the action takes place before that of the main clause (see sentence 2 below). Without a knowledge of this basic relationship in Japanese, sentence comprehension is made more difficult. An example of this is sentence 6 of "*Aruke Orinpikku*":

(2) *Yokkakan arukitooshita mono ni kanpo no shoosho to medaru ga ataerareru dake da.*

'It's just that a certificate of completion and a medal are given to those who last the distance over four days.'

The relative clause *yokkakan arukitooshita* 'continued to walk for four days' has its verb *arukitooshita* in the past tense, which means the medal and certificate are awarded after completing the event.

Another example is sentence 3 of the same article:

(9) *Nimannin o koeru sekai kakkoku no hitobito ga kono machi Neimeehen ni atsumatte, aruku.*

'More than 20,000 people from various countries throughout the world gather in the town of Nijmegen and walk.'

The relative clause *nimannin o koeru* 'exceed 20,000 people' has its verb *koeru* 'exceed' in the present tense which means 20,000 are gathered for the walk while it is taking place.

4.1.5. Words per Sentence.

This is a rather superficial measurement of sentence difficulty since it does not take into account complexity in grammar or vocabulary. However, it is a correct generalization to say that complex sentences tend to be long, so perhaps sentence length in itself can be used as a heuristic guide to grammatical complexity. This is not to say that it is an infallible guide but can only serve as a rough approximation of difficulty. In order to count words in Japanese, judgments have to be made on where to determine

word boundaries. Japanese sentences are normally written with no spaces between the words. In this dissertation, the words will be divided up according to the rules found in Martin (1988, pp. 16-17). When these passages are divided up according to these conventions, the average number of words per sentence in "*Aruke Orinpikku*" is 9.97 while in "*Hoogen to Kyootsuugo*" it is 21.27 (see section 4.3).

4.1.6. Noun Head Modification.

This section covers the modification of nouns by other nouns and adjectives. There are differences in noun modification between English and Japanese. In Japanese, modifiers precede the noun head they modify while in English they come either in front of (adjectives, demonstrative adjectives, etc.) or after (relative clauses) the head. Consider sentence number 1 of "*Aruke Orinpikku*" as an example:

(10) *Mainen oranda no chiisa na machi de ooki na moyooshi ga okonawareru.*

'In a small town in Holland, a big event is held every year.'

The noun phrase *oranda no chiisa na machi* 'a small town in Holland' is analyzed as follows: *(oranda no) (chiisa na machi)*. The particle *no* indicates the modification of the noun *machi* 'town' by the noun *oranda* 'Holland' and *na* indicates that the adjective stem *chiisa-* 'small' modifies the noun *machi*. Here *no* indicates the locative genitive

(Martin, 1988, p. 259). As indicated above, the translation of this phrase is 'a small town in Holland'. In English, the head noun 'town' is modified by the adjective 'small' which comes in front of it and by the prepositional phrase 'in Holland' which comes after it. This difference in word order makes it more difficult for English-speaking L2 readers of Japanese. The modifier in the noun phrase *ooki na moyooshi* 'big event' is the adjective *ooki na* 'big'. Here *na* indicates that the adjective stem *ooki* 'big' modifies the noun *moyooshi* 'event'.

In the evaluation of difficulty, points are awarded on the basis of how many modifiers there are. If there is only one modifier, then no points are awarded. If there are two, then one point is awarded. If there are three, then two points are awarded and so on. In the case of modifiers the general formula for awarding points is:

$$p = m - 1$$

where p equals the number of points awarded and m equals the number of modifiers. The same is true for the coordinating conjunction *to* 'and': two or more coordinating conjunctions will be awarded points in the same fashion.

Another example of noun head modification is sentence number 6 of "*Aruke Orinpikku*":

(2) *Yokkakan arukitooshita mono ni kanpo no shoosho to medaru ga ataerareru dake da.*

'It's just that a certificate of completion and a

medal are given to those who last the distance over four days.'

In the noun phrase *kanpo no shoosho to medaru* 'a certificate of completion and a medal', actually two noun phrases are conjoined by *to* 'and': *kanpo no shoosho* 'certificate of completion' and *medaru* 'medal'. The *no* which serves to mark the attributive genitive (ibid.) indicates that *kanpo* 'completion' modifies *shoosho* 'certificate'. Note that in this Japanese phrase, the modifier *kanpo no* precedes the noun head *shoosho* and that in the corresponding English phrase 'a certificate of completion', the modifier follows the noun head. This difference adds difficulty to the task that an English-speaking reader of this Japanese text has in comprehending it.

Nouns can also be conjoined without the use of the connective *to*. An example is sentence 28 of "*Aruke Orinpikku*":

(24) "Walk" to iu senmon zasshi mo dete iru.

'There is now a special magazine, "Walk".'

The noun phrase *senmon zasshi* 'specialty magazine' combines two nouns without the connector *to*. This fact needs to be taken into account when considering difficulty.

4.1.7. Conjunctions.

This section is a consideration of sentence level conjunctions which connect two or more sentences on an equal basis. Because of this, one sentence is not seen as embedded

in the other. These conjunctions can be either coordinative (and), sequential (then), disjunctive (or), consequential (therefore), adversative (but), corrective (on the contrary), or explanatory (that is) (Martin, 1988, pp. 817-819).

An example of a sentence-level conjunction is contained in sentence number 10 of "*Aruke Orinpikku*":

(25) *Suru to, nenpai no josei ga susumidete itta.*

'Then an old woman came forward.'

The sequential connective is *suru to* 'then' connecting sentence 10 with 9:

(26) *Hajimete sanka shita toki, nakama to issho ni "faito, faito" to kowadaka ni sakende aruita.*

'The first time he participate, he shouted with other participating Japanese, "Fight! Fight!"'

This connective adds difficulty to the understanding process because the reader needs to be aware of what happened in the previous sentence and relate it to the present one.

An example of a consequential connective is sentence 3 in "*Hoogen to Kyootsuugo*":

(27) *Sore de, hitobito wa, tagai ni jiyuu ni ikiki suru koto ga muzukashikatta.*

'So it was difficult for people to freely associate with each other.'

The connective is *sore de* 'so' relating this sentence to the previous, sentence 2 of this text:

(3) *Nihon no chisei wa yama ya kawa ga ooku, motomoto kootsuu ni fuben de aru ue, mukashi wa, nihyaku suujuu mo no daimyoo no ryoochi ni wakarete seiji ga okonawarete ita.*

'As for Japan's physical geography, in addition to there being a lot of mountains and rivers naturally making it difficult for transportation, in former former times, Japan was divided into 200 to 300 fiefs owned by feudal lords and administered.'

Sentence 13 of "*Aruke Orinpikku*" contains an example of an adversative particle which serves as a sentence-level connective:

(28) *Ganbarou to iikikaseru karui chooshi no "faito" datta ga, Kaneko san wa "We don't want to fight" to iu kotoba ni komerareta mono o sasshite, fukaku atama o sageta.*

'It was a light "Fight!" calling on people to exert an effort, but Kaneko realized the thinking behind the words, "We don't want to fight," and hung his head in shame.'

The particle *ga* 'but' connects both parts of the sentence, and it is up to the reader to interpret the two parts in a way that preserves the contrast.

Each of these connectives is worth 1 point since the reader has to relate different parts of the reading to make sense of the passage.

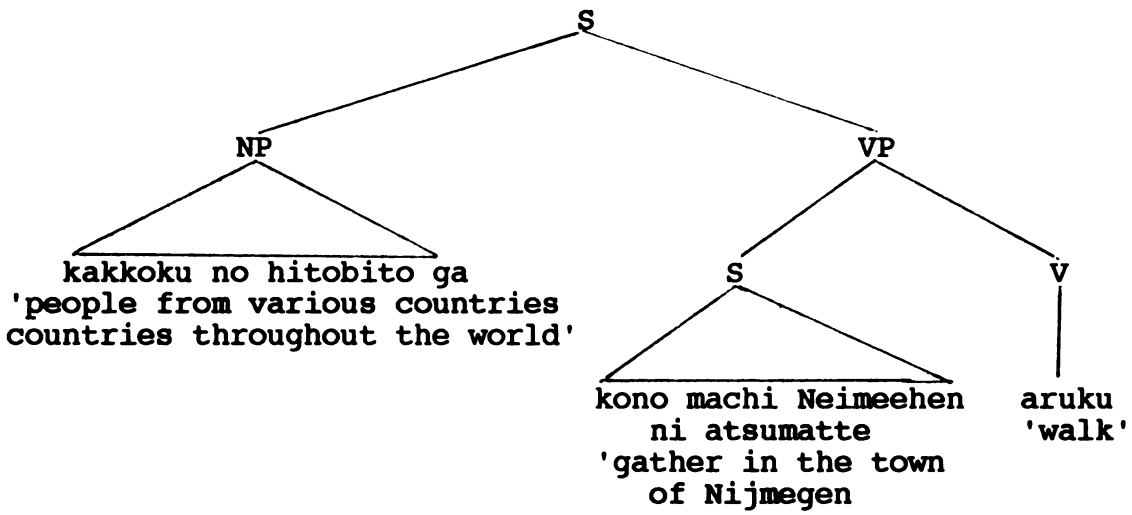
4.1.8. Subordinators.

Subordinators are used to embed one or more clauses in a sentence. Examples of subordinators would be : *no ni* 'although', *kara* 'because', *-te kara* 'after', *no de* 'because', *ba* 'if', *tame ni* 'for the purpose of', *to* 'when', and *-nagara* 'while'. An example of embedding using the subordinating connector, *te*, is sentence 3 of "*Aruke Orinpikku*":

(9) *Nimannin o koeru sekai kakkoku no hitobito ga kono machi Neimeehen ni atsumatte, aruku.*

'More than 20,000 people from various countries throughout the world gather in the town of Nijmegen and walk.'

This sentence has the following constituent structure:



The verb of the embedded clause is in the gerundive form, *atsumatte*, of the verb *atsumaru* 'gather'. Certainly an embedding pattern like this adds more difficulty to the reading process because an embedded clause must be processed within the matrix sentence.

An example of the subordinator *no de* 'because' is shown by sentence 26 of "*Aruke Orinpikku*":

(29) *Mainen no koto na no de, juumin to sankasha wa en de musubareru to iu.*

'Since it is an annual event, (they) say that the residents and participants are strongly tied together.'

The clause *mainen no koto na no de* 'since it is an annual event' is embedded in the sentence thus making it a more involved structure to process.

Another example of the use of a subordinator is sentence number 19 from the same passage:

(30) *Gunka o utainagara heitai ga aruku.*

'Soldiers walk while singing military songs.'

In the clause *gunka o utainagara* 'singing military songs', the stem form *utai* of the verb *utau* 'sing' is combined with the subordinator *-nagara*. This subordination causes the reader to do some extra processing.

Another structure involving verb sequencing brings about a form of embedding through subordination. Examples of verb sequencing are: *-te kuru* 'motion towards the speaker', *-te iku* 'motion away from the speaker', *-te miru* 'try and find out (something)', *-te shimau* 'to finish (something)', *-te morau* 'the speaker receives (the favor of doing something) from an equal or inferior', *-te itadaku* 'the speaker or someone who belongs to the speaker receives (the favor of doing something) from a superior', *-te kureru* 'something is done for the speaker or someone who belongs to the speaker by someone equal or inferior', *-te kudasaru* 'something is done for the speaker or someone who belongs to the speaker by someone superior', *-te ageru* 'the speaker gives (does the favor of doing something) to an equal or superior', and *-te*

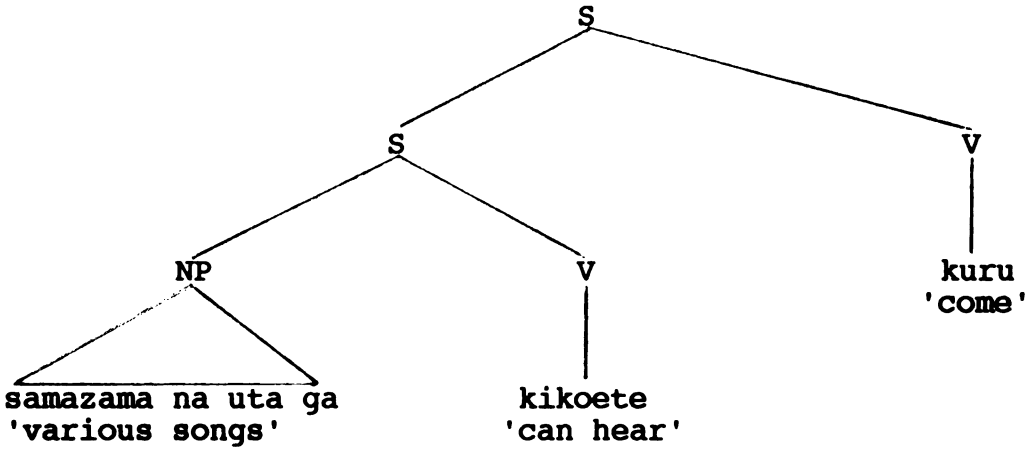
yaru 'the speaker gives (does the favor of doing something) to an inferior'.

The meanings of the verb sequences *-te kuru* and *-te iku* vary according to the situation and the point of view of the speaker. Sentence 18 from "*Aruke Orinpikku*" has an example of this form of sequencing:

(31) *"Kiiroi ribon," "Oosuzanna," "Moshi, moshi kame yo" to samazama na uta ga kikoete kuru.*

'Various songs, such as "Tie a Yellow Ribbon," "Oh, Suzanna," and "Moshi, Moshi Kameyo", can be heard.'

Ignoring the quoted material, this sentence has the following constituent structure:



The gerundive *kikoete* is embedded within the matrix sentence which makes processing more difficult in this complex sentence. The verb *kuru* expresses the fact that the sound of the music comes towards the speaker.

This same passage contains an example of the use of *-te kureru* 'something is done for the speaker or someone who

belongs to the speaker by someone equal or inferior'. Consider sentence number 25:

(32) *Kuroobaa no hanataba o okutte kureru shoojo mo iru.*

'There are girls who present (the walkers) with clover bouquets.'

This clause *kuroobaa no hanataba o okutte* 'present clover bouquets' is contained within the relative clause "kurooba no hanataba o okutte kureru." ('who present (the walkers) with clover bouquets') which modifies the head noun "shoojo" ('girl'). Again this requires additional processing on the part of the reader.

All the cases of subordination receive a point because of the embedding involved.

4.1.9. The Passive.

Case provides further insight into readability. Agents which are subjects are generally more prominent. The passive construction acts to reduce this prominence by moving the agent out of the subject position. Sentence 6 from "*Aruke Orinpikku*" illustrates this:

(2) *Yokkakan arukitooshita mono ni kanpo no shoosho to medaru ga ataerareru dake da.*

'It's just that a certificate of completion and a medal are given to those who last the distance over four days.'

The phrases *kanpo no shoosho* 'a certificate of completion' and *medaru* 'medal' are not the agents but the undergoers in this sentence. As can be seen, there are no specific agents

indicated explicitly in this sentence. As a result, the agent has been moved out of its expected primary position. In other words, it has been 'disowned', which can make it more difficult for the reader to process the sentence. Thus, a point is added for the passive.

4.1.10. Causative.

The causative construction introduces a new case role, the instigator (the causer), into a sentence (Martin, 1988, p. 292). In the case of transitive verbs, the instigated or the underlying agent (the causee), is marked by the particle *ni* (ibid., p. 293). In the case of intransitive verbs, the causee is marked by the particle *o* in the coercive case and by the particle *ni* in the non-coercive case (ibid.). This introduction of a new case role (the instigator or causer) leads to reading difficulty. An example of a transitive verb in the causative is the following:

(33) ***Haha*** *ga* *kodomo ni* *hoorensoo o*

mother nom. particle child agent spinach acc. particle

tabesaseta.

be made to eat

'The mother had/made her child eat spinach.'

In this case *haha* 'mother' is the causer, *kodomo* 'child' is the causee, and *hoorensoo* 'spinach' is the object. An example involving an intransitive verb is the following:

(34) ***Haha*** *ga* *musume* *o* *soko* *e*

mother nom. particle daughter acc. particle there to

ikaseta.

be made to go

'The mother made her daughter go there.'

Here *haha* 'mother' is the causer and *musume* 'daughter' is the causee. Here coercion is expressed. The corresponding non-coercive of this sentence would be:

(35) ***Haha*** *ga musume ni soko e ikaseta.*

'The mother let her daughter go there.'

The causative can also be used to express the permissive (let...). An example is the following sentence:

(36) *Kikasete kudasai.*

let hear give

'Let (me) hear.'

In "*Aruke Orinpikku*", there is one example of the use of the causative:

(37) *Kuroi hada o kagayakaseta musume-san*

tanned skin acc. particle let shine girls-honorific

ga aruku.

nom. particle walk

'Girls with glistening tanned skins walk.'

The head noun *musumesan* 'girls' for the relative clause *kuroi hada o kagayakaseta* 'making tanned skin shine' serves as the causer for the corresponding causative sentence:

(38) *Musumesan ga kuroi hada o kagayakaseta.*

'The girls let their tanned skins shine.'

Kuroi hada functions as the nonvolitional causee for the sentence. In the causative construction, the nonvolitional causee is followed by the particle *o* (Shibatani, 1976, p. 255). This causative construction expresses the permissive. The real difficulty for the reader is determining the case relation of *musumesan* to the relative clause in view of the fact that the verb of the relative clause is causative.

One point is added when the causative occurs because of the difficulties it introduces into case roles.

4.1.11. Verb Compounding.

Verb compounding occurs when two verbs are brought together with the first verb in the stem form. A verb compound occurs in sentence number 6 of "*Aruke Orinpikku*":

(2) *Yokkakan arukitooshita mono ni kanpo no shoosho to medaru ga ataerareru dake da.*

'It's just that a certificate of completion and a medal are given to those who last the distance over four days.'

The verb under consideration is *arukitooshita* 'continued to walk' which is analyzed as follows:

aruki	+	*tooshita*
walk		continued

The form *aruki* is the stem form of the verb *aruku* 'walk'. The second verb *tooshita* is the past tense form of the verb *toosu* 'continue'. Such a combination can cause difficulty since the reader has to be familiar with the two verb forms and how their forms and meanings fit together. As a result, 1 point is added whenever this construction occurs.

4.1.12. Quotations.

Quotations lead to sentence embedding and therefore make sentence processing more difficult for the reader. Quotations are marked by the quotation particle *to*. Furthermore, quotations need not be direct but can be reported or indirect speech. An example of indirect speech is sentence number 11 of "*Aruke Orinpikku*":

(39) "*Naze tatakaou to iu no.*"

why let's fight quotation particle say nominalizing particle

"Why do you talk about fighting?"

The embedded clause is *tatakaou* 'let's fight.' with the verb in the volitional form. The reader needs to recognize the volitional form in the embedded indirect quotation and integrate it with the rest of the sentence in order to comprehend it. The use of the nominalizing particle *no* means that the questioner is asking for an explanation about the use of the word "fight". The full form of the polite version of the question would be: *Naze tatakaou to iu no (desu ka).*

The form *no desu* is asking for an explanation from the person to whom the question is addressed.

An example of the *to iu* clause used for a direct quotation is in sentence 28 from the same passage:

(40) *"Walk" to iu senmon zasshi mo dete iru.*

'There is now a special-interest magazine, "Walk"'

The clause *'Walk' to iu* 'called walk' defines the name of the *senmon zasshi* 'special-interest magazine'. Difficulty is caused by the reader having to relate *'Walk'* to *senmon zasshi* as the title of the magazine. The clause *'Walk' to iu* ' is a form of the relative clause (see section 4.1.13 below). The fact that this clause comes first is the reverse of the English order which would be: 'a special-interest magazine called "Walk"'. This reversal of expected word order for speakers of English adds to the reading difficulty, and 1 point is added.

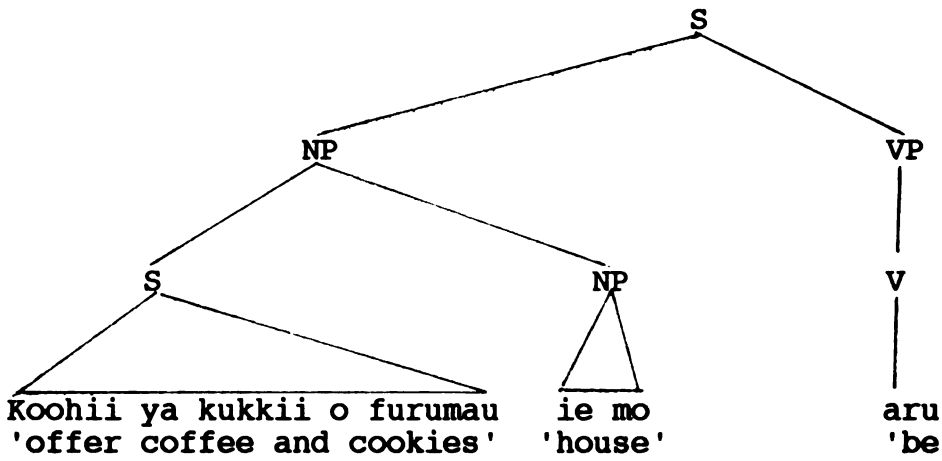
4.1.13. Relative Clauses.

Relative clauses are a cause of difficulty in reading Japanese. There are differences between Japanese and English in the position and structure of relative clauses. Whereas in Japanese relative clauses come before the head noun, in English they come after the head noun. English employs relative pronouns but Japanese does not. These differences cause reading difficulties for English-speaking readers of

Japanese as a second language. An example of these differences is sentence number 24 of "*Aruke Orinpikku*":

(41) *Koohii ya kukkii o furumau ie mo aru.*

'There are families which treat (walkers) to coffee and cookies.'



The relative clause *koohii ya kukkii o furumau* 'which treat (walkers) to coffee and cookies' precedes the head noun *ie* 'house' and does not have a relative pronoun. Also, the argument in the relative clause corresponding to the head noun is missing. These differences with English cause difficulty for English-speaking readers of Japanese.

Another example of a relative clause is found in sentence 7 of "*Hoogen to Kyootsuugo*":

(42) *Fudan yoku tsukau aisatsu no kotoba o mite miyoo.*

'Let's look at words that are ordinarily well-used for greetings.'

The relative clause is *fudan yoku tsukau* 'that are ordinarily well-used' which precedes and modifies the noun phrase *aisatsu no kotoba* 'words of greeting'.

In conclusion, the fact that relative clauses create embedding constitutes a source of difficulty for readers. Additional difficulty is created by the fact that Japanese relative clauses precede the noun head and have no relative pronouns to mark their presence. Another source of difficulty for relative clauses is tense as explained in section 4.1.4. Thus, 1 point is added whenever a relative clause occurs.

4.1.14. Hedges.

Sentence 22 in "*Aruke Orinpikku*" contains a hedge *kamoshirenai* 'maybe':

(43) *Orinpikku no seishin wa honke yori mo kochira ni uketsugarete iru no kamoshirenai.*

'The real spirit of the Olympic Games may have been preserved more in this (four days' march) than in the Olympics itself.'

The verb *kamoshirenai* adds a hedge to the statement about the real spirit of the Olympic Games which requires the reader to do further processing, thus adding to the difficulty.

Another hedge is *daroo* 'perhaps or probably' which appears in sentence 32 in the same passage:

(44) *Arukitsuzukeru riyuu wa samazama da ga, aruki no shinzui wa yahari, aruku koto o tanoshimu koto daroo.*

'There are various reasons for continuing to walk, but essence of walking is in its enjoyment.'

In this sentence, the author is expressing his opinion with a certain tentativeness, a nuance which the reader needs to understand and so 1 point is added.

4.1.15. Further Embeddings.

This classification covers cases not included in the above. In such cases, a point is added. A further example of an embedding involves the particle *dake* 'only'. The following is an example from "*Aruke Orinpikku*":

(2) *Yokkakan arukitooshita mono ni kanpo no shoosho to medaru ga ataerareru dake da.*

'It's just that a certificate of completion and a medal are given to those who last the distance over four days.'

The embedded clause is *Yokkakan arukitooshita mono ni kanpo no shoosho to medaru ga ataerareru* 'A certificate of completion and a medal are given to those who last the distance over four days'. In this case, "dake" follows the embedded clause and adds a nuance of "so much and no more" to the action of the clause (Alfonso, 1966, p. 712).

4.1.16. Comparatives.

The way comparisons are structured in Japanese is different from English. The comparison particle in Japanese is *yori* 'than'. An example is the following sentence 22 from "*Aruke Orinpikku*":

(45) *Orinpikku no seishin wa honke yori mo kochira ni uketsugarete iru no kamoshirenai.*

'The real spirit of the Olympic Games may have been preserved more in this (four days' march) than in

the Olympics itself.'

An analysis of this sentence is as follows:

Orinpikku no *seishin wa* *honke*

Olympic possessive particle spirit topic particle originator

yori mo kochira ni uketsugarete iru

than this place in has been preserved

no *kamoshirenai.*

complementizer may be

The phrase *honke yori* 'than the originator (referring to the Olympics)' is the point of comparison with the "Four Days' March". The particle *mo* after *yori mo* emphasizes the comparison. In contrasting Japanese with English, *yori* comes after what is being compared (in this case, 'the Olympics') whereas in English "than" comes before it ('than in the Olympics'). This difference with English makes the comparison difficult to read. The occurrence of a comparative adds 1 point.

4.1.17. Rhetorical Structure.

Discourse constraints also affect the comprehensibility of a Japanese text. The texts that are being discussed here are expository in nature. As mentioned in chapter 2, section 2.1., John Hinds (1983a, p. 188) stated that the basic organization of rhetorical structure for Japanese is *ki-shoo-ten-ketsu* where *ki* means 'beginning', *shoo* 'support', *ten* 'change', and *ketsu* 'conclusion'. The *ki* begins the topic,

the *shoo* develops it, the *ten* moves off the track of the topic to a related area, and the *ketsu* ties everything together in the form of a conclusion. However, this is not a conclusion in the shape of a summary but in terms of a global statement that brings the argument to a new level. According to Hinds, this style is neither deductive (a thesis statement followed by arguments to back it up) nor inductive (a series of arguments leading up to a thesis statement), but rather "quasi-inductive" which "has as its purpose the task of getting readers to think for themselves, to consider the observations made, and to draw their own conclusions" (1990, pp. 99-100). A quasi-inductive style in Japanese appears to lack coherence to an English-speaking reader although to the Japanese native speaker it is perfectly natural. This point of view merely assumes that the reader will take a more active role in getting comprehensible meaning out of a passage.

The passage "*Aruke Orinpikku*" exhibits the *ki-shoo-ten-ketsu* pattern (refer to Appendix A to see the passage). The sentence, *Mainen, oranda no chiisa na machi de, ooki na moyooshi ga okonawareru.* 'In a small town in Holland, a big event is held every year.' introduces the topic and begins the *ki*. The *shoo* starts at the third sentence, *Nimannin o koeru sekai kakkoku no hitobito ga kono machi Neimeehen ni atsumatte, aruku.* 'More than 20,000 people from various

countries throughout the world gather in the town of Nijmegen and walk.' and develops the topic further. The *ten* is introduced by sentence 27, *Ima Nihon dewa, aruki no aikoosha ga gekizoo shi, yaku kyuuhyakuman to mo iwarete iru.* 'In Japan today those who like to walk have increased dramatically and are said to number about 9 million.' The *ten* moves the subject of the passage to the popularity of walking in Japan. Finally the *ketsu* is expressed by the concluding sentence, *Tanoshiminagara arukeba, kaze no iro ga miete kuru.* 'If you walk while enjoying it, you can see the color of the wind.' This is not the kind of conclusion that would appear in an English composition, which tends to be a summary of the topic and its development. The *ketsu* functions to move the topic to a whole new level. In this case, the theme of walking is given a poetic nuance. English expository writing tends to be organized around a central thesis with each subtopic supporting the thesis statement and with the conclusion summing up the argument. English rhetoric does not employ a *ten* or an abrupt change (Hinds, 1983a, p. 188). An English-speaking reader while reading a Japanese expository composition would sense a certain lack of focus, perhaps making comprehension more difficult. Another potential troublesome point for English-speaking readers of Japanese is the conclusion. A poetic nuance would perhaps be hard to pick up. As can be seen from these observations,

Japanese rhetorical structure in itself can create problems for comprehension on the part of readers who come from differing rhetorical backgrounds.

This same *ki-shoo-ten-ketsu* pattern can be found in "*Hoogen to Kyootsuugo*" (refer to Appendix A to see the passage). The *ki* begins with the first sentence, *Nihon wa, kuni ga semai wari ni, tochi ni yoru hoogen no chigai ga ookii.* 'For a small country, Japan has large differences in its geographical dialects.' and introduces the topic, Japanese dialects. The second sentence begins the *shoo, Nihon no chisei wa yama ya kawa ga ooku, motomoto kootsuu ni fuben de aru ue, mukashi wa, nihyaku suujuu mo no daimyoo no ryoochi ni wakarete seiji ga okonawarete ita.* 'As for Japan's physical geography, in addition to there being a lot of mountains and rivers naturally making it difficult for transportation, in former times, Japan was divided into 200 to 300 fiefs owned by feudal lords and administered.' This sentence begins an explanation of the reason for diversity in geographical dialects. The *ten* starts at sentence 6, *Konnichi de mo, sono tochitochi no hoogen wa, mainichi no seikatsu no naka de ikiiki to tsukawarete iru.* 'Even today, the dialect of each area is being used vividly in the middle of everyday life.' Here the topic changes to a comparison between dialects using some language data. The *ketsu* is expressed by the final sentence, *Nazenara, hoogen wa, sono*

tochi no seikatsu ya rekishi to fukai tsunagari ga ari, kazokudooshi tomodachidooshi, tochi no hitodooshi ga kutsuroida hanashi o suru toki ni wa, shizen ni kuchi o tsuite dete kite, tagai ni yoku kimochi o tsuujiau koto ga dekiru mono dakara de aru. 'The reason for this is a dialect has a close relation with the life and history of the local area, so when family, friends, and people of that region engage in relaxed conversation, the dialect just rushes out naturally and is able to mutually convey emotion.' The *ketsu* takes the discussion of dialects to a whole new level by talking about their cultural meanings. In the eyes of English speakers, this passage could be seen as lacking cohesion. Again, in Japanese, it is up to the reader to put everything into a coherent whole.

4.1.18. The Difficult Kanji in a Passage.

Japanese text is written in both kana (hiragana and katagana) and *kanji*. If more difficult Chinese characters are used in a text, the passage becomes more difficult since readability is directly related to the number of difficult *kanji* in a passage. The level of difficulty of Chinese characters is measured in terms of frequency of use. I am judging the degree of difficulty of *kanji* based upon my own experience as a learner of Japanese. In each of these passages, each difficult *kanji* is worth one point. The

difficult *kanji* are underlined in the passages given at the end of this chapter.

4.1.19. Vocabulary.

Vocabulary is a strong predictor in determining the difficulty of a passage. Within the domain of vocabulary, there are several levels of difficulty (Lado, 1972, pp. 275-288). First of all, words that are very similar in form and meaning in both English and Japanese are easy to read and understand. These words enter the language as the result of borrowing. In particular, words of foreign origin in Japanese are written in katakana so that words borrowed from English are easy to spot for English-speaking readers. Examples from "*Aruke Orinpikku*" (refer to Appendix A to see the passage) are *orinpikku* 'Olympics' in the title, *oranda* 'Holland' in sentence 1, *foodeezu maachi* 'four days' march' in sentence 2, or *koohii* 'coffee' and *kukkii* 'cookie' in sentence 24. Secondly, words that are similar in form but different in meaning in English and Japanese are a little more difficult but do not constitute major difficulty. An example of such a word is *faito* 'fight' which is used in sentences 9 and 13 in the same passage. For the Japanese who were walking, saying *faito* was just a way to encourage one another not to give up. For Americans, or perhaps even the Dutch, to use this word while walking would be out of place. It is certainly something cheerleaders would say during a

basketball or football game, but it is not something participants would say in a walking event. Consequently, there are differences in the meaning of the word 'fight' in Japanese and English. Such differences make understanding a little more difficult. Thirdly, words that are of normal difficulty have similar meanings but are different in form. An example of this would be the word *sekai* in sentence 3 of "*Aruke Orinpikku*". Both *sekai* and 'world' have similar meanings, so the reader just needs to learn the Japanese word form for 'world'. An example of this from "*Hoogen to Kyootsuugo*" (refer to Appendix A to see the passage) would be the word *semai* found in sentence 1. *Semai* is similar in meaning to the English word 'narrow', so all the reader has to do is remember the form of the Japanese word for 'narrow'. The above cases range from a low level to a moderate level of difficulty, so no points are awarded in these cases.

A more serious source of difficulty is the use of idioms. One example of the idiomatic use of language is found in sentence 26 of "*Aruke Orinpikku*":

(46) *Mainen no koto na no de, juumin to sankasha wa <u>en de musubareru</u> to iu.*

Since it is an annual event, (they) say that the residents and participants are strongly tied together.'

The phrase in question is *en de musubareru* 'to be tied by connection', which means the participants are "knit" together in a common bond. Such an idiomatic usage is very hard for

readers of Japanese as a second language to understand, so it will be given one point. Another example of idiomatic usage is in sentence 21 in the same passage:

(47) *Ryukku o se ni shita roojin ga aruku.*

'An old man with a knapsack on his back walks.'

The phrase *se ni suru* meaning 'put on the back' has the following literal meaning:

se ni suru

back on do

'put on the back'

Deriving the idiomatic meaning from this phrase will add difficulty to the passage, so it is worth one point.

Another source of difficulty is word frequency. Less frequent words are simply more difficult because readers are not exposed to them as often and are, therefore, less familiar with them. An example is the word mentioned above, *en* 'connection'. Intermediate level university students tend not to be familiar with this word. On top of that, the word is written in its *kanji* form in this passage, a Chinese character which is probably not familiar to students.

This has been a discussion of some of the major categories of difficulty when considering vocabulary. In the passages in Appendix A, the difficult vocabulary items are marked in bold face with each one worth one point. As I did in judging the degree of difficulty of Chinese characters, I

am evaluating the degree of difficulty of vocabulary based upon my own experience as a learner of Japanese.

4.1.20. Cultural Assumptions.

The subject matter of the passages used in this study is not difficult or technical, so passage content generally does not cause any trouble for the readers of these passages. However, with respect to "*Aruke Orinpikku*", a knowledge of Japanese culture would help the reader understand the incident where the woman complained about the use of "fight". For Japanese, the use of the word "fight" is not unusual while walking or running in groups. Such a usage helps to synchronize the activity and also functions as an encouragement. It is like being your own cheerleader. In this case, a cultural knowledge of Japan would discourage a literal interpretation of this word but would interpret the use of this word as functioning to convey some sort of encouragement. In connection with this incident, sentence 13 in this passage indicates that as a result of the woman's criticism Mr. Kaneko "hung his head". This would indicate a loss of face on his part. A knowledge of this aspect of Japanese culture would also aid in understanding Mr.Kaneko's reaction to this event.

With respect to "*Hoogen to Kyootsuugo*", a cultural understanding would help the reader understand that *Aomori* and *Kagoshima* refer to names of prefectures in Japan and

furthermore that *Aomori* is in the far north and *Kagoshima* is in the far south. Therefore, it is reasonable to expect that people from these two respective regions would have different cultural traditions and also would have trouble understanding each other, given the fact that these two regions are so far apart, thus making communication between the two difficult in former times when transportation was an arduous task. Each name is worth one point of difficulty.

4.2. The Evaluation of Two Texts. In the light of the twenty features listed above, the two texts, "*Aruke Orinpikku*" ("Walking Olympics") and "*Hoogen to Kyootsuugo*" ("Dialects and the Common Language"), were evaluated as to their level of difficulty. Potential grammatical problem areas in the sentences of these passages were indicated by the number of the category which was affected. Potential problem areas with respect to vocabulary, Chinese characters, rhetoric, and culture were also indicated. After each sentence was evaluated for problem areas, the total number of points for that sentence were added up. After all the sentences of each passage were evaluated, the total difficulty for each passage was then calculated.

To understand how the passages were analyzed, the following information is important: the numbers below the lines equal the number for the category of the grammatical difficulty (each difficulty = 1 point); bold-face type

indicates a vocabulary problem (each problem = 1 point); underlining indicates a problem with a Chinese character (each problem = 1 point); and brackets ([...]) indicate a problem with an idiom (each idiomatic construction = 1 point).

For ease of reference, the following is a repetition of the list of the grammatical categories used in the analysis (the same list as in chapter 3, section 3.1):

Syntax.

1. Homophonous particles.
    a. *ni* marking benefit, goal, locative, purpose, result, the agent, or the indirect object.
    b. *to* marking the conjunctive or the comitative.
    c. *o* marking the direct object or the place traversed.
    d. *no* indicating the locative genitive or the objective genitive.
    e. *mo* meaning 'also', 'even', or 'as much as'.
2. Nominalizers -- *koto* and *no*.
3. Anaphora.
4. Tense.
5. Words per sentence.
6. Noun head modification.
7. Conjunctions.
8. Subordination.
9. Passive.

10. Causative.

11. Verb complexes -- verb compounding.

12. Quotations -- Quoted material comes before the quotation particle *to*.

13. Relative clauses.

14. Hedges.

    a. *kamoshirenai* 'maybe'.

    b. *daroo* 'perhaps, probably'.

15. Further embeddings.

16. Comparatives.

Discourse.

17. Rhetorical structures.

Vocabulary.

18. The percentage of *kanji* in a passage.

19. Vocabulary.

    a. Form-meaning relationships between English and Japanese.

        1) Words similar in form and meaning.

        2) Words similar in form but different in meaning.

        3) Words different in form but similar in meaning.

    b. Idioms.

Culture.

20. Cultural assumptions.

As an example of how a sentence is analyzed, consider sentence 26 from "*Aruke Orinpikku*":

(46) *Mainen no koto na no de, juumin to sankasha wa en de musubareru to iu.*

Since it is an annual event, (they) say that the residents and participants are strongly tied together.'

This sentence would be analyzed as follows:

Mainen no koto na no de, ***juumin*** *to sankasha wa [<u>**en**</u> de*

8

*<u>**musu**</u>**bareru**] to iu.*

9 12

For this sentence, the numbers underneath indicate three hypothesized areas of grammatical difficulty involving: 1) subordination (category 8), 2) the passive (category 9), and 3) a quotation (category 12). Of course, what is difficult is considered in light of what is difficult for the subjects of this pilot study. The boldface type for the words ***juumin*** and ***en*** indicates difficult vocabulary, together contributing two points of difficulty with respect to vocabulary. Added to this vocabulary difficulty is the idiomatic phrase *[en de musubareru]* 'to be tied by connection', so there are a total of three vocabulary problems. *<u>En</u>* and *<u>musu</u>bareru* are underlined because in the Japanese text (see Appendix B to see the passage written in Japanese orthography) difficult Chinese characters are used for these words, so there are two points of difficulty with respect to Chinese characters. As can be seen, there are also 15 words in this sentence. Given this analysis, the results can be tabulated as follows:

Grammar = 3 points
Vocabulary = 3 points
Kanji = 2 points
Length = 15 words

Refer to Appendix A for a complete analysis of each sentence in both passages. Under each sentence, there is a tabulation of the results of the analysis. A discussion of the results of this analysis is in the next section.

4.3. The Results of the Evaluation.

4.3.1. The Results for "*Aruke Orinpikku*". The following is the summary of the data derived from the passages in this pilot study. The passage "*Aruke Orinpikku*" has a length of 329 words with an average sentence length of 9.97 words. The total number of problem points in the passage is 199. These problem points are broken down as follows:

1) The total number of grammar points is 85 which is the sum of all the grammatical problems in the passage. When the total number of grammar points (85) is divided by the total number of problem points (199) in the passage, grammatical problems constitute 42.71% of the possible errors. The index of grammatical difficulty is the result of dividing the grammar points (85) by the number of words in the passage (329). In this case, the index of grammar difficulty is .258.

2) The total number of vocabulary points is 49 which is the total of all the vocabulary problems. When this number is divided by the total problem points, vocabulary problems are 24.62% of the possible errors. When the vocabulary points (49) are divided by the number of words in the passage, then index of vocabulary difficulty comes to .149.

3) The total number of *kanji* points comes to 62. When this number is divided by the total problem points, *kanji* problems constitute 31.16% of the possible errors. The index of *kanji* difficulty is .188.

4) Rhetoric Points only amount to 2 points which comes to 1.01% of the possible errors. The index of rhetoric difficulty comes out to .006.

5) There is only 1 culture points which is 0.50% of the possible errors. The index of culture difficulty equals .003.

See Chart 1 for a pictorial comparison of the relative percentages of problems involving grammar, vocabulary, *kanji*, rhetoric, and culture. The total passage difficulty for "*Aruke Orinpikku*" is calculated by adding the total problem points (199) to the average sentence length (9.97) and then dividing that sum by the passage length in words (329), which results in an index of passage difficulty of 0.64.

Table 1 tabulates the above results. The numbers in boldface across the top indicate the 20 categories and the numbers along the sides indicate the sentence numbers. The row for totals directly below sentence 33 gives the totals for each category. Given these totals, it is possible to rank the grammatical categories to determine the order of their predicted influence on difficulty. The ranking for the grammatical categories in terms of magnitude of predicted influence is (excluding categories 5, 17, 18, 19, and 20) (see page 100):

	Category	Number of Problems
(1)	Subordination (8)	16
(2)	Relative clauses (13)	15
(3)	Quotations (12)	11
(4)	Passive (9)	9
(5)	Noun head modification (6)	7
(6)	Nominalizers (2)	6

Chart 1

Percentages of Predicted Problems in "Aruke Orinpikku"

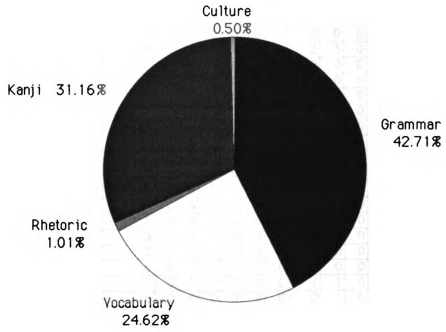


Table 1

					Aruke Orinpikku Problems															
										Categories										
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Sentence																				
1	0	0	0	0	11	1	0	0	1	0	0	0	0	0	0	0	0	1	1	0
2	0	0	0	0	11	0	0	0	2	0	0	2	0	0	0	0	0	0	0	0
3	1	0	0	0	14	1	0	1	0	0	0	0	1	0	0	0	0	1	1	0
4	0	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0	2	1	0
5	0	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0	2	1	0
6	0	0	0	0	13	1	0	0	1	0	1	0	1	0	1	0	0	2	3	0
7	0	0	0	0	11	0	0	0	0	0	0	0	0	0	0	0	0	0	2	1
8	0	0	1	0	16	0	0	0	0	0	0	0	0	0	0	0	0	3	1	0
9	0	0	0	0	15	0	0	1	0	0	0	1	1	0	0	0	0	3	2	0
10	0	0	0	0	8	0	1	1	0	0	0	0	0	0	0	0	0	2	2	0
11	0	1	0	1	5	0	0	0	0	0	0	1	0	0	0	0	0	1	0	0
12	0	0	0	0	7	0	0	0	0	0	0	0	0	0	0	0	0	1	2	0
13	0	0	0	1	24	1	1	1	1	1	1	2	3	0	0	0	0	4	2	0
14	0	2	0	0	12	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0
15	1	0	0	0	5	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0
16	1	0	0	0	5	0	0	0	0	0	0	0	0	0	0	0	0	2	1	0
17	0	0	0	0	4	0	0	1	1	0	0	0	0	0	0	0	0	0	1	0
18	0	0	0	0	14	0	0	1	0	0	0	1	0	0	0	0	0	1	1	0
19	0	0	0	0	6	0	0	1	0	0	0	0	0	0	0	0	0	4	1	0
20	0	0	0	0	7	0	0	0	0	1	0	0	1	0	0	0	0	1	1	0
21	0	0	0	0	8	0	0	0	0	0	0	0	1	0	0	0	0	2	3	0
22	1	1	0	0	13	0	0	0	1	0	1	0	0	1	0	1	0	3	3	0
23	0	0	0	1	15	0	0	2	0	0	0	1	1	0	0	0	0	2	2	0
24	0	0	0	0	8	0	0	0	0	0	0	0	1	0	0	0	0	0	1	0
25	0	0	0	0	9	0	0	1	0	0	0	0	1	0	0	0	0	1	1	0
26	0	0	0	0	15	0	0	1	1	0	0	1	0	0	0	0	1	2	3	0
27	0	0	0	0	16	0	0	1	1	0	0	1	0	0	0	0	0	4	2	0
28	0	0	0	0	7	0	0	0	0	0	0	1	1	0	0	0	0	3	0	0
29	0	0	0	0	6	0	0	0	0	0	0	0	1	0	0	0	0	3	3	0
30	0	0	0	0	8	1	0	0	0	0	0	0	1	0	0	0	0	5	4	0
31	0	0	0	0	5	1	0	0	0	0	0	0	0	0	0	0	0	4	2	0
32	0	2	0	0	17	0	1	0	0	0	1	0	1	1	0	0	0	2	2	0
33	0	0	0	0	8	0	0	3	0	0	0	0	0	0	0	0	1	0	0	0
Totals	4	6	1	3	329	7	3	16	9	2	4	11	15	2	1	1	2	62	49	1

Average sent. length =	9.97	Sum of problems =	199	
% of gram. problems =	42.71%	Σ of gram. prob. =	85	Grammar difficulty = .258
% of voc. problems =	24.62%	Σ of voc. prob. =	49	Vocabulary difficulty = .149
% of kanji problems =	31.16%	Σ of kanji prob. =	62	Kanji difficulty = .188
% of rhet. problems =	1.01%	Σ of rhet. prob. =	2	Rhetorical difficulty = .006
% of culture problems =	0.50%	Σ of culture prob.=	1	Cultural difficulty = .003
Index of Passage Difficulty =			.64	

(7)	Homophonous particles (1)	4
(8)	Verb complexes (11)	4
(9)	Tense (4)	3
(10)	Conjunctions (7)	3
(11)	Causative (10)	2
(12)	Hedges (14)	2
(13)	Anaphora (3)	1
(14)	Further embeddings (15)	1
(15)	Comparatives (16)	1

The categories of subordination (8) and relative clauses (13) are predicted to have the most influence on difficulty since they predict 16 and 15 problems respectively. Next comes quotations (12) with 9 problems, and so on. What this supports is that for this passage, subordination is a more important predictor of difficulty than conjunctions. These are predictions that need to be tested empirically, which will be done at a later stage in this pilot study.

4.3.2. The Results for "*Hoogen to Kyootsuugo*". The following is the summary of the data derived from an analysis of "*Hoogen to Kyootsuugo*". The total Passage Length is 234 words with the average sentence length of 21.27 words. The total number of problem points in the passage is 88. These problem points are broken down as follows:

1) The total number of grammar points is 54 which is the sum of all the grammatical problems in the passage. When the total number of grammar points (54) is divided by the total number of problem points (88) in the passage, grammatical problems constitute 61.36% of the possible errors. The index of grammatical difficulty is the result of dividing the grammar points (54) by the number of words in the passage (234). In this case, the index of grammar difficulty is .231.

2) The total number of vocabulary points is 22 which is the total of all the vocabulary problems. When

this number is divided by the total problem points, vocabulary problems are 25.00% of the possible errors. When the vocabulary points (22) are divided by the number of words in the passage, then index of vocabulary difficulty comes to .094.

3) The total number of *kanji* points comes to 8. When this number is divided by the total problem points, *kanji* problems constitute 9.09% of the possible errors. The index of *kanji* difficulty is .034.

4) Rhetoric Points only amount to 2 points which comes to 2.27% of the possible errors. The index of rhetoric difficulty comes out to .009.

5) There is only 2 culture points which is 2.27% of the possible errors. The index of culture difficulty equals .009.

See Chart 2 for a pictorial comparison of the relative percentages of problems involving grammar, vocabulary, *kanji*, rhetoric, and culture. The total passage difficulty is calculated by adding the total problem points (88) to the average sentence length (21.27) and then dividing that sum by the passage length in words (234), which results in an index of passage difficulty of 0.47.

Table 2 tabulates these results. As with Table 1, the numbers in boldface across the top indicate the 20 categories and the numbers along the sides indicate the sentence numbers. The row for totals directly below sentence 11 gives the totals for each category. Given these totals, it is possible to rank the grammatical categories to determine the order of their predicted influence on difficulty. The ranking for the grammatical categories in terms of magnitude of predicted influence is (excluding categories 5, 17, 18,

Percentages of Predicted Problems in "Hoogen to Kyootsuugo"

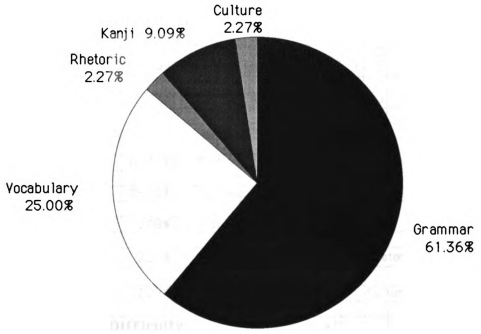


Table 2

Hoogen to Kyootsuugo Problems																				
								Categories												
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Sentence																				
1	0	0	0	0	15	0	0	0	0	0	0	0	2	0	0	0	0	0	2	0
2	1	0	0	0	31	1	0	2	2	0	0	0	1	0	0	0	0	4	6	0
3	0	1	0	1	13	0	1	0	0	0	0	0	0	0	0	0	0	0	1	0
4	0	1	0	0	15	0	1	0	1	0	0	0	1	0	0	0	0	0	1	0
5	1	1	0	1	37	2	0	2	0	0	1	1	0	0	0	0	0	2	3	2
6	1	0	0	0	18	1	0	0	1	0	0	0	0	0	0	0	1	0	1	0
7	0	0	0	0	9	0	0	1	0	0	0	0	1	0	0	0	0	0	0	0
8	0	0	0	0	21	1	0	0	0	0	0	2	2	0	0	0	0	0	0	0
9	0	0	0	0	13	1	1	0	0	0	0	0	1	0	0	0	0	0	0	0
10	0	0	1	0	15	2	0	0	0	0	0	0	0	0	0	0	0	0	1	0
11	1	1	0	0	47	2	1	5	0	0	0	0	3	0	0	0	1	2	7	0
Totals	4	4	1	2	234	10	4	10	4	0	1	3	11	0	0	0	2	8	22	2
Average sentence length					21.27		Sum of problems =					88								
% of gram. problems =					61.36%		Σ of gram. prob. =					54		Grammar difficulty =						.231
% of voc. problems =					25.00%		Σ of voc. prob. =					22		Vocabulary difficulty =						.094
% of kanji problems =					9.09%		Σ of kanji prob. =					8		Kanji difficulty =						.034
% of rhet. problems =					2.27%		Σ of rhet. prob. =					2		Rhetorical difficulty =						.009
% of culture problems =					2.27%		Σ of culture prob.=					2		Cultural difficulty =						.009
Index of Passage Difficulty =												.47								

19, and 20):

Category	Number of Problems
(1) Relative clauses (13)	11
(2) Noun head modification (6)	10
(3) Subordination (8)	10
(4) Homophonous particles (1)	4
(5) Nominalizers (2)	4
(6) Conjunctions (7)	4
(7) Passive (9)	4
(8) Quotations (12)	3
(9) Tense (4)	2
(10) Anaphora (3)	1
(11) Verb complexes (11)	1
(12) Causative (10)	0
(13) Hedges (14)	0
(14) Further embeddings (15)	0
(15) Comparatives (16)	0

The category of relative clauses (13) is predicted to have the most influence on difficulty since it predicts 11 problems. Next come noun head modification (6) with 10 problems and subordination (8) with 10 problems. Then comes homophonous particles (1) with 4 problems and so on. This says that for this passage, relative clauses are a more important predictor of difficulty than homophonous particles. These are predictions for this passage that need to be tested empirically at a later stage in this pilot study.

4.4. Summary. According to the features given above, the passage "*Aruke Orinpikku*" is more difficult than "*Hoogen to Kyootsuugo*". This can be seen from the following table of difficulty indices:

Table 3

	Aruke Orinpikku	*Hoogen to Kyootsuugo*
Grammar	.258	.231
Vocabulary	.149	.094
Kanji	.188	.034
Rhetoric	.006	.009
Culture	.003	.009
Passage Difficulty	.64	.47

In the areas of grammar, vocabulary, and *kanji*, the indices of difficulty predict that "*Aruke Orinpikku*" will be more difficult than "*Hoogen to Kyootsuugo*". Particularly, there is a large difference in the indices of *kanji* and vocabulary difficulty in these two passages. This would predict that a large measure of the difficulty between these two passages is predictable from the differential in *kanji* and vocabulary difficulty. Thus, passage difficulty is largely a function of *kanji* and vocabulary difficulty in the case of these two passages. However, other factors, such as linguistic complexity, should not be ignored since they, too, play a role in textual difficulty. Also, as explained above, average sentence length is incorporated into the calculation of passage difficulty. It is interesting to note that the average sentence length for "*Aruke Orinpikku*" (9.97) is shorter than that for "*Hoogen to Kyootsuugo*" (21.27).

However, "*Aruke Orinpikku*" is rated as more difficult by the index of passage difficulty. Also the index of grammar difficulty as given above would rate "*Aruke Orinpikku*" (.258) as more difficult than "*Hoogen to Kyootsuugo*" (.231). This would indicate that sentence length by itself is not necessarily a reliable predictor of passage difficulty. An empirical study needs to address these observations.

The above data also make certain predictions about the relative contribution of grammar, vocabulary, *kanji*, rhetoric, and culture percentage-wise to the total number of possible problem areas. The following table shows the percentages each area contributes to the total errors for each passage:

Table 4

	Aruke Orinpikku	*Hoogen to Kyootsuugo*
Grammar	42.71%	61.36%
Vocabulary	24.62%	25.00%
Kanji	31.16%	9.09%
Rhetoric	1.01%	2.27%
Culture	0.50%	2.27%

The following chapter discusses the results of an initial experimental pilot study to examine some of the above predictions. This experiment is preliminary to a computer

experiment which attempts to further investigate these issues.

CHAPTER 5

The Experiment To Assess Difficulty in Japanese Text

5.0. Introduction. The two passages, "*Aruke Orinpikku*" ("Walking Olympics") and "*Hoogen to Kyootsuugo*" ("Dialects and the Common Language"), will now be investigated as to their actual difficulty. In this pilot study, an experiment was conducted wherein the subjects circled or underlined the segments in the passage that they thought were difficult. This information was evaluated to give a preliminary assessment of the predictions that were made in chapter 4 (a further assessment of these predictions will be given as a result of the computer experiment in chapter 6). Furthermore, this experimental technique was critiqued as to its validity in assessing textual difficulty. The question of whether this experimental instrument measures what it is supposed to is discussed in this chapter. The purpose of this investigation is to facilitate the creation of reading software based on these two passages. In order to be effective, software must help students where they are actually having reading difficulty. This investigation was conducted to find these areas of actual difficulty, and thus help streamline the software design process. This software, along with teaching reading comprehension, will be able to

further evaluate reading difficulty in the process, thus providing a feedback mechanism for the evaluation of textual difficulty

The subjects in this pilot study were six third-year Japanese students at a large Midwestern University. They were told to circle or underline segments in these passages that caused difficulties in the five areas of grammar, *kanji*, vocabulary, rhetoric, or culture. They were asked not to distinguish between these areas of difficulty by the way they marked the segments because the distinction between these five areas was probably not clear in their minds. The contribution of these areas was evaluated by an interpretive analysis of the way the students marked the text. The students were not asked to mark the passages within a certain time period; however, they were finished within 25 minutes.

The passages themselves were presented in a typical Japanese format in vertical columns and no spacing between words. The characters were presented in large enough characters for the students to easily read and mark. Samples of the texts used for the experiment are presented in Appendix B.

The following is a discussion of how the experiment meets the predictions of the previous chapter. The original analysis is presented along with the experimental results for each sentence. The fact that this experiment did not fulfill

certain predictions does not imply that the predictions were bad. Perhaps, the experimental instrument for measuring them is inaccurate or invalid in certain ways. This issue is discussed further in this chapter along with a proposal for a better experimental instrument. The following is an analysis of experimental results for "*Aruke Orinpikku*" and "*Hoogen to Kyootsuugo*". The analysis is based on two calculations:

1) The first calculation is the percentage of predictions made in the previous chapter that were correct. This is called the prediction success rate.

2) The second calculation is the percentage of the actual problem areas as determined by this experiment that were successfully predicted. This is called the actual success rate.

By looking at these two types of success rates in combination, it is possible to acquire a comprehensive view of the accuracy of the predictions. The following passages, "*Aruke Orinpikku*" and "*Hoogen to Kyootsuugo*", were analyzed using these two types of success rates. It should also be noted that the numerical results of the student survey are printed in outline characters immediately above and below the sentences in section 5.1. The numbers printed in outline above the line indicate the number of students who had trouble with the particular Chinese character in question. The numbers in outline below the line indicate the number of students who had either problems with vocabulary or grammar. Sometimes, the distinction between grammar and vocabulary

problems is not so clear due to the fact that they are marked the same way in this experimental method. It is a matter of interpretation. The lowest line of numbers below a line of text which is printed in ordinary characters contains the predictions made in the previous chapter. Whole phrases which students circle must be treated as a whole. To indicate this grouping, they are underlined. In the following, the use of the Japanese word *kanji* refers to Chinese characters. The word *kanji* itself has the following literal meaning: *kan* 'Han (the old name for China)' plus *ji* 'letter'. Each sentence is accompanied by two tables: 1) Predictions and 2) Actual Problems. The Table of Predictions breaks down the predictions into their respective categories: grammar, vocabulary, *kanji*, rhetoric, and culture. The number of fulfilled predictions in each category is listed along with the prediction success rate. Finally, the total number of predictions and fulfilled predictions is added up and the total prediction success rate for the whole sentence is calculated. The Table of Actual Problems breaks down the actual problems into their respective categories as in the Table of Predictions. The number of actual problems in each category that were successfully predicted is listed along with the actual success rate. Finally, the total number of actual problems and the total number of the actual problems that were successfully predicted are respectively added up.

Then, the total actual success rate is calculated by dividing the total number of actual problems that were successfully predicted by the total number of actual problems. Following the analysis of all the sentences in the passages, there is a general discussion of the results for these passages, after which some general conclusions produced by the analysis are stated.

5.1. Data Presentation.

5.1.1. The Analysis of "*Aruke Orinpikku*". The following is a sentence-by-sentence analysis:

4

1. *Mainen oranda no chiisa na machi de ooki na* ***moyooshi*** *ga*

2

6

okonawareru.

1

9

'In a small town in Holland, a big event is held every year.'

Four of the six students circled the *kanji, moyoo* 'event', to indicate it as a source of trouble; two of the six students marked the whole word, *moyooshi*. The choice of the whole word also appears to indicate that the students had trouble reading and understanding the *kanji*. This indicates that both *moyoo* and *moyooshi* are actual problem areas. One student also marked *okonawareru* 'is held' as a source of difficulty which could mean that he or she failed to

understand the passive morphology (grammatical feature 9). Thus *okonawareru* is the third actual problem area. The way the students marked the sentence indicates that the predictions were fairly accurate. The experiment confirmed 3 of the 4 predictions at a prediction success rate of 75%. The only unfulfilled prediction involved noun head modification (grammatical feature 6). The actual success rate was 100% since all of the three actual problems were predicted. The results for this sentence are tabulated in the following table:

Predictions

	Predictions	Fulfilled Predictions	Prediction Success Rate
Grammar	2	1	50%
Vocabulary	1	1	100%
Kanji	1	1	100%
Total	4	3	75%

Actual Problems

	Actual Problems	Actual Problems Predicted	Actual Success Rate
Grammar	1	1	100%
Vocabulary	1	1	100%
Kanji	1	1	100%
Total	3	3	100%

2. *Foodeezu Maachi to mo yobare, aruke orinpikku to mo*
1 1

12 9 12

yobarete iru.
1

9

'It is called the four days' march; it is also called the Walking Olympics.'

In this sentence, *Foodeezu* 'four days', *Maachi* 'march' and *yobarete* 'is called' were marked only once indicating three actual problem areas. The two-word phrase, *Foodeezu Maachi*, was not predicted to cause trouble since it is directly transliterated from English. The fact that *yobarete* was marked seems to indicate a grammatical problem with the passive, so one grammatical prediction (grammatical feature 9) was successful. Only 1 out of the 4 predicted grammatical problems was verified; therefore, the prediction success rate for this sentence was 25%. Also, only one actual problem area was predicted, so the actual success rate was 33% since there were three actual problems. (Not Applicable, abbreviated as n/a, means no predictions were made in chapter 4, so no fulfillments are possible.)

Predictions

	Predictions	Fulfilled Predictions	Prediction Success Rate
Grammar	4	1	25%
Vocabulary	0	0	not applicable
Kanji	0	0	n/a
Total	4	1	25%

Actual Problems

	Actual Problems	Actual Problems Predicted	Actual Success Rate
Grammar	1	1	100%
Vocabulary	2	0	0%
Kanji	0	0	n/a
Total	3	1	33.3%

3 3
3. *Nimannin o koeru sekai kakkoku no hitobito ga kono machi*
2 1 1

1 13 6

1
Neimeehen ni atsumatte, aruku.
1 1

8

'More than 20,000 people from various countries throughout the world gather in the town of Nijmegen and walk.'

Three students marked the *kanji* in the word, *koeru* 'exceed', and two marked the whole word indicating a possible problem with meaning. This indicates two actual areas of difficulty, one for the *kanji* and one for the whole word. One student marked *sekai* 'world', a word which was not

predicted but apparently is the third actual problem. Also three students marked the *kanji, kak(u)* 'each, various', in *kakkoku* 'various countries' (the fourth actual problem), and one student marked the whole word (the fifth actual problem). Trouble with this word was not predicted. One student marked *Neimeehen* 'Nijmegen' (the sixth actual problem), since he or she did not realize it is the name of the town where the walk was held. One student marked the *kanji* in the word *atsumatte* 'gather' (the seventh actual problem), and another marked the whole word (the eighth), perhaps indicating trouble with the embedded verb (grammatical feature number 8: subordination). Only 3 of the 6 points of difficulty predicted in chapter 4 were verified by this experiment (see the table below). The prediction success rate was 50%. In addition, the experiment indicated that were were five problem areas that were not predicted, which meant an actual success rate of 37.5% (see the table below).

Predictions

	Predictions	Fulfilled Predictions	Prediction Success Rate
Grammar	4	1	25%
Vocabulary	1	1	100%
Kanji	1	1	100%
Total	6	3	50%

Actual Problems

	Actual Problems	Actual Problems Predicted	Actual Success Rate
Grammar	1	1	100%
Vocabulary	4	1	25%
Kanji	3	1	33.3%
Total	8	3	37.5%

4. ***Shoohai*** *mo nai.*
5

'There are no winners or losers.'

Five students marked *shoohai* 'victory or defeat' as causing trouble which indicates that the meaning of the word is a comprehension problem for the students. Also, the *kanji, shoo* 'victory', and the *kanji, hai* 'defeat', could be a problem, but that is not indicated here.

Predictions

	Predictions	Fulfilled Predictions	Prediction Success Rate
Grammar	0	0	n/a
Vocabulary	1	1	100%
Kanji	2	0	0%
Total	3	1	33.3%

Actual Problems

	Actual Problems	Actual Problems Predicted	Actual Success Rate
Grammar	0	0	n/a
Vocabulary	1	1	100%
Kanji	0	0	n/a
Total	1	1	100%

4 3
5. ***Jun'i*** *mo nai.*
1

'There is no order of placement.'

Four students marked the *kanji, jun* 'order', as an area of difficulty, and three students marked the *kanji, i* 'position'. In addition, one marked the whole word, *jun'i* 'order', indicating a problem in understanding this word. Thus, there were three actual problems. The prediction success rate and the actual success rate were 100%.

Predictions

	Predictions	Fulfilled Predictions	Prediction Success Rate
Grammar	0	0	n/a
Vocabulary	1	1	100%
Kanji	2	2	100%
Total	3	3	100%

Actual Problems

	Actual Problems	Actual Problems Predicted	Actual Success Rate
Grammar	0	0	n/a
Vocabulary	1	1	100%
Kanji	2	2	100%
Total	3	3	100%

6. *Yokkakan* ***arukitooshita*** *mono ni* ***kanpo*** *no* ***shoosho*** *to*

medaru ga ataerareru dake da.

'It's just that a certificate of completion and a medal are given to those who last the distance over four days.'

No students marked *arukitooshita* 'continued to walk' although it was predicted to be a problem. Three students marked *kanpo* 'completion of walking', perhaps indicating a problem with the *kanji*. However, it cannot be stated that there was an actual problem with the *kanji* since the students marked the whole word and the individual Chinese characters in this word are not that difficult for intermediate students. All that can be said is that the students had trouble with the vocabulary item, *kanpo*. One student marked the *kanji*, *shoo* 'proof', and three students marked the complete word, *shoosho* 'certificate'. Two marked the *kanji*

in the word, *ataerareru* 'be given' (not predicted to cause trouble in chapter 4); furthermore, two circled the whole word, perhaps indicating trouble with the passive construction (grammatical feature 9). The total number of actual problems was 5.

Predictions

	Predictions	Fulfilled Predictions	Prediction Success Rate
Grammar	5	1	20%
Vocabulary	3	2	66.7%
Kanji	2	1	50%
Total	10	4	40%

Actual Problems

	Actual Problems	Actual Problems Predicted	Actual Success Rate
Grammar	1	1	100%
Vocabulary	2	2	100%
Kanji	2	1	50%
Total	5	4	80%

7. *Kotoshi no* ***taikai*** *ni wa nihon kara gojuurokunin* ***sanka*** [4]

shita.

'Fifty-six Japanese participated in this year's march.'

Four people marked the word *sanka* 'participation' as a source for a comprehension problem. That is all that was marked. The number of actual problems was 1.

Predictions

	Predictions	Fulfilled Predictions	Prediction Success Rate
Grammar	0	0	n/a
Vocabulary	2	1	50%
Kanji	0	0	n/a
Total	2	1	50%

Actual Problems

	Actual Problems	Actual Problems Predicted	Actual Success Rate
Grammar	0	0	n/a
Vocabulary	1	1	100%
Kanji	0	0	n/a
Total	1	1	100%

8. *Sanka kyuukai no Kaneko Tomokazu san (Nihon Aruke Aruke Kyookaichoo) ni wa konna omoide ga aru.*

'Tomokazu Kaneko, chairman of the Japan Walk-Walk Society, who has participated nine times, has the following recollection.'

Three people marked *sanka* 'participation', one person *kyuukai* 'nine times' and two people *Kaneko*, which is a family name. All these problem areas were not predicted. Three people marked the *kanji*, *Tomo* (a Chinese character used in a

personal name), as troublesome, which was predicted. One person marked the whole phrase, *Nihon Aruke Aruke Kyookaichoo* 'chairman of the Japan Walk-Walk Society', and one marked *Aruke Aruke Kyookaichoo* 'chairman of the Walk-Walk Society'. In addition, *Kyookaichoo* 'head of the society' was marked by two people, clearly a vocabulary problem involving difficult *kanji*. The rest of the phrase, *Nihon Aruke Aruke* 'Japan Walk-Walk', contained vocabulary and *kanji* that was simple for the subjects, so perhaps it was a problem with concatenation. One person had a problem with the *kanji*, *de* 'appearance', in *omoide* 'recollection'. The total number of actual problems is 6.

Predictions

	Predictions	Fulfilled Predictions	Prediction Success Rate
Grammar	1	0	0%
Vocabulary	1	1	100%
Kanji	3	1	33.3%
Total	5	2	40%

Actual Problems

	Actual Problems	Actual Problems Predicted	Actual Success Rate
Grammar	0	0	n/a
Vocabulary	4	1	25%
Kanji	2	1	50%
Total	6	2	33.3%

9. *Hajimete sanka shita toki, nakama to issho ni "faito,*

faito" to ***kowadaka*** *ni* ***sakende*** *aruita.*

'The first time he participated, he shouted with other participating Japanese, "Fight! Fight!"'

Three people marked *sanka* 'participation'. Two people had trouble with *naka* 'relationship' in *nakama* 'companion' while three people marked the whole word. One person did not understand the character, *sho* 'thread', in *issho* 'together with' while three people marked the whole word. One person marked *kowa* 'voice' in *kowadaka* 'loud voice', and one person marked the whole word. Probably, more than one person should have marked *kowa* since it is a very difficult reading; however, the meaning of this *kanji*, 'voice', is not difficult, so the students assumed they knew how to read it. Another word was difficult because of the *kanji* contained in it: *sakende* 'shout'. Three people marked the *kanji* in this word, and one person marked the whole word because he or she perhaps had trouble with the embedding signalled by the gerundive "sakende", as explained in the previous chapter (grammatical feature 8). Thus, the total number of actual problems is 9.

Predictions

	Predictions	Fulfilled Predictions	Prediction Success Rate
Grammar	3	1	33.3%
Vocabulary	2	2	100%
Kanji	3	2	66.7%
Total	8	5	62.5%

Actual Problems

	Actual Problems	Actual Problems Predicted	Actual Success Rate
Grammar	1	1	100%
Vocabulary	4	2	80%
Kanji	4	2	100%
Total	9	5	55.6%

1 2

10. *Suru to,* ***nenpai*** *no josei ga* ***susumidete itta.***

4

7 8

'Then an old woman came forward and said:'

Four people marked *nenpai* 'elderly', one person marked the *kanji, sei* 'gender', in *josei* 'woman', and two people marked the *kanji* in *susumidete* 'come forward', so the total number of actual problems is 3.

Predictions

	Predictions	Fulfilled Predictions	Prediction Success Rate
Grammar	2	0	0%
Vocabulary	2	1	50%
Kanji	2	1	50%
Total	6	2	33.3%

Actual Problems

	Actual Problems	Actual Problems Predicted	Actual Success Rate
Grammar	0	0	n/a
Vocabulary	1	1	100%
Kanji	2	1	100%
Total	3	2	66.7%

11. "*Naze* 4 *tatakaou to iu no.*"
1

4 12 2

"Why do you talk about fighting."

Four students marked the *kanji* in *tatakaou* 'let's fight'. One student marked the phrase, *tatakaou to iu*, 'say, "Let's fight."', which indicates that the student had trouble with the grammar with respect to the verb tense of *tatakaou* (grammatical feature 4) and the structure signalled by the quotative particle, *to*, (grammatical feature 12). Thus the total number of actual problems is 3.

Predictions

	Predictions	Fulfilled Predictions	Prediction Success Rate
Grammar	3	2	66.7%
Vocabulary	0	0	n/a
Kanji	1	1	100%
Total	4	3	75%

Actual Problems

	Actual Problems	Actual Problems Predicted	Actual Success Rate
Grammar	2	2	100%
Vocabulary	0	0	n/a
Kanji	1	1	100%
Total	3	3	100%

12. "*Watakushitachi wa [tatakai wa* **gomen**] *da wa.*"
4
1

"We don't want to fight."

Four students marked the *kanji* in *tatakai* 'fight', so the total number of actual problems is 1.

Predictions

	Predictions	Fulfilled Predictions	Prediction Success Rate
Grammar	0	0	n/a
Vocabulary	1	0	0%
Kanji	1	1	100%
Total	2	1	50%

Actual Problems

	Actual Problems	Actual Problems Predicted	Actual Success Rate
Grammar	0	0	n/a
Vocabulary	0	0	n/a
Kanji	1	1	100%
Total	1	1	100%

13. *Ganbarou to iikikaseru karui* ***chooshi*** *no "faito" datta*

ga, Kaneko san wa "We don't want to fight" to iu kotoba ni

komerareta *mono o sasshite, fukaku atama o sageta.*

'It was a light "Fight!" calling on people to exert an effort, but Kaneko realized the thinking behind the words, "We don't want to fight," and hung his head.'

One student marked *ganbarou* 'let's try hard', indicating a problem with the verb tense (grammatical feature 4). One student circled *iikikaseru* 'persuade', perhaps indicating at least problems with the grammatical form. The grammatical form of this word can provide potentially three problem areas. First of all, *iikikaseru* is a verbal complex (grammatical feature 11):

ii	+	*kikaseru*
say		make to hear.

Secondly, *kikaseru* is the causative form (grammatical feature 10) of the verb *kiku* 'hear'. Thirdly, *iikikaseru* is a verb in a relative clause (grammar feature 13). As for explaining the difficulty involved with *iikikaseru* for this particular student, it is possible to hypothesize exactly what the cause is. All that can be said is that there are three possibilities for the grammatical source of the trouble: 1) not knowing the structure of the verbal complex, 2) not understanding the causative form, or 3) not understanding it is the form of the verb used in a relative clause (not a very likely explanation since these are third-year students). Any one of these grammatical causes could explain the difficulty with *iikikaseru*, so any one of these predictions can be fulfilled. However, this experimental tool cannot determine which prediction is the explanatory cause for the difficulty with this word. To continue with the analysis of this sentence, three students marked the *kanji* in *karui* 'light (adj.)'. One student marked the word *chooshi* 'style, manner', perhaps indicating a problem with vocabulary. One student circled the complete phrase *Ganbarou to iikikaseru karui chooshi*. It seems like this indicated a grammatical problem with the head-modifier construction for the student. The complete construction is really *Ganbarou to iikikaseru karui chooshi no "faito"* 'It was a light "Fight!" calling on

people to exert an effort'. The difficulty in this construction was predicted by the grammatical features listed for the items in this sentence (see sentence 13 above): 1) the tense of *ganbarou* (grammatical feature 4), 2) the quotation particle *to* (grammatical feature 12), 3) the verb complex *iikikaseru* (grammatical feature 11), 4) the causative form *kikaseru* (grammatical feature 10), and 5) the embedding caused by the relative clause *ganbarou to iikikaseru* 'persuade to exert an effort' (grammar feature 13). Later in the sentence, one student circled the *kanji*, *ha* 'leaf', in *kotoba* 'words' ('h' changes to 'b' because of sequential voicing). One student marked *komerareta* 'be included', perhaps due to grammatical difficulties caused by the passive (grammatical feature 9). Four students circled the *kanji* in *sasshite* 'realize', and one student circled the whole word perhaps indicating trouble with verb form because it indicates an embedded clause (grammar feature 8). One student marked the *kanji* in *fukaku* 'deeply' as causing trouble. Another student marked the whole word, *fukaku*, again perhaps indicating trouble with the *kanji* since in the text the entire word is composed of the *kanji* plus the adverbial suffix, which is relatively easy. Finally, three students marked *sageta* 'lowered', indicating problems with vocabulary. Thus, the total number of actual problems is 13.

This experimental instrument picked up no cultural interference in this passage.

Predictions

	Predictions	Fulfilled Predictions	Prediction Success Rate
Grammar	12	7	58.3%
Vocabulary	2	1	50%
Kanji	4	2	50%
Culture	1	0	0%
Total	19	10	52.6%

Actual Problems

	Actual Problems	Actual Problems Predicted	Actual Success Rate
Grammar	7	6	85.7%
Vocabulary	2	1	50%
Kanji	4	2	50%
Total	13	9	69.2%

14. *Aruku koto no daisuki na hitobito ga atsumatte, aruku*

2 6 8

koto o tanoshimu.

2

'People who really like walking, gather and enjoy their walking.'

In this passage no actual problems were indicated. Therefore, no predictions were fulfilled.

Predictions

	Predictions	Fulfilled Predictions	Prediction Success Rate
Grammar	4	0	0%
Vocabulary	0	0	n/a
Kanji	0	0	n/a
Total	4	0	0%

Actual Problems

	Actual Problems	Actual Problems Predicted	Actual Success Rate
Grammar	0	0	n/a
Vocabulary	0	0	n/a
Kanji	0	0	n/a
Total	0	0	n/a

15. *Midori no oka o aruku.*
    1 4 1

'They walked over green hills.'

For one student, the *kanji* for *oka* 'hills' was a problem. Four students circled *midori no oka* 'green hills' indicating difficulty in understanding this phrase. It seems that the subjects had trouble understanding the Chinese characters for *midori* 'green' and *oka* 'hills' because as vocabulary items they are quite simple. This means the number of actual problems is two: one involving the Chinese character *oka* and the other the character *midori*.

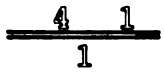
Predictions

	Predictions	Fulfilled Predictions	Prediction Success Rate
Grammar	1	0	0%
Vocabulary	0	0	n/a
Kanji	1	1	100%
Total	2	1	50%

Actual Problems

	Actual Problems	Actual Problems Predicted	Actual Success Rate
Grammar	0	0	n/a
Vocabulary	0	0	n/a
Kanji	2	1	50%
Total	2	1	50%

16. ***Ungazoi*** *no michi o aruku.*



1

'They walked on roads alongside canals.'

All the subjects had trouble with *ungazoi* 'alongside canals'. Four students circled *unga* 'canals'. It seems that the students had trouble in understanding the *kanji, un* 'transportation', and the *kanji, ka* 'river' (which becomes *ga* through sequential voicing). One student circled *zoi* 'along', which is a noun derived from *sou* 'to go along' (/s/ changes to /z/ because of sequential voicing). Because *zoi*

is not written in *kanji*, it is a vocabulary problem. The result is that there are three actual problems.

Predictions

	Predictions	Fulfilled Predictions	Prediction Success Rate
Grammar	1	0	0%
Vocabulary	1	1	100%
Kanji	2	2	100%
Total	4	3	75%

Actual Problems

	Actual Problems	Actual Problems Predicted	Actual Success Rate
Grammar	0	0	n/a
Vocabulary	1	1	100%
Kanji	2	2	100%
Total	3	3	100%

17. *Arukinagara **fureai** ga umareru.*
2 1
8 9

'While walking, contacts are made.'

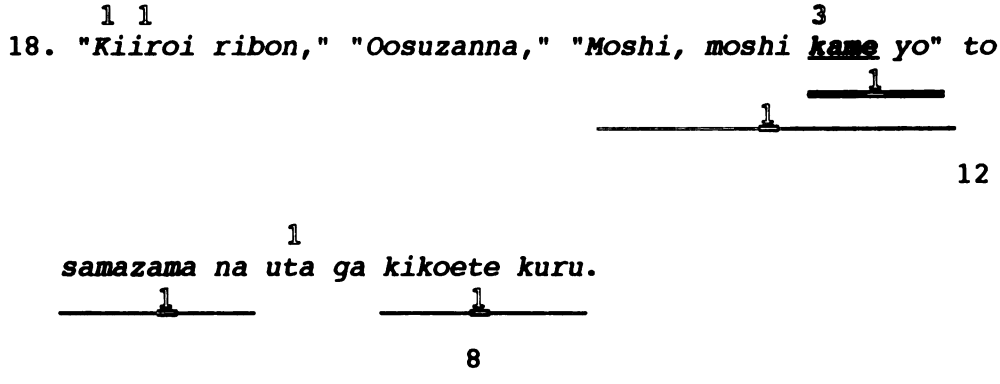
Some subjects marked the separate morphemes, *fure* 'contact' and *ai* 'mutual', that compose *fureai* 'contacts', but actually these morphemes form one word. It is this word they did not understand.

Predictions

	Predictions	Fulfilled Predictions	Prediction Success Rate
Grammar	2	0	0%
Vocabulary	1	1	100%
Kanji	0	0	n/a
Total	3	1	33.3%

Actual Problems

	Actual Problems	Actual Problems Predicted	Actual Success Rate
Grammar	0	0	n/a
Vocabulary	1	1	100%
Kanji	0	0	n/a
Total	2	1	50%



'Various songs, such as "Tie a Yellow Ribbon," "Oh, Suzanna," and "Moshi, moshi Kame yo", can be heard.'

One student circled the *kanji*, *ki* 'yellow', and another *iro* 'color'. Two students did not understand the title for the Japanese folk song. One circled *kame yo* 'turtle (emphasis)', and the other the complete title, "Moshi, moshi

kame yo" 'Hello, turtle (emphasis)'. It seems like the *kanji* for *kame* 'turtle' was difficult. Perhaps, there also were difficulties in understanding the other vocabulary in the title, e.g., *moshi moshi* 'hello'. To continue with the analysis of the sentence, one student circled *samazama na* 'various', which appears to be a vocabulary problem. The *kanji, uta* 'song', was circled once. Finally, one student circled the phrase *kikoete kuru*, which is a sequence of verbs, *kikoete* 'can hear' (gerundive form) and *kuru* 'come'. This construction exhibits subordination on the part of *kikoete* (grammatical feature 8). The implication of the verb, *kuru*, is that the sound is coming toward the narrator. In summary, the total number of actual problems is 8.

Predictions

	Predictions	Fulfilled Predictions	Prediction Success Rate
Grammar	2	1	50%
Vocabulary	1	0	0%
Kanji	1	1	100%
Total	4	2	50%

Actual Problems

	Actual Problems	Actual Problems Predicted	Actual Success Rate
Grammar	1	1	100%
Vocabulary	3	0	0%
Kanji	4	1	25%
Total	8	2	25%

19. ***Gunka*** *o utainagara* ***heitai*** *ga aruku.*

'Soldiers walk while singing military songs.'

Three subjects circled *gunka* 'military song', one subject circled the *kanji* in *utainagara* 'while singing', and five subjects circled *heitai* 'soldier'. It seems that the difficulty of the Chinese characters in these words is the source of the problems with understanding. This difficulty would make understanding the meanings of these words a problem. Thus, there are five actual problems here, all related to difficulties with Chinese characters.

Predictions

	Predictions	Fulfilled Predictions	Prediction Success Rate
Grammar	1	0	0%
Vocabulary	1	0	0%
Kanji	4	4	100%
Total	6	4	66.7%

Actual Problems

	Actual Problems	Actual Problems Predicted	Actual Success Rate
Grammar	0	0	n/a
Vocabulary	0	0	n/a
Kanji	5	4	80%
Total	5	4	80%

1 3 2
20. *Kuroi hada o **kagayakaseta** musumesan ga aruku.*
1 1
2 2

10 13

'Girls with glistening tanned skins walk.'

One student circled the *kanji* in *kuroi* 'black'. Two students circled the word, *hada* 'skin', indicating a vocabulary problem. One student marked *da* (in *hada*) which clearly indicates a confusion with word boundaries. Three students indicated trouble with the *kanji* in *kagayakaseta* 'made to shine'. One student circled *kaseta* indicating trouble with the causative suffix *ase*. This would be a grammatical problem (grammatical feature 10). Two students circled the whole word, *kagayakaseta*, perhaps indicating at least a vocabulary problem. Two students circled *musume* 'girl', which seems to indicate a problem in reading the *kanji* for 'girl'. Thus, there are a total of seven actual problems.

Predictions

	Predictions	Fulfilled Predictions	Prediction Success Rate
Grammar	2	1	50%
Vocabulary	1	1	100%
Kanji	1	1	100%
Total	4	3	75%

Actual Problems

	Actual Problems	Actual Problems Predicted	Actual Success Rate
Grammar	1	1	100%
Vocabulary	2	1	50%
Kanji	3	1	33.3%
Total	7	3	42.9%

4 3
21. ***Ryukku*** *o [****se*** *ni shita]* ***roojin*** *ga aruku.*
1 2

13

'An old man with a knapsack on his back walks.'

One subject circled *ryukku* 'rucksack', which was not written in *kanji*; therefore, this is a vocabulary problem. Four subjects circled *se* 'back'. This *kanji* was predicted to be difficult for them. Three subjects circled the *kanji*, *roo* 'old', in *roojin* 'old man'. Two circled the whole word, perhaps indicating a vocabulary problem. Consequently, the number of actual problems is 4.

Predictions

	Predictions	Fulfilled Predictions	Prediction Success Rate
Grammar	1	0	0%
Vocabulary	3	2	66.7%
Kanji	2	2	100%
Total	6	4	66.7%

Actual Problems

	Actual Problems	Actual Problems Predicted	Actual Success Rate
Grammar	0	0	n/a
Vocabulary	2	2	100%
Kanji	2	2	100%
Total	4	4	100%

3
22. *Orinpikku no* ***seishin*** *wa* ***honke*** *yori mo kochira ni*
2 2

16 1

uketsugarete *iru no kamoshirenai.*

1

11 9 2 14

'The real spirit of the Olympic Games may have been preserved more in this (four days' march) than in the Olympics itself.'

Three students circled the *kanji, sei* 'feeling', in *seishin* 'spirit' signifying a *kanji* problem while two students indicated a vocabulary problem by circling the whole word. Two students circled *honke* 'originator' indicating a problem with word meaning. One student circled *uketsu* and *rete iru* in the verb phrase, *uketsugarete iru* 'has been preserved, inherited'. There seem to be a number of factors involved in this mistaken parsing. In effect, this student parses this verb phrase as follows:

uketsu *ga* *rete iru.*

The *ga* in this phrase is treated like the nominative particle, *ga*. It seems there is a basic misunderstanding of the passive structure in this phrase (grammatical feature 9). Another problem here is that *uketsugarete* is derived from *uketsugu* 'inherit', a verb compound (feature 11), which is analyzed as follows:

uke + *tsugu*
'receive' 'succeed'.

All these problems with parsing resulted in putting word boundaries in the wrong place. This analysis indicates a total of 5 actual problem areas.

Predictions

	Predictions	Fulfilled Predictions	Prediction Success Rate
Grammar	6	2	33.3%
Vocabulary	3	2	66.7%
Kanji	3	1	33.3%
Total	12	5	41.7%

Actual Problems

	Actual Problems	Actual Problems Predicted	Actual Success Rate
Grammar	2	2	100%
Vocabulary	2	2	100%
Kanji	1	1	100%
Total	5	5	100%

2 1 2
23. **Endoo** *ni wa, isu o narabe, yasunde ike to* **temaneki** *o*
4 1 2 2 2

8 11 4 11

2
suru shufu ga iru.
1

13

'Along the road, there are housewives who line up chairs and beckon to (walkers) to come and rest.'

Two students marked the *kanji, en* 'along', signifying a *kanji* problem, and four marked the whole word, *endoo* 'along the road', to indicate a vocabulary problem. One student marked *isu* 'chair', indicating a vocabulary problem since this word is not written in *kanji* in the text. One student marked the *kanji* in *narabe* 'line up', and two marked the whole word indicating difficulty with vocabulary. Two students marked *ike* 'go', which seems to indicate a problem with tense (grammatical feature 4). Two students circled the *kanji* for *mane* 'invite' in the word, *temaneki* 'beckon', and two circled the whole word. Finally, two students circled the *kanji* for *fu* 'woman', and one circled the whole word, *shufu* 'housewife'. This indicates a total of 10 actual problems.

Predictions

	Predictions	Fulfilled Predictions	Prediction Success Rate
Grammar	5	1	20%
Vocabulary	2	2	100%
Kanji	2	2	100%
Total	9	5	55.6%

Actual Problems

	Actual Problems	Actual Problems Predicted	Actual Success Rate
Grammar	1	1	100%
Vocabulary	5	2	40%
Kanji	4	2	50%
Total	10	5	50%

24. *Koohii ya kukkii o* ***furumau*** *ie mo aru.*
5

13

'There are families which treat (walkers) to coffee and cookies.'

Five students marked the word *furumau* 'treat'. It seems to indicate a problem with vocabulary, so there is one actual problem here.

Predictions

	Predictions	Fulfilled Predictions	Prediction Success Rate
Grammar	1	0	0%
Vocabulary	1	1	100%
Kanji	0	0	n/a
Total	2	1	50%

Actual Problems

	Actual Problems	Actual Problems Predicted	Actual Success Rate
Grammar	0	0	n/a
Vocabulary	1	1	100%
Kanji	0	0	n/a
Total	1	1	100%

2
25. Kuroobaa no hanataba o okutte kureru shoojo mo iru.
3 1

8 13

'There are girls who present (the walkers) with clover bouquets.'

Two subjects circled the *kanji*, *taba* 'bunch', indicating they did not know it, while 3 subjects circled the whole word, *hanataba*, 'bouquet' indicating they did not understand the meaning of the word. Finally, one student circled *shoojo* 'girls' indicating a lack of understanding of the word's meaning. As a result, there are three actual problems.

Predictions

	Predictions	Fulfilled Predictions	Prediction Success Rate
Grammar	2	0	0%
Vocabulary	1	1	100%
Kanji	1	1	100%
Total	4	2	50%

Actual Problems

	Actual Problems	Actual Problems Predicted	Actual Success Rate
Grammar	0	0	n/a
Vocabulary	2	1	50%
Kanji	1	1	100%
Total	3	2	66.7%

26. *Mainen no koto na no de, juumin to sanka*sha *wa* [*en de musubareru*] *to iu.*

'Since it is an annual event, (they) say that the residents and participants are strongly tied together.'

Four students marked *juumin* 'residents', and three marked *sanka* 'participation' as difficult vocabulary. Note the *sanka* was also marked in sentences 7 and 9, so *sanka* was a consistently difficult vocabulary item. One student even marked the phrase *juumin to sanka*, possibly indicating a problem with complex noun head forms (grammar feature 4) because *to* 'and' connects both *juumin* and *sanka*. This grammatical problem was not predicted. To continue with the analysis of this sentence, five students circled *en* 'connection' as difficult, which was predicted. Two students

marked the *kanji* in *musubareru* 'be tied', while two students marked the whole word. The fact that the whole word was marked can lead to the conclusion that the students had trouble because this verb is in the passive form (grammar feature 9). Finally, one student circled the entire phrase, *en de musubareru* 'be strongly tied together', which was predicted to be a difficult idiom (vocabulary feature 19). This discussion indicates that the number of actual problems is 7.

Predictions

	Predictions	Fulfilled Predictions	Prediction Success Rate
Grammar	3	1	33.3%
Vocabulary	3	2	66.7%
Kanji	2	2	100%
Total	8	5	62.5%

Actual Problems

	Actual Problems	Actual Problems Predicted	Actual Success Rate
Grammar	2	1	50%
Vocabulary	3	2	66.7%
Kanji	2	2	100%
Total	7	5	71.4%

27. *Ima nihon de wa, 'aruki' no* ***aikoosha*** *ga* ***gekizoo*** *shi,*
1 4
2

8

yaku kyuuhyakuman to mo iwarete iru.
4

12 9

'In Japan today, those who like to walk have increased drastically and are said to number about 9 million.'

One student marked the word, *aikoo* 'liking', and two students marked the entire compound, *aikoosha* 'enthusiast', indicating a problem with vocabulary. Five students marked *gekizoo* 'drastic increase', which would mean that this vocabulary item was difficult for the students. The fact that the two Chinese characters, *geki* 'severe' and *zoo* 'increase', are difficult compounds the problem and adds two more actual problems to the process of reading comprehension. Finally, one student circled *iwarete* 'be said'. It seems that the problem here is with the passive form of this verb (grammatical feature 9). Thus, the number of actual problems is 5. This is the first sentence of the *ten* 'change' as was explained in the last chapter; however, this experimental instrument does not appear to measure any interference at all with reading comprehension. This could be just the limitation of this instrument. Perhaps, rhetorical interference can be measured at a much more global level.

Predictions

	Predictions	Fulfilled Predictions	Prediction Success Rate
Grammar	3	1	33.3%
Vocabulary	2	2	100%
Kanji	4	2	50%
Ten	1	0	0%
Total	10	5	50%

Actual Problems

	Actual Problems	Actual Problems Predicted	Actual Success Rate
Grammar	1	1	100%
Vocabulary	2	2	100%
Kanji	2	2	100%
Total	5	5	100%

1
28. *"Walk" to iu <u>sen</u>mon <u>zasshi</u> mo dete iru.*
5

12 13

'There is now a special magazine, "Walk".'

One subject circled the *kanji*, *sen* 'chief' in *senmon* 'specialty'. Five students circled *zasshi* 'magazine'. This word is in the students' working vocabulary, but the Chinese characters that compose this word are difficult: *zatsu* 'miscellany' and *shi* 'document'; therefore, this adds two actual problems to the reading comprehension. It seems that there are 3 actual problems in this sentence.

Predictions

	Predictions	Fulfilled Predictions	Prediction Success Rate
Grammar	2	0	0%
Vocabulary	0	0	n/a
Kanji	3	3	100%
Total	5	3	60%

Actual Problems

	Actual Problems	Actual Problems Predicted	Actual Success Rate
Grammar	0	0	n/a
Vocabulary	0	0	n/a
Kanji	3	3	100%
Total	3	3	100%

29. ***Undoo busoku*** *o* ***kaishoo*** *suru tame.*

13

'To provide a solution to the lack of exercise.'

One person circled *undoo* 'exercise', and two people circled the whole phrase, *undoo busoku* 'lack of exercise', indicating comprehension problems with both vocabulary items. One person circled the *kanji, kai* 'understanding', indicating a problem understanding it, and four circled the whole word *kaishoo* 'solution'. Thus the actual number of problems is 4.

Predictions

	Predictions	Fulfilled Predictions	Prediction Success Rate
Grammar	1	0	0%
Vocabulary	3	3	100%
Kanji	3	1	33.3%
Total	7	4	57.1%

Actual Problems

	Actual Problems	Actual Problems Predicted	Actual Success Rate
Grammar	0	0	n/a
Vocabulary	3	3	100%
Kanji	1	1	100%
Total	4	4	100%

2 2
30. ***Tairyoku*** *to* ***seishinryoku*** *no* ***genkai*** *ni* ***idomu*** *tame.*
2 3 5 2

6 13

'To challenge one's physical and mental limits.'

Two students circled *tairyoku* 'physical strength'. Two students circled the *kanji*, *sei* 'spirit', indicating a problem with *kanji*, and three circled the whole word, *seishinryoku* 'psychological strength'. Five students had trouble with the word, *genkai* 'limit'. Two students had trouble understanding the *kanji* in *idomu* 'challenge', while two marked the whole vocabulary item. This means the total number of actual problems is 6.

Predictions

	Predictions	Fulfilled Predictions	Prediction Success Rate
Grammar	2	0	0%
Vocabulary	4	4	100%
Kanji	5	2	40%
Total	11	6	54.5%

Actual Problems

	Actual Problems	Actual Problems Predicted	Actual Success Rate
Grammar	0	0	n/a
Vocabulary	4	4	100%
Kanji	2	2	100%
Total	6	6	100%

31. ***Konjoo*** *no* ***ikusei*** *no tame.*
5 5

6

'To nurture the spirit.'

Five students marked the word, *konjoo* 'spirit', and five marked *ikusei* 'nurturing'. The individual *kanji* were not marked, so it is difficult to tell what their problems with *kanji* were. As a result, there are only two obvious actual problems.

Predictions

	Predictions	Fulfilled Predictions	Prediction Success Rate
Grammar	1	0	0%
Vocabulary	2	2	100%
Kanji	4	0	0%
Total	7	2	28.6%

Actual Problems

	Actual Problems	Actual Problems Predicted	Actual Success Rate
Grammar	0	0	n/a
Vocabulary	2	2	100%
Kanji	0	0	n/a
Total	2	2	100%

32. *Arukitsuzukeru riyuu wa samazama da ga, aruki no* ***shinzui***
wa ***yahari****, aruku koto o tanoshimu koto daroo.*

'There are various reasons for continuing to walk, but the essence of walking is in its enjoyment.'

One student marked the *kanji*, *yuu* 'reason, cause', in *riyuu* 'reasons' (a *kanji* problem), and two circled the whole word (a vocabulary problem). These problems were not predicted. One student circled *samazama* 'various', also, a vocabulary problem which was not predicted. Two circled *zui* 'path' (a *kanji* problem) in *shinzui* 'essence' while four

marked the whole word (a vocabulary problem). The result is that there are 5 actual problems.

Predictions

	Predictions	Fulfilled Predictions	Prediction Success Rate
Grammar	6	0	0%
Vocabulary	2	1	50%
Kanji	2	1	50%
Total	10	2	20%

Actual Problems

	Actual Problems	Actual Problems Predicted	Actual Success Rate
Grammar	0	0	n/a
Vocabulary	3	1	33.3%
Kanji	2	1	50%
Total	5	2	40%

33. *Tanoshiminagara arukeba, kaze no iro ga miete kuru.*

8 8 8

'If you walk while enjoying it, you can see the color of the wind.'

In this passage no actual problems were indicated. Therefore, no predictions were fulfilled. The fact that this sentence is the *ketsu* or conclusion was explained in the last chapter; however, this experimental instrument does not appear to measure any interference at all with reading comprehension. As mentioned before, this could be just the

limitation of this measuring instrument. As noted before, perhaps rhetorical interference can be measured at a much more global level.

Predictions

	Predictions	Fulfilled Predictions	Prediction Success Rate
Grammar	3	0	0%
Vocabulary	0	0	n/a
Kanji	0	0	n/a
Ketsu	1	0	0%
Total	4	0	0%

Actual Problems

	Actual Problems	Actual Problems Predicted	Actual Success Rate
Grammar	0	0	n/a
Vocabulary	0	0	n/a
Kanji	0	0	n/a
Total	0	0	n/a

5.1.2. The Analysis of "*Hoogen to Kyootsuugo*". The following is a sentence by sentence analysis:

1. *Nihon wa, kuni ga semai* **wari** ***ni***, *tochi ni yoru* **hoogen** *no*

2 1

2

13 13

chigai ga ookii.

'For a small country, Japan has large differences in its geographical dialects.'

Two students circled *wari* 'proportion', and two circled the phrase, *wari ni* 'in proportion to'. The fact that *wari* was circled indicates that it is a vocabulary problem. The fact that the entire phrase, *wari ni*, is circled indicates that this phrase was not understood. Another student circled *hoogen* 'dialect' to indicate vocabulary difficulty. Thus, there are three actual problems.

Predictions

	Predictions	Fulfilled Predictions	Prediction Success Rate
Grammar	2	0	0%
Vocabulary	2	2	100%
Kanji	0	0	n/a
Total	4	2	50%

Actual Problems

	Actual Problems	Actual Problems Predicted	Actual Success Rate
Grammar	0	0	n/a
Vocabulary	3	3	100%
Kanji	0	0	n/a
Total	3	3	100%

2. *Nihon no* ***chisei*** *wa yama ya kawa ga ooku,* ***motomoto***

2 3

8

kootsuu *ni fuben de aru ue, mukashi wa, nihyaku suujuu mo*
1 1 1 1

13 1

no ***daimyoo*** *no* ***ryoochi*** *ni wakarete* ***seiji*** *ga okonawarete*
2 1 1 1

6 9 8 9

ita.

'As for Japan's physical geography, in addition to there being a lot of mountains and rivers naturally making it difficult for transportation, in former times, Japan was divided into 200 to 300 fiefs, owned and administered by feudal lords.'

Two students marked the *kanji, sei* 'influence', in the word *chisei* 'typography' indicating a difficulty understanding this *kanji*, and three marked the whole word indicating a vocabulary problem. One student marked *kootsuu* 'transportation', indicating another vocabulary problem. One circled the whole phrase, *aru ue* 'be in addition to', which would indicate that there is, perhaps, a grammatical problem here since *aru* functions as the verb of the relative clause, *motomoto kootsuu ni fuben de aru* 'which naturally makes it difficult for transportation', which modifies the relational head noun, *ue* 'above'. This problem was predicted by grammatical feature 13 (relative clauses). Another student also circled *ruu* and *e* in this phrase, (*a*(*ru ue*)), indicating a problem with word boundaries which may go back to a vocabulary problem. Still another student just circled the

e. Clearly, this indicates a problem with word division and vocabulary. Two students marked the word *daimyoo* 'feudal lord', which would indicate a vocabulary problem. One student also marked *ryoochi* 'territory', another vocabulary problem. One student marked *wakarete* 'be divided', which would perhaps indicate a problem with subordination (grammar feature 8). Also, *wakarete* is in the passive which would create a further grammatical problem (grammar feature 9). Finally a student marked *okonawarete* 'be done', a passive form (grammar feature 9).

Predictions

	Predictions	Fulfilled Predictions	Prediction Success Rate
Grammar	7	3	42.9%
Vocabulary	6	4	66.7%
Kanji	4	1	25.0%
Total	17	8	47.1%

Actual Problems

	Actual Problems	Actual Problems Predicted	Actual Success Rate
Grammar	4	4	100%
Vocabulary	5	4	80%
Kanji	1	1	100%
Total	10	9	90%

3. *Sore de, hitobito wa, tagai ni jiyuu ni ikiki suru koto*
4 2 2
7 2
ga muzukashikatta.
1
4

'So it was difficult for people to freely associate with each other.'

Four students circled *tagai* 'mutual', two circled *jiyuu* 'free', and two circled *ikiki* 'association'. These are all vocabulary problems. One student circled the segment of text, *to ga muzukashi*, which is meaningless according to the context. This indicates a problem with word boundaries which may go back to a vocabulary or grammar problem.

Predictions

	Predictions	Fulfilled Predictions	Prediction Success Rate
Grammar	3	0	0%
Vocabulary	1	1	100%
Kanji	0	0	n/a
Total	4	1	25%

Actual Problems

	Actual Problems	Actual Problems Predicted	Actual Success Rate
Grammar	0	0	n/a
Vocabulary	3	1	33.3%
Kanji	0	0	n/a
Total	3	1	33.3%

4. *Sono tame, kotoba mo, hitotsuhitotsu no* ***chihoogoto*** *ni*
1

7

wakareru yoo ni natta no de aru.
1

9 13 2

'For this reason, language, too, came to be divided into individual geographical areas.'

One student circled *kotoba* 'language' indicating a problem with the *kanji* in this word. Another student circled the phrase, *wakareru yoo ni* 'to be divided'. It seems that the difficulty in understanding this phrase is grammatical in nature and has to do with the embedding (grammar feature 13 -- relative clause) of the passive verb *wakareru* 'be divided' (grammar feature 9). The passive form of *wakareru* seems to be causing difficulty although this form was not explicitly circled. Thus there are four actual problems in this sentence.

Predictions

	Predictions	Fulfilled Predictions	Prediction Success Rate
Grammar	4	2	50%
Vocabulary	1	0	0%
Kanji	0	0	n/a
Total	5	2	40%

Actual Problems

	Actual Problems	Actual Problems Predicted	Actual Success Rate
Grammar	2	2	100%
Vocabulary	0	0	n/a
Kanji	2	0	0%
Total	4	2	50%

5. *Toku ni tooi chihoo to no ikiki wa taihen na koto datta*
2

1 6

kara, hyakunen hodo mae made wa, Aomori no hito to
3

8 6

1
Kagoshima *no hito ga* ***deatte*** *mo, hotondo kotoba ga*
1 1 1
1

11 8

tsuujinakatta *to iu koto de aru.*

4 12 2

'Especially because association with a faraway district was difficult, up to 100 years ago, even if a person from Aomori and a person from Kagoshima met, they could not communicate.

Two students marked *ikiki* 'association'. It seems this is a vocabulary problem; however, it was not predicted. Three students marked *Aomori*. More than a vocabulary problem, this seems to be a cultural difficulty. In this case, these students were not familiar with the geography of Japan. *Aomori* is a prefecture in northern Japan. One

student marked the *kanji*, *ka*, in *Kagoshima*, and another student circled both the Chinese characters, *ka* and *go*, in the same word. Both of these characters are very difficult. Three students circled the whole word indicating their unfamiliarity with the word. Again, cultural understanding is required. *Kagoshima* is a city and prefecture on the southern island of *Kyuushuu*. One student circled the gerundive verb form, *deatte* 'meet'. This seems to be a grammatical problem because the gerundive verb form was circled and the particle "mo" following the gerundive forms the concessive construction: *...te mo* 'even if', which is a form of subordination (grammar feature 8). Also *deatte* 'met', is a verb compound (feature 11), which is analyzed as follows:

de + *atte*

'appear' 'meet'.

Finally, one student circled the vocabulary item, *kotoba* 'language', indicating a problem with the *kanji* in this word. This problem was not predicted.

Predictions

	Predictions	Fulfilled Predictions	Prediction Success Rate
Grammar	9	2	22.2%
Vocabulary	3	1	33.3%
Kanji	2	2	100%
Culture	2	2	100%
Total	16	7	48.3%

Actual Problems

	Actual Problems	Actual Problems Predicted	Actual Success Rate
Grammar	2	2	100%
Vocabulary	3	1	33%
Kanji	4	2	50%
Culture	2	2	100%
Total	11	7	63.6%

6. *Konnichi de mo, sono tochitochi no* ***hoogen*** *wa, mainichi no*

6

seikatsu no naka de ikiiki to tsukawarete iru.

2 1

1 9

'Even today, the dialect of each area is being used vividly in the middle of everyday life.'

One student circled *ikiiki* 'vivid'. Another student circled the passive *tsukawarete* 'be used' (grammar feature 9). This is the *ten* 'change' as was explained in the last chapter (section 2.1). As noted before, this experimental instrument does not appear to measure any interference at all with reading comprehension, which could be just the limitation of this instrument. As indicated before, a better solution might be to measure rhetorical interference at a much more global level.

Predictions

	Predictions	Fulfilled Predictions	Prediction Success Rate
Grammar	3	1	33.3%
Vocabulary	1	0	0%
Kanji	0	0	n/a
Ten	1	0	0%
Total	5	1	20%

Actual Problems

	Actual Problems	Actual Problems Predicted	Actual Success Rate
Grammar	1	1	100%
Vocabulary	1	0	0%
Kanji	0	0	n/a
Total	2	1	50%

7. *Fudan yoku tsukau aisatsu no kotoba o mite miyoo.*
1 1

13 8

'Let's look at words that are ordinarily well-used for greetings.'

One student marked *fudan* 'ordinarily', a vocabulary problem, and another marked *kotoba* 'language', indicating a problem with the *kanji* in this word.

Predictions

	Predictions	Fulfilled Predictions	Prediction Success Rate
Grammar	2	0	0%
Vocabulary	0	0	n/a
Kanji	0	0	n/a
Total	2	0	0%

Actual Problems

	Actual Problems	Actual Problems Predicted	Actual Success Rate
Grammar	0	0	n/a
Vocabulary	1	0	0%
Kanji	2	0	0%
Total	3	0	0%

8. *"Konbanwa" to iu yoru no aisatsu o, "Oban de gozaimasu"*
1

12 13

"Oban ni narimashita" aruiwa, tada "Oban" to iu tochi ga
1 1 1

6 12 13

aru.

'There is a region where the evening greeting "Konban wa" ("Good evening") is said "Oban de gozaimasu", "Oban ni narimasu", or simply "Oban".

One student circled *oban* 'evening' each time it was used. Another circled *aruiwa* 'or'. These are vocabulary problems.

Predictions

	Predictions	Fulfilled Predictions	Prediction Success Rate
Grammar	5	0	0%
Vocabulary	0	0	n/a
Kanji	0	0	n/a
Total	5	0	0%

Actual Problems

	Actual Problems	Actual Problems Predicted	Actual Success Rate
Grammar	0	0	n/a
Vocabulary	2	0	0%
Kanji	0	0	n/a
Total	2	0	0%

9. *Mata, "Arigotoo" no kawari ni, "Ookini" to ka "Dandan" o*

7 6

tsukau chihoo ga aru.

13

"Again, there is a district which uses "Ookini" and "Dandan" instead of "Arigatoo" ("Thank you").

One student circled the *kanji, ka* 'exchange', indicating difficulty in understanding it. One student circled the whole word, *kawari* 'substitute', indicating a vocabulary difficulty. Another student circled *wari ni*, which has no meaning in this context. Clearly, this is a boundary problem

which has its roots in vocabulary difficulty. As a result, there are three actual problems in this sentence.

Predictions

	Predictions	Fulfilled Predictions	Prediction Success Rate
Grammar	3	0	0%
Vocabulary	0	0	n/a
Kanji	0	0	n/a
Total	3	0	0%

Actual Problems

	Actual Problems	Actual Problems Predicted	Actual Success Rate
Grammar	0	0	n/a
Vocabulary	2	0	0%
Kanji	1	0	0%
Total	3	0	0%

10. *Korera no aisatsu kotoba ni wa, sono tochi sono tochi no*
1

3 6 6

1
aji ga ***komotte*** *iru.*
2

'As for these words of greeting, they are full of the flavor of each particular region.'

One student circled *kotoba* 'language' indicating a problem with the *kanji* in this word. The same student circled the Chinese character, *aji* 'favor'. It seems that

this is a problem in understanding the meaning of this *kanji*. Two students circled the gerundive form, *komotte* 'be filled with'. This would be a very difficult word for them, so this seems to be a vocabulary problem.

Predictions

	Predictions	Fulfilled Predictions	Prediction Success Rate
Grammar	3	0	0%
Vocabulary	1	1	100%
Kanji	0	0	n/a
Total	4	1	25%

Actual Problems

	Actual Problems	Actual Problems Predicted	Actual Success Rate
Grammar	0	0	n/a
Vocabulary	1	1	100%
Kanji	3	0	0%
Total	4	1	25%

11. ***Nazenara**, hoogen wa, sono tochi no seikatsu ya* <u>*rekishi*</u>

1

1

7 6

2

to fukai ***tsunagari*** *ga ari,* ***kazokudooshi***,

3 4

1 8

tomodachidooshi, *tochi no* ***hitodooshi*** *ga* ***kutsuroida***

2 2 1
1 5

6 13

2
hanashi o suru toki ni wa,shizen ni [kuchi o tsuite] dete
1

13 8 8

kite, tagai ni yoku kimochi o ***tsuujiau*** *koto ga dekiru*
3

8 2 13

mono dakara de aru.

8

'The reason for this is a dialect has a close relation with the life and history of the local area, so when family, friends, and people of that region engage in relaxed conversation, the dialect just rushes out naturally and is able to mutually convey emotion.'

One student underlined the phrase *nazenara, hoogen wa* 'the reason is a dialect'. The sentence level conjunction, *nazenara* 'the reason is', connects this sentence with the previous explaining why a dialect is so closely connected with the region it is associated with. It seems that the problem here is with the sentence connector, *nazenara* (grammar feature 7). This person is also apparently having trouble with the vocabulary item, *hoogen* 'dialect', along with another student who circled this item. Two students circled the Chinese character in *fukai* 'deep'. Three students circled *tsunagari* 'connection' indicating a vocabulary problem since this word is written in *hiragana* in

this text. Students circled the *dooshi* 'fellow' in *kazokudooshi* 'fellow family members', *tomodachidooshi* 'fellow friends', and *hitodooshi* 'fellow citizens', which clearly indicates a vocabulary problem. One student circled the whole word *hitodooshi*, again revealing a comprehension problem with the *dooshi* compound. Six students circled the verb *kutsuroida* 'to be relaxed'. It seems that this is a problem with vocabulary. Five of the students circled *kutsuroi*, and another student circled *kutsuro*, which indicates they did not know the word well enough to know the proper word boundaries. It seems what the students saw here was an adjective or a noun but not a verb. Actually, the fact that *kutsuroida* is a plain past tense verb that modifies the head noun, *hanashi* 'speech' could have confused the students (grammar feature 13 -- relative clauses). To continue with the analysis of this sentence, two students circled the *kanji*, *zen* 'nature' (a *kanji* problem), in *shizen* 'natural' while one student marked the whole word (a vocabulary problem). Three students marked *tagai* 'mutual', which indicates a vocabulary problem. This word was also marked in sentence 3 of this passage. The fact that this sentence is the *ketsu* or conclusion was explained in the last chapter. As mentioned before, this experimental instrument does not appear to measure any interference at all with reading comprehension on the part of the *ketsu*. As noted

before, this could be just the limitation of this measuring instrument. Maybe rhetorical interference can be measured at a much more global level.

Predictions

	Predictions	Fulfilled Predictions	Prediction Success Rate
Grammar	13	2	15.4%
Vocabulary	7	5	71.4%
Kanji	2	0	0%
Ketsu	1	0	0%
Total	23	7	30.4%

Actual Problems

	Actual Problems	Actual Problems Predicted	Actual Success Rate
Grammar	2	2	100%
Vocabulary	8	5	62.5%
Kanji	2	0	0%
Total	12	7	58.3%

5.2. Conclusions. This section mainly presents a summary and some preliminary discussion of the data. Further expanded discussion of the implications of this data is presented in section 7.2.1.

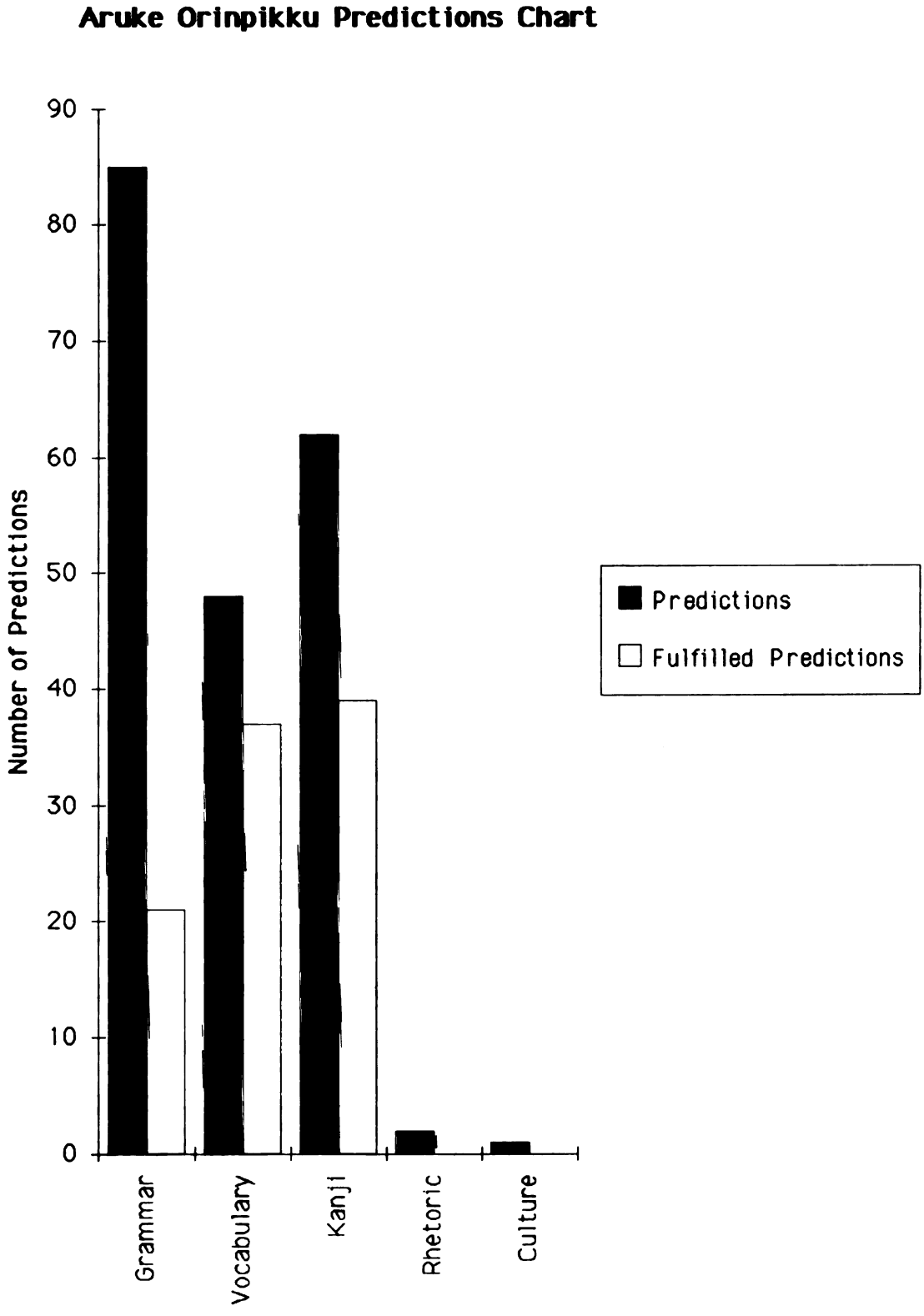
5.2.1. Conclusions for "*Aruke Orinpikku*". Table 5 contains a summary of the results (refer to chart 3 for a graphical picture) for the predictions in "*Aruke Orinpikku*". It contains the predictions and the actually fulfilled

predictions for each sentence. The fulfilled predictions are the intersections between predictions made in the last chapter and the actual problems the students encountered in this experiment. According to table 5, only 24.71% of the grammar predictions were fulfilled. The subjects in this experiment mainly circled words and not larger units, so it is hard to determine if they knew how the words fit together. Since grammar is the study of how words fit together, it is hard for this empirical study to determine the effect of grammar on difficulty. The low prediction success rate for grammar indicates this. The rate of fulfilled predictions for vocabulary and *kanji* is much higher: 77.08% and 62.90% respectively. It seems that problems with vocabulary and *kanji* are much easier to predict, perhaps, because this instrument can measure these word level entities more readily. No predictions for rhetoric were fulfilled. This instrument had trouble measuring rhetorical problems as explained in relation to sentences 20 and 33 of "*Aruke Orinpikku*". Also, the one cultural prediction in the passage for sentence 13 was not fulfilled. The total prediction success rate for this passage was 48.99%, due mainly to the low prediction success rate for grammar. It seems like this empirical investigation had trouble measuring grammatical problems since the subjects just circled words and not larger segments of text. Computer software can be designed to

Table 5

			Aruke Orinpikku Predictions							
		Fulfill.		Fulfill.		Fulfill.		Fulfill.		Fulfill.
	Grammar	Grammar	Vocab.	Vocab.	*Kanji*	*Kanji*	Rhetoric	Rhetoric	Culture	Culture
Sent.	Predict.	Predict.	Predict.	Predict.	Predict	Predict.	Predict.	Predict.	Predict	Predict.
1	2	1	1	1	1	1	0	0	0	0
2	4	1	0	0	0	0	0	0	0	0
3	4	1	1	1	1	1	0	0	0	0
4	0	0	1	1	2	0	0	0	0	0
5	0	0	1	1	2	2	0	0	0	0
6	5	1	3	2	2	1	0	0	0	0
7	0	0	2	1	0	0	0	0	0	0
8	1	0	1	1	3	1	0	0	0	0
9	3	1	2	2	3	2	0	0	0	0
10	2	0	2	1	2	1	0	0	0	0
11	3	2	0	0	1	1	0	0	0	0
12	0	0	1	0	1	1	0	0	0	0
13	12	7	2	1	4	2	0	0	1	0
14	4	0	0	0	0	0	0	0	0	0
15	1	0	0	0	1	1	0	0	0	0
16	1	0	1	1	2	2	0	0	0	0
17	2	0	1	1	0	0	0	0	0	0
18	2	1	1	0	1	1	0	0	0	0
19	1	0	1	0	4	4	0	0	0	0
20	2	1	1	1	1	1	0	0	0	0
21	1	0	3	2	2	2	0	0	0	0
22	6	2	3	2	3	1	0	0	0	0
23	5	1	2	2	2	2	0	0	0	0
24	1	0	1	1	0	0	0	0	0	0
25	2	0	1	1	1	1	0	0	0	0
26	3	1	3	2	2	2	0	0	0	0
27	3	1	2	2	4	2	1	0	0	0
28	2	0	0	0	3	3	0	0	0	0
29	1	0	3	3	3	1	0	0	0	0
30	2	0	4	4	5	2	0	.0	0	0
31	1	0	2	2	4	0	0	0	0	0
32	6	0	2	1	2	1	0	0	0	0
33	3	0	0	0	0	0	1	0	0	0
Total	85	21	48	37	62	39	2	0	1	0
Prd. Suc. % =		24.71%		77.08%		62.90%		0.00%		0.00%
Total Fulfilled Predictions =					97					
Total Predictions =					198					
Total Prediction Success rate =						48.99%				

Chart 3


Aruke Orinpikku Predictions Chart
Number of Predictions
90
80
70
60
50
40
30
20
10
0
Grammar
Vocabulary
Kanji
Rhetoric
Culture
Predictions
Fulfilled Predictions

measure more fully the contribution of grammar to passage difficulty by dividing the text into larger segments. See chapter 6 for a fuller discussion of the computer program.

Table 6 contains a summary of the actual problems (refer to chart 4 for a graphical picture of this summary) the subjects had with "*Aruke Orinpikku*". Here the grammatical prediction rate for the problems the students actually had was quite high--90.91%. This means the grammatical problems the students actually had with grammar were predicted successfully. This is to be expected because so many grammatical predictions were made. However, it seems like this instrument missed a lot of these predictions (see the previous paragraph). The computer program attempts to further measure the effect of grammar on textual difficulty (see chapter 6).

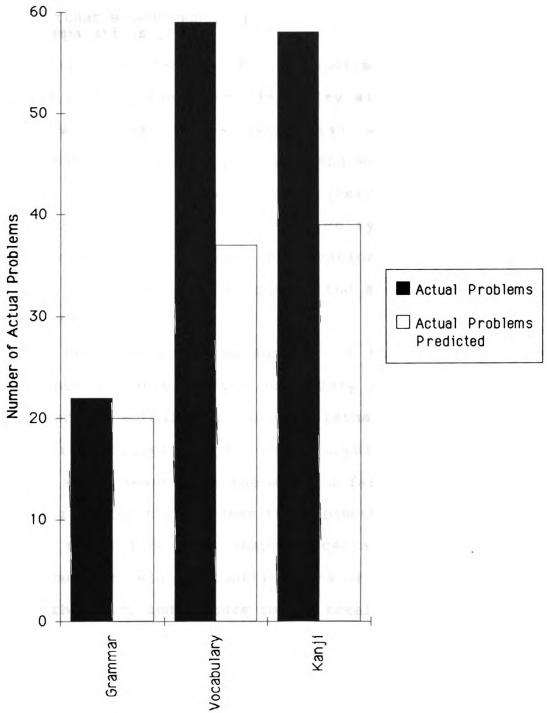
Given the actual grammatical problems as determined by this experiment, it is possible to rank the grammatical features to determine the order of their actual influence on difficulty. The ranking for the grammatical features in terms of the magnitude of their actual influence is (excluding features 5, 17, 18, 19, and 20):

	Feature	Number of Problems
(1)	Passive (9)	7
(2)	Tense (4)	4
(3)	Subordination (8)	4
(4)	Causative (10)	2
(5)	Verb complexes (11)	2
(6)	Quotations (12)	2

Table 6

	Aruke Orinpikku Actual Problems					
		Actual		Actual		Actual
	Actual	Grammar	Actual	Vocabulary	Actual	*Kanji*
	Grammar	Problems	Vocabulary	Problems	*Kanji*	Problems
Sentence	Problems	Predicted	Problems	Predicted	Problems	Predicted
1	1	1	1	1	1	1
2	1	1	2	0	0	0
3	1	1	4	1	3	1
4	0	0	1	1	0	0
5	0	0	1	1	2	2
6	1	1	2	2	2	1
7	0	0	1	1	0	0
8	0	0	4	1	2	1
9	1	1	4	2	4	2
10	0	0	1	1	2	1
11	2	2	0	0	1	1
12	0	0	0	0	1	1
13	7	6	2	1	4	2
14	0	0	0	0	0	0
15	0	0	0	0	2	1
16	0	0	1	1	2	2
17	0	0	1	1	0	0
18	1	1	3	0	4	1
19	0	0	0	0	5	4
20	1	1	2	1	3	1
21	0	0	2	2	2	2
22	2	2	2	2	1	1
23	1	1	5	2	4	2
24	0	0	1	1	0	0
25	0	0	2	1	1	1
26	2	1	3	2	2	2
27	1	1	2	2	2	2
28	0	0	0	0	3	3
29	0	0	3	3	1	1
30	0	0	4	4	2	2
31	0	0	2	2	0	0
32	0	0	3	1	2	1
33	0	0	0	0	0	0
Totals	22	20	59	37	58	39
Actual Success % =		90.91%		62.71%		67.24%
Total Actual Problems Predicted =					96	
Total Actual Problems =					139	
Total Actual Success Rate =					69.06%	

Aruke Orinpikku Actual Problems Chart



(7)	Relative clauses (13)	1
(8)	Homophonous particles (1)	0
(9)	Noun head modification (6)	0
(10)	Nominalizers (2)	0
(11)	Anaphora (3)	0
(12)	Conjunctions (7)	0
(13)	Hedges (14)	0
(14)	Further embeddings (15)	0
(15)	Comparatives (16)	0

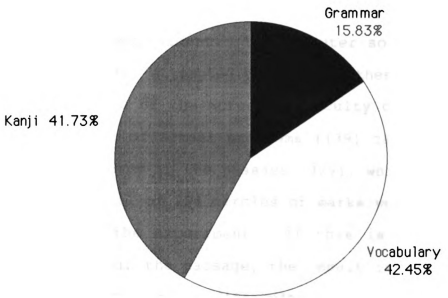
According to the results of this experiment, the passive (9) has the most influence on difficulty since it represents 7 problems. Next comes tense (4) with 4 problems, subordination (8) with 4 problems, and so on. What this says is that for this passage, the passive voice is a more important determiner of difficulty than tense and subordination. These are observations that need to be further tested empirically during the experiment involving the computer.

To continue with the summary of the actual problems (contained in table 6), the vocabulary and *kanji* prediction rates for the actual problems were rather good at 62.71% and 67.24% respectively. The total actual success rate was 69.06%, which means that there was a fairly good prediction success rate for the problems the subjects actually had.

At the end of last chapter, certain predictions were made about the relative contributions of grammar, vocabulary, *kanji*, rhetoric, and culture to the total number of problems. The predictions were: 1) grammar -- 42.71%; 2) vocabulary -- 24.62%; 3) *kanji* -- 31.16%; 4) rhetoric -- 1.01%; and 5) culture -- 0.50%. According to the results of this

Chart 5

Percentage of Actual Problems in "Aruke Orinpikku"



experiment, each area made the following contributions to the total number of actual problems: 1) grammar -- 15.83%; 2) vocabulary -- 42.45%; and 3) *kanji* -- 41.73%. A chart of these findings for the actual problems is shown in chart 5. It seems like the importance of grammar was over-predicted and the importance of vocabulary and *kanji* under-predicted. However, this could be an artifact of the inadequacy of this testing instrument, especially in the area of measuring grammatical difficulty as discussed above. Furthermore, problems with rhetoric and culture were not measured in the results of this experiment. The computer software explained in the next chapter attempted to overcome these shortcomings.

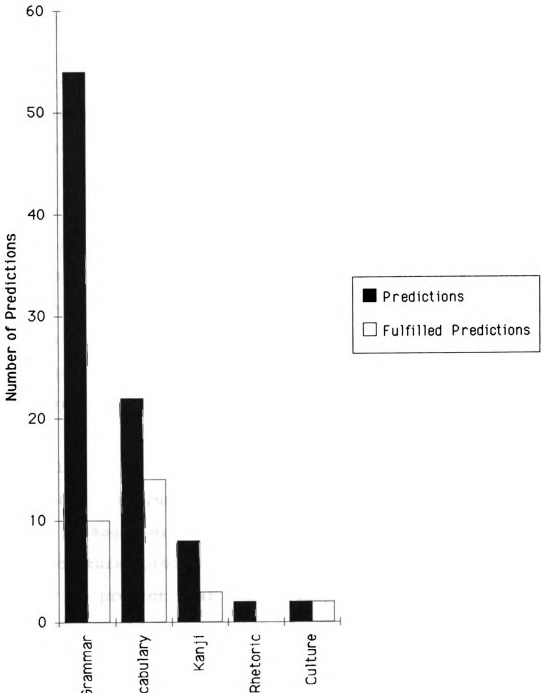
As a measure of the actual difficulty of this passage, the total number of actual problems (139) can be divided by the number of words in the passage (329), which comes out to .42. Also a total of 294 circles or marks were made in this passage during the experiment. If this is divided by the number of words in the passage, the result is .89. This can also be another measure of difficulty.

5.2.2. Conclusions for "*Hoogen to Kyootsuugo*". Table 7 summarizes the results (refer to chart 6 for a graphical picture) for the predictions in "*Hoogen to Kyootsuugo*". The predictions and the actually fulfilled predictions for each sentence are contained in this table. The fulfilled predictions are the intersections between predictions made in

Table 7

Hoogen to Kyootsuugo Predictions										
		Fulfill.		Fulfill.		Fulfill.		Fulfill.		Fulfill.
	Grammar	Grammar	Vocab.	Vocab.	*Kanji*	*Kanji*	Rhetoric	Rhetoric	Culture	Culture
Sent.	Predict.	Predict.	Predict	Predict.	Predict.	Predict.	Predict.	Predict.	Predict	Predict.
1	2	0	2	2	0	0	0	0	0	0
2	7	3	6	4	4	1	0	0	0	0
3	3	0	1	1	0	0	0	0	0	0
4	4	2	1	0	0	0	0	0	0	0
5	9	2	3	1	2	2	0	0	2	2
6	3	1	1	0	0	0	1	0	0	0
7	2	0	0	0	0	0	0	0	0	0
8	5	0	0	0	0	0	0	0	0	0
9	3	0	0	0	0	0	0	0	0	0
10	3	0	1	1	0	0	0	0	0	0
11	13	2	7	5	2	0	1	0	0	0
Total	54	10	22	14	8	3	2	0	2	2
Pred. Succ. % =		18.52%		63.64%		37.50%		0.00%		100%
Total Fulfilled Predictions =					29					
Total Predictions =					88					
Total Prediction Success rate =						32.95%				

Hoogen to Kyootsuugo Predictions Chart



the last chapter and the actual problems the students encountered in this experiment. According to this table, only 18.52% of the grammar predictions were fulfilled. As in the previous passage, the subjects in this experiment mainly circled words and not larger units, so it is hard to determine if they knew how the words fit together or if they knew how to indicate syntactic difficulties from the discourse level on down. As mentioned previously, since grammar is the study of how words fit together, it is hard for this empirical study to determine the effect of grammar on difficulty. The rate of fulfilled predictions for vocabulary is much higher at 63.64%. Again vocabulary problems seem easier to predict as in the case of the previous passage. There is a 37.5% success rate for the *kanji* predictions. Eight problem areas for Chinese characters had been predicted, but only three were circled. Again as in the previous passage, no predictions for rhetoric were fulfilled. This seems to be a limitation of this experimental instrument as explained when sentences 6 and 11 of this passage were discussed. However, in this passage, the two cultural predictions were successfully fulfilled. It was easy to predict that the geographical names, *Aomori* and *Kagoshima*, would cause difficulty since English-speaking students would probably not be familiar with these place names. The total prediction success rate for this passage

was 32.95% due to the low prediction success rates for grammar and *kanji*. As with "*Aruke Orinpikku*", it seems like this empirical investigation had trouble measuring grammatical problems since the subjects mainly circled words and not larger segments of text. As mentioned previously in the discussion of the results of "*Aruke Orinpikku*", computer software can be designed to measure more fully the contribution of grammar to passage difficulty by dividing the text into larger segments. See chapter 6 about the computer program.

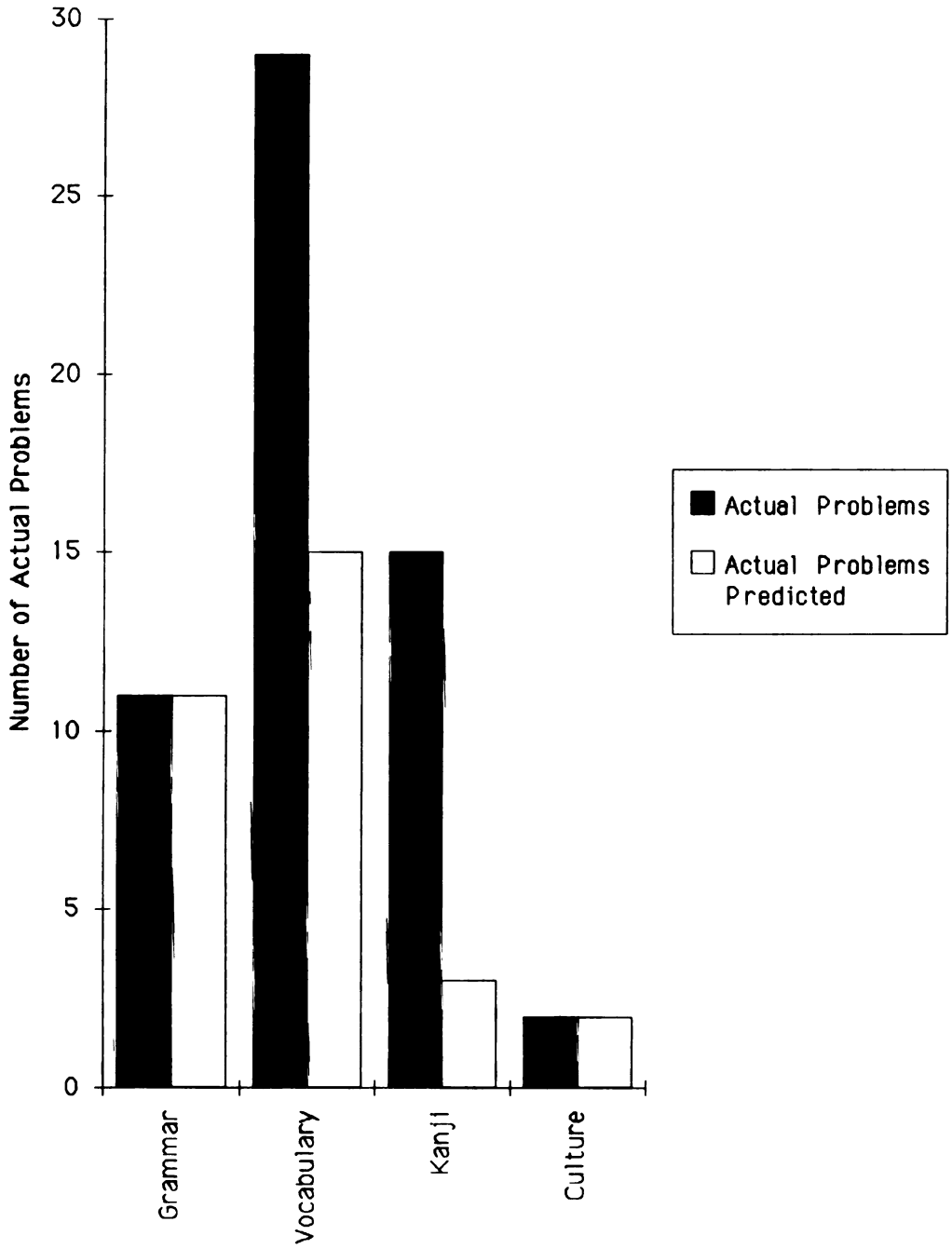
Table 8 contains a summary of the actual problems (refer to chart 7 for a graphical picture) the subjects had. The grammatical prediction rate for the problems the students actually had was 100%. A lot of grammatical predictions had been made in the previous chapter, so it is not surprising that the actual grammatical problems the subjects had were well covered.

Given the actual grammatical problems as determined by this experiment, it is possible to rank the grammatical features in "*Hoogen to Kyootsuugo*" to determine the order of their actual influence on difficulty. The ranking for the grammatical features in terms of the magnitude of their actual influence is (excluding features 5, 17, 18, 19, and 20) (see page 184):

Table 8

		Hoogen to Kyootsuugo Actual Problems						
		Actual		Actual		Actual		Actual
	Actual	Grammar	Actual	Vocab.	Actual	*Kanji*	Actual	Culture
	Grammar	Probl.	Vocab.	Probl.	*Kanji*	Probl.	Culture	Probl.
Sentence	Probl.	Predict.	Probl.	Predict.	Probl.	Predict.	Probl.	Predict.
1	0	0	3	3	0	0	0	0
2	4	4	5	4	1	1	0	0
3	0	0	3	1	0	0	0	0
4	2	2	0	0	2	0	0	0
5	2	2	3	1	4	2	2	2
6	1	1	1	0	0	0	0	0
7	0	0	1	0	2	0	0	0
8	0	0	2	0	0	0	0	0
9	0	0	2	0	1	0	0	0
10	0	0	1	1	3	0	0	0
11	2	2	8	5	2	0	0	0
Totals	11	11	29	15	15	3	2	2
Actual Success % =		100%		51.72%		20.00%		100%
Total Actual Problems Predicted =					31			
Total Actual Problems =					57			
Total Actual Success rate =					54.39%			

Hoogen to Kyootsuugo Actual Problems Chart



	Feature	Number of Problems
(1)	Passive (9)	4
(2)	Relative clauses (13)	3
(3)	Subordination (8)	2
(4)	Conjunctions (7)	1
(5)	Verb complexes (11)	1
(6)	Homophonous particles (1)	0
(7)	Nominalizers (2)	0
(8)	Anaphora (3)	0
(9)	Tense (4)	0
(10)	Noun head modification (6)	0
(11)	Causative (10)	0
(12)	Quotations (12)	0
(13)	Hedges (14)	0
(14)	Further embeddings (15)	0
(15)	Comparatives (16)	0

According to the results of this experiment, the passive (9) has the most influence on difficulty since it represents 4 problems. Next comes relative clauses (13) with 3 problems, subordination (8) with 2 problems, conjunctions (7) with 1 problem, and verb complexes (11) with 1 problem. What this says is that for this passage, the passive voice is a more important determiner of difficulty than conjunctions and verb complexes. These are observations that need to be further tested empirically during the experiment involving the computer.

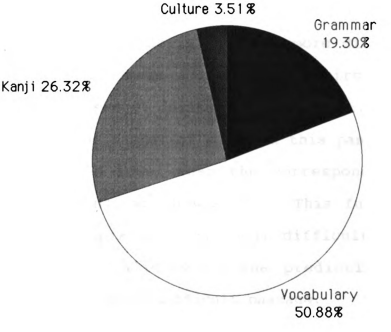
To continue with the summary of the actual problems (contained in table 8), the vocabulary prediction rate for the actual vocabulary problems was 51.72%. This rate indicates that they had a fair amount of trouble with vocabulary items that had been predicted not to cause trouble. The *kanji* prediction rate for actual *kanji* problems was 20%. They seem to have had a large number of problems

with *kanji* in areas other than predicted. The prediction rate for the actual cultural problems in this passage was 100%. This is due to the successful prediction of problems related to understanding the place names, *Aomori* and *Kagoshima*. The total actual success rate for this passage was 54.39% especially due to the low prediction success rate for *kanji*.

At the end of the previous chapter, certain predictions were made about the relative contributions of grammar, vocabulary, *kanji*, rhetoric, and culture to the total number of problems in this passage, "*Hoogen to Kyootsuugo*". The predictions were: 1) grammar -- 61.36%; 2) vocabulary -- 25%; 3) *kanji* -- 9.09%; 4) rhetoric -- 2.27%; and 5) culture -- 2.27%. According to the results of the experiment on "*Hoogen to Kyootsuugo*", each area made the following contributions to the total number of actual problems: 1) grammar -- 19.30%; 2) vocabulary -- 50.88%; 3) *kanji* -- 26.32%; and 4) culture -- 3.51%. Chart 8 illustrates these findings. It seems like the importance of grammar was over-predicted. However, again this could be an artifact of the inadequacy of the testing instrument used for this passage, in particular in the area of measuring grammatical difficulty as discussed above. The contribution of *kanji* to the total number of problems was predicted to be 9.09%, but according to the experiment it was 26.32%, which indicates that the

Chart 8

Percentage of Actual Problems in "Hoogen to Kyootsuugo"



importance of *kanji* was under-predicted. Problems with rhetoric did not appear in the results of this experiment; however, cultural problems did, constituting 3.77% of the total number of problems, which is very close to the predicted value, 2.22%.

As a measure of the actual difficulty of "*Hoogen to Kyootsuugo*", the total number of actual problems (57) can be divided by the number of words in the passage (234). This comes out to .24, which is lower than the corresponding figure for "*Aruke Orinpikku*", which was .42. This means "*Aruke Orinpikku*" is definitely the more difficult passage. Also the subjects made a total of 86 circles or marks in "*Hoogen to Kyootsuugo*" during the experiment. If this number is divided by the number of words in this passage, the result is .37, which is lower than the corresponding figure for "*Aruke Orinpikku*", which was .89. This further indicates that "*Aruke Orinpikku*" is the more difficult passage. This gives empirical validity to the prediction that "*Aruke Orinpikku*" is the more difficult passage.

The question that remains is whether the subjects in this experiment really understood these passages. Because of this, the researcher has developed software to help determine the kind of help students need in order to comprehend a Japanese text. This software attempts to motivate students to comprehend the text by providing comprehension questions

that must be answered by reading the text carefully. This software also attempts to determine the effect of grammar on readability by keeping track of how much the students use the grammar help facility in the program. In this way, perhaps some of the shortcomings of the experimental technique covered in this chapter can be compensated for. At this point, it is difficult to determine to what extent the students comprehended the passages discussed in this chapter. As a result, based on the data and analysis in this chapter, software has been developed to help determine the level of the students' reading ability and to help them understand these texts.

CHAPTER 6

The Computer Experiment

6.0. Introduction. A HyperCard computer program was developed for the two passages, "*Aruke Orinpikku*" ("Walking Olympics") and "*Hoogen to Kyootsuugo*" ("Dialects and the Common Language"). Assistance was provided by having the reader choose the information that is necessary to understand these passages. This information was divided into five different areas: vocabulary, *kanji* (Chinese characters), grammar, rhetoric, and culture (background knowledge). The content of this information was determined both by the hypotheses as to what contributes to textual difficulty as discussed in chapter 4 and by the empirical study of what textual elements the students themselves thought were difficult as presented in chapter 5. Beyond this, this program could also record the information the reader used to understand these texts. It could keep track of how often readers made selections on vocabulary, Chinese characters, grammar, rhetoric, and culture in order to understand these passages. This information was analyzed to determine what elements in the passage made the text difficult. The assumption was made that the more difficult textual elements needed to be accessed more in order to understand the text. The data that was contained in the readers' records of how

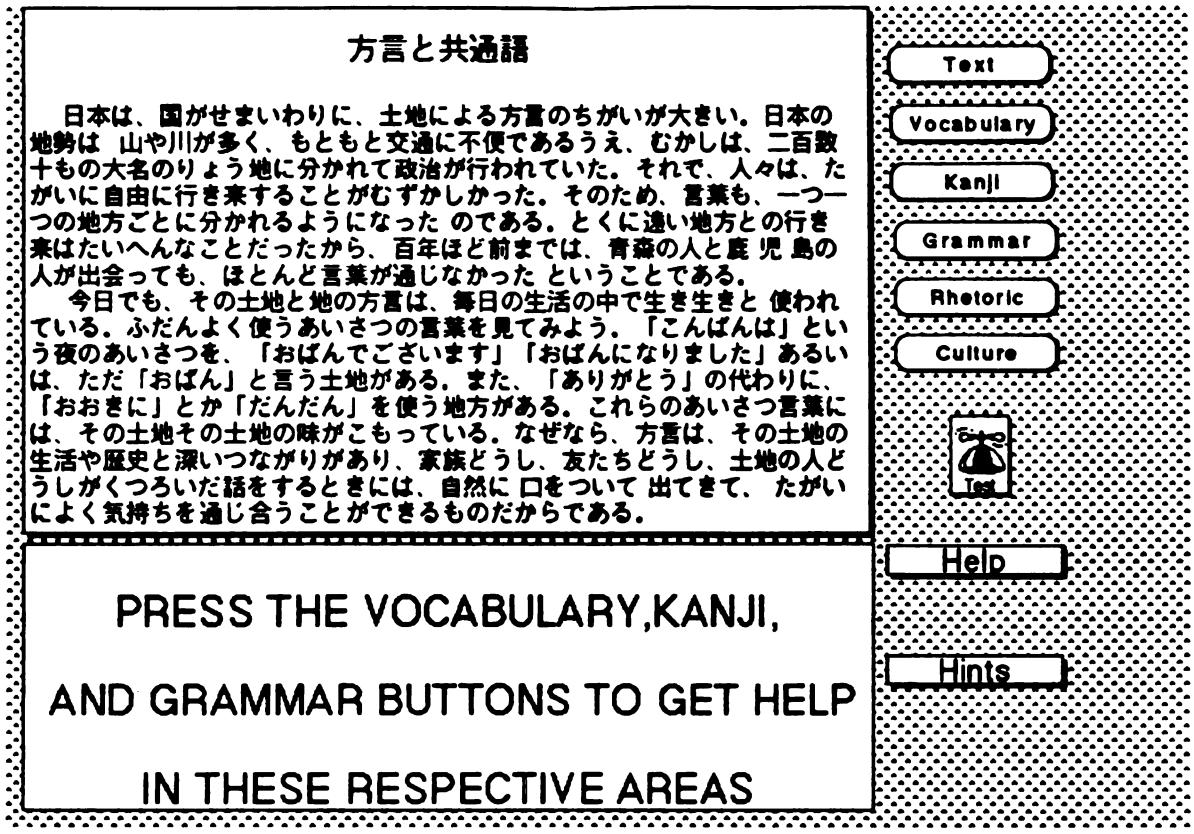
often they used information to understand the passages was analyzed to acquire an overall picture of the sources of textual difficulty. When compared to the study in chapter 5, this was a different kind of empirical study of what the readers found difficult in these passages. In fact, this program was based upon the results of the study contained in chapter 5 which acted as a preliminary pilot study around which this program was developed. In summary, this program not only let the readers choose the help they needed to understand the passages but also analyzed the difficulty of the passages based on the help they received while processing the texts. This produced an empirical analysis of the sources of textual difficulty.

6.1. The Program. An Apple Macintosh IIsi was used to develop the program and test it on-line with students. The Macintosh model used in this experiment has a standard 80MB hard disk drive with 5MB of internal RAM. The video display was on a 13-inch high-resolution monitor positioned at eye level for the readers who were sitting in front of the monitors. A mouse was also utilized to enable the reader to interact with the computer screen. As mentioned before, the programming environment for this program is HyperCard, an authoring environment developed by Apple Computer. The HyperCard implementation used in this study runs on the Apple KanjiTalk System, version 6.0.7, a system which utilizes the

Japanese writing system. As mentioned in chapter 2, section 2.4, HyperCard employs a hypertext environment which allows the user to choose words or linguistic units of larger size on the screen in order to have the program define, translate, or explain them. These words are chosen with the aid of a mouse which is part of the computer environment. The reader does not interact with the computer by using the keyboard. All the interaction is done through the use of the mouse, which makes it more convenient for the user. In summary, the purpose of this environment is to facilitate the comprehension of Japanese in a way that is natural and intuitive to the reader. The following are the sections of the program that the subjects in this experiment could utilize.

6.1.1. The Introduction to the Program for the User. When the subjects go through the introductory section to the program, they learn how each page of the Japanese text is organized. An illustration of how a page of Japanese text, in this case "*Hoogen to Kyootsuugo*", is presented is shown in Figure 1. The subjects receive the explanation that the screens with text have buttons on them which can be clicked with the mouse to provide the help that is needed to understand the text. They are told that there are six kinds of buttons: vocabulary, *kanji*, grammar, rhetoric, culture, and text. The subjects learn that when the vocabulary button

Figure 1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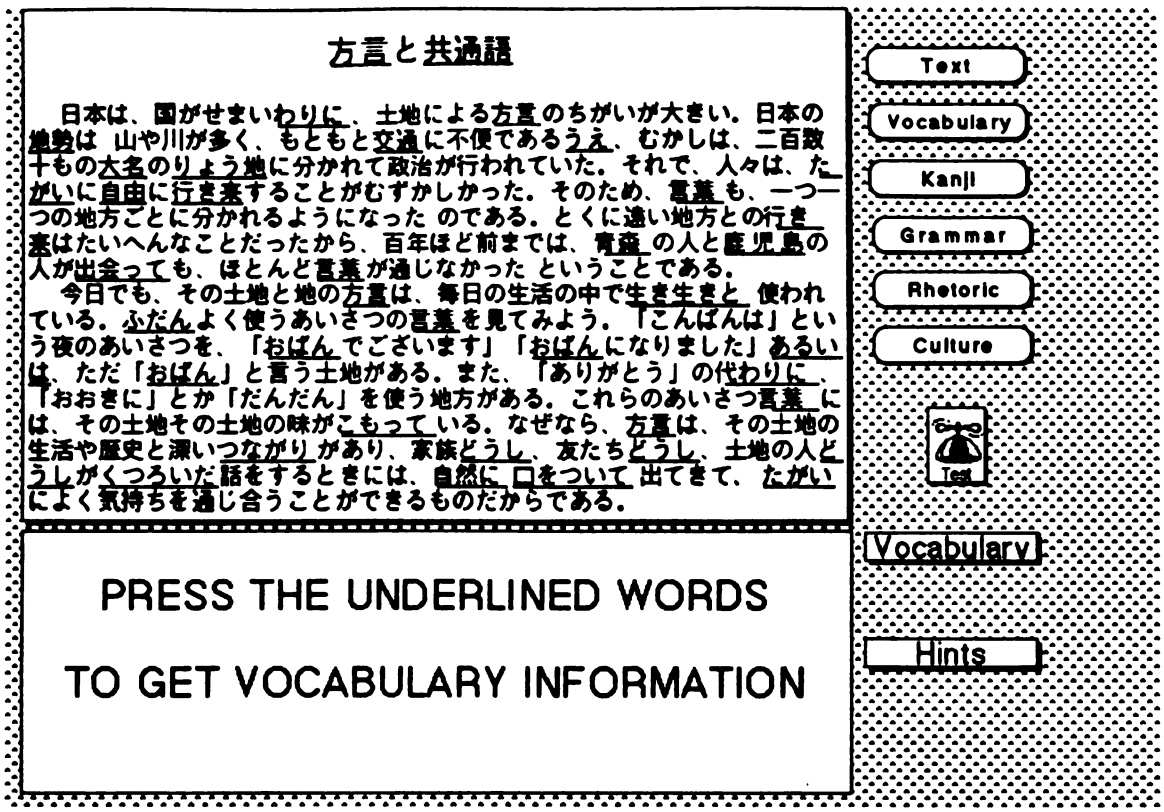
今日でも、その土地と地の方言は、毎日の生活の中で生き生きと 使われている。ふだんよく使うあいさつの言葉を見てみよう。「こんばんは」という夜のあいさつを、「おばんでございます」「おばんになりました」あるいは、ただ「おばん」と言う土地がある。また、「ありがとう」の代わりに、「おおきに」とか「だんだん」を使う地方がある。これらのあいさつ言葉には、その土地その土地の味がこもっている。なぜなら、方言は、その土地の生活や歴史と深いつながりがあり、家族どうし、友たちどうし、土地の人どうしがくつろいだ話をするときには、自然に 口をついて 出てきて、 たがいによく気持ちを通じ合うことができるものだからである。
Text
Vocabulary
Kanji
Grammar
Rhetoric
Culture
Test
Help
Hints
PRESS THE VOCABULARY,KANJI,
AND GRAMMAR BUTTONS TO GET HELP
IN THESE RESPECTIVE AREAS

is clicked with the mouse, underlines appear in the text which mark the words that are predicted to be difficult for them as determined by the analysis of chapter 4 and the empirical study in chapter 5. These words can be clicked on to get the necessary help. They also learn that by clicking the *kanji*, grammar, rhetoric, and culture buttons, they can receive help in those respective areas. When they click the *kanji* button, difficult (as determined by chapters 4 and 5) *kanji* are underlined, and those can be clicked on to get the appropriate help. When the grammar button is clicked, parts of sentences are underlined to indicate segments which are predicted to be difficult for this group of subjects (based on the studies of chapters 4 and 5). When the rhetoric button is clicked, sentences that mark the *ki* 'beginning', *shoo* 'development', *ten* 'change', and *ketsu* 'conclusion' are underlined. When these sentences are clicked on, explanations about this rhetorical structure are given to the subjects in this study. When the culture button is chosen, sentences or sections that present cultural difficulties are underlined. When these sentences are selected, cultural explanations are given based upon the predictions of cultural difficulty in chapter 4 under feature 20. Finally, the text button just gives the text without any underlining to distract the reader. In summary, these six buttons give the reader a variety of options by which the text can be engaged

Figure 2


方言と共通語
日本は、国がせまいわりに、土地による方言のちがいが大きい。日本の地勢は 山や川が多く、もともと交通に不便であるうえ、むかしは、二百数十もの大名のりょう地に分かれて政治が行われていた。それで、人々は、たがいに自由に行き来することがむずかしかった。そのため、言葉も、一つ一つの地方ごとに分かれるようになった のである。とくに遠い地方との行き来はたいへんなことだったから、百年ほど前までは、青森の人と鹿児島の人が出会っても、ほとんど言葉が通じなかった ということである。
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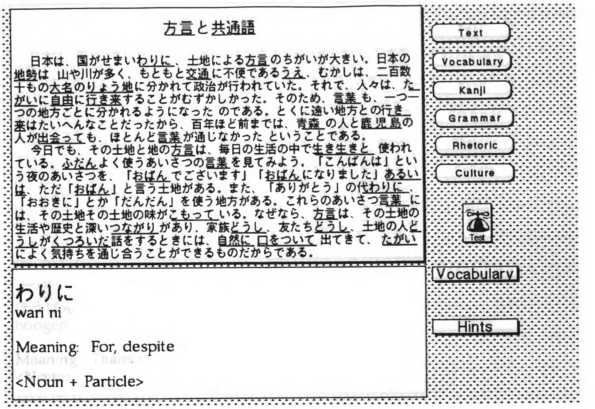
PRESS THE UNDERLINED WORDS
TO GET VOCABULARY INFORMATION
Text
Vocabulary
Kanji
Grammar
Rhetoric
Culture
Test
Vocabulary
Hints

in order to facilitate textual understanding.

6.1.2. The Vocabulary Section. As mentioned above, when the subjects click the vocabulary button with the mouse, underlines appear in the text under the words and phrases that are predicted to be difficult for the subjects. These words have been determined to be difficult by the analysis of chapter 4 and the empirical study in chapter 5. Figure 2 contains the picture of the computer screen that appears for "*Hoogen to Kyootsuugo*" when the vocabulary button is clicked by the mouse. Notice that problematic phrases have been underlined. For example, in sentence 1, the phrase, *wari ni* 'in proportion to", and the word, *hoogen* 'dialect', have been underlined. By clicking on the phrase, *wari ni*, with the mouse, a window appears at the bottom of the screen that defines the meaning of this phrase (see Figure 3). This window contains this phrase written both in *hiragana* and Roman letters along with the definition and the concatenation of word categories (noun + particle) contained in the phrase. Another example is the definition that appears in the window at the bottom of the screen when *hoogen* is clicked on (see Figure 4). Here the window contains this word written in Chinese characters, *hiragana*, and Roman letters along with the meaning and the word category, noun. The purpose of this information on vocabulary is to help the reader comprehend text in a way that is both intuitive and easy to understand.

Figure 3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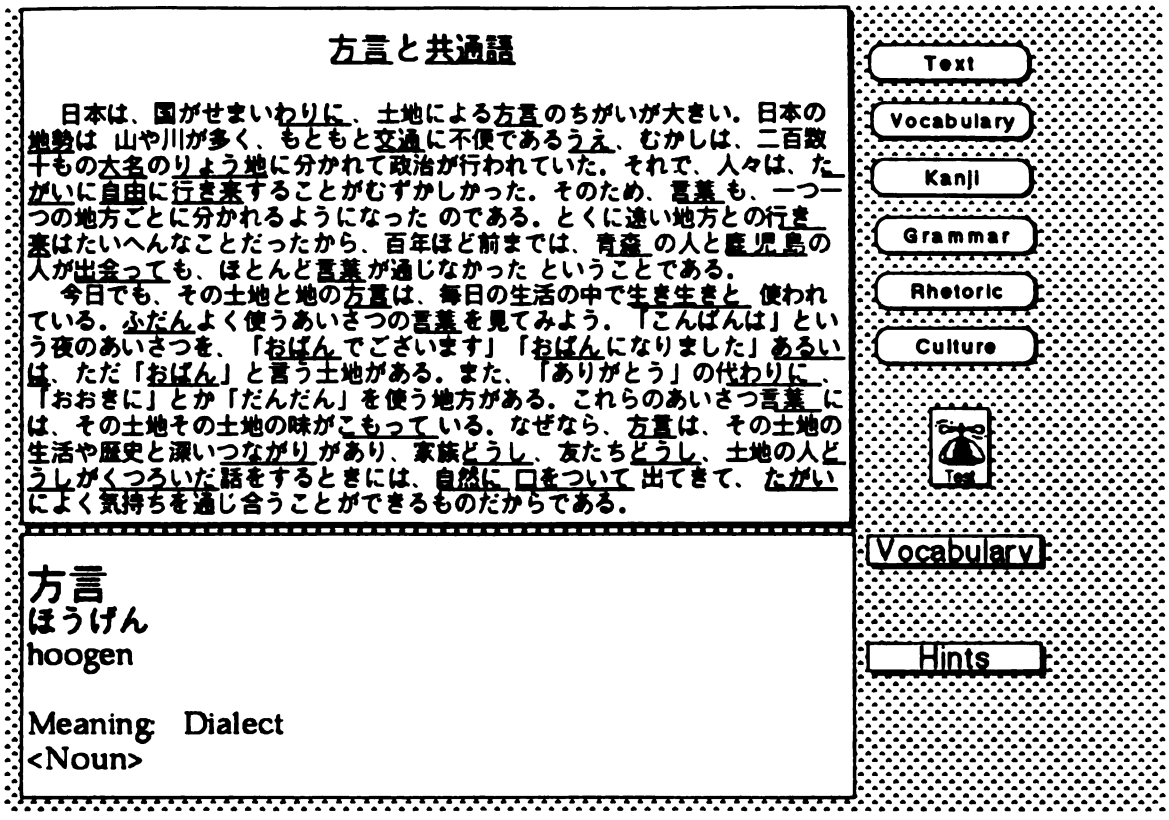
わりに
wari ni
Meaning: For, despite
<Noun + Particle>
Text
Vocabulary
Kanji
Grammar
Rhetoric
Culture
Exercise
Test
Vocabulary
Hints

Figure 4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方言
ほうげん
hoogen
Meaning: Dialect
<Noun>
Text
Vocabulary
Kanji
Grammar
Rhetoric
Culture
Test
Vocabulary
Hints

In summary, the focus of the kind of help that is given here is on the problems that this group of subjects were having in understanding the text, based on the studies of both chapters 4 and 5. This program builds upon the knowledge the subjects already have of Japanese vocabulary and extends that knowledge when requested by providing vocabulary help. The subjects have the power to choose what vocabulary help they need and when they need it. This potentially creates a user-friendly environment.

6.1.3. The *Kanji* Section. As with the vocabulary, when the subjects click the ***kanji*** button, underlines appear in the text under the *kanji* that are predicted to be difficult for the subjects as determined by chapters 4 and 5. When the subjects click on the underlined Chinese characters, they get appropriate help to understand the *kanji* that are difficult for them. When a Chinese character with an underline is chosen, the window below the text shows information about this character. The *on* (Chinese pronunciation of the character) is given in capital letters, while the *kun* (Japanese pronunciation of the character) is given in small letters. The meaning of the character is also provided in the window. Figure 5 contains an example of how this information is presented in the window below the text. The noun, *moyooshi*, appears in the first sentence of "*Aruke Orinpikku*". The noun itself means 'event'. The Chinese

Figure 5

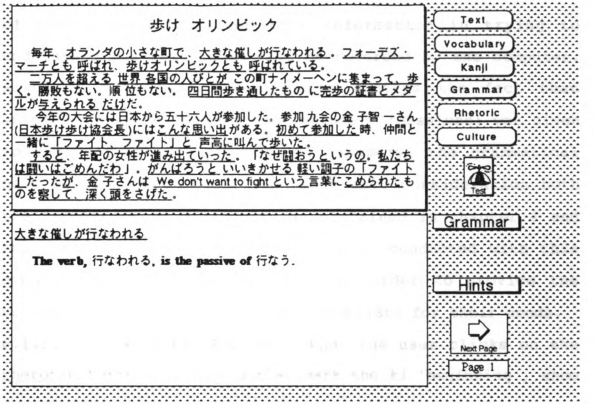
催　SAI

moyoo(su)　to hold (a meeting)

character in this word is given in Figure 5. This character has a Chinese pronunciation of *SAI*, which is used in compounds, and a Japanese pronunciation of *moyoo(su)*, a verb which literally means 'to hold (a meeting)'. The stem form of *moyoo(su)* is *moyoo(shi)*, which is the noun which appears in this text. In summary, the purpose for providing information on Chinese characters is to provide in-depth understanding of word meaning. The use of Chinese characters forms an important component of Japanese vocabulary that the reader of Japanese needs to be aware of.

6.1.4. The Grammar Section. As seen in Figure 6, when the grammar button is clicked, parts of sentences are underlined to indicate segments that are determined to be difficult for this group of subjects (based on the studies of chapters 4 and 5). When these segments are chosen by the subjects, grammatical information about these segments appears in the window at the bottom of the screen. Figure 6 contains the text for page 1 of "*Aruke Orinpikku*". The clause, *ooki na moyooshi ga okonawareru* 'a big event is held', has been selected, and information about the passive verb, *okonawareru* 'is held', appears in the window at the bottom of the screen. The passive verb in this clause has been explained in this window because the passive construction was predicted to cause difficulty in section 4.1.9 of chapter 4. The fact that a student marked *okonawareru* in the empirical experiment

Figure 6


歩け オリンピック
毎年、オランダの小さな町で、大きな催しが行なわれる。フォーデズ・マーチとも 呼ばれ、歩けオリンピックとも 呼ばれている。
一万人を超える 世界 各国の人びとが この町ナイメーヘンに集まって、歩く。勝敗もない。順 位もない。四日間歩き通したもの に完歩の証書とメダルが与えられる だけだ。
今年の大会には日本から五十六人が参加した。参加 九会の金 子智 一さん(日本歩け歩け協会長)にはこんな思い出がある。初めて参加した時、仲間と一緒に「ファイト、ファイト」と 声高に叫んで歩いた。
すると、年配の女性が進み出ていった。「なぜ闘おうというの。私たちは闘いはごめんだわ」。がんばろうと いいきかせる 軽い調子の「ファイト」だったが、金 子さんは We don't want to fight という言葉にこめられたものを察して、深く頭をさげた。
Text
Vocabulary
Kanji
Grammar
Rhetoric
Culture
Test
大きな催しが行なわれる
The verb, 行なわれる, is the passive of 行なう.
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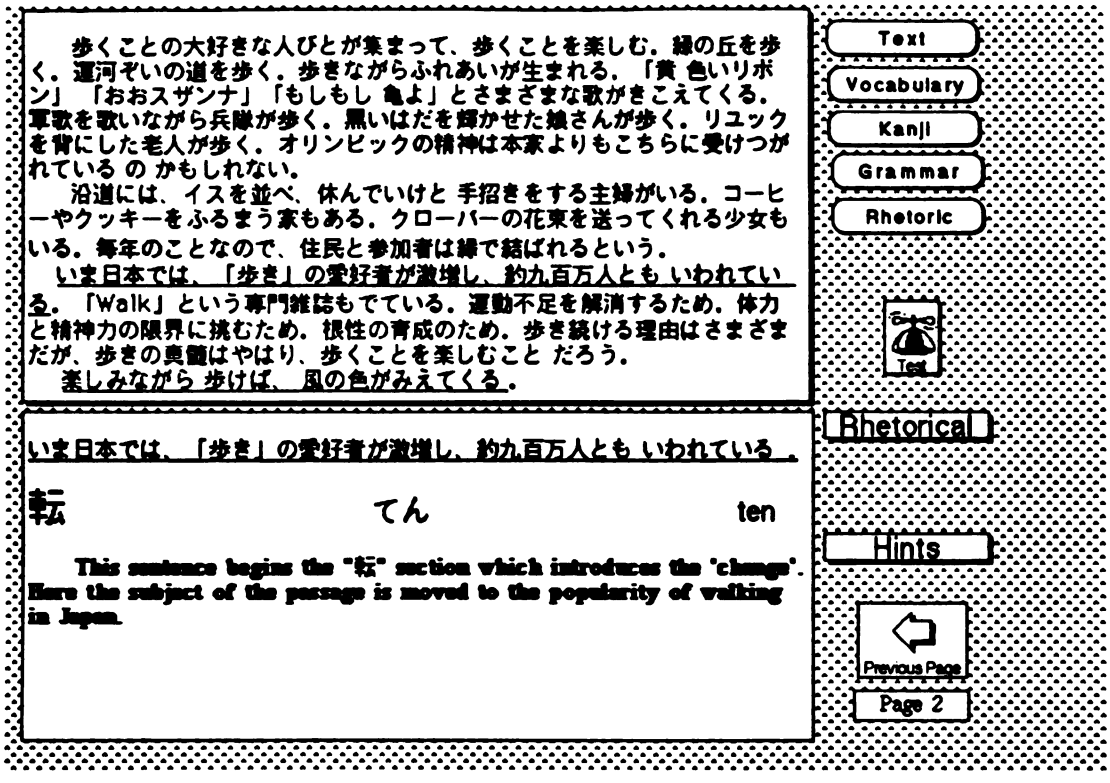
of difficulty (as explained in chapter 5) indicates the possibility that the passive form of this verb is a source of difficulty. Therefore, the fact that this verb is in the passive is explained to the users of this program. If a user of this program utilizes this information in trying to understand the text, that fact is recorded by the computer. Also, in this case the computer records the fact that information about grammatical feature 9 (passives) was given to the user of this program. In summary, the grammatical help section of this program takes into consideration both the hypotheses of difficulty as explained in chapter 4 and the empirical experiment of difficulty conducted with this group as explained in chapter 5 in order to provide the grammatical information that is appropriate for their needs.

6.1.5. The Rhetoric Section. When the user clicks on the rhetoric button, sentences that mark the *ki* 'beginning', *shoo* 'development', *ten* 'change', and *ketsu* 'conclusion' are underlined. When these sentences are selected, explanations on the rhetorical structure are provided. Figure 7 contains the text for page 2 of "*Aruke Orinpikku*". In this example, the sentence beginning the *ten* 'change' in the rhetorical structure has been selected: *Ima Nihon dewa, aruki no aikoosha ga gekizoo shi, yaku kyuuhyakuman to mo iwarete iru.* 'In Japan today, those who like to walk have increased dramatically and are said to number about 9 million.' In the

Figure 7


歩くことの大好きな人びとが集まって、歩くことを楽しむ。緑の丘を歩く。運河ぞいの道を歩く。歩きながらふれあいが生まれる。「黄色いリボン」「おおスザンナ」「もしもし亀よ」とさまざまな歌がきこえてくる。軍歌を歌いながら兵隊が歩く。黒いはだを輝かせた娘さんが歩く。リュックを背にした老人が歩く。オリンピックの精神は本家よりもこちらに受けつがれているのかもしれない。
沿道には、イスを並べ、休んでいけと手招きをする主婦がいる。コーヒーやクッキーをふるまう家もある。クローバーの花束を送ってくれる少女もいる。毎年のことなので、住民と参加者は縁で結ばれるという。
いま日本では、「歩き」の愛好者が激増し、約九百万人ともいわれている。「Walk」という専門雑誌もでている。運動不足を解消するため、体力と精神力の限界に挑むため、根性の育成のため、歩き続ける理由はさまざまだが、歩きの真髄はやはり、歩くことを楽しむことだろう。
楽しみながら歩けば、風の色がみえてくる。
いま日本では、「歩き」の愛好者が激増し、約九百万人ともいわれている。
転 てん ten
This sentence begins the "転" section which introduces the 'change'. Here the subject of the passage is moved to the popularity of walking in Japan.
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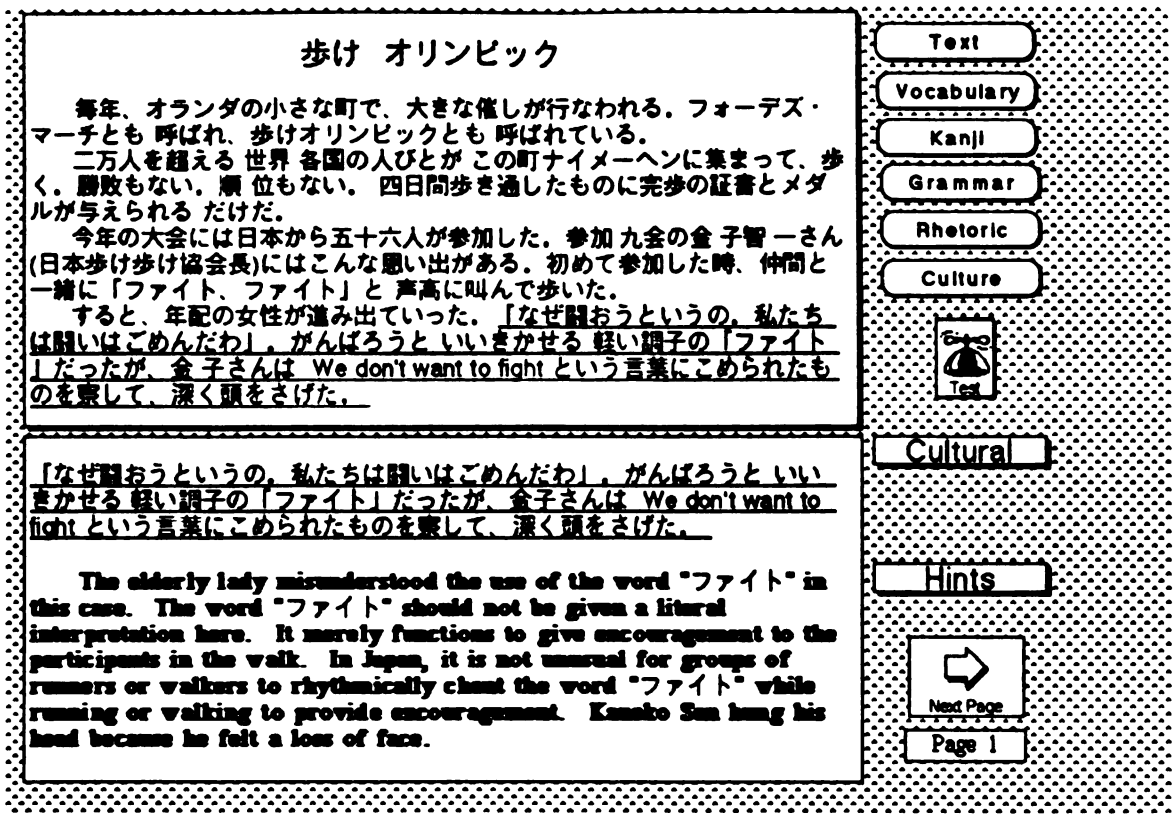
window below the text, a message describes the rhetorical function of this sentence, which is to bring about a change in the topic. Here the topic moves from the 'Walking Olympics' in Holland to the popularity of recreational walking in Japan. The information provided to the users of this program should help to make the passage more coherent by helping them follow the progression of the passage. According to Hinds (1983a, pp. 190-191), to native speakers of English, a composition that exhibits the *ki-shoo-ten-ketsu* pattern appears to lack coherence. Explanations about the points of transitions in Japanese expository texts can certainly increase the sense of coherence for English-speaking readers. In summary, the purpose of rhetorical explanations is to assist the readers in understanding Japanese text by helping them to understand the rhetorical structure contained in it.

6.1.6. The Culture Section. When the user clicks the culture button, sentences or sections that present cultural difficulties are underlined. When these sections are selected by the user, cultural explanations are given based upon the predictions of cultural difficulty given in chapter 4 under feature 20 (section 4.1.20). Figure 8 contains the text for page 1 of "*Aruke Orinpikku*". In this example, the sentences explaining the interaction between the elderly woman and Mr. Kaneko about the meaning of the word *faito*

Figure 8


歩け オリンピック
毎年、オランダの小さな町で、大きな催しが行なわれる。フォーデズ・マーチとも 呼ばれ、歩けオリンピックとも 呼ばれている。
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すると、年配の女性が進み出ていった。「なぜ闘おうというの。私たちは闘いはごめんだわ」。がんばろうと いいきかせる 軽い調子の「ファイト」だったが、金 子さんは We don't want to fight という言葉にこめられたものを察して、深く頭をさげた。
「なぜ闘おうというの。私たちは闘いはごめんだわ」。がんばろうと いいきかせる 軽い調子の「ファイト」だったが、金子さんは We don't want to fight という言葉にこめられたものを察して、深く頭をさげた。
The elderly lady misunderstood the use of the word "ファイト" in this case. The word "ファイト" should not be given a litural interpretation here. It merely functions to give encouragement to the participants in the walk. In Japan, it is not unusual for groups of runners or walkers to rhythmically chant the word "ファイト" while running or walking to provide encouragement. Kaneko San hung his head because he felt a loss of face.
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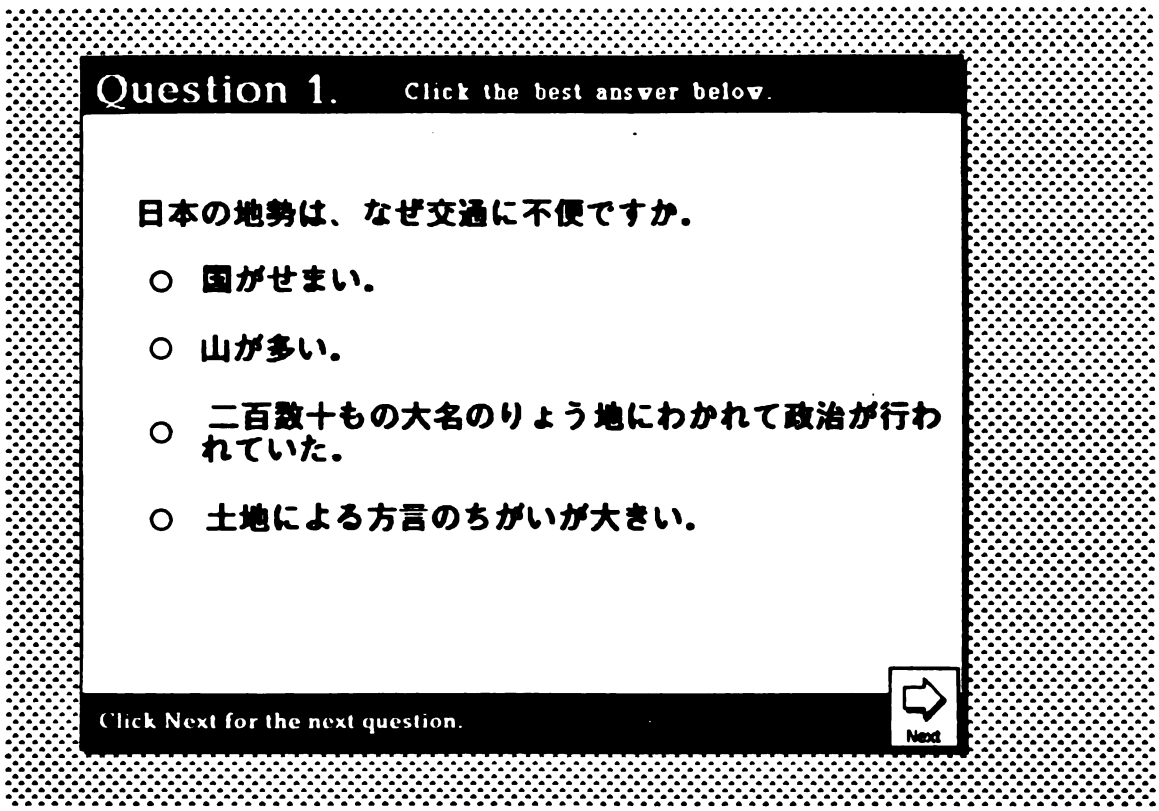
'fight' have been selected: *"Naze tatakaou to iu no. Watakushitachi wa tatakai wa gomen da wa." Ganbarou to iikikaseru karui chooshi no "faito" datta ga, Kaneko san wa "We don't want to fight" to iu kotoba ni komerareta mono o sasshite, fukaku atama o sageta.* '"Why do you talk about fighting. We don't want to fight." It was a light "Fight!" calling on people to exert an effort, but Kaneko realized the thinking behind the words, "We don't want to fight," and hung his head.' In the window below the text, a message discusses the meaning of the word *faito* 'fight'. The elderly lady did not understand that when the Japanese used the word *faito* during the walk, they were not using the word in its literal sense. They were merely giving encouragement to each other. Mr. Kaneko felt embarrassed that the use of this word had created such a misunderstanding. The users of this program need to know that in Japanese culture, the use of the word *faito* while walking or running is not to be taken literally. In summary, providing cultural background to a passage written in another language facilitates the understanding of that passage because it can provide access to the knowledge, assumptions, and beliefs made by the people in that culture.

6.1.7. The Tests. After each passage, there is a set of six comprehension questions based on the content of the passages. These questions were developed by the researcher. These questions were constructed to measure the extent of reading

Figure 9


Question 1.
Click the best answer below.
日本の地勢は、なぜ交通に不便ですか。
○ 国がせまい。
○ 山が多い。
○ 二百数十もの大名のりょう地にわかれて政治が行われていた。
○ 土地による方言のちがいが大きい。
Click Next for the next question.
Next

comprehension on the part of the subjects. These tests employ a multiple-choice format. Each test item employs a question followed by a set of answers. One of these answers is correct, and three are distractors. See Figure 9 for an example question.

6.1.8. Monitoring. The computer is used to monitor what kind of information the reader uses while working through the lesson. The program records the number of times information on vocabulary, Chinese characters, grammar, rhetoric, and culture is used in order to understand a text. An analysis of this information over a group of users can determine the difficulty of a text. The assumption is that the more difficult a certain element of text is, the more the users need information to explain that element. There is a proportional relationship between the number of times information about a textual element is accessed and the difficulty of that element. Difficulty is determined by the number of times information on certain textual elements is used. This sort of information is used to analyze the sources of textual difficulty, and thus, the computer can be an aid in linguistic study.

This program keeps a record of both individual user performances and the group performance as a whole. The number of times and relative percentages of help received in vocabulary, *kanji*, grammar, rhetoric, and culture are

recorded on an individual and group basis. Thus, a record of the total number of times information is used on an individual and group basis is kept. Also, there is a record of the length of time it took the readers to read the passages. Also, the program keeps a tabulation of the help received according to the twenty experimental features. Furthermore, a record is kept of each student's answers and scores while taking the two comprehension tests. In addition, there is a record of the time it took to complete the tests. The computer also tallies a complete summary of the scores and times on a group basis. This information is used to evaluate textual difficulty according to the assumption that the more difficult a certain element of text is, the more the readers need information to explain that element. In addition, the test scores can be used to compare computer-mediated text with text that is presented in an off-line condition. With this data, empirically-based conclusions can be drawn on whether the computer can facilitate the reading of Japanese as a second language on the part English-speaking readers.

6.1.9. The Procedure. The passages used in this computer program were the same as those that were used in the experiment in chapter 5. The subjects for the experiment in chapter 5 were students at the end of the third year of Japanese. This same group of students was used for the

computer experiment, this time at the beginning of the fourth year of Japanese. In order to avoid the practice effects involved in giving the texts to the whole group, only half of the third-year students were involved in the experiment in chapter 5 This way only some of the students in the subject group for the computer experiment had seen the texts before. This is important because only some of the students were influenced by the practice effects of seeing the texts before.

The subjects were assigned to two separate experimental groups: 1) the group that read the passages in the off-line condition on printed pages, and 2) the group that read the passages in the on-line condition on the computer monitor. The subjects in group 1 were given as much time as necessary to read the passages. The amount of time it took to read the passages was recorded. When they finished reading one passage, they were supplied with the six printed comprehension questions that went with that passage (see Appendix C). The time it took to take the test was recorded. After the test was finished, the second text was given out. When the second text was finished and the time it took to read the text was recorded, they took the second test (see Appendix C). When they finished the test, the time it took to take the second test was recorded. At this point, they were finished.

The subjects in group 2 were given an introduction to how a computer operates before they read the passages. The computer program itself contained an introduction to how the program worked. Before even reading the passages, the subjects had to work through this introduction. Once the subjects finished the introduction, they read the computer-mediated text version of the first text, "*Hoogen to Kyootsuugo*", using any of the help facilities they needed to understand the passage. Once they finished the passage, they took the comprehension test based on the content of the text (see Appendix C). This was the same test as used in the off-line condition except that the subjects used the mouse to select the answers on the monitor. Once the test was finished, the subjects read the second text, "*Aruke Orinpikku*". When that was finished, they took the second test (see Appendix C). When the second test was completed, the program came to an end. The time it took to read the passages and do the tests was automatically recorded by the computer. The computer also recorded all the help the subjects received and the scores they got on the tests.

6.2. The Results. This section presents a summary of the data. Further expanded discussion of the implications of this data is presented in chapter 7.

6.2.1. On-line Help Received. In section 6.1.8. of this chapter, an assumption was put forth. It stated that the more difficult a certain element of text is, the more the reader needs information to explain that element. This indicates that there is a proportional relationship between the number of times information about a textual element is accessed in a computer program and the difficulty of that element. Difficulty is determined by the number of times information on certain textual elements is used. Using this sort of information, the passages can be analyzed to determine the sources of textual difficulty.

The following chart gives the percentages of the number of times the users requested help while reading these passages:

Table 9

	Aruke Orinpikku	*Hoogen to Kyootsuugo*
Grammar	0%	8.70%
Vocabulary	61.9%	82.61%
Kanji	35.71%	8.70%
Rhetoric	0%	0%
Culture	2.38%	0%

6.2.2. Test Scores. Each passage was followed by six multiple-choice questions containing four choices with one of the choices constituting the correct answer. The students

who read the passages in the on-line condition and those who read the passages in the off-line condition took the same tests. The average test scores for both the on-line and off-line groups are indicated in the following table. The averages are calculated based on 6 possible points for each test (one point for each question).

Table 10

	Aruke Orinpikku	*Hoogen to Kyootsuugo*
On-line	0.5	2.5
Off-line	3.0	3.0

6.2.3. Passage Reading Time. The length of time to read the passages in both the on-line and off-line condition is compared in the following chart:

Table 11

	Aruke Orinpikku	*Hoogen to Kyootsuugo*
On-line	11 mins. 5.5 secs.	7 mins. 56 secs.
Off-line	9 mins. 28.5 secs.	6 mins. 28 secs.

6.3. Discussion. This section presents some initial discussion. Further discussion of the implications of this data is presented in the next chapter. The biggest surprise is the fact that information on grammar was accessed very little by the students. Vocabulary was certainly accessed

the most. This finding about the importance of vocabulary for readers is supported by the research as reported in the literature (Anderson and Freebody, 1981; Coleman, 1971; Freebody and Anderson, 1981; Klare, 1974-1975; Lado, 1972; Marks, Doctorow, and Wittrock, 1974; Thorndike, 1973), which states that vocabulary is a strong predictor of overall textual difficulty. Another surprising finding is that the students reading the passages in the off-line condition had a better average on both tests. Possible reasons for this are discussed in chapter 7. Not surprisingly, another finding is that students reading the passages in the on-line condition were slower. It took time for them to access all the on-line help in vocabulary, *kanji*, grammar, rhetoric, and culture. This tended to slow them down. The next chapter further discusses the implications for this data.

CHAPTER 7

Discussion

7.0. Introduction. As stated in Chapter 2, the main purpose of this pilot study was to examine the effect of syntactic variables on L2 reading of Japanese. This study addressed the following two hypotheses:

1. Grammatical variables affect the difficulty of the reading of a Japanese text by native speakers of English.

2. Computer-mediated text can facilitate the comprehension of a passage more than ordinary text.

In testing the first hypothesis, this pilot study focused on the contributions of grammatical structure to passage difficulty. As a part of this study, the contributions of rhetorical structure, vocabulary, and culture to textual difficulty were also considered in order to complete the total picture of the major factors that affect the level of difficulty of Japanese text. All these factors help contribute to the difficulty that faces the reader of Japanese as a second language. This pilot study considered a list of 20 features which can contribute to passage difficulty. This list is an enumeration of 20 possible variables that are hypothesized to influence passage difficulty. This is not an exhaustive list, but a list that can provide some insight into textual difficulty. These

variables are mainly syntactic in nature which is the focus of this study; however, variables that are rhetorical, lexical, and cultural in nature were also considered in order to provide a more balanced study of the sources of textual difficulty. In order to test the second hypothesis, computer software was designed with the 20 variables in mind in order to determine 1) whether it can measure quantitatively the contribution these factors make to passage difficulty and 2) whether it can actually facilitate the reading of Japanese text. This software was tested on human subjects in order to measure its effectiveness in measuring textual difficulty and its power to facilitate the comprehension of Japanese written text.

7.1. The Study. Two Japanese texts were evaluated in light of grammatical, rhetorical, lexical, and cultural issues affecting textual difficulty. Most of the features used in the evaluation were grammatical in nature, so the constructions in these passages which contributed to grammatical complexity were focused on in order to illustrate some of the issues involved in passage difficulty. Each one of the features was a specific hypothesis as to what contributes to passage difficulty in reading comprehension.

In order to empirically examine these features, two Japanese texts, one rated difficult and the other easy with respect to these 20 features, were investigated as to the

actual difficulty they presented to English-speaking students who were reading Japanese as a second language. The readers were asked to read these texts and circle or underline the parts of the texts they thought were difficult. The purpose of this experiment was to critique the validity of the assessment of difficulty according to the 20 features. The actual analysis of the predictive ability of the 20 features is based on two calculations: 1) the percentage of predictions that were correct and 2) the actual problem areas as determined by this experiment that were successfully predicted. These calculations were explained in chapter 5.

Based upon both the linguistic analysis (as contained in chapter 4) and the results of the experiment assessing the difficulty in both texts (as contained in chapter 5), a computer program was written focusing on the potential problem areas in the reading comprehension of these two passages. The program focused on the areas of difficulty that were indicated by this linguistic analysis (chapter 4) and the evaluation of the performance of the target population during the experiment assessing the difficulty in both texts (chapter 5). The computer program provided help in these areas of anticipated difficulty for the target population. The goal was to provide the most appropriate help to intermediate Japanese students.

In this computer program, computer-mediated text was manipulated in a variety of ways. The reader interacted with the passage which was placed on the computer screen in a text window. At any point during the reading process, the reader had certain resources available which could be used to facilitate understanding of the text. These resources were in the form of a help menu which presented certain choices to facilitate comprehension.

The computer was used to monitor the kind of information the reader used while doing the lesson. It kept track of the number of times information on vocabulary, Chinese characters, grammar, rhetoric, and culture was accessed in order to understand the text. An analysis was made of this information over a group of users to determine what was difficult in text. The assumption was that the more difficult a certain element of text is, the more the users need information to explain that element. There was a proportional relationship between the number of times information about a textual element is accessed and the difficulty of that element. As a result, difficulty was determined by the number of times information on certain textual elements was accessed. This sort of information was used to acquire an overall picture of the sources of textual difficulty.

The software developed for this pilot study was evaluated under two treatment conditions. The first treatment condition presented text in an off-line condition in conventional print on a piece of paper, and the second presented text in an on-line condition on the computer screen with options on a help menu to aid in comprehension. Students read the two passages under one of these two treatment conditions. One group of students read the texts in the off-line treatment condition (condition 1) and the other group in the on-line treatment condition (condition 2). Following the passages in both treatment conditions, the students were presented with a series of six multiple-choice comprehension questions giving four options with three distractors and one correct answer. While not looking at the passages, the students in both treatment groups answered these questions as a test of their reading comprehension. Besides keeping track of the comprehension score, the program kept track of the time it took to read the passages. Also, a record was kept of the amount of time needed to complete the comprehension questions. In addition to this, a record was kept of the help the subjects in the on-line treatment group used in order to facilitate understanding of the text. In summary, this pilot study was carried out to investigate the causes of difficulty in Japanese texts and the possible

contributions computer-mediated text can make to the comprehension of text.

7.2. The Results.

7.2.1. The Implications of the Data of Chapter 5.

7.2.1.1. The Implications for "*Aruke Orinpikku*". A major difference in the predicted problems for this passage, as given in chapter 4, and the actual problems, as encountered in chapter 5, was the relative percentage of the problems contributed by grammar, vocabulary, *kanji*, rhetoric, and culture to the total number of problems. Table 12 compares these predictions (in chapter 4) with the actual problems (in chapter 5):

Table 12

	% of Predictions	% of Actual Problems
Grammar	42.71%	15.83%
Vocabulary	24.62%	42.45%
Kanji	31.16%	41.73%
Rhetoric	1.01%	0%
Culture	0.50%	0%

According to the predictions of chapter 4 made on the basis of the 20 features, grammar at 42.71% of the total number of problems was expected to have the most influence on the difficulty of this passage. However, in the experiment in chapter 5, which assessed the actual difficulty of this

passage, vocabulary at 42.45% and *kanji* at 41.73% had the most impact on difficulty while grammar was at only 15.83%. The findings in this experiment about the importance of vocabulary are supported by the reported research in the literature (Anderson and Freebody, 1981; Coleman, 1971; Freebody and Anderson, 1981; Klare, 1974-1975; Lado, 1972; Marks, Doctorow, and Wittrock, 1974; Thorndike, 1973), which states that vocabulary is a strong predictor of overall textual difficulty. In considering overall textual difficulty, vocabulary difficulty and *kanji* difficulty are important considerations, but they need to be balanced against other factors, such as linguistic structure.

Comparing the prediction success rate with the actual success rate in relation to the areas of grammar, vocabulary, *kanji*, rhetoric, and culture provides further evaluation of the predictions made in chapter 4. Table 13 gives the prediction success rate and the actual success rate for each of the above areas:

Table 13

	Pred. Success Rate	Actual Success Rate
Grammar	24.71%	90.91%
Vocabulary	77.08%	62.71%
Kanji	62.90%	67.24%
Rhetoric	0.00%	0.00%
Culture	0.00%	0.00%

For grammar, the prediction success rate was quite low at 24.71% while the actual success rate was quite high at 90.91%. The reason for this was that too much emphasis was placed on grammar in making predictions in chapter 4. The problems the students actually had with grammar were predicted successfully, but in the process too many extra grammatical predictions were made. The students seemed to be preoccupied with problems involving vocabulary and *kanji*, rather than with problems involving grammar. This is not to say that they do not have problems with grammar, but they seemed to think that information on vocabulary and *kanji* was more crucial for textual understanding. Thus, the predictions for vocabulary and *kanji* were much more accurate because the students needed to know vocabulary and *kanji* to understand the passage. The prediction and the actual success rates for rhetoric were 0% because no predictions for rhetoric were fulfilled. This appears to be a limitation of the experimental instrument of chapter 5 because it does not appear to measure any rhetorical interference at all with reading comprehension. Perhaps, the students themselves need not be aware of rhetorical structure to basically understand this passage. Also the prediction and the actual success rates for culture were 0% because this experimental instrument picked up no cultural interference in this passage. Either there was no problem with cultural

understanding here, or this experimental instrument just could not detect it.

A further evaluation of the predictions made in chapter 4 can be made by comparing the ranking for the grammatical features in terms of their predicted influence on passage difficulty (chapter 4) with the same grammatical features in terms of the magnitude of their actual influence (chapter 5). In Table 14, the predicted influence of these features on passage difficulty is compared with the actual influence (excluding features 5, 17, 18, 19, and 20). The percentages indicate the relative percent of grammatical influence of each feature on textual difficulty. The higher the percentage, the greater the influence.

Table 14

	Predicted Influence	Actual Influence
1. Homophonous Particles	4.71%	0%
2. Nominalizers	7.06%	0%
3. Anaphora	1.18%	0%
4. Tense	3.53%	18.18%
6. Noun Head Modification	8.24%	0%
7. Conjunctions	3.53%	0%
8. Subordination	18.82%	18.18%
9. Passive	10.59%	31.82%
10. Causative	2.35%	9.09%
11. Verb Complexes	4.71%	9.09%
12. Quotations	12.94%	9.09%
13. Relative Clauses	17.65%	4.55%
14. Hedges	2.35%	0%
15. Further Embeddings	1.18%	0%
16. Comparatives	1.18%	0%

The actual influences as indicated in the right-hand column are the results of the empirical study undertaken in chapter 5. These results test the predictions in the left-hand column that were given in chapter 4 about the influence of grammatical features on textual difficulty. These percentages were calculated by dividing the number of problems in each feature category by the total number of grammatical problems. For example, the total number of predicted problems for the feature, Homophonous Particles, was 4. Since the total number of predicted grammatical problems was 85, the predicted relative percent influence of homophonous particles on grammatical difficulty was 4.71% (which is 4/85 x 100%). However, the actual number of problems for the feature, Homophonous Particles, was 0 according to the experiment given in chapter 5. According to that experiment, the total number of actual grammatical problems was 22, so the actual relative percent influence of homophonous particles on grammatical difficulty was 0% (which is 0/22 x 100%), which was at variance with the predicted amount, 4.71%.

Examining this table, it can be seen that the actual grammatical influences are at variance with the predictions. The closest match was subordination with the predicted influence at 18.82% and the actual influence at 18.18%. Subordination was hypothesized to be an important source of

grammatical difficulty, and the empirical study of chapter 5 confirmed that it was. This is because subordination has to do with the embedding of clauses, which adds to sentence and therefore passage difficulty. Relative clauses were predicted to be a major source of grammatical difficulty at 17.65%, but the empirical study indicated that they were not as great a problem because the percentage was 4.55%. Quotations were predicted to be another major contribution to grammatical difficulty at 12.94%, and the actual contribution was 9.09% which was reasonably close to the prediction. Quotations increased the embedding, thus adding to sentence complexity. The combined feature categories of subordination, quotations, and relative clauses indicate that clause embedding was 31.82% (which is the sum of 18.18%, 9.09%, and 4.55%) of the actual grammatical problems and an important component of passage difficulty.

Verb morphology was predicted to be 16.47% of the grammatical difficulty, which is the sum of passive, 10.59%, tense, 3.53%, and causative, 2.35%. However, surprisingly, verb morphology was 59.09% of the actual grammatical difficulty, the sum of passive, 31.82%, tense, 18.18%, and causative, 9.09%. Verb morphology was difficult for the students partly because they needed to understand the case roles involved with the passive and causative. Perhaps, the students also had trouble with the Japanese tense system.

Verb complexes also gave the students trouble at 9.09%; the prediction was 4.71%. The students had trouble with the compounding of verbs. This difficulty is mainly related to the semantics involved in combining two verb forms together.

The features involving homophonous particles, noun head modification, and nominalizers did not measure up to the predictions of chapter 4. In reality, homophonous particles were not a source of difficulty. The correct interpretation of homophonous particles depends on the context in which they are found. A clear context can eliminate the ambiguity posed by homophonous particles, thus decreasing the difficulty posed by them. This was the case in this passage. Noun head modification had an influence on difficulty according to the empirical experiment in chapter 5 but not quite as much as predicted in chapter 4. Modification of nouns by other nouns and adjectives did not seem to be a major problem. The actual influence for nominalizers was 0% although it was predicted to be 7.06%. The nominalizers themselves were not a problem, but the embedding they produced perhaps caused difficulty.

The rest of the features had a 0% actual influence, but they were not predicted to have much influence anyway, so that is not surprising. It would be difficult for any one single passage to contribute to difficulty in all of the

twenty feature categories. Each passage presents its own unique difficulties and challenges to the reader.

7.2.1.2. The Implications for "*Hoogen to Kyootsuugo*". As with "*Aruke Orinpikku*", there were differences in the predicted problems for this passage, as given in chapter 4, and the actual problems, as encountered in chapter 5. Table 15 compares these predictions (in chapter 4) with the actual problems (in chapter 5):

Table 15

	% of Predictions	% of Actual Problems
Grammar	61.36%	19.30%
Vocabulary	25.00%	50.88%
Kanji	9.09%	26.32%
Rhetoric	2.27%	0%
Culture	2.27%	3.51%

According to the predictions of chapter 4, grammar at 61.36% of the total number of problems was predicted to influence passage difficulty most, but in the experiment in chapter 5, vocabulary at 50.88% had the most impact on difficulty while grammar was at only 19.30%. These findings supporting the importance of vocabulary are backed up by the research in the literature as cited above. However, as mentioned above, in considering overall textual difficulty, although vocabulary difficulty is an important consideration, it needs to be

balanced against other factors, such as linguistic structure. The prediction for the *kanji* was 9.09%, but the actual impact on difficulty was 26.32%. This means that in actuality *kanji* is second to vocabulary in determining passage difficulty. The prediction for culture at 2.27% was close to the actual difficulty at 3.51%. The prediction for culture was fairly easy because it involved Japanese place names which could be circled by the students doing the experiment if they felt that these place names were difficult to understand. The method works best at a strictly local level where one can circle the problem.

When the prediction success rate is compared with the actual success rate in relation to the areas of grammar, vocabulary, *kanji*, rhetoric, and culture, the predictions made in chapter 4 can be further evaluated. Table 16 gives the prediction success rate and the actual success rate for each of the above areas:

Table 16

	Pred. Success Rate	Actual Success Rate
Grammar	18.52%	100%
Vocabulary	63.64%	51.72%
Kanji	37.50%	20.00%
Rhetoric	0.00%	0.00%
Culture	100%	100%

The prediction success rate for grammar was quite low at 18.52% while the actual success rate was 100%. As stated above, the reason for this was that too much emphasis was placed on making predictions for grammar in chapter 4. The problems the students really had with grammar were predicted successfully, but in the process too many extra grammatical predictions were made. The students seemed to focus on problems involving vocabulary and *kanji*, rather than grammar. To these students, information on vocabulary and Chinese characters was more important for the comprehension of Japanese text. Thus, the predictions for vocabulary and *kanji* were more accurate because the students needed to know vocabulary and *kanji* to understand the passage. As a result, they marked more vocabulary and *kanji* difficulties. As with "*Aruke Orinpikku*", the prediction and the actual success rates for rhetoric were 0% because no predictions for rhetoric were fulfilled. Again, the experimental instrument of chapter 5 does not appear to measure any rhetorical interference at all with reading comprehension. In addition, the prediction and the actual success rates for culture were 100% because the students only circled the predicted cultural problems. The prediction for culture was not difficult because the students could easily circle the Japanese place names that were hard to understand.

As with the passage, "*Aruke Orinpikku*", a further evaluation of the predictions made in chapter 4 for "*Hoogen to Kyootsuugo*" can be made by comparing the ranking for the grammatical features in terms of their predicted influence on passage difficulty (chapter 4) with the same grammatical features in terms of the magnitude of their actual influence (chapter 5). In Table 17, the predicted influence of these features on passage difficulty is compared with the actual influence (excluding features 5, 17, 18, 19, and 20):

Table 17

	Predicted Influence	Actual Influence
1. Homophonous Particles	7.41%	0%
2. Nominalizers	7.41%	0%
3. Anaphora	1.85%	0%
4. Tense	3.70%	0%
6. Noun Head Modification	18.52%	0%
7. Conjunctions	7.41%	9.09%
8. Subordination	18.52%	18.18%
9. Passive	7.41%	36.36%
10. Causative	0%	0%
11. Verb Complexes	1.85%	9.09%
12. Quotations	5.56%	0%
13. Relative Clauses	20.37%	27.27%
14. Hedges	0%	0%
15. Further Embeddings	0%	0%
16. Comparatives	0%	0%

The percentages printed in the chart give the relative percent of grammatical influence of each feature on textual difficulty. The higher the percentage, the greater the grammatical influence of that feature. The purpose of this

table is to show the grammatical features that have the most influence on passage difficulty. Given this information, it is possible to have a more accurate idea of the features that influence difficulty the most.

As with table 14, the actual influences as indicated in the right-hand column are the results of the empirical study undertaken in chapter 5. These results test the predictions in the left-hand column that were made in chapter 4 about the influence of grammatical features on textual difficulty. These percentages were the results of dividing the number of problems in each feature category by the total number of grammatical problems. To give an example, the total number of predicted problems for the feature, Conjunctions, was 4 for "*Hoogen to Kyootsuugo*". Since the total number of predicted grammatical problems was 54, the predicted relative percent influence of sentence-level conjunctions on grammatical difficulty was 7.41% (which is 4/54 x 100%). However, the actual number of problems for the feature, Conjunctions, was 1 for this passage according to the experiment given in chapter 5. According to that experiment, the total number of actual grammatical problems was 11, so the actual relative percent influence of sentence-level conjunctions on grammatical difficulty was 9.09% (which is 1/11 x 100%), close to the predicted percentage.

Examining this table, the actual grammatical influences for "*Hoogen to Kyootsuugo*" are at various degrees of variance with the predictions. As with "*Aruke Orinpikku*", the closest match involved subordination with the predicted influence at 18.52% and the actual influence at 18.18%. Subordination was hypothesized to be an important predictor of grammatical difficulty, and the empirical study of chapter 5 confirmed this hypothesis. Subordination involves the embedding of clauses, contributing to sentence and passage difficulty. Relative clauses were predicted to be a major source of grammatical difficulty at 20.37%, and the empirical study in chapter 5 showed that they were because the actual contribution to grammatical difficulty was 27.27%. In "*Hoogen to Kyootsuugo*", branching direction seems to be an important issue in comprehending relative clauses, a fact which supports the predictions. Quotations were predicted to make a modest contribution to grammatical difficulty at 5.56%, but the actual contribution in this passage was 0%, which indicates they were not significant source of difficulty in this passage. The combined feature categories of subordination and relative clauses indicate that clause embedding was 45.45% (which is the sum of 18.18% and 27.27%) of the actual grammatical problems and a very important component of passage difficulty. This degree of embedding is reflected in the average sentence length for this passage,

which is 21.27 words, compared to an average sentence length of 9.97 for "*Aruke Orinpikku*", which had a lower embedding percentage of 31.82%.

Verb morphology in "*Hoogen to Kyootsuugo*" was predicted to be 11.11% of the grammatical difficulty, which is the sum of passive, 7.41%, and tense, 3.70%. However, surprisingly, verb morphology was 36.36% of the actual grammatical difficulty, the sum of passive, 36.36%, and tense, 0%. The passive was difficult for the students because they needed to understand the positioning of the case roles involved with this voice. In the passive, the agent (if it appears) is moved from the subject position to an unfocused adjunct position, and the undergoer takes its place. The student needs to be aware of this change in the functional positioning of these roles. Verb complexes also gave the students trouble at 9.09%. The students' trouble with the verb compounding was mainly related to the semantics involved in combining two verb forms.

Homophonous particles and noun head modification had no influence on difficulty in this passage according to the empirical experiment in chapter 5 although a fair amount of influence had been predicted in chapter 4 (homophonous particles at 7.41% and noun head modification at 18.52%). In "*Aruke Orinpikku*" (see section 7.2.1.1), homophonous particles and noun head modification had some influence on

passage difficult but not quite as much as predicted. Obviously, these two features did not contribute as much to textual difficulty as predicted in this experiment. As mentioned is section 7.2.1.1 in the discussion of "*Aruke Orinpikku*", the correct interpretation of homophonous particles depends on the context in which they are found. A clear context can eliminate the ambiguity posed by homophonous particles, thus decreasing the difficulty posed by them. This is the case also in this passage, "*Hoogen to Kyootsuugo*". As with "*Aruke Orinpikku*", noun head modification did not seem to be a major source of difficulty in this passage for the students.

Also, in "*Hoogen to Kyootsuugo*", the actual influence for nominalizers was 0% although it was predicted to be 7.41%. This is the same result (0%) as that found in "*Aruke Orinpikku*", so nominalizers do not seen to be a major problem. It seems the nominalizers themselves were not a problem, but the embedding they produced caused the difficulty.

The rest of the features have a 0% actual influence, but they were predicted to have little or no influence anyway, so that is expected. It would be difficult for any one single passage to contribute to difficulty in all of the twenty feature categories. Each passage contains its own unique set of difficulties.

7.2.1.3. Summary of the Implications. In examining the results of the experiment on the sources of difficulty in "*Aruke Orinpikku*" and "*Hoogen to Kyootsuugo*" in chapter 5, vocabulary has been shown to be the most significance factor in determining textual difficulty. This is in accord with previous research in the literature on reading theory. Chinese characters are also an important factor in textual difficulty for readers of Japanese as a second language. Grammar is another important factor in textual difficulty although not as important as vocabulary. Two major factors involved in grammatical difficulty stand out in the experiment: embedding and verb morphology. The embedding apparent in these passages involves subordination, quotations, and relative clauses. This embedding adds complexity and length to sentences. Verb morphology involves verb tense, the passive, and the causative. Verb morphology was difficult for the students because they needed to understand the Japanese tense system and also the case roles involved with the passive and causative. Rhetorical structure and cultural background also contribute to textual difficulty, but it is an effect that is difficult to measure by the empirical instrument in chapter 5. Further research needs to investigate in more detail the effect of rhetorical structure and culture on difficulty in text.

The study in chapter 5 also confirmed that "*Aruke Orinpikku*" (predicted difficulty index = 0.64) is more difficult than "*Hoogen to Kyootsuugo*" (predicted difficulty index = 0.47) as predicted in chapter 4, section 4.2. The actual difficulty for these passages, based on the experiment in chapter 5, confirms these predictions. The actual difficulty index of a passage is the total number of actual problems in a passage divided by the number of words in that passage. For each passage, this index can be further divided into sub-indices for grammar, vocabulary, *kanji*, rhetoric, and culture. These are calculated by dividing the number of actual problems in each of these sub-areas by the total number of words in the passage under consideration. Table 18 contains the results of these calculations for actual difficulty, based on the experiment in chapter 5:

Table 18

	Aruke Orinpikku	Hoogen to Kyootsuugo
Grammar	0.07	0.05
Vocabulary	0.18	0.12
Kanji	0.18	0.06
Rhetoric	0.00	0.00
Culture	0.00	0.01
Total Difficulty	0.42	0.24

According to these calculations, "*Aruke Orinpikku*" (difficulty index = 0.42) is more difficult than "*Hoogen to Kyootsuugo*" (difficulty index = 0.24) confirming some of the predictions. All the sub-indices of "*Aruke Orinpikku*" are larger than those of "*Hoogen to Kyootsuugo*" except for culture. However, the difference in the culture indices was minimal. The interesting thing is that the index of difficulty for grammar is larger for "*Aruke Orinpikku*" than for "*Hoogen to Kyootsuugo*" even though the average sentence length for "*Hoogen to Kyootsuugo*" (21.27) is longer than for "*Aruke Orinpikku*" (9.97). This indicates that even if the average sentence length in one passage is longer than in the other, it does not guarantee that the passage with the longer average sentence length is more difficult grammatically. This is interesting because sentence length is an important variable in readability formulas, which estimate passage difficulty. These formulas are too superficial. This research indicates that what is needed is a deeper analysis of grammatical structure in order to determine grammatical difficulty and refine the formulas.

7.2.1.4. Conclusions. Based upon the empirical study of chapter 5, syntactic variables, such as tense (4), subordination (8), passive (9), causative (10), quotations (12), and relative clauses (13), have been shown to cause difficulty in the reading of Japanese text by native speakers

of English. In section 2.6 of chapter 2, it was stated that there is a gap in the reading research of Japanese as a second language relating to the effect that textual variables have on the readability of Japanese text. This study was a first attempt to fill this gap. Further research needed to be done, so an additional step in this research project was to use the computer to investigate the effect of syntactic variables on textual difficulty. In addition to this, this project investigated the role of the computer in facilitating the reading of Japanese text. In the next section of this chapter, the results of this further study will be discussed.

7.2.2. The Implications of the Data of Chapter 6.

7.2.2.1. The Subjects. The computer experiment was conducted on 6 fourth-year Japanese students. In the one-hour time period allotted for the experiment, only 2 students completed the computer experiment (one-half hour for each student) while four students completed the test in the off-line condition. The experiment in the on-line condition took longer for each student than did the experiment in the off-line condition. Also, there was only one computer, so only one student could use the computer at a time. The students reading the passages in the off-line condition could work simultaneously since the passages and tests were printed on ordinary pieces of paper. As a result, more of them could do the test in the allotted time period. The subjects

themselves were not separated according to their ability. The subjects reading the passages in the on-line condition had seen the passages before during the test given in the spring of 1991; however, that experience did not seem to give them an advantage. As a result, the practice effects caused by seeing the passages before can apparently be ignored. The fact that the number of students that participated in this experiment was rather small lead to some unpredictable results.

7.2.2.2. The Contributions to Passage Difficulty. The contributions of grammar, vocabulary, *kanji*, rhetoric, and culture to textual difficulty as predicted in chapter 4, and determined empirically by the experiments in chapters 5 and 6 for "*Aruke Orinpikku*" are given in table 19:

Table 19

	Predictions (Chapter 4)	Actual Problems (Chapter 5)	Computer (Chapter 6)
Grammar	42.71%	15.83%	0%
Vocabulary	24.62%	42.45%	61.90%
Kanji	31.16%	41.73%	35.71%
Rhetoric	1.01%	0%	0%
Culture	0.50%	0%	2.38%

According to the predictions in chapter 4, grammar at 42.71% was predicted to have the most influence on passage difficulty. However, according to the results of the

experiments in chapters 5 and 6, grammar is not seen as a major component in passage difficulty. The fact that grammar had a zero percentage in the computer experiment for this passage could have been caused by the fact that only two students did the on-line experiment. According to these experiments, vocabulary has an important impact on passage difficulty. This is in accord with the findings as published in the literature as mentioned previously. According to the predictions in chapter 4, *kanji* at 31.16% was predicted to have an important impact on passage difficulty. This was born out by both experiments. Also rhetoric and culture were predicted not to have a major effect on passage difficulty. This prediction was supported by these experiments. In considering overall textual difficulty, although vocabulary and *kanji* are the most important considerations, linguistic structure, rhetoric, and culture do need to be considered in order to create a balanced approach to textual understanding.

The contributions of grammar, vocabulary, *kanji*, rhetoric, and culture to textual difficulty as predicted in chapter 4, and determined empirically by the experiments in chapters 5 and 6 for "*Hoogen to Kyootsuugo*" are given in table 20:

Table 20

	Predictions (Chapter 4)	Actual Problems (Chapter 5)	Computer (Chapter 6)
Grammar	61.36%	19.30%	8.70%
Vocabulary	25.00%	50.88%	82.61%
Kanji	9.09%	26.32%	8.70%
Rhetoric	2.27%	0%	0%
Culture	2.27%	3.51%	0%

Here grammar fares a little better in the computer experiment at 8.70%. However, grammar is not the influence on textual difficulty it was predicted to be. The grammatical features of noun head modification (feature 6), passive (feature 9), and relative clauses (feature 13) received 1 point each in the computer experiment. This means information on these feature categories was requested only once. Apparently, the two students did not think grammar was a major problem. It is interesting to note that the grammatical information that was requested did involve the passive construction and clause embedding. This corroborates the results of the experiment in chapter 5, discussed in section 7.2.1 of this chapter, which analyzed the importance of the contribution of verb constructions and embedding to textual difficulty. According to the experiments in chapters 5 and 6, vocabulary is the most important consideration in textual difficulty for this passage, in accordance with the findings of current research.

The experimental results for *kanji* (8.70%) in the computer experiment correspond closely to the prediction (9.09%). Chinese characters were not used a great deal in this passage, so as a result, they were not a major consideration. As in "*Aruke Orinpikku*", rhetoric and culture were predicted not to have a major effect on difficulty in this passage. This prediction was supported by these experiments. In this passage also, when considering overall textual difficulty, vocabulary needs to be considered along with linguistic structure, *kanji*, rhetoric, and culture.

It is interesting to note that the students requested information from the computer 65 times. For the passage, "*Hoogen to Kyootsuugo*", 23 requests for information were made while 42 requests were made for "*Aruke Orinpikku*". This suggests that "*Aruke Orinpikku*" was the more difficult passage since the students needed more help to understand it. This result coincides with the prediction made in chapter 4 that "*Aruke Orinpikku*" was the more difficult passage.

7.2.2.3. Discussion of the Test Scores. One of the most surprising results of the computer experiment was that the off-line group did better in the multiple-choice comprehension tests than the on-line group did. There are several explanations for this. One student complained that the fonts were hard to read on the computer screen, which would partially explain the fact that students using the

computer program were slower in reading the passages and performed more poorly on the tests. Another explanation is that the better students read the texts in the off-line condition. A larger number of students would have perhaps created a more balanced testing sample. Another possibility is that the students who worked with the computer were not computer-literate enough to feel comfortable in utilizing all the help facilities. From their test scores, it would seem that they under-utilized the computer. They should have requested more grammatical information. Perhaps, they were overconfident as to their grammatical knowledge. Perhaps, other factors are involved. Only further research will help to clarify the situation.

7.3. Conclusion. In conclusion, grammatical variables have been shown to affect estimates of textual difficulty by English-speaking readers of Japanese as a second language. This small pilot study was a first attempt to fill a gap in the research into reading Japanese as a second language in relation to the effect textual variables have on the readability of Japanese text. In any future study, the grammatical features will have to be weighted differently based on the results of this study. For example, important features involving clause embedding (e.g., subordination, quotations, and relative clauses) will have to be given a greater weight. Other less important features (e.g.,

homophonous particles and comparatives) should be given less weight. Also, based on the outcome of this study, the variables involving vocabulary and *kanji* should be given more weight than the grammatical features. In addition, the effect of rhetoric and culture on passage difficulty needs to be investigated further in future research since this study did not shed much light in this area.

Furthermore, this was the first time a computer was utilized to monitor the use of resources on the part of the students observed in this experiment as they attempted to understand Japanese text. However, this experiment did not show that the computer could facilitate the comprehension of Japanese text more than the simple reading of an ordinary printed page. This is not the final word, however. Testing with more students needs to be done. Perhaps, then the power of the computer to facilitate the reading comprehension of Japanese can be verified. Different kinds of experiments can be designed that measure the reading comprehension of students more accurately. Perhaps, instead of multiple-choice questions, more open-ended short-answer or essay-type questions should be asked. Only further experimentation will help to clarify the role of the computer in facilitating the comprehension of text for English-speaking readers of Japanese as a second language.

Appendix A

Analysis of of the Japanese Texts

Aruke Orinpikku

Walking Olympics

1. ***Mainen oranda no chiisa na machi de ooki na moyooshi ga***

6

okonawareru.

9

'In a small town in Holland, a big event is held every year.'

Grammar = 2 points
Vocabulary = 1 point
Kanji = 1 point
Length = 11 words

2. ***Foodeezu Maachi to mo yobare, aruke orinpikku to mo***

12 9 12

yobarete iru.

9

'It is called the four days' march; it is also called the Walking Olympics.'

Grammar = 4 points
Vocabulary = 0 points
Kanji = 0 points
Length = 11 words

3. *Nimannin o **koeru** sekai kakkoku no hitobito ga kono machi*

1 13 6

Neimeehen ni atsumatte, aruku.

8

'More than 20,000 people from various countries throughout the world gather in the town of Nijmegen and walk.'

Grammar = 4 points
Vocabulary = 1 point
Kanji = 1 point
Length = 14 words

4. ***Shoohai** mo nai.*

'There are no winners or losers.'

Grammar = 0 points
Vocabulary = 1 point
Kanji = 2 points
Length = 3 words

5. ***Jun'i** mo nai.*

'There is no order of placement.'

Grammar = 0 points
Vocabulary = 1 point
Kanji = 2 point
Length = 3 words

6. *Yokkakan **arukitooshita** mono ni **kanpo** no **shoosho** to*

11 13 6

medaru ga ataerareru dake da.

9 15

'It's just that a certificate of completion and a medal are given to those who last the distance over four days.'

Grammar = 5 points
Vocabulary = 3 points
Kanji = 2 points
Length = 13 words

7. *Kotoshi no **taikai** ni wa nihon kara gojuurokunin **sanka** shita.*

'Fifty-six Japanese participated in this year's march.'

Grammar = 0 points
Vocabulary = 2 points
Kanji = 0 points
Length = 11 words

8. *Sanka kyuukai no Kaneko Tomokazu san (Nihon Aruke Aruke **Kyookaichoo**) ni wa konna omoide ga aru.*

3

'Tomokazu Kaneko, chairman of the Japan Walk-Walk Society, who has participated nine times, has the following recollection.

Grammar = 1 point
Vocabulary = 1 point
Kanji = 3 points
Length = 16 words

9. *Hajimete sanka shita toki, nakama to issho ni "faito,*

13

*faito" to **kowadaka** ni **sakende** aruita.*

12 8

'The first time he participated, he shouted with other participating Japanese, "Fight! Fight!"'

Grammar = 3 points
Vocabulary = 2 points
Kanji = 3 points

Length = 15 words

10. *Suru to,* ***nenpai*** *no josei ga* ***susu****midete* ***itta.***

7 8

'Then an old woman came forward and said:'

Grammar = 2 points
Vocabulary = 2 points
Kanji = 2 points
Length = 8 words

11. *"Naze* ***tataka****ou to iu no."*

4 12 2

"Why do you talk about fighting."

Grammar = 4 points
Vocabulary = 0 points
Kanji = 1 point
Length = 5 words

12. *"Watakushitachi wa [****tataka****i wa* ***gomen****] da wa."*

"We don't want to fight."

Grammar = 0 points
Vocabulary = 2 point
Kanji = 1 point
Length = 7 words

13. *Ganbarou to iikikaseru* ***karu****i* ***chooshi*** *no "faito" datta*

4 12 11 10 13 6

ga, Kaneko san wa "We don't want to fight" to iu kotoba ni

7 12 13

komerareta *mono o* ***sas****shite, fukaku atama o sageta.*

9 13 8

'It was a light "Fight!" calling on people to exert an effort, but Kaneko realized the thinking behind the words, "We don't want to fight," and hung his head in shame.'

Grammar = 12 points
Vocabulary = 2 points
Kanji = 4 points
Culture = 1 point
Length = 24 words

14. *Aruku koto no daisuki na hitobito ga atsumatte, aruku*

2 6 8

koto o tanoshimu.

2

'People who really like walking, gather and enjoy their walking.'

Grammar = 4 points
Vocabulary = 0 points
Kanji = 0 points
Length = 12 words

15. ***Midori*** *no oka o aruku.*

1

'They walked over green hills.'

Grammar = 1 points
Vocabulary = 0 points
Kanji = 1 point
Length = 5 words

16. ***Ungazoi*** *no michi o aruku.*

1

'They walked on roads alongside canals.'

Grammar = 1 points
Vocabulary = 1 point
Kanji = 2 points
Length = 5 words

17. *Arukinagara **fureai** ga umareru.*

8 9

'While walking, contacts are made.'

Grammar = 2 points
Vocabulary = 1 point
Kanji = 0 points
Length = 4 words

18. *"Kiiroi ribon," "Oosuzanna," "Moshi, moshi **kame** yo" to*

12

samazama na uta ga kikoete kuru.

8

'Various songs, such as, "Tie a Yellow Ribbon," "Oh, Suzanna," and "Moshi, moshi Kameyo", can be heard.'

Grammar = 2 points
Vocabulary = 1 points
Kanji = 1 point
Length = 14 words

19. ***Gunka** o utainagara **heitai** ga aruku.*

8

'Soldiers walk while singing military songs.'

Grammar = 1 point
Vocabulary = 1 point
Kanji = 4 points
Length = 6 words

20. *Kuroi hada o* ***kagayakaseta*** *musumesan ga aruku.*

10 13

'Girls with glistening tanned skins walk.'

Grammar = 2 points
Vocabulary = 1 point
Kanji = 1 point
Length = 7 words

21. ***Ryukku*** *o [****se*** *ni shita]* ***roojin*** *ga aruku.*

13

'An old man with a knapsack on his back walks.'

Grammar = 1 point
Vocabulary = 3 points
Kanji = 2 points
Length = 8 words

22. *Orinpikku no* ***seishin*** *wa* ***honke*** *yori mo kochira ni*

16 1

uketsugarete *iru no kamoshirenai.*

11 9 2 14

'The real spirit of the Olympic Games may have been preserved more in this (four days' march) than in the Olympics itself.'

Grammar = 6 points
Vocabulary = 3 points
Kanji = 3 points
Length = 13 words

23. ***Endoo*** *ni wa, isu o narabe, yasunde ike to* ***tenaneki*** *o*

8 8 4 12

suru shufu ga iru.

13

'Along the road, there are housewives who line up chairs and beckon to walkers to come and rest.'

Grammar = 5 points
Vocabulary = 2 points
Kanji = 2 points
Length = 15 words

24. *Koohii ya kukkii o* ***furumau*** *ie mo aru.*

13

'There are families which treat (walkers) to coffee and cookies.'

Grammar = 1 points
Vocabulary = 1 point
Kanji = 0 points
Length = 8 words

25. *Kuroobaa no* ***hanataba*** *o okutte kureru shoojo mo iru.*

8 13

'There are girls who present (the walkers) with clover bouquets.'

Grammar = 2 points
Vocabulary = 1 point
Kanji = 1 point
Length = 9 words

26. *Mainen no koto na no de,* ***juumin*** *to sankasha wa [****en*** *de*

8

musu*bareru] to iu.*

9 12

'Since it is an annual event, (they) say that the

residents and participants are strongly tied together.'

Grammar = 3 points
Vocabulary = 3 points
Kanji = 2 points
Length = 15 words

27. *Ima nihon de wa, 'aruki' no **aikoosha** ga **gekizoo** shi,*

8

yaku kyuuhyakuman to mo iwarete iru.

12 9

'In Japan today, those who like to walk have increased drastically and are said to number about 9 million.'

Grammar = 3 points
Vocabulary = 2 points
Kanji = 4 points
Ten = 1 point
Length = 16 words

28. *"Walk" to iu **senmon** **zasshi** mo dete iru.*

12 13

'There is now a special magazine, "Walk".'

Grammar = 2 points
Vocabulary = 0 points
Kanji = 3 points
Length = 7 words

29. ***Undoo busoku** o **kaishoo** suru tame.*

13

'To provide a solution to the lack of exercise.'

Grammar = 1 point
Vocabulary = 3 points
Kanji = 3 points
Length = 6 words

30. ***Tairyoku*** *to* ***seishinryoku*** *no* ***genkai*** *ni* ***idomu*** *tame.*

6 13

'To challenge one's physical and mental limits.'

Grammar = 2 points
Vocabulary = 4 points
Kanji = 5 points
Length = 8 words

31. ***Konjoo*** *no* ***ikusei*** *no tame.*

6

'To nurture the spirit.'

Grammar = 1 points
Vocabulary = 2 points
Kanji = 4 points
Length = 5 words

32. *Arukitsuzukeru riyuu wa samazama da ga, aruki no* ***shinzui***

11 13 7

wa ***yahari****, aruku koto o tanoshimu koto daroo.*

2 2 14

'There are various reasons for continuing to walk, but the essence of walking is in its enjoyment.'

Grammar = 6 points
Vocabulary = 2 points
Kanji = 2 points
Length = 17 words

33. *Tanoshiminagara arukeba, kaze no iro ga miete kuru.*

8 8 8

'If you walk while enjoying it, you can see the color of the wind.'

Grammar = 3 points

Vocabulary = 0 points
Kanji = 0 points
***Ketsu* = 1 point**
Length = 8 words

Hoogen to Kyootsuugo

Dialects and the Common Language

1. *Nihon wa, kuni ga semai* ***wari ni****, tochi ni yoru* ***hoogen*** *no*

13 13

chigai ga ookii.

'For a small country, Japan has large differences in its geographical dialects.'

Grammar = 2 points
Vocabulary = 2 points
Kanji = 0 points
Length = 15 words

2. *Nihon no* ***chisei*** *wa yama ya kawa ga ooku,* ***motomoto***

8

kootsuu *ni fuben de aru ue, mukashi wa, nihyaku suujuu mo*

13 1

no ***daimyoo*** *no* ***ryoochi*** *ni wakarete* ***seiji*** *ga okonawarete*

6 9 8 9

ita.

'As for Japan's physical geography, in addition to there being a lot of mountains and rivers naturally making it difficult for transportation, in former times, Japan was divided into 200 to 300 fiefs, owned and administered by feudal lords.'

Grammar = 7 points
Vocabulary = 6 points
Kanji = 4 points
Length = 31 words

3. *Sore de, hitobito wa, **tagai** ni jiyuu ni ikiki suru koto*

7 2

ga muzukashikatta.

4

'So it was difficult for people to freely associate with each other.'

Grammar = 3 point
Vocabulary = 1 point
Kanji = 0 points
Length = 13 words

4. *Sono tame, kotoba mo, hitotsuhitotsu no **chihoogoto** ni*

7

wakareru yoo ni natta no de aru.

9 13 2

'For this reason, language, too, came to be divided into individual geographical areas.'

Grammar = 4 points
Vocabulary = 1 point
Kanji = 0 points
Length = 15 words

5. *Toku ni tooi chihoo to no ikiki wa taihen na koto datta*

1 6

kara, hyakunen hodo mae made wa, Aomori no hito to

8 6

***Kagoshima** no hito ga **deatte** mo, hotondo kotoba ga*

11 8

***tsuujinakatta** to iu koto de aru.*

4 12 2

'Especially because association with a faraway district was difficult, up to 100 years ago, even if a person from Aomori and a person from Kagoshima met, it is said they could not communicate.

Grammar = 9 points
Vocabulary = 3 points
Kanji = 2 points
Culture = 2 points
Length = 37 words

6. *Konnichi de mo, sono tochitochi no* ***hoogen*** *wa, mainichi no*

6

seikatsu no naka de ikiiki to tsukawarete iru.

1 9

'Even today, the dialect of each area is being used actively in the middle of everyday life.'

Grammar = 3 points
Vocabulary = 1 point
Kanji = 0 points
Ten = 1 point
Length = 18 words

7. *Fudan yoku tsukau aisatsu no kotoba o mite miyoo.*

13 8

'Let's look at words that are ordinarily well-used for greetings.'

Grammar = 2 points
Vocabulary = 0 points
Kanji = 0 points
Length = 9 words

8. *"Konbanwa" to iu yoru no aisatsu o, "Oban de gozaimasu"*

12 13

"Oban ni narimashita" aruiwa, tada "Oban" to iu tochi ga

6 12 13

aru.

'There is a region where the evening greeting "Konban wa" ("Good evening.") is said "Oban de gozaimasu", "Oban ni narimasu", or simply "Oban".

Grammar = 5 points
Vocabulary = 0 points
Kanji = 0 points
Length = 21 words

9. *Mata, "Arigotoo" no kawari ni, "Ookini" to ka "Dandan" o*

7 6

tsukau chihoo ga aru.

13

"Again, there is a district which uses "Ookini" and "Dandan" instead of "Arigatoo" ("Thank you").

Grammar = 3 points
Vocabulary = 0 points
Kanji = 0 points
Length = 13 words

10. *Korera no aisatsu kotoba ni wa, sono tochi sono tochi no*

3 6 6

aji ga ***komotte*** *iru.*

'As for these words of greeting, they are full of the flavor of each particular region.'

Grammar = 3 points
Vocabulary = 1 point
Kanji = 0 points
Length = 15 words

11. ***Nazenara,*** *hoogen wa, sono tochi no seikatsu ya* ***rekishi***

7 6

to fukai ***tsunagari*** *ga ari,* ***kazokudooshi,***

1 8

tomodachidooshi, *tochi no* ***hitodooshi*** *ga* ***kutsuroida***

6 13

hanashi o suru toki ni wa, shizen ni [kuchi o tsuite] dete

13 8 8

kite, tagai ni yoku kimochi o ***tsuujiau*** *koto ga dekiru*

8 2 13

mono dakara de aru.

8

'The reason for this is a dialect has a close relation with the life and history of the local area, so when family, friends, and people of that region engage in relaxed conversation, the dialect just rushes out naturally and is able to mutually convey emotion.'

Grammar = 13 points
Vocabulary = 7 points
Kanji = 2 point
"Ketsu" = 1 point
Length = 47 words

Appendix B

The Passages Written in Japanese Orthography

Aruke Orinpikku 'Walking Olympics'

17 歩けオリンピック

毎年、オランダの小さな町で、大きな催しが行われる。フォーデーズ・マーチとも呼ばれ、歩けオリンピックとも呼ばれている。

二万人を超える世界各国の人びとがこの町ナイメーヘンに集まって、歩く。勝敗もない。順位もない。四日間歩き通したものに完歩の証書とメダルが与えられるだけだ。

今年の大会には日本から五十六人が参加した。参加九回の金子智一さん（日本歩け歩け協会長）にはこんな思い出がある。初めて参加した時、仲間と一緒に「ファイト、ファイト」と声高に叫んで歩いた。

すると、年配の女性が進み出ていった。「なぜ闘おうというの。私たちは闘いはごめんだわ」。がんばろうといいきかせる軽い調子の「ファイト」だったが、金子さんは We don't want to fight という言葉にこめられたものを察して、深く頭をさげた。

歩くことの大好きな人びとが集まって、歩くことを楽しむ。緑の丘を歩く。運河ぞいの道を歩く。歩きながらふれあいが生まれる。「黄色いリボン」「おおスザンナ」「もしもし亀よ」とさまざまな歌がきこえてくる。軍歌を歌いながら兵隊が歩く。黒いはだを輝かせた娘さんが歩く。リュックを背にした老人が歩く。オリンピックの精神は本家よりもこちらに受けつがれているのかもしれない。

沿道には、イスを並べ、休んでいけと手招きをする主婦がいる。コーヒーやクッキーをふるまう家もある。クローバーの花束を送ってくれる少女もいる。毎年のことなので、住民と参加者は縁で結ばれるという。

いま日本では、「歩き」の愛好者が激増し、約九百万人ともいわれている。『WALK』という専門雑誌もでている。運動不足を解消するため。体力と精神力の限界に挑むため。根性の育成のため。歩き続ける理由はさまざまだが、歩きの神髄はやはり、歩くことを楽しむことだろう。

楽しみながら歩けば、風の色がみえてくる。

方言と共通語

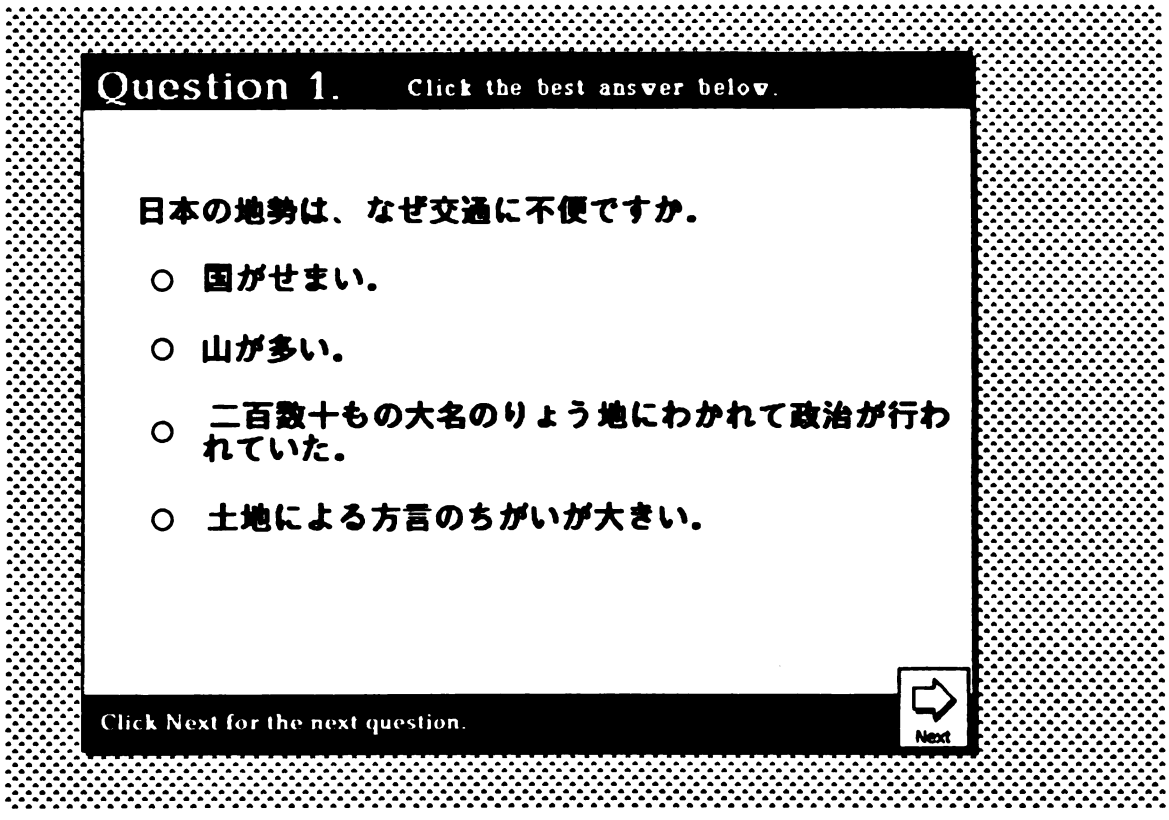
日本は、国がせまいわりに、土地による方言のちがいが大きい。日本の地勢は山や川が多く、もともと交通に不便であるうえ、むかしは、二百数十もの大名のりょう地に分かれて政治が行われていた。それで、人々は、たがいに自由に行き来することがむずかしかった。そのため、言葉も、一つ一つの地方ごとに分かれるようになったのである。とくに遠い地方との行き来はたいへんなことだったから、百年ほど前までは、青森の人と鹿児島の人が出会っても、ほとんど言葉が通じなかったということである。

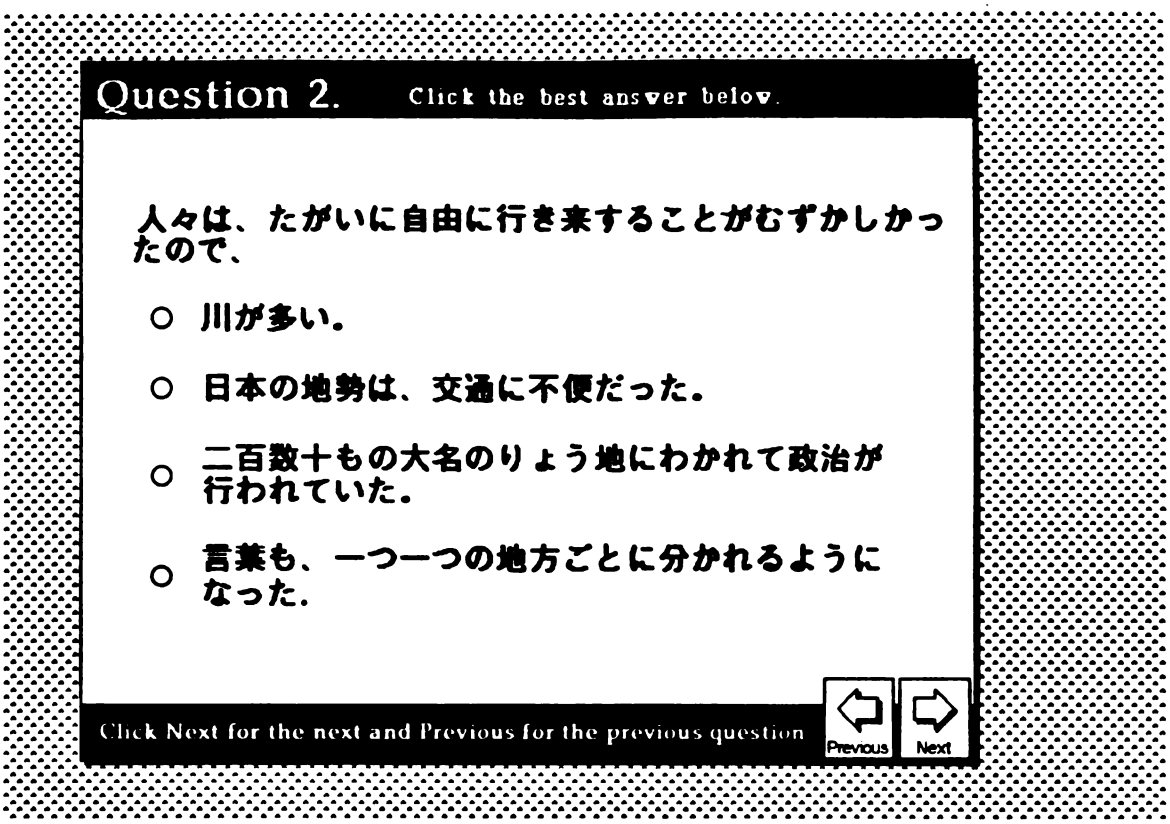
今日でも、その土地土地の方言は、毎日の生活の中で生き生きと使われている。ふだんよく使うあいさつの言葉を見てみよう。「こんばんは」という夜のあいさつを、「おばんでございます」「おばんになりました」あるいは、ただ「おばん」と言う土地がある。また、「ありがとう」の代わりに、「おおきに」とか「だんだん」を使う地方がある。これらのあいさつ言葉には、その土地その土地の味がこもっている。なぜなら、方言は、その土地の生活や歴史と深いつながりがあり、家族どうし、友だちどうし、土地の人どうしがくつろいだ話をするときには、自然に口をついて出てきて、たがいによく気持ちを通じ合うことができるものだからである。

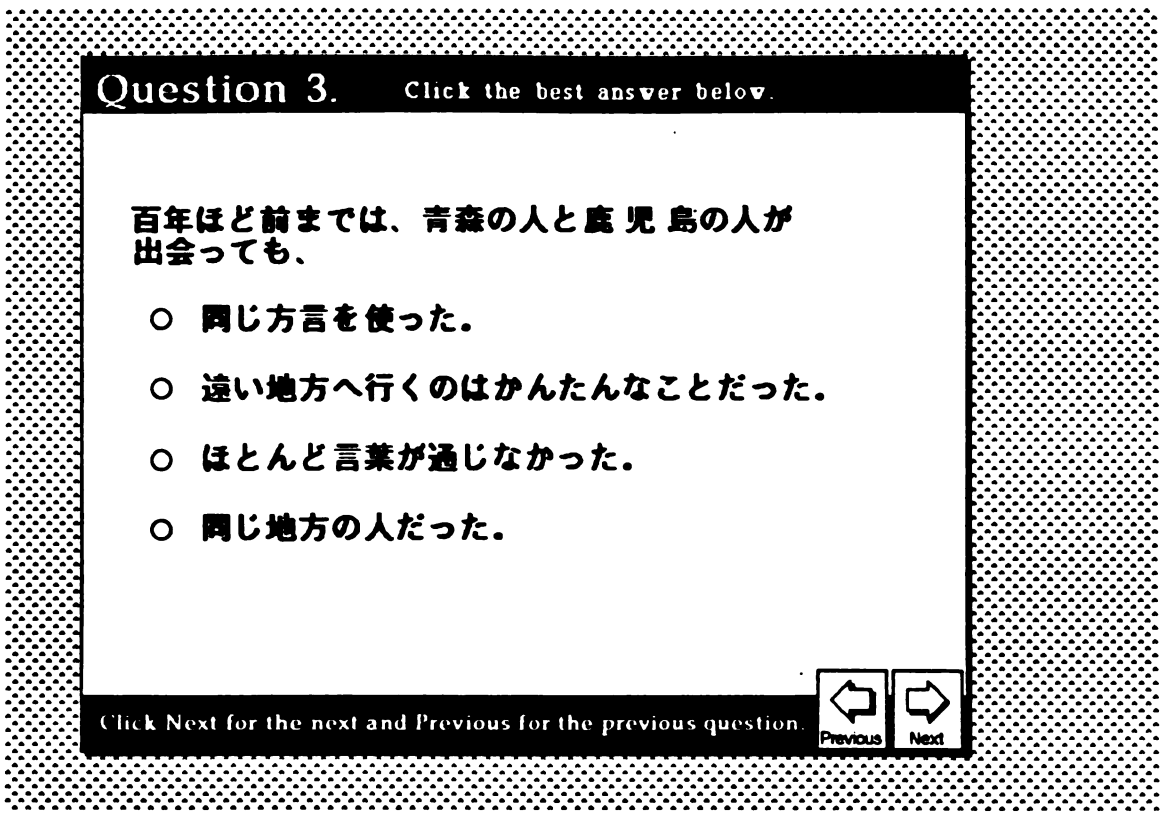
Appendix C

The Comprehension Questions

Aruke Orinpikku 'Walking Olympics'




Question 2.
Click the best answer below.
人々は、たがいに自由に行き来することがむずかしかったので、
川が多い。
日本の地勢は、交通に不便だった。
二百数十もの大名のりょう地にわかれて政治が行われていた。
言葉も、一つ一つの地方ごとに分かれるようになった.
Click Next for the next and Previous for the previous question
Previous
Next


Question 3.
Click the best answer below.
百年ほど前までは、青森の人と鹿児島の人が出会っても、
○ 同じ方言を使った。
○ 遠い地方へ行くのはかんたんなことだった。
○ ほとんど言葉が通じなかった。
○ 同じ地方の人だった。
Click Next for the next and Previous for the previous question.
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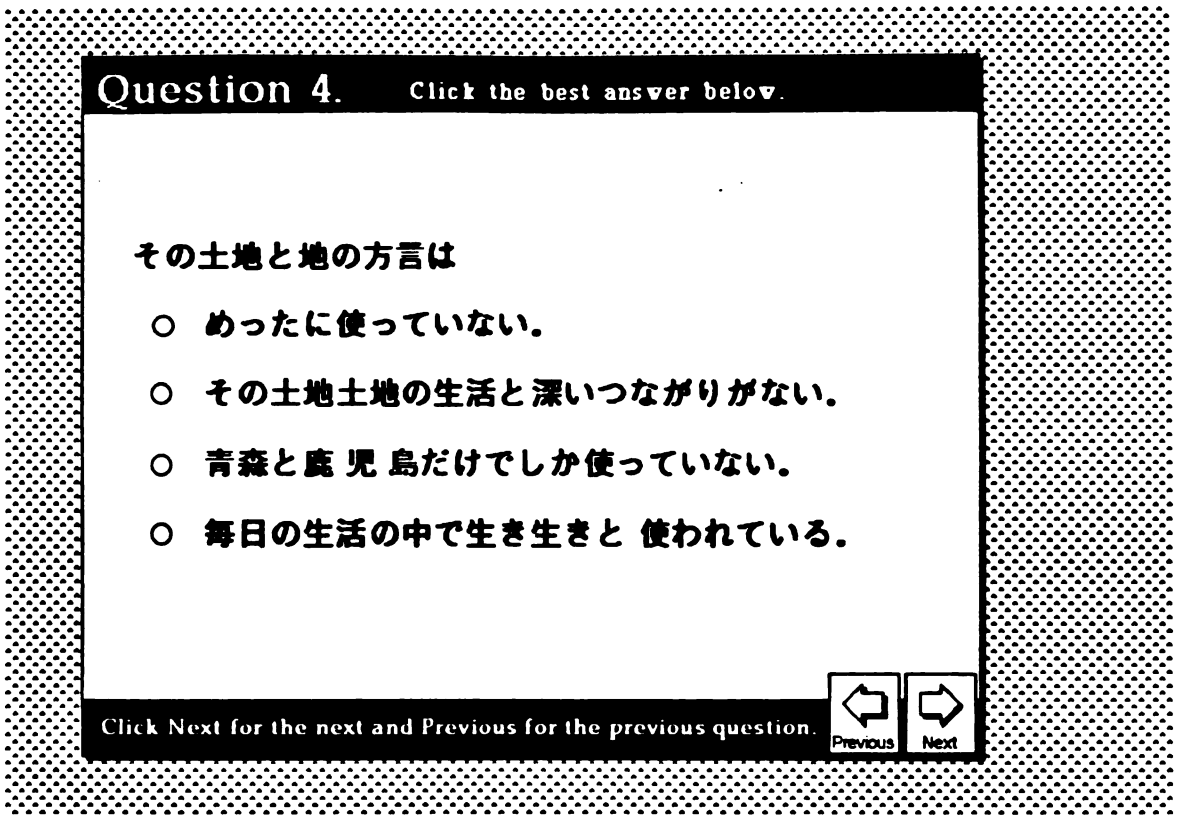
Question 4.
Click the best answer below.
その土地と地の方言は
○ めったに使っていない。
○ その土地土地の生活と深いつながりがない。
○ 青森と鹿 児 島だけでしか使っていない。
○ 毎日の生活の中で生き生きと 使われている。
Click Next for the next and Previous for the previous question.
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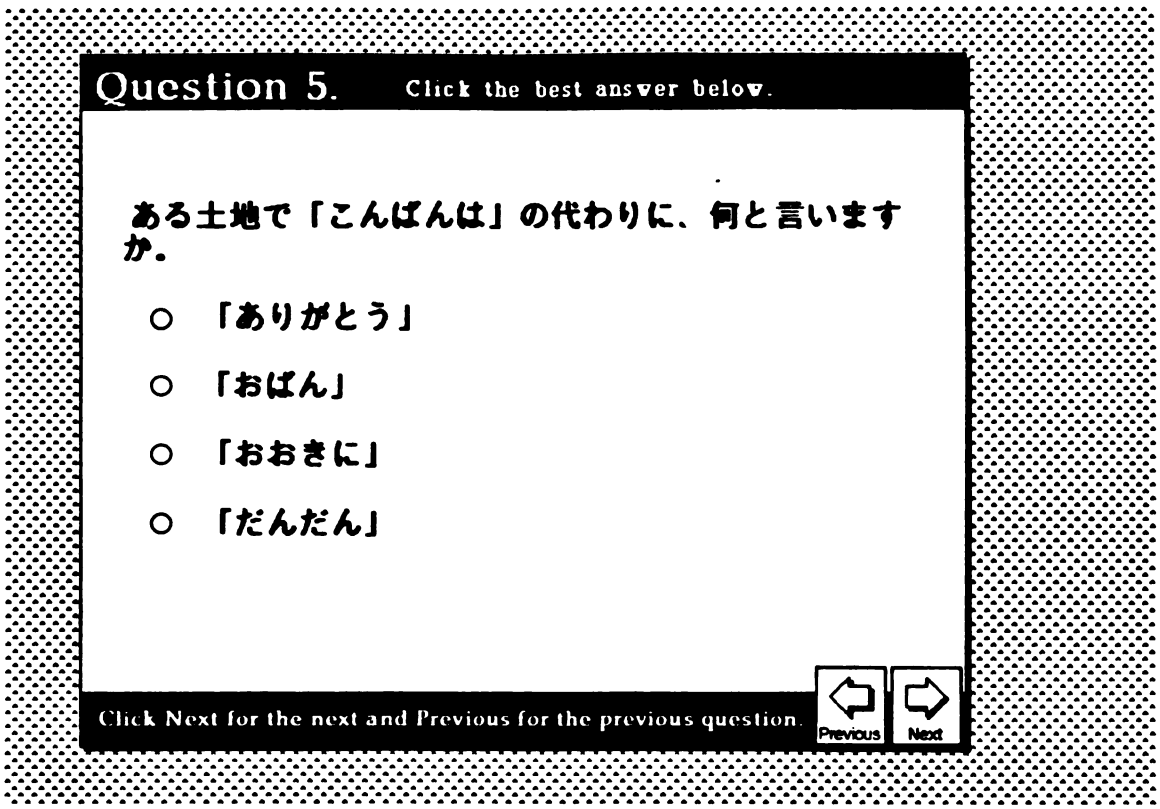
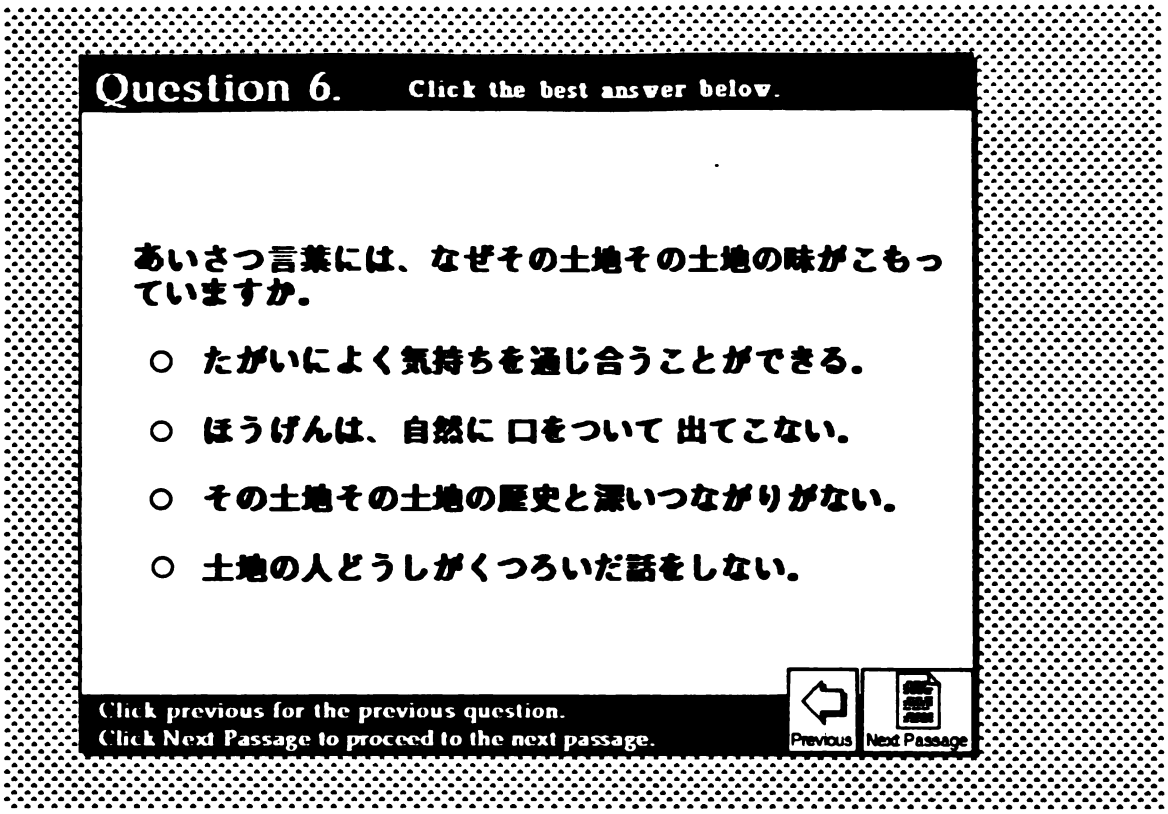
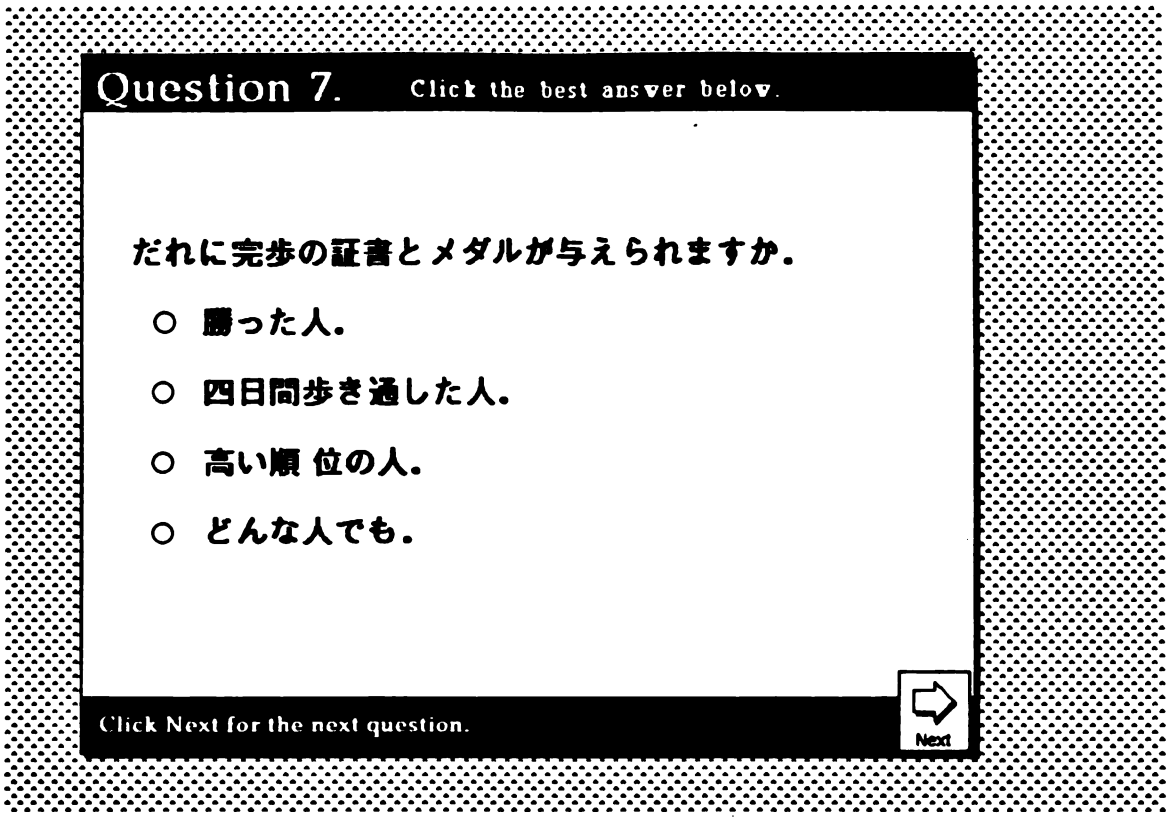
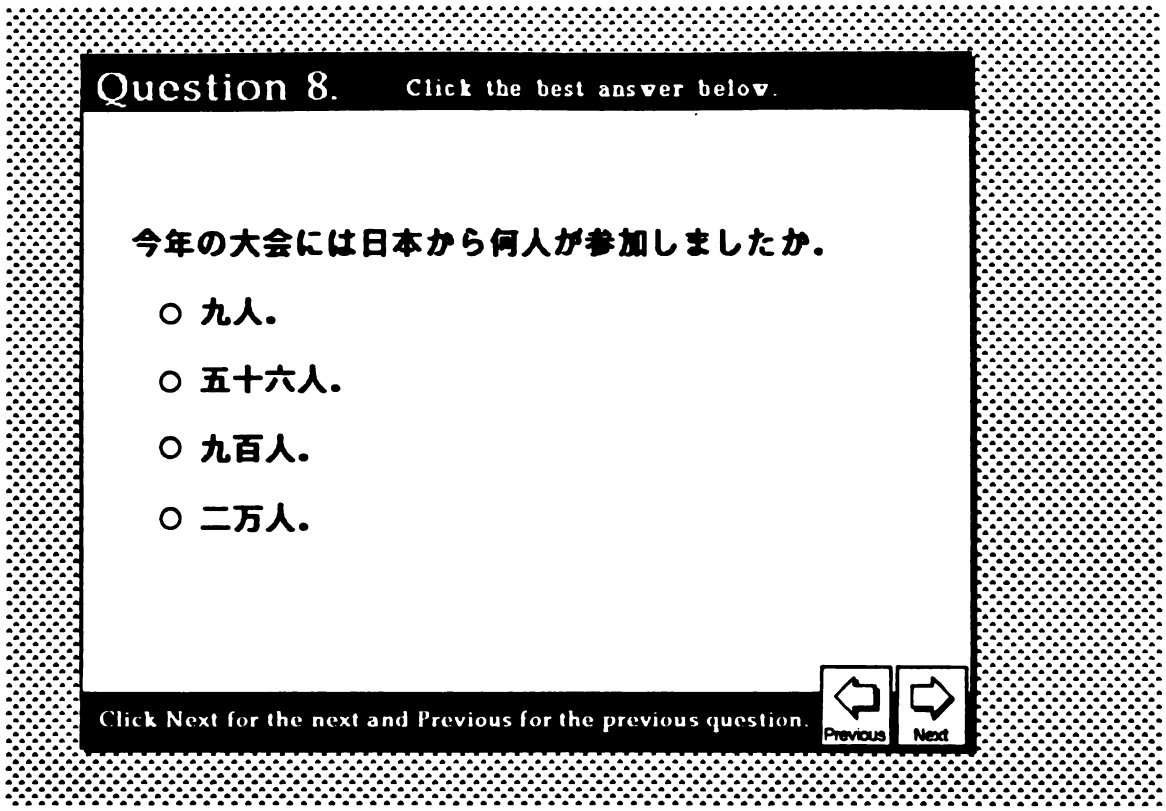
Next


Question 5.
Click the best answer below.
ある土地で「こんばんは」の代わりに、何と言いますか。
○ 「ありがとう」
○ 「おばん」
○ 「おおきに」
○ 「だんだん」
Click Next for the next and Previous for the previous question.
Previous
Next


Question 6.
Click the best answer below.
あいさつ言葉には、なぜその土地その土地の味がこもっていますか。
○ たがいによく気持ちを通じ合うことができる。
○ ほうげんは、自然に 口をついて 出てこない。
○ その土地その土地の歴史と深いつながりがない。
○ 土地の人どうしがくつろいだ話をしない。
Click previous for the previous question.
Click Next Passage to proceed to the next passage.
Previous
Next Passage


Question 7.
Click the best answer below.
だれに完歩の証書とメダルが与えられますか。
○ 勝った人。
○ 四日間歩き通した人。
○ 高い順 位の人。
○ どんな人でも。
Click Next for the next question.
Next


Question 8.
Click the best answer below.
今年の大会には日本から何人が参加しましたか。
○ 九人。
○ 五十六人。
○ 九百人。
○ 二万人。
Click Next for the next and Previous for the previous question.
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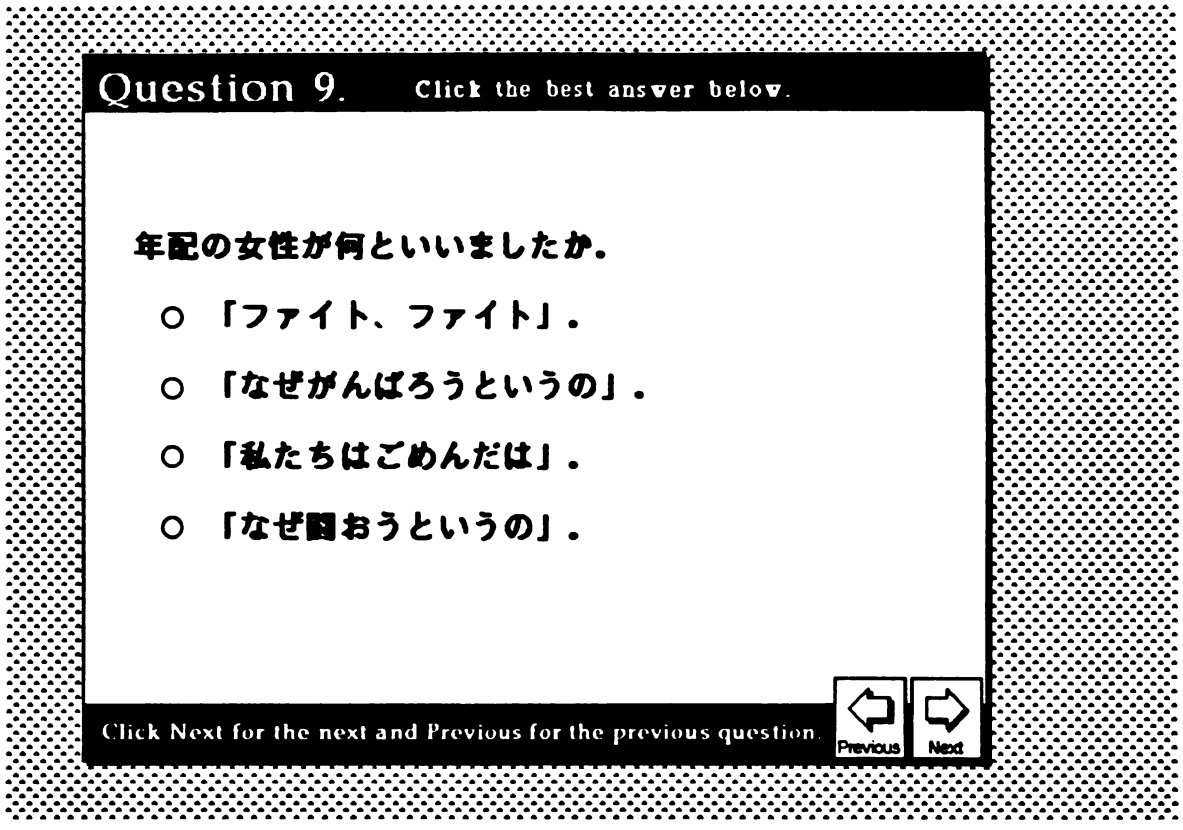
Next


Question 9. Click the best answer below.
年配の女性が何といいましたか。
○ 「ファイト、ファイト」。
○ 「なぜがんばろうというの」。
○ 「私たちはごめんだは」。
○ 「なぜ闘おうというの」。
Click Next for the next and Previous for the previous question.
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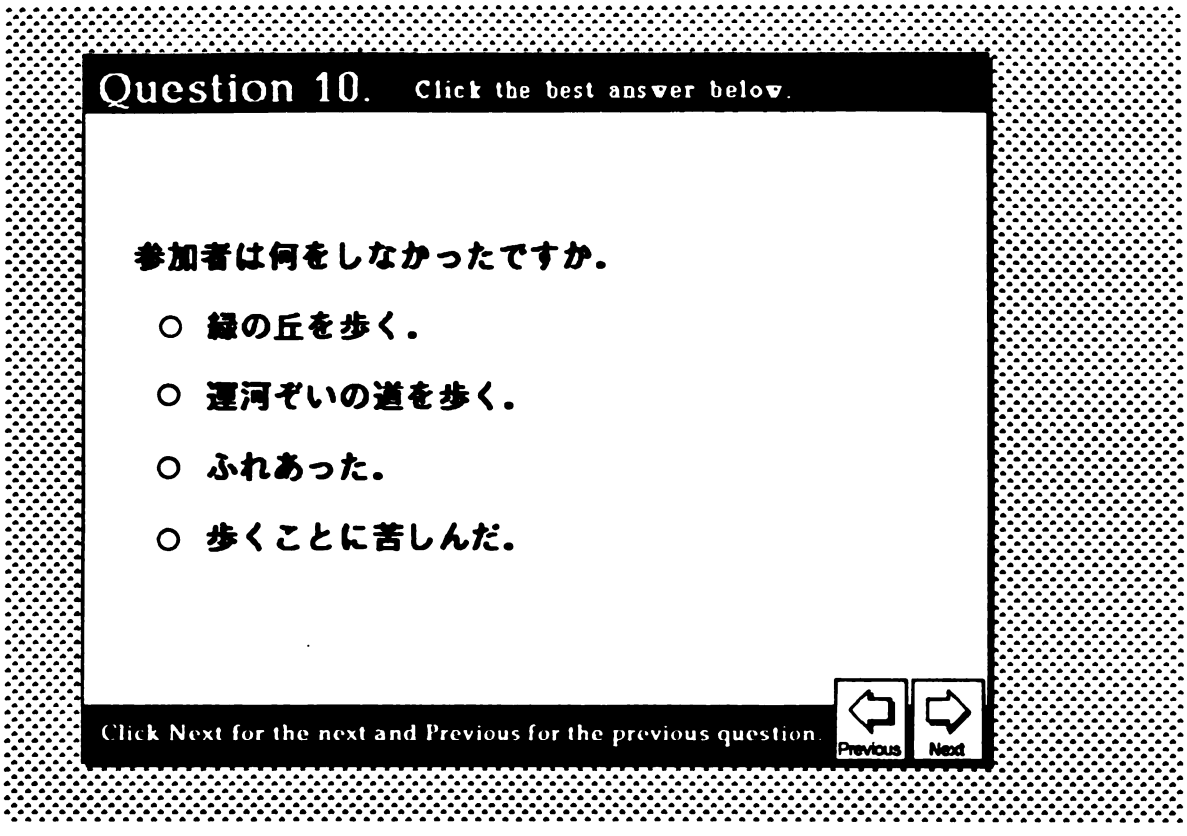
Next


Question 10. Click the best answer below.
参加者は何をしなかったですか。
○ 緑の丘を歩く。
○ 運河ぞいの道を歩く。
○ ふれあった。
○ 歩くことに苦しんだ。
Click Next for the next and Previous for the previous question.
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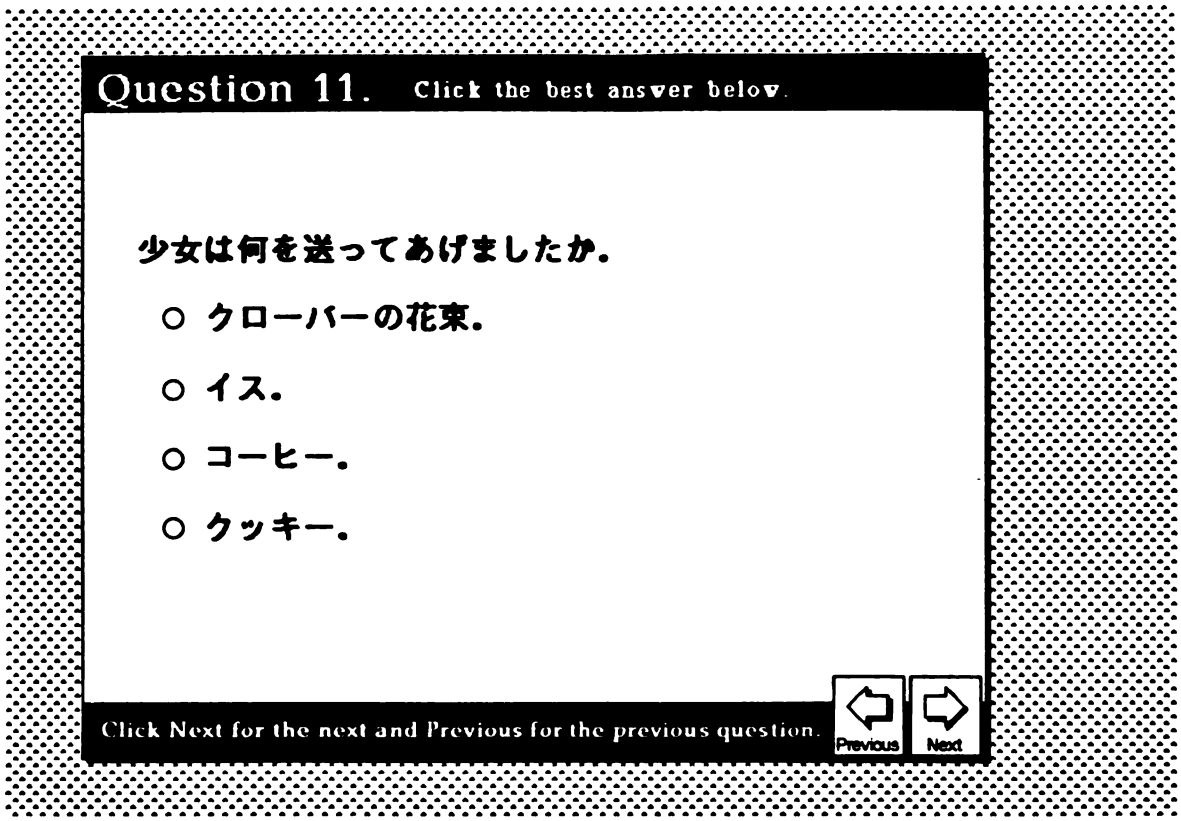
Next


Question 11. Click the best answer below.
少女は何を送ってあげましたか。
○ クローバーの花束。
○ イス。
○ コーヒー。
○ クッキー。
Click Next for the next and Previous for the previous question.
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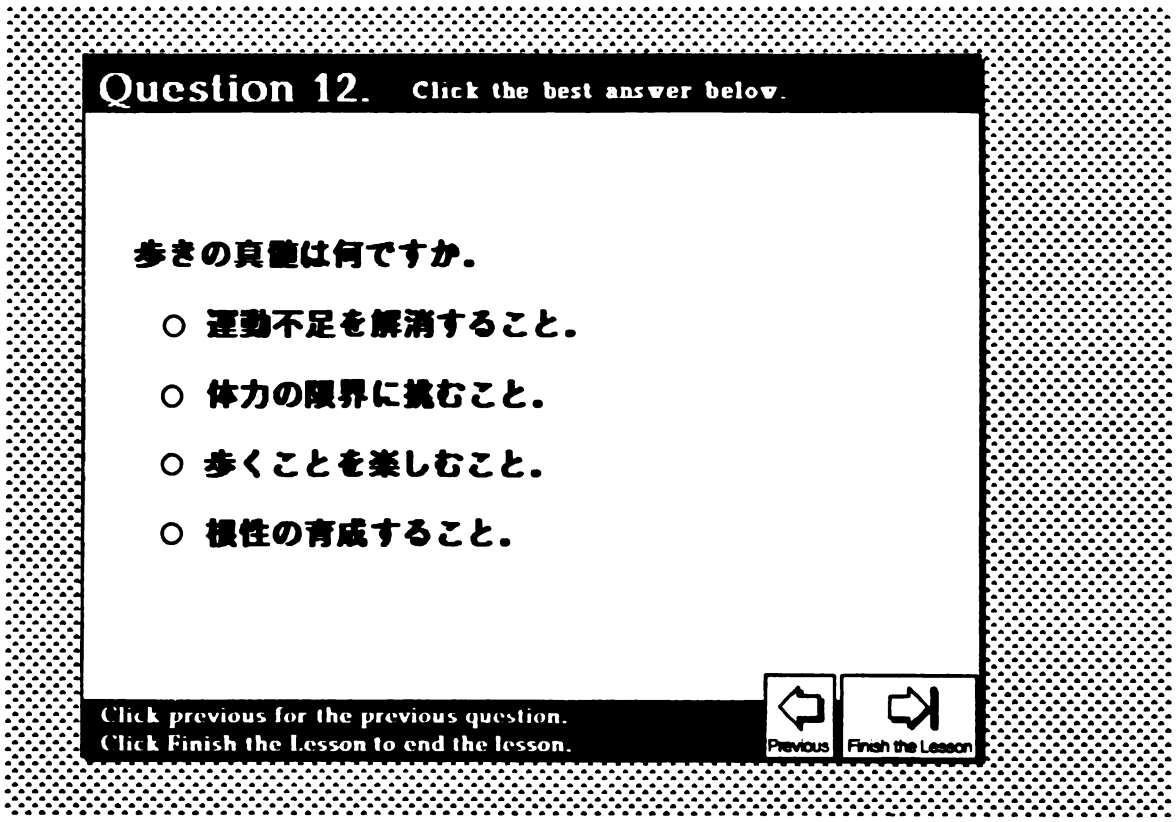
Question 12. Click the best answer below.
歩きの真髄は何ですか。
○ 運動不足を解消すること。
○ 体力の限界に挑むこと。
○ 歩くことを楽しむこと。
○ 根性の育成すること。
Click previous for the previous question.
Click Finish the Lesson to end the lesson.
Previous
Finish the Lesson

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