Classification Schemes and Empirical Study of Context Clues[1]

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The unlocking of the meaning of unknown words is one of the major reading problems of high school and college students. Been (1974:94) states that "the teaching of vocabulary is an essential element of foreign language study, and one which can be best taught through contextualized material." A great deal of emphasis has been placed on the importance of getting the student to see words in context, not the isolated word, through reading exercises. However, the concrete systematic teaching of vocabulary through context clues has been little dealt with in traditional reading courses for students of English as a second or foreign language (ESL or EFL students) (Hirano 1981:231). They have not been given much chance to develop the skill of intelligent guessing, a technique that should be encouraged above dictionary use, and the lack of which might adversely affect reading comprehension.

The purpose of this paper is (1) to review the previous studies which deal with classification schemes of context clues, (2) to discuss some methods of the teaching of the skill of guessing word meanings from context clues at the intermediate and advanced levels which the previous studies suggested, and (3) to present and discuss the results of the research the writer conducted subsequent to the 1981 study to investigate the use of context clues by college students in guessing word meanings for the purpose of improving their vocabulary and reading efficiency.

I. Classification schemes of types of context clues

1. Review of the previous studies of context clues in English as L_1[2]

Certain classification schemes of types of context clues are useful for instruction in the use of the clues. Artley was the first in the field of reading English as L_1 to devise context clues (Quealy 1969:514). He provided an extensive classification of context clues. The two "classic" articles on context clues which dealt with native speakers of English, are those by Artley (1943) and McCullough (1943) (Dulin 1969:33). In them, categories were presumed by the authors through speculative observation of contextual situations, with no empirical testing. Seibert (1943) attempted to deduce the mental process involved in deriving word meanings by inference from the context in a cloze procedure test of context clues. This resulted in five categories of context clues. Ames (1965) posited fourteen types of context clues on the basis of responses of his subjects in his exploratory study. He investigated the use of context clues by graduate students in guessing the meanings of verbs, nouns, adjectives, and adverbs.

We will first of all direct our attention to a classification of types which have been well described (Quealy 1969:516-17) and which can provide us with a framework upon which to base teaching materials. Quealy reported five authors' attempts to classify types of context clues which are useful in guessing the meaning of unknown words from the context. He presented in Table 1 all the context clues that the five authors listed. Each author's categories are listed under similar ones established by preceding authors. Judging from the articles by Artley (1943) and McCullough (1943), the clues on which the writer put asterisks in Table 1 should be listed under different ones.

Davis (1969) seemed to include synonym clues in definition ones in his simplified classification scheme: 1) definition; 2) contrast; 3) experience; 4) inference; 5) analysis; 6) combination of analysis with

one of the other four.

Table 1. Composite of contextual aids schemes for five authors

	Artley (1943)	*McCullough (1943)*	*Seibert (1945)*	*Deighton (1959)*	*Ames (1965)*
Typographical aids	Quotation marks Italics Bold face type				
Structural aids	Appositive phrase or clause Non-restrictive phrase Interpolated phrase or clause		Sentence structure	Modifiers	Modifying phrases or clauses Non-restrictive clauses or Appositive phrases
Substitute words	Synonyms Antonyms	Synonym		Restatement	Synonym
Word elements	Roots Prefixes Suffixes				
Figures of speech	Metaphors Similes	Comparison or Contrast			Comparison or Contrast
Pictorial representations	Pictures Diagrams				
Inference			Clues found in general meaning of paragraph	Inference	
Direct explanation		Definition		Definition	Definition or Description
Background of experience*		Familiar expression or Language experience			Language experience or Familiar expressions
Subjective clues	Tone Mood Intent	Reflection of a mood or attitude	Association of ideas		Tone, setting, and mood of a selection
Miscellaneous aids		Summary*	Use of deduction	Example	Clues derived from main idea and supporting details of paragraph organization
		Experience	Word association		Association clues
					Words connected or in series
					Referral
					Question and answer pattern of paragraph organization
					Preposition
					Cause and effect pattern of paragraph and sentence organization

(Quealy 1969: 516-517)

This writer thinks that, in contrast to the six schemes above, the following one (Thomas & Robinson 1972) is more organized and sophisticated:

(1) Direct explanation
(2) Comparison or contrast
(3) Synonym or restatement
(4) Experience
(5) Inference
(6) Explanation through example
(7) Summary
(8) Familiar expression or language experience
(9) Mood or tone
(10) Words in a series

2. Studies of context clues in ESL or EFL

Compared with the studies of context clues in English as L_1, less study has been done in ESL or EFL. The categories listed by three of the authors in this field are presented in Table 2:

Table 2. Classification schemes of context clues in ESL or EFL

Norris (1972)	Kruse (1979)	Brown (1980)
Definition	Definition (Parentheses Footnotes	Definition
Comparison or Contrast Synonym	Antonyms and Synonyms)	Contrast
Summary	Inference (Example Summary—Restatement, Information,	Inference
Experience	Experience)	Experience Analysis

The definition clues in the Norris and Kruse schemes above seem to correspond to typographical and structural aids in Artley's (1943)

study. The synonyms (X, that is Y; X or Y; X, Y, etc.) that are among definition clues in the Kruse scheme are different from those in the Norris one which are substitute words, not marked by typographical and structural aids. Brown's definition clues seem to be similar to the synonym clues in the Norris scheme, and Norris' summary clues could be included in the inference clues in Kruse and Brown's schemes.

On the basis of the review of the literature above, the attempt to classify types of context clues was made by Hirano (1981):

(1) Explanation (1. typographical clues—parentheses, dashes, quotation marks, italics, boldface 2. syntactic clues—X is Y; X, that is Y: X or Y; X, Y; X, which is Y 3. example clues)
(2) Contrast
(3) Synonym or restatement
(4) Experience
(5) Inference
(6) Others—analysis clues, mood or tone clues, series clues, combination of clues

The reason for the use of the term "explanation" instead of the term "definition" is because of the vague differentiation of the latter from the synonym, and because it would enable us to group Thomas & Robinson's explanation through example clue and Kruse's example clue into the explanation clue. The writer included summary clues in inference clues. (1), (2), (3) and (6) (analysis clues) could be called physically recognizable clues (Kruse 1979:209), while (4), (5), and (6) (mood or tone clues), physically unrecognizable clues.

3. Examples of context clues

For convenience, an example which illustrates clearly each of the types of context clues is presented according to this writer's classification, though a number of examples of context clues were reported in

Hirano (1980, 1981):

(1) Explanation (see APPENDIX)
(2) Synonym or restatement (see APPENDIX)
(3) Contrast: Most dentists' offices are *drab* places, but Emilio's new office is a bright, careful place (Baudoin, E. et al. 1977).
(4) Experience: The *sweat* rolled down his face. His entire body was wet, as if he had fallen into a spring.... The heat was terrible (Norris 1972:202).
(5) Inference: The guard gave only a *perfunctory* glance at the forged I. D. card and James breathed easily again (Brown 1980).
(6) Others

Mood or tone clue: The *lugubrious* wails of the gypsies marched the dreary whistling of the wind in the all-but-deserted cemetery (Thomas & Robinson 1972:23).

Series clue: It was a very strange house, because the walls were painted red, yellow, pink, white, brown, and *azure*.

Since the characteristics of some types of context clues in the classification schemes devised by Artley (1943), McCullough (1943) and Seibert (1945) (Table 1) do not seem to be easy to understand, some examples of them are drawn here from each of the three studies:

(Artley)

Interpolated phrase or clause: *Humus*—the food for plant life—comes from the decaying vegetable matter of the fertilizer.

Simile: The old car *lurched* forward like an anxious dog released by its master.

Metaphor: You dare not *evade* the responsibility, for the promise you gave is binding.

(McCullough 1958)

Familiar expression or language experience: as *famished* as a bear (hungry), Have a *jolly* Christmas (merry).

(Seibert)

Word-association: He drank a *cup* of coffee. The *smoothness* of his baby's skin. There was a plate with knife, fork and *spoon*. What do you *think* of that!
Sentence structure: She *rose* from her bed, *ran* to the window in her bare feet, and *shouted* for help (a chain of actions).

II. Some methods of instruction in the use of context clues and related empirical studies

McCullough (1943) dealt with problems of context clues in reading English as L_1. He pointed out that, if students could learn many types of clues and practice identifying and using them, they would sense meanings more efficiently. He suggested one classroom activity for practicing identification and usage: First the teacher would begin by giving students a pre-test consisting of passages from books.

Each passage should contain as the omitted word one of the crucial words in the reading course. Also, each passage might represent a different type of context clue. The teacher would ask each student to write a description of his attack on the meaning of the omitted word, which could be substituted for the crucial word. A discussion following the test would lead the student to realize that various types of context clues exist, while the teacher would be learning more of his or her student's individual differences in ability to derive meaning from context clues.

Seibert (1945) investigated the problem as it relates to foreign language learning. He offered the following suggestions in order to train the students specifically and systematically in the art of drawing inferences:

(1) The teacher could study the different categories and try to find as many examples as possible for each.
(2) Explain to the students how and why the missing word can be

guessed in any one specific category, and give a great number of examples to the class.

(3) All the words in the sentence should be known except the word to be guessed.

(4) Teach the students a method of controlling and checking the guess work like the following: a) recognition of key words; b) use of common sense; c) the meaning of the word guessed must fit in with the general meaning of the paragraph; d) sometimes a guess can be confirmed by what the author says later.

Several exploratory studies into the nature of context clues have been made. Dulin (1969:35) said: "The overall conclusions of these studies are that (a) many individual differences exist in ability to use context clues, (b) older students make more use of context than do younger ones, and (c) the closer the contextual aid and the greater its amount, the more effective it is." He reported studies by other researchers who found a high positive correlation between ability to use context and vocabulary and general reading comprehension, a close correlation with knowledge of grammar, and negative correlation with anxiety.

Quealy (1969) reported the studies by Artley (1943), McCullough (1943) and Strang (1944) which suggested the need for specific instruction in the use of context clues to native speakers of English, and conducted a study of their use of context clues. He, in his study using 72 senior high school students in America, indicated differences in the use of context clues according to intellectual ability, grade level, sex, and form classes (parts of speech). In the introspective technique, subjects were asked to verbalize their thought processes and to explain how they used context clues to supply meaning for the created nonsense words. The responses of each subject were tape recorded. The classification scheme derived by Ames (1965) was used in the Quealy study. The findings of his study offered the following conclusions and impli-

cations for instruction and the development of instructional materials at the senior high school level:

(1) Intellectual ability was highly related to the effective use of context clues.
(2) Males and females did not differ significantly in their use of context clues across the three grade levels (the tenth, eleventh, and twelfth grades) though comparisons of boys and girls within the three grades revealed significant differences only at the tenth-grade level.
(3) Maturity level was not significantly related to effective use of context clues.
(4) Students differed significantly in their identification and use of the four parts of speech. The intellectual ability, not grade level and sex differences, is related to the effective use of context clues among the four parts of speech.
(5) It seems that new materials designed to improve use of contextual aids in the senior high school should account for intellectual ability level, and the parts of speech, but not sex differences and maturity (grade) level (except perhaps in the tenth grade).

Further research seems to be needed that will examine whether the findings above are true of ESL or EFL students, since Quealy studied the use of context clues by senior high school students whose mother tongue was English. In any event, his findings are of great interest.

Also, Carton (1971), in his study on inferencing in foreign language learning, reported an interesting finding of the relations and interactions between certainty and guessing. He stated: "In studying certainty, a distinction is to be made between subjective certainty and objective certainty.... Objective certainty may justify ready inferencing, but subjective certainty may be expected to determine ready inferencing. How can subjective and objective certainty be made to coincide? An interesting finding in respect to the *Visual Inference Test*

along these lines was the tendency of subjects to report higher certainty in respect to correct guesses than in respect to incorrect guesses. . . ." (p. 56)

Clarke and Nation (1980) described a strategy for guessing meanings from context and suggested ways of practicing this strategy. They wrote: "The strategy involves four steps: 1. determining the part of speech of the word; 2, looking at the immediate grammar; 3, studying the wider context (usually the conjunction relationships); 4, guessing the word and checking the guess." (p. 211)

Limitations Often a wrong meaning is derived from the study of context alone, though the context must always be considered. Students should be shown that there will be times when context will be of no help (Ames 1970). Seibert (1945) listed the words which cannot be guessed: words without clues; determinatives; technical words; specific substantives used in enumerations; and things outside the reader's experience. Hirano (1980) showed the disadvantages of the use of context clues that were pointed out by Dechant (1973:208). Thus, it should be stressed that students should be taught a variety of techniques to attack unfamiliar words. However, students should be made aware of the power of context as one of the most effective means of deriving word meanings, and the value of the skill of guessing from context clues. It goes without saying teachers should emphasize the use of context clues themselves, not the names of the specific categories of context clues, though the use of classification schemes can be bases for organizing instruction in the use of context clues.

III. Experiment on the guessing of unknown words from context clues

1. Introduction

Hirano (1981) investigated to what extent undergraduate students could guess the meaning of unfamiliar words from five types of context

clues for the purpose of improving the teaching of vocabulary and reading. Table 3 (Hirano 1981) gives the results of the test which was administered to 160 college sophomores.

Table 3. Percentage of correct responses for college sophomores (N = 160)

rank	types of context clues	percentage of correct responses
1	Contrast clue	70.5%
2	Experience	60.6
3	Synonym or restatement clue	52.3
4	Inference clue	48.7
5	Explanation clue	40.4
	(mean)	53.2
1 > 4, t = 2.83*		
1 > 5, t = 4.27*		
2 > 5, t = 2.87*		

*p < .05

(Hirano 1981 : 234)

Fifty-four freshmen at Niigata University took the same test at the same period (in July, 1981). The results of the freshmen test are presented in Table 4.

Table 4. Percentage of correct responses for college freshmen (N = 54)

rank	types of context clues	percentage of correct responses
1	Contrast clue	63.8%
2	Experience clue	54.2
3	Inference clue	49.2
4	Synonym or restatement clue	48.4
5	Explanation clue	43.0
	(mean)	(51.7)
1 > 5, t = 2.89*		

*p < .05

Both Tables 3 and 4 indicate that contrast clues provide the easiest

means for guessing the meaning of unknown words, but explanation clues are the hardest. The difference in the percentage of correct responses (guesses) between contrast clues and explanation clues was significant at the .05 level in the two tables. Also, the writer could not find a significant difference in the mean percentage of correct guesses between freshmen and sophomores: 51.7% and 53.2%, respectively. Thus, the similarity between the responses of the freshmen and those of the sophomores would seem to indicate that college freshmen do not differ much from college sophomores in terms of their use of context clues.

2. Purpose of this study

Some weaknesses existed in the study by Hirano (1981): no control was provided for the number of words and the syntactic complexity of each of the contextual situations in which use of context clues would arise; some test-items were difficult to comprehend; it did not investigate how the difference in the position of synonym clues would affect the guessing of word meanings; the relationship of correct guessing to the speed of and confidence in guessing was not examined.

The present study was designed to compensate for these problems. It was conducted for the following purposes:

(1) To confirm the results of the previous study in 1981, i.e., to investigate again in Test I whether physically recognizable clues (explanation clues with the lowest percentage of correct responses in the 1981 study) or physically unrecognizable clues (experience and inference clues) make it easier to guess the meaning of unfamiliar words from context,[3] with each context (test-item) controlled in order that each item is very similar in number of words and syntactic complexity.

(2) To see in Test II if there are significant differences in ease of meaning-acquisition through context when the positions of

synonym clues are considered.

(3) To attempt to examine the relation of correct guessing to the speed of and confidence in guessing, comparing the responses of an upper group with those of a lower group so that the investigation of these psychological factors would make the teaching of vocabulary and reading more effective.

3. Procedure

3.1 Subjects

Test I and Test II (see APPENDIX) were given to three classes of college sophomores, 120 students in all at Niigata University, majoring mainly in literature, law, and economics. They took Test I and Test II in sequence. Approximately 25 minutes were allowed for completion of Test I, and 20 to 25 minutes, for that of Test II.

3.2 Materials

Each item of Tests I and II was chosen with some modifications from Baudoin (1977), Thomas (1972), Yoshida et al. (1982), Miyashita et al. (1982) Yorkey (1970), and Davis (1967). Each one was designed to include one type of context clue and *Kōkō kihon eitango katsuyoshū* (1981) was checked to make sure that all the words of each item should be known to the subjects except underlined words. Some asterisks were put on words that we thought were unknown to them and were translated into Japanese below each test-item. In underlined parts, nonsense words were then created to replace the original words. These nonsense words were composed of five phonemes, CCVCC, and a dictionary was checked to insure that no such English words existed. As we were specifically concerned with the problem of deriving word meanings from context by inference, we purposely eliminated the possibility of word meanings being already known or guessed by etymology.

Test I consisted of 12 test-items, in which 6 explanation clues (Type

A) and 6 experience and inference clues (Type B) were used. Each item (context) contained, on the average, 21 words,[4] and all of them were much the same in syntactic complexity, marked by T-unit, the number of words per T-unit (W/T), the number of clauses per T-unit (C/T), the number of words per clause (W/C) (Hunt 1973:189). The syntactic complexity of Test I is shown in Table 5.

Table 5. Syntactic complexity of Types A and B in Test I

Type	No. of items	No. of words	Syntactic complexity			
			T-unit	W/T	C/T	W/C
Type A	6	19–22	1	19–22	2	9.5–11
Type B	6	19–22	1	19–22	2	9.5–11

Test II consisted of 8 test-items in which synonym clues were used, each of which was classified into Type A or Type B. In the 4 Type A items the synonym clue appeared before the unfamiliar word, while in the 4 Type B items the synonym clue came after the unfamiliar word. The test-items were altered so that the number of words in each item was almost the same, with an average of 30 words.[5] In each context, the distance of synonym clues from the unfamiliar words was controlled so that an average of 12 words intervened between the clues and unfamiliar words. They are presented in Table 6.

Table 6. Controlls in Test II

Type	No. of items	No. of words	No. of words which intervene between clues and unfamiliar words
Type A	4	29–32	10–14
Type B	4	29–32	10–14

However, it was too difficult to control the syntactic complexity of the items in Test II. Therefore, further study of synonym clues occurring

just before and after unfamiliar words with controlled syntactic complexity is needed.

3.3 Directions for the tests

Before the experiment we read an explanation of the task which the student was to perform. In Test I, 120 subjects were instructed to guess the meanings of underlined nonsense words through context and to write them in Japanese or English. They had only to circle it if the context contained a synonym or restatement for the underlined nonsense word. In Test II, they were only required to search for the synonym or restatement for the nonsense word in each test-item and to circle it. In order to investigate the relation of correct guessing to the speed of and confidence in guessing, 85 out of 120 subjects, two classes were asked to fill in column 1 and column 2, concerned with instant guessing and confidence in guessing, respectively, completing each item. The directions for filling in the columns were: "Put an 'O' in column 1 if you were able to guess instantly, an 'X' if guessing was not done instantly, or a '?' if you cannot decide. In column 2, put an 'O' if you were able to guess confidently, an 'X' if you were not confident in guessing, or a '?' if you cannot decide."

3.4 Scoring

One point was given for each correct guess in both tests. In Test I, we had difficulty deciding which of the responses was acceptable and which was not. Some synonymous meanings had to be accepted.

4. Results and Discussions

4.1 Test I

The results obtained from Test I (Table 7) indicated that Type A (explanation clues) had a lower mean percentage of correctly guessed unknown words than Type B (experience and inference clues).[6]

Table 7. Mean percentages of correct responses in Test I (N = 120)

	Type A	Type B
No. of items	6	6
Mean percentage	27.4%	59.6%
t	4.12*	

*$p < .01$

A t-test was used for the comparison of the two means. Significant difference in ease of meaning-acquisition was found at the .01 level between Type A (physically recognizable clues) and Type B (physically unrecognizable clues). With each context being very similar in the number of words and syntactic complexity, this result proved, as in the 1981 study, that explanation clues are not as useful for guessing word meanings as we expect (Dulin 1969:38). The reason for this is that students have difficulty using explanation clues properly unless they grasp correctly the relationships of the sentence structures in each context. It is apparent from the students' questionnaires in the 1981 and present studies that they do not consciously make much use of explanation clues. Thus, it might be helpful to differentiate instruction in the use of context clues to accommodate the different types. Particularly important in teaching students to develop the skill of guessing from context clues is the teacher's careful explanation, directly or through group discussion, of how a word meaning can be guessed from explanation clues, or from typographical and syntactic clues such as dashes, commas, or, that is, etc. This can be done through illustrative sentences containing an unknown word and an explanation clue that are taken from reading the students will be doing. The necessary knowledge about explanation clues will be provided by systematic teaching with a number of examples and exercises. In addition to this, students should practice guessing meanings from contexts with the other types of clues more than with the explanation clue, since the latter has proved

not to be so effective (Dulin 1969:38).

4.2 Test II

In Test II, the directions to just circle the parts for the unknown words made the percentages of correct responses (82.9% and 76.5%) higher than was expected. As can be seen from Table 8, the significant difference in the percentage of correct responses was not found at .05 level between Type A and Type B.

Table 8. Mean percentages of correct responses in Test II (N = 120)

	Type A	Type B
No. of items	4	4
Mean percentage	82.9%	76.5%
t	0.93	

Thus, it appears that the position of synonym clues has no significant effect on students' ability to guess word meanings from that type of clue. The result of Test II seems to suggest that it would probably not be necessary to take into account the position of synonym clues in teaching students to use them. However, the result presented in Table 8 should not be considered as the final conclusion, since in Test II, only eight test-items were involved and the syntactic complexity varied from test-item (context) to test-item (context). The data has shown us a trend, but many more test items are needed before some specific conclusions can be reached.

4.3 Psychological factors

It is shown in Table 9 how the correctness of guessing is related to the speed of and confidence in guessing among the lower and upper group students.

85 subjects were rank ordered on the basis of their total score from Tests I and II. They were then divided into three groups, upper,

Table 9. Comparisons of correct responses, instant guessing and confidence in guessing among upper and lower groups (N=85)

		total number of correct guesses	$\bar{X}$	SD	Column 1 (instant guessing)			Column 2 (confidence in guessing)		
					a(O)	b(X)	c(?)	a(O)	b(X)	c(?)
Test I	Upper	187	8.1	1.5	95 (50.8)	62 (33.2)	30 (16.0)	50 (26.7)	98 (52.4)	39 (20.9)
	Lower	68	3.0	1.2	39 (57.4)	14 (20.6)	15 (22.1)	21 (30.9)	22 (32.4)	25 (36.8)
Test II	Upper	165	7.2	0.7	95 (57.6)	42 (25.5)	28 (17.0)	76 (46.1)	60 (36.4)	29 (17.6)
	Lower	126	5.5	1.5	85 (67.5)	29 (20.6)	15 (11.9)	60 (47.6)	22 (17.5)	44 (34.9)

middle, and lower; 27% (n=23), 46% (n=37) and 27% (n=23) of the subjects, respectively. In Table 9, comparisons were made between the upper and lower groups. It deals only with *correct* guesses, not wrong ones. In column 1, the relationship of correct guessing to instant guessing is presented, whereas column 2 indicates that of correct guessing to confidence in guessing. In Test I the total occurrence of correct guesses the upper group made is 187. In each column, the left figure represents the actual number of occurrences and the right, their percentage. 95 in column 1, indicates the number of the responses of the upper group which were instant and correct, 62 is the number of the guesses they reported they had not made instantly, but which they did correctly, and 30 is the number of correct guesses for which they could not choose either "O" or "X". The percentage of the number of instant and correct guesses (95), divided by the total number of correct guesses (187), was 50.8%. Column 2a presents the number and the percentage of the responses they reported they were confident in, and which were correct, while column 2b, those they reported they had not done confidently, though the responses were judged correct.

A Chi-square (X^2) test was used to compare the responses of the three categories (a, b, and c) in each group in each column (e.g., 95, 62, and 30)[7] (Table 10). In addition, since X^2 analysis revealed

Table 10. Chi-square test results

Test	Group	Column 1 (a vs. b vs. c)	Column 2 (a vs. b vs. c)
Test I	Upper Group	$X^2 = 33.89$*	$X^2 = 31.5846$*
	Lower Group	$X^2 = 17.6762$*	$X^2 = 0.3823$
Test II	Upper Group	$X^2 = 45.4181$*	$X^2 = 20.7627$*
	Lowhr Group	$X^2 = 67.4761$*	$X^2 = 17.3330$*

*$p < .001$

that the differences among the responses in each group in each column were significant, except those of the lower group in column 2 in Test I, the Ryan, T. A. significance test was run to determine if there was any significant difference in the number of the responses between each of the two categories (a and b, b and c, a and c) in each group in each column.[8] The Ryan test revealed significant differences ($p < .05$) between the categories a and b in each group in each column, except in the lower group, column 2, Test I and in the upper, column 2, Test II. As column 1 in Table 9 shows, more than half of the correct guesses by each group were made instantly both in Test I and Test II, in other words, without regard to the difficulty or ease of the tests. Column 2 reveals that, in a slightly difficult test like Test I, where the mean percentage of correct answers was 43.5%, the percentage of correct guesses made without confidence by the upper group (column 2b) was higher than the other two (columns 2a and 2c), though there was no significant difference in the percentage of correct responses among columns 2a, 2b, and 2c for the lower group. On the other hand, in an easier test like Test II, with about 79.7% correct answers, each group made more correct guesses confidently (column 2a), although

the difference in the percentage of correct responses between columns 2a ('confident') and 2b ('not confident') was not significant for the upper group. Therefore, whether or not they are confident in their correct guesses is very likely to be related to the difficulty of the tests, though instant guesses are not.

In the comparison between upper and lower groups, statistical analysis showed that they differed significantly in the speed of and confidence in guessing.[9] That is, in Test I, there were significant differences between the two groups in the percentage of correct responses in columns 1b, 2b, and 2c, while in Test II, in column 1a, 2b, and 2c (see Table 11). In both Test I and Test II, although no significant

Table 11. Comparison of upper and lower groups

Test	Column 1			Column 2		
	a. U vs. L	b. U vs. L	c. U vs. L	a. U vs. L	b. U vs. L	c. U vs. L
Test I	$z = 0.94$	$z = 2.1^{**}$	$z = 1.08$	$z = 0.66$	$z = 2.98^{***}$	$z = 2.42^{**}$
Test II	$z = 1.75^{*}$	$z = 0.98$	$z = 1.24$	$z = 0.25$	$z = 3.78^{****}$	$z = 3.33^{****}$

$^{*}p < .10$ $^{**}p < .05$ $^{***}p < .005$ $^{****}p < .001$

difference was found between them in column 1b in Test II, the upper group had a significantly higher percentage of correct responses they had not done quickly (e.g. 33.2%) than the lower group (e.g. 20.6%) (column 1b), and also (column 2b) a significantly higher percentage of responses they reported they were not confident in, though those responses were correct (i.e., 52.4% and 36.4%). Especially in Test I, as I mentioned above, it was found that, in spite of their correct guesses, about half of them were not made confidently by the upper group. Thus, judging from these results of comparisons among the two groups, it could be assumed that, by employing a number of different methods to attack unknown words (Strang 1944:89), the upper group become more cautious in guessing, which seems to explain why they tend to

take more time to make correct guesses, and are less confident in their correct guesses than the lower group, who would use fewer methods of attack. Though the lower group made fewer correct guesses than the upper, the former seemed to guess instantly when they guessed correctly. The percentages in column 1a and column 2a in Test II were higher than those in Test I, since Test II was on the whole an easier test for the subjects. The fact that the lower group had a higher percentage than the upper in column 2c of Tests I and II, that is, the former was able to say neither 'confident' nor 'not confident' more frequently, seems to indicate that more of the correct guesses by the lower group were made by a fluke than those of the upper. It goes without saying that the fact that the students' judgment on the speed of and the presence of confidence in guessing includes subjective factors should be given consideration in the discussion of the findings of this research.

5. Conclusion

This experimental study was done with a view to the improvement of effective teaching of how to develop skill in the use of context clues for vocabulary-reading improvement. It helped clarify which type of context clue is more effective for guessing and which is not, and also the relationship between the position of synonym clues and ease of guessing. How correct guessing is related to instant guessing and confidence in guessing was investigated, too. The results of this study are summarized as follows:

(1) Explanation clues are not so effective for guessing word meanings, as in the writer's study in 1981.

(2) It seems that the position of synonym clues has no significant effect on students' ability to derive meanings of unfamiliar words from that type of clue. However, this finding should not be

considered as the ultimate conclusion. Further research is required.

(3) The students' confidence in their correct guesses are related to the difficulty of the tests, but the speed of guessing is not. The upper group seem to become more cautious in guessing, by employing a number of different methods to attack unfamiliar words, which may have a relation to the result that they are less confident in their correct guesses than the lower group.

Consequently, the findings above should be accounted for in designing instructional material using context clues for college students.

We should continue to accumulate more data through more of the same kind of experiments, using words of different parts of speech, different materials and more test-items. Also, further studies are needed that will develop experimental instructional techniques and materials, and evaluate their effect on the improvement of the use of context clues and reading, through the use of control groups.

Notes

1 This is a revised version of a paper presented at the 21st Annual Convention of the Japan Association of College English Teachers (JACET) in Kyoto in October, 1982. I would like to thank Roger Muetzelfeld, who checked the test-items and the English working of the paper. I would also like to express my gratitude to Tsunenori Karube and Yoshihiko Shibuya for their assistance in providing students for this study.

2 L_1=the student's first language or mother tongue.

3 In Test I, contrast clues were eliminated from consideration, since the difference in the percentage of correct guesses between contrast clues and explanation clues was significant in the previous study. The reason synonym or restatement clues were not considered in Test I was that, unlike explanation clues, they are not marked by obvious signals such as dashes, commas, that is, or, etc., and are not always easily recognized. Experience clues and inference clues were grouped together, because both of them are physically unrecognizable clues.

4 According to the writer's experimental findings, it does not seem to be so difficult to guess the meanings of unfamiliar words by the use of explanation clues if the context has about 20 words. However, how many words are enough for correct guessing should be studied further.

5 Finocchiaro (1964:74) states: "Experimentation has shown that students experience little or no difficulty when one "new" word is interspersed among about thirty familiar words."

6 A lower percentage of correct Type A responses (27.4%), compared with that of the 1981 study (40.4%), is probably due to the latter being mainly a multiple-choice test, and the former a translation test with some modifications of the previous test in 1981.

7 $X^2 = \sum \frac{(f_o - f_e)^2}{f_e}$

8 Critical ratio was used. $CR = \frac{|f_i - f_j| - |}{\sqrt{f_i + f_j}}$ (Iwahara 1980 : 114)

9 The normal distribution test was used: $z_0 = \frac{|P_1 - P_2|}{\sqrt{\frac{P_1(1-P_1)}{n_1} + \frac{P_2(1-P_2)}{n_2}}}$

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APPENDIX

Results of Test I & II

Test I

Type	Item No.		Percentage of correct responses
Type A (explanation) clue	4	He knows the United Nations has a general *skuld* (assembly)—a large meeting of all the members —as well as smaller committees.	54.2%
	1	It is said his *brint* (statesmanship)—his political ability and wishes to do good for the world—made him a wonderful prime minister.	38.3
	12	Teaching can be studied as an independent behavior which is separated from considerations of *trask* (didactics), that is, the science of teaching.	27.5
	9	*Frent* (sabotage), which is destruction of enemy supplies and property, was used often by both sides during World War II.	23.3
	7	Experts in *crism* (kinesics), in their study of body motion as related to speech, hope they will discover new methods of communication.	15.8
	5	We think of plants in general as absorbing water and food, while we think of animals as *spilm* (ingesting) or "eating" it.	5.0
		(average)	(27.4)
Type B	8	He ran into the fire to save his brother inside the building, saying that the *glamp* (flames) raced across the floor.	71.7

3	Knowing that the slightest mistake meant losing his job, the waiter carried the expensive wine glasses *flark* (gingerly) from the kitchen.	65.0
10	With mud from head to toe, flowers still held in his hand, John looked so *prolm* (ludicrous) that we couldn't help laughing.	60.8
6	When the wife suddenly got sick and died in Africa, her young husband was wild with *slimp* (grief) and killed himself.	59.2
2	Pets are often a *swind* (nuisance), because you can't go anywhere without making arrangements for them to stay behind or accompany you.	51.7
11	Because he left his wet swimming trunks in the dark closet for over a week, they began to *drant* (mildew).	49.2
	(average)	(59.6)

Test II

Type	Item No.		Percentage of correct responses
Type A (Clues before unfamiliar words)	1	Just as coughing and a sore throat are indications of physical illness, a sense of disorientation* and an inability to sleep are *frent* (symptoms) of the psychological illness, culture shock.	88.3
	7	The businessman was surprised to see me sitting behind his desk. He gave me a *flesk* (startled) look, then smiled and said, "Well, I didn't know you were in town."	83.3
	6	Although he often had the opportunity, Mr. Yamada never stole money from a customer. This would have endangered* his position at the bank, and he did not want to *grest* (jeopardize) his future. (*endanger＝危険にさらす)	82.5

	3	Flooded with spotlights—the focus of all attention —the newly chosen Miss Teen Age America began her year long-reign. She was the *trund* (cynosure) of all eyes for the rest of the evening.	77.5
		(average)	(82.9)
Type B (Clues after unfamiliar words)	4	Regardless of his many reforms and arguments, the senator* was forced into a *clust* (cul-de-sac) by his opponents. What can a man do to rescue himself from a blind alley*? (*senator＝上院議員　　*blind alley＝行き詰まり)	87.5
	8	In order to strengthen his arguments, Toffler quotes *quark* (reputable) social scientists who agree with him. He hopes that, by quoting respected scholars, his arguments will be accepted by most readers.	81.7
	5	The president's wife was beautiful and faithful but her continual *smact* (extravagance) made him wonder if he could really afford such a luxury. Each month he was going deeper into debt.	79.2
	2	They were willing to take terrible *plomp* (risks) in order to find a better place. Hunger, disease, and Indian attacks were everyday dangers when they settled themselves in the new land.	57.5
		(average)	(76.5)

(Niigata Prefectural Women's Junior College)