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A SCIENTIFIC APPROACH TOWARD LEXICOGRAPHY: THE USER PERSPECTIVE[1]

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0. Introduction

People often made a caricature of lexicography by saying that it was until quite recently the job which a minority of introverted word collecters engaged in secretly inside a dark and dismal room. Lexicographers were reluctant to admit that lexicography could be approached scientifically though it might not be a science itself. Their motto was that lexicography should be an art and that nothing but the artisan spirit and craftmanship could accomplish a fine work in this field. This image of dictionary-making, however, has been replaced by a more flexible and contemporary view of dictionary-making.

Now we understand that lexicography should be an interdisciplinary area and that it needs information from different fields and it needs to involve a wide variety of specialists. Moreover, the recent view of lexicography indicates that we need systematic theories and empirical researches in this field. The establishment of DSNA (Dictionary Society of North America) and EURALEX (European Association for Lexicography) shows that the time has come to do some systematic and scientific investigations on each facet of dictionary-making. This proposes to show the importance and necessity of empirical research in the field of lexicography and report as such an example the investigation on the Japanese user's reference skills on L2 bilingual dictionaries.

1. A rationale of scientific approaches toward lexicography

One of the most significant factors which changed the recent trend of lexicography is the focus on the users. Particularly the recent publication of several products of a new generation of lexicography (e. g. *Longman Dictionary of Contemporary English, Chambers Universal Learner's Dictionary)* shows that lexicography is now addressee-conscious. In other words, one of the present concerns of lexicographers is the learner, particularly the EFL learner. As Hartmann (1981:299) pointed out, this tendency has become gradually pronounced as more emphasis has been given on the notion of *purpose specificity* in EFL teaching. It is a natural but always ignored fact that different dictionaries should serve different consumers. But very few people have ever raised the questions such as "Do we know why someone turns to a dictionary for assistance?", "Who needs dictionaries?", "What's a dictionary for ?" or "How do you find what you need?" So far dictionaries measured themselves against the lexicographer's own criteria of what a dictionary should be rather than the observed needs of real users. It was not until a few years ago that the user perspective started to gain in status and affect several issues in the whold field of lexicography.

The user perspective has been stressed in several works (Hartmann 1981,1983,1985 ; Tomaszczyk 1979 ; Wiegand 1977) ; the methodology in lexicography was discussed in Béjoint (1981) and several researches have been carried out (see Hartmann 1985 for the list of major researches). It must be said, however, that most of the researchers regrettably did not try to work on the user research on the basis of carefully designed experimental researches. They are aware of the notion of purpose-specificity which is one of the most fruitful notions in applied linguistics in recent years, but they are blind to another important notion in applied linguistics, which is, *scientific analysis as a technique.* If I say, "lexicography is a science," they may frown. But now scientific analysis is getting applied to many different areas, even linguistics as many of our readers know. Data obtained by empirical means: observation,

correlation and experimeantation, helps us have deeper understanding about the things which we want to investigate. This application of scientific analysis to the fields such as psychology or linguistics has been more prevailing in the United States rather than in Europe because of its scholastic attitude. This is one of the reasons why most of the lexicographical researches carried out in Europe did not attempt scientific analysis. It is true that working out neatly designed experiments is very hard in the field of lexicography but this should not be the reason for the avoidance or abolition of this approach.

The user perspective started to throw light on the need of empirical research in the field of lexicography. Not just a desk work or the comparison of existing dictionaries but going out into the real situation in which dictionaries are used and doing some surveys are necessary now. There are some surveys (Tomaszczyk 1979; Béjoint 1981) which investigated dictionary use in different situations. They are valuable as the first attempts, but not satisfactory. Dr. Hartmann rightly commented:"More empirical research is needed in this area, but we should be aware of the inherent limitations of indirect reporting on behaviour and attitudes by means of opinion polls and questionnaires." (Hartmann 1985:8) Now that we are dealing with the users, living creatures, we have to construct our research design so that many variables are carefully controlled and that the things we want to see are clearly revealed. This is not just a comparison of one dictionary with another, but totally different approaches are necessary toward this user problem. This is the reason why I emphasize the importance of carefully designed research experiments.

We should employ experimental designs and devices in other disciplines like psychology where scientific approach is far more popular and advanced. By doing more research on the users on the basis of this scientific analysis, we can get deeper understanding of the user's habits, skills and needs, which in turn will surely improve the future lexicographical output. As

an example of such an experimental research, a research on the reference skills of the Japanese users of English-Japanese dictionaries will be reported in the following section.

2. *A study on the Japanese college student's reference skills of English-Japanese dictionaries for interpretive purposes*

2.1. Purpose

The recent development of learner's dictionaries is remarkable but it also causes a new type of problem. Because of the abundance of information in a dictionary, the users have difficulties coping with a variety of imformation presented in a sophisticated manner. Too many conventions and codes ofren confuse the user who has never been trained systematically to handle them. There is a growing danger of opening the gap between dictionaries and users. This is why we need to know more about the user's needs and reference skills.

2.2. Methodology

The subjects (402 Japanese college students studying at Tokyo Gakugei University, a national teacher's college in Tokyo) were actually asked to look up words in dictionaries and translate English passages into Japanese. Each test consisted of an English passage, ranging from 100 to 140 words in length and contained several invented words. The subjects were provided with the dictionaries which had the entries for these invented words and were asked to put the English passage into Japanese by consulting the dictionaries. Words were invented so that all the subjects looked up the same words and that information in each entry could be controlled. To make the point clear, let us look at the following example:

(1) I *beducked* his family of his death.

Suppose that the subject came across this sentence and looked up the word *beduck* in the dictionary, which said:

(2) *beduck* (vt.) 1 (事を)(人に)報告する,通知する("to inform")
2 (事を)(人に)確認する("to make sure")
(NOTE : In a real dictionary entry in the research English equivalents did not appear.)

the subject would have hard time deciding which meaning was suitable for its translation equivalent. In Japanese, both meanings above perfectly make sense in this sentence. Therefore, the subject can choose either of them unless some other clues are available. Compare it with the following case:

(3) *beduck* (vt.) 1 (事を)(人に)報告する,通知する((of...))
2 (事を)(人に)確認する((about...))

This time, the collocational information ((of...)) is supposed to help the subject pick up the first definition instead of the second, if he really uses this information.

By providing the subject with two kinds of dictionaries, one with the information such as in (3) and the other without, we can see how the subject uses the given information by checking what definition he or she chose for the translation equivalent. Six different pieces of information were selected to see if the subjects used them properly:

(4) a. grammatical information
b. verb pattern

c. countable vs. uncountable nouns

d. gloss

e. collocation

f. idiom

The followings are the examples of sentences and dictionary entries for these pieces of information in (4):

(5) Grammatical information

"The man heard the *oscer*."

Dic. A: *oscer* (n.) 1 会話;対話("conversation")

2 要求 ("demand")

B: *oscer* (n.) 1 ((-s))会話;対話

2 ((the))要求

(6) Verb pattern

"She *goughts* playing chess."

Dic. A: *gought* (vt.) 1 ...を好む("to like")

2 ...を楽しむ("to enjoy")

B: *gought* (vt.) 1 [+to do]...を好む

2 [+ -ing]...を楽しむ

(7) Countable vs. Uncountable nouns

"With a *cowsel*, he said so."

Dic. A: *cowsel* (n.) 1 怒り;苦渋("anger")

2 しかめっ面;怒い顔("scowl")

B: *cowsel* (n.) 1 [U]怒り;苦渋

2 [C]しかめっ面;怒い顔

(8) Gloss

"He went to the airport *poisture.*"

Dic. A: *poisture* (n.) 1 荷物あずかり所("baggage room")
2 カウンター,受付("counter")

B: *poisture* (n.) 1 (駅の)荷物あずかり所
("駅の"means "of train station")
2 (空港)のカウンター,受付
("空港の"means "of airport")

(9) Collocation

"We must *attrove* into the matter."

Dic. A: *attrove* (vi.) 1 尋ねる("to ask for information")
2 調べる("to look into")

B: *attrove* (vi.) 1 尋ねる((about...))
2 調べる((into...))

(10) Idiom

"It's *hot as Pades* here."

Dic. A: *Pades* (n.) 地獄("hell")

B; *Pades* (n.) 地獄

be hot as pades 死ぬ程暑い(terribly hot)

On the top of these six kinds of information, the effect of illustrative examples and definition order was also investigated. Illustrative examples often have explanatory power which could dispense with the need of the information chosen above. Therefore, we need to consider the effect of illustrative examples separately from other information. The definition order could be another variable. There is a tendency among the users to stop searching for the meaning when they find apparently correct definitions even though many other definitions still remain under the same entry. If this is truly the case, the choice of definitions in this research would be also affected

by the order of definitions. Thus we needed to control its effect, too.

Consequently there were three variables to be controlled: [±INFORMATION](six pieces of information above), [±EXAMPLE] and [±ORDER]([-ORDER] here means the opposite order of [+ORDER]). Eight different sets of dictionaries were prepared to control these variables. For instance, the word in (6) needed eight different kinds of dictionaries to see the effects of the three variables described above:

(11) *gought*	[V-pattern]	[Example]	[Order]
Dic. A	+	+	+
B	+	+	+
C	+	−	+
D	+	−	−
E	−	+	+
F	−	+	−
G	−	−	+
H	−	−	−

These eight different dictionaries were given to different students and they used one of them for their reference. We could see if the subjects used the information [V-pattern] by comparing the results of the tests with the dictionary A with those with E, B with F, C with G, and D with H. The comparison between the dictionary A test results and B test results would show us how the definition order affects the choice of the appropriate equivalent. As for the effect of exemplification, the comparison of A with C, B with D, E with G or F with H could be used.

2.3. Subjects

402 subjects participated in this study. They were randomly selected from the Japanese student population studying at Tokyo Gakugei

University. 63 of them were English-major students and the rest of them majored in either Japanese Education, Sociology, Physical Education, Art, Elementary Education, Mathematics, Science or Education for Handicapped Children. English-major students take about 10 EFL classes including literature, linguistics and TEFL courses, while non-English-major students take only one EFL class once a week. Therefore the first group is more likely to be exposed to English-Japanese dictionaries than the second.

2.4. Materials

Four differnt passage sets were used in order to check the use of particular information in different contexts. The invented words in each passage set and their check points are indicated below:

(12)	Text 1	Text 2	Text 3	Text 4
gram.inf.	ame	oscer	——	——
V-pattern	gast	lenovate／unix	grait	——
U／C	——	jotler	——	cowsel
gloss	lectvus	poisture	——	comrade
col.	psecter	——	——	attrove
idiom	——	——	foot／Pades	sirtar

Eighe different dictionary versions contained different information of these invented words. Each dictionary contained all the invented words in (13) and other English words which mighe be difficult for the subjects to understand without their own dictionaries. Each entry was written according to the commonest conventions which were taken for making English-Japanese learner's dictionaries.

2.5. Procedure

The subjects were tested in their own classes and were asked to translate one of the four tests into Japanese. One of the eight sets of dictionaries were randomly provided to each subject. Those who used the dictionaries *without* the information under investigation served as a control group while those who got information in their dictionaries as an experimental group. Working time for translation was 25 minutes. After the tests, the subjects were presented with questionnaires which asked them about their dictionary habits and refernce needs and also asked them to recall the process of retrieving the information for certain invented words from the dictionaries and describe the way they reached the final interpretation. After ten minutes, the tests and the questionnaires were collected.

3. Results

Translation equivalents for each invented words were collected from each Japanese translation. They were classified into the following three categories: a) right definition, b) wrong definition, and c) others. The right definition is the one which the subjects were supposed to choose when certain information such as V-pattern, collocation and the like was given in the dictionary. The wrong definition is the one which the subjects were *not* supposed to pick up when the given information was in the dictionary, or any other incorrect answers for the equivalents. "Others" include no direct translations or no answers because of the lack of time.

Chi-square tests were used in order to see if there was any relationship between the choice of definitions and particular information. Results of chi-square tests for each invented words are shown in Table 1. There are some spaces which lack for data. This is because those particular words did not have illustrative examples in their entries. Therefore data were not obtained for those sections which were related to [+EXAMPLE].

Table 1 indicates several interesting findings. First, the effect of six definitions types of information was not clear in most of the items. Since no significant relationship could be found between the choice of definitions and the type of information found in the dictionary, we cannot make any meaningful conclusion as to the positive effect of these pieces of information in this kind of dictionary-use. However, other two kinds of information, that is, the example and the definition order, showed quite significant effect upon the subjects' choice of definitions. As illustrated in Table 1, the order effect was very strong in many cases when the examples were given in dictionaries while no order effect could be found when the dictionaries did not have examples. This indicates that the subjects tended to choose the first definition rather than the second if the examples followed the definitions. On the other hand, when no example was provided, they looked at both definitions and were more likely to choose the right one suitable for the context. This finding adds some weight to the argument that the dictionary users, if not skilled, tend to look at the first definition only and do not go through the whole entry. It is especially noteworthy that the examples, which are often said to be very helpful to determine the right meaning of the word in the context, were found to be hardly used in this type of dictionary look-up. They even prevented the subjects from going on to the second definitions. Of course, this would not be the case when the users spend more time on searching for the meaning. But this finding suggests that we need to be cautious of the scope and the purpose of a dictionary or what kind of user it intends to be designed for.

It may be argued that the reason why the subjects did not use the six kinds of information under investigation is that they may have tendency to depend upon the contextual information rather than the syntactic one. In other words, when the user wants to find out the meaning of a certain word, he depends more on the contextual information (what the story says so far or

Table 1:Chi-square scores for the relation between types of information and the choice of definitions

		[+IF]				[+EX]				[+OR]			
		[+EX]		[−EX]		[+OR]		[−OR]		[+EX]		[−EX]	
		[+OR]	[−OR]	[+OR]	[−OR]	[+IF]	[−IF]	[+IF]	[−IF]	[+IF]	[−IF]	[+IF]	[−IF]
ame	GI	1.52	.04	.50	2.64	1.64	4.71	1.51	1.01	4.97	*10.99	5.06	1.39
oscer	GI	—	—	1.67	3.93	—	—	—	—	—	—	1.64	3.46
gast	VP	.75	1.59	2.68	2.10	4.08	2.20	2.82	.26	4.07	*6.21	1.09	2.05
gought	VP	4.35	1.81	.86	*6.01	3.21	1.68	5.71	2.59	4.92	4.23	1.92	3.94
grait	VP	3.85	4.10	.40	1.79	2.43	0	.79	4.16	*7.22	5.38	3.32	1.20
lenovate	VP	1.41	2.01	3.18	3.85	2.81	4.00	4.02	2.00	2.81	1.35	4.02	3.06
unix	VP	3.05	.69	1.09	—	2.32	1.18	—	—	*3.10	.70	—	—
jotler	UC	—	—	5.36	5.06	—	—	—	—	—	—	2.79	1.20
cowsel	UC	1.86	1.15	1.47	1.29	*7.34	*6.94	1.28	2.40	*15.42	*7.22	5.64	3.70
comrade	GL	—	—	2.21	2.12	—	—	—	—	—	—	3.08	1.98
lectvus	GL	1.34	2.48	*10.77	4.97	2.17	*7.73	*8.46	1.20	*6.16	4.11	3.04	1.23
poisture	GL	—	—	*19.44	5.92	—	—	—	—	—	—	1.34	5.77
attrove	CL	1.71	4.07	5.19	4.72	1.20	3.72	3.52	3.03	5.79	*10.40	1.14	1.07
psecter	CL	2.77	.01	.97	4.58	2.25	2.26	3.26	1.86	.33	3.38	2.26	2.53
foot	ID	—	—	—	*19.07	—	—	—	—	—	—	—	—
pades	IS	—	—	—	*45.74	—	—	—	—	—	—	—	—

(NOTE:GI=grammatical information, VP=verb pattern, UC=un/countable, GL=gloss, CL=collocation, ID=idiom;Asterisks show that the score is significant at .05 level)

in what situation the word is used) rather than the grammatical (what kind of word follows the word; whether this word is countable or not; etc.). Table 2 shows that this is really the case. Though there are some cases (e.g. *gought, pades*) in which the subjects depended more on the information in a dictionary than the context, in most cases the results of the questionnaires indicate that the subjects tended to depend upon the context rather than the information in a dictionary. This is why the syntactic information chosen for the study was found to be hardly used in a positive way to find out right definitions but the subjects looked at the first definitions only and if they fit to the contexts, took them regardless of any other definition following it in the same entry.

Table 3 indicates that exposure to dictionaries makes significant difference in achievement. Especially English-major students were more familiar to such information investigated in this research, so they could use it more effectively than non-English majors. It is noteworthy, however, that even English-majors tended to depend upon the contextual information rather than the syntactic one to choose the right definition. They also used the six kinds of information to block inadequate definitions rather than to choose correct ones. This suggests that deliberate teaching is definitely necessary to make full use of information in a dictionary.

To ricapitulate, the findings suggest the followings:

1) The user has a habit of looking at the first definition only.

2) The user uses the semantic or contextual information more than the syntactic one in choosing a right definition.

3) The six types of information chosen for the study tend to be used for blocking the choice of wrong definitions and not for choosing the correct one.

What we have tried to show in this paper is that there is a growing awareness of the need of empirical support for the theory and

Table 2

Results of the questionnaires

word	INF	INF referred	context	others	total
ame	GI	4(25%)	6(37.5%)	6(37.5%)	16
oscer	GI	10(26)	25(66)	3(8)	38
gast	VP	1(7)	7(46.5)	7(46.5)	15
gought	VP	32(46)	12(27)	26(37)	70
grait	VP	15(34)	12(27)	17(39)	44
lenovate	VP	10(25)	21(53)	9(22)	40
unix	VP	3(7)	27(68)	10(25)	40
cowsel	UC	6(8)	29(41)	36(51)	71
jotler	UC	2(5)	32(84)	4(11)	38
lectvus	GL	14(27)	26(50)	12(23)	52
poisture	GL	16(38)	22(52)	4(10)	42
psecter	CL	8(14)	28(48)	22(38)	58
attrove	CL	26(36)	23(32)	24(32)	73
foot	ID	14(34)	8(20)	19(46)	41
Pades	ID	14(34)	7(17)	20(49)	41
sirtar	ID	10(11)	26(30)	52(59)	88

NOTE:"INF referred" here means that the subjects answered "yes" to the question of wheter they referred to the information in question to find suitable meanings.

Table 3

	ame [−EX/+OR/+IF]		*gast* [+EX/+OR/+IF]	
	E.	N.E.	E.	N.E.
R.D.	100%	64%	67%	17%
W.D.	0%	29%	33%	25%
OTH.	0%	7%	0%	58%

	gast [+EX/−OR/+IF]		*cowsel* [+EX/+OR/+IF]	
	E.	N.E.	E.	N.E.
R.D.	100%	29%	71%	25%
W.D.	0%	0%	29%	62.5%
OTH.	0%	71%	0%	12.5%

	psecter [+EX/+OR/+IF]	
	E.	N.E.
R.D.	100%	50%
W.D.	0%	14%
OTH.	0%	36%

Note: E.=English-major; N.E=non-English-major;
R.D.=right definition; W.D.=wrong definition; OTH.=others

practice of lexicography and that, as such an example, the research on the Japanese college students' reference skills for receptive use of L2 bilingual dictionaries was reported. Although some of the findings are already familiar to the readers, I belive that to make a statement or guess is one thing and to confirm or prove it to be true is quite another. As we expect more sophisticated lexicographical output, we should be aware that more claims, ideas and approaches in lexicography should receive clear empirical support.

NOTE

1) This is a slightly modified version of my thesis submitted to Tokyo Gakugei University in December 1984 in partial fulfillment of the requirements for the degree of bachelor of education. For further details of designs and test samples, see Tono(1984).

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