論　文

Cognitive Styles and Communication Strategies

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I. Introduction

The most noteworthy and remarkable accomplishment that has been delivered by researchers of second language acquisition (SLA) in the last two decades is the clarification of communicative competence. It is generally considered that it consists of four components: grammatical competence, sociolinguistic competence, discourse competence, and strategic competence (Canale and Swain 1980).

Communication strategies (CSs), the main focus of this research paper, have been dealt with in the research area of strategic competence, and they can be roughly defined as systematic attempts by second language learners to compensate for their linguistic shortcomings. The author of this paper reported a recent research trend in this area, and he indicated that it is necessary to clarify how individual differences are reflected on the use of CSs (Iwai 1996a and 1996b).

This paper first reports the results of an experiment conducted recently by the author to examine the relationship between different cognitive styles and the use of CSs, and the implications of the results and related research questions will be discussed later. Three different types of tests were given to the subjects of this experiment to measure their cognitive styles, and this paper primarily concentrates on one of these cognitive styles, namely, field dependence (FD) and field independence (FI), of second language (L2) learners and their use of CSs.

II. Method and Hypotheses

1. Subjects

The total number of subjects in this study consists of twenty freshman and sophomore students majoring in International Studies at the university with which the present author is affiliated. They were chosen from a total of sixty students on the basis of the scores of an English proficiency test and the scores of a FD/FI test.

The proficiency test given in this experiment was an official version of the TOEIC (Test of English for International Communication), which is now widely taken by many English learners in the world. This test was adopted in this study due to the fact that it is

a test battery to measure learners' communicative levels in English rather than their grammatical knowledge. For this reason, it was determined to be most suitable for this study which is primarily concerned with English learners' communicative competence.

The test used to measure the cognitive styles of FD and FI is called the Group Embedded Figures Test (GEFT), which was produced by Witkin and his colleagues and has been commonly used in psychology-related studies (Witkin et al. 1971). It is provided as a booklet consisting of two sets of nine questions with seven preparatory questions. The highest score of this test is 18 and the lowest 0. Following the proficiency test, the GEFT was given to all sixty students.

Twenty students chosen from sixty students were classified into two by two matrix categories, i.e., TOEIC (high vs. low) and GEFT (FD vs. FI), and five subjects were assigned to each category.

Those students were requested to participate in oral interview sessions later. The table below shows mean scores and standard deviations of the TOEIC and the GEFT in four groups:

	H-FD	H-FI	L-FD	L-FI
N	5	5	5	5
TOEIC	616	627	438	431
SD	37.48	43.39	32.33	34.17
GEFT	6.2	15.8	7.4	16.8
SD	2.05	1.30	3.23	0.84

Table 1: Means and SD's of four groups
Note: H and L stands for high and low in the TOEIC.
FI is field independent, and FD is field dependent.

The TOEIC scores of the H-FD group and the H-FI group are significantly higher than the other two groups (independent *t*-test $t=11.85$ $p<.01$). The GEFT scores of the two FI groups are also much higher than the other two FD groups at a significant level ($t=10.34$ $p<.01$).

2. Tasks

Each individual subject took part in an oral interview consisting of three different tasks with three different control levels. Different tasks were administered because previous CS studies indicate that not only learners' variables (e.g., proficiency) but also task variables (kinds of tasks with different experimental control levels) affect CS use (e.g., Poulisse 1990). The interviewer was a female native English speaker with abundant experiences in SLA research, and the present author gave directions for these tasks in Japanese. Each interview lasted approximately 30 to 40 minutes. The interview sessions were video-taped and audio-taped, and then transcribed later for analysis. The main activities of the three tasks are briefly summarized below.

Task 1: Picture Description. (Appendix A) This is the same data eliciting technique as the present author reported in the last issue of the NIDAVA (Iwai 1996a), although it was done orally this time. Two different pictures were shown to the interviewees, and they were asked to describe ten different stops in them. This task was presumably the easiest because the items in the picture to which it was considered that the subjects would apply certain CSs were mostly concrete nouns. Out of ten items that were required to describe, four items were targeted for the analyses of CS use. They are: the sun's ray, a flipper, a hat string, and a crab claw. Since the subjects' utterances were limited only to the target items, this task can be said to be most tightly controlled by the researcher.

Task 2: Story Retelling. (Appendix B) This interview task was adopted from the Nijmegen project (Poulisse 1990, p. 217). Poulisse's original story in English was slightly modified and translated into Japanese. First, the story was told to the subjects in Japanese. Next, they were requested to reproduce it in Japanese in order to assure that the subjects understood the story and that they knew the target words in Japanese. Then, they were asked to retell the story in English with the help of a seven-frame comic strip. The investigated words are: an old people's home (*rojin home*), a care taker (*kanrinin*), a resume (*rirekisho*), and a funeral (*soshiki*).

Task 3: Free Talking. In this final task, the subjects talked with the interviewer about two photographs displayed to them. One picture was taken in front of a Japanese shrine, and two children wearing kimono were accompanied by their parents to visit the shrine for a *shichigosan* festival (a traditional Japanese ceremony to celebrate children's growth at the ages of seven, five, and three). Another picture shows two Japanese women divers putting on a traditional costume and holding a wooden *oke* (a tub or a big bucket) on top of their heads. It was assumed that the subjects had to rely on certain CSs to talk about these photos since no equivalent English words were available to describe main items in them. The observed words are: *shichigosan* (see above), *chitoseame* (a present of a long white stick candy to children), *ama* (women divers), and *oke* (see above). Finally, this can be said to be the least controlled task since the subjects were to talk about anything they wanted to.

3. Hypotheses

Prior to the experiment, the following two statements were hypothesized:

Hypothesis 1: The kinds of CSs L2 learners use will not differ from each other despite their proficiency difference, which was the main result revealed by Iwai (1995).

Hypothesis 2: The cognitive style difference of FD and FI will affect their use of CSs. That is, FI learners will be able to use CSs more effectively than their counterparts because FI students, by nature, can find solutions to their lexical problems without being restricted to the actual images of the given tasks.

III. Results

1. Results of Task 1 and Task 2

Tables 2 and 3 on the next page show kinds and frequency of CSs used in Task 1 and Task 2, respectively. CSs were classified into five categories taking the process-oriented taxonomy advocated by the researchers of the Nijmegen project into account (see Poulisse and Schils 1989, pp. 20-22, and also Poulisse 1990, p. 109).[1] Although avoidance strategy was beyond their consideration, it is included in this study as in the product-oriented CS taxonomies (e.g., see Tarone 1983, pp. 62-63). In addition, the occurrences of detouring strategy, which was found and named by the present author (Iwai 1996a), were counted for the analyses of the elicited data even though its use was observed only in Task 1. The author of this study pointed out and discussed the importance of inclusion of these two CSs in the previous study (Iwai *ibid*).

To see how two factors (high vs. low in the TOEIC and FD vs. FI in the GEFT) affect the use of CSs, an analysis of variance (ANOVA) for a 2 x 2 design was conducted to each CS, except for the detouring strategy and the cases where no CS were used.[2] The former was excluded from the statistical analyses because its use was limited to Task 1 and that its relative occurrences were far fewer than any other CS category. Since the figures given in Tables 2 and 3 represent frequency of CS use, each subject's data of CS use were altered to percentage data in order to apply ANOVA to them. Furthermore, results of CS use in Task 2 and Task 3 were combined because samples of CS use in each task were considered to be not large enough and, therefore, to lack in statistical reliability.

Tables 4 to 6 show the results of ANOVA in the categories of HOCO (Holistic Conceptual strategy), ANCO (Analytic Conceptual strategy), and AVOID, respectively. The results of statistical analyses in these tables reveal that the proficiency factor, the FD/FI factor, and their interaction effect did not affect the learners' CS use, except for the proficiency variable in Table 5 (significant at the level of $p<.01$). Thus, as far as Tasks 1 and 2 are concerned, learners' cognitive style difference turns out to have nothing to do with their CS use and, thus, Hypothesis 2 is rejected.

Further analyses are necessary to interpret the influence of proficiency difference obtained in Table 5. The statistical significance obviously derived from the fact that the learners with high English proficiency used the strategy of ANCO twice more frequently in Task 2 than those with low proficiency, which is displayed in Table 3 above. This is, however, not the case in Task 1 as Table 2 shows, where the strategy of HOCO predominates over other CSs. The risks of reliability violation being acknowledged, the strategy of HOCO in Task 1 and the strategy of ANCO in Task 2 were statistically processed by ANOVA, and the results shown in Tables 7 and 8 were obtained.

		HOCO	ANCO	DET	AVOID	NS
H-FD	sun's ray	3		1		1
N=5	flipper	3	2			
	hat strong	4			1	
	crab claw	4			1	
	Total	14	2	1	2	1
H-FD	sun's ray	3		1		1
N=5	flipper		1	3	1	
	hat strong	4			1	
	crab claw	5				
	Total	12	1	4	2	1
H-FD	sun's ray	4			1	
N=5	flipper	1		3	1	
	hat strong	3		1	1	
	crab claw	4			1	
	Total	12	0	4	4	0
H-FD	sun's ray	5				
N=5	flipper	1		2	2	
	hat strong	4		1		
	crab claw	3			2	
	Total	13	0	3	4	0

		HOCO	ANCO	DET	AVOID	NS
H-FD	old people's home	1	4			
N=5	care taker	1	3		1	
	resume		4		1	
	funeral	1	1			3
	Total	3	12	0	2	3
H-FD	old people's home	1	4			
N=5	care taker	1	3		1	
	resume	1	3		1	
	funeral		3			2
	Total	3	13	0	2	2
H-FD	old people's home	3	1		1	
N=5	care taker	2			3	
	resume	1	4			
	funeral		1		2	2
	Total	6	6	0	6	2
H-FD	old people's home	3	1		1	
N=5	care taker	2	1		2	
	resume	2	2		1	
	funeral	2	2			1
	Total	9	6	0	4	1

Table 2: Group total of CS use in Task 1

Table 3: Group total of CS use in Task 2

Note: Det = Detouring Strategy AVOID = Avoidance NS = No strategy use

Source	df	SS	MS	F-ratio
Between Groups				
Proficiency (A)	1	322.40	322.40	1.19
FD/FI (B)	1	7.81	7.81	0.03
A x B	1	154.01	154.01	0.57
Within Groups	16	4306.18	269.14	

Table 4: Results of ANOVA for HOCO (Task 1 + Task 2)

Source	df	SS	MS	F-ratio
Between Groups				
Proficiency (A)	1	3127.50	3127.50	20.44**
FD/FI (B)	1	0.68	0.68	0.00
A x B	1	0.00	0.00	0.00
Within Groups	16	2448.38	153.02	

Table 5: Results of ANOVA for ANCO (Task 1 + Task 2) **p<.01

Source	df	SS	MS	F-ratio
Between Groups				
Proficiency (A)	1	922.08	922.08	3.78
FD/FI (B)	1	22.90	22.90	0.94
A x B	1	5.83	5.83	0.02
Within Groups	16	2448.38	153.02	

Table 6: Results of ANOVA for AVOID (Task 1 + Task 2)

Source	df	SS	MS	F-ratio
Between Groups				
Proficiency (A)	1	420.44	420.44	0.71
FD/FI (B)	1	3.44	3.44	0.01
A x B	1	169.64	169.94	0.29
Within Groups	16	9472.11	592.01	

Table 7: Results of ANOVA for HOCO in Task 1

Source	df	SS	MS	F-ratio
Between Groups				
Proficiency (A)	1	8004.00	8004.00	0.02**
FD/FI (B)	1	13.94	13.94	0.94
A x B	1	0.00	0.00	0.00
Within Groups	16	12112.56	757.04	

Table 8: Results of ANOVA for ANCO in Task 2 **p<.01

The results in Table 7 present statistical proof that the proficiency difference as well as the FD/FI difference did not affect learners' CS use in Task 1, although HOCO was a predominantly preferred CS in Task 1. Table 8, on the other hand, tells us that the use of ANCO strategy is affected in Task 2 by the proficiency factor (significant at $p<.01$).

These findings result in a contradictory conclusion to Hypothesis 1. Since no difference between groups was obtained, the hypothesis can be supported in Task 1, which is the most tightly controlled task as mentioned above. Contrary to this, the same hypothesis can be rejected from the results of Task 2 since the significance level of the proficiency factor reached $p<.01$. The reasons for these contradictory results will be discussed further in the discussion section.

2. Results of Task 3

The conventional CS taxonomies were not very useful for the analyses of CSs the subjects used in Task 3, except for *oke*.[3] This is because the target items in this task were words about Japanese cultural events and customs, and, therefore, the subjects had to explain them with English words and phrases they knew. In such cases, we can hardly expect that the strategy of HOCO, which was the most common strategy in Task 1, would frequently be used.

For this reason, the analysis technique in terms of 'information bits' (IB) reported in Hirano (1987) was applied to elicited utterances, instead of the commonly used taxonomies. The IB analysis examines how much information a speaker gives to a target item in order to explain it. Take a look at the next example from one of our subjects:

(e.g.) I: Can you tell me anything about this picture?
S: Ah that is about celebrat, cebre, celebrating ceremony (N) ah, when, in Japanese (N) we celebrate the children grown up to the, 3 and 5 and 7 years old.
I: OK.
S: Nn and maybe this boy is 5 years old (N) and this girl is 7 years old (N) and, and they maybe they were going to the shrine.
Note: I=interviewer. S=student. N's in parentheses show some kinds of back channel cues such as "uh-huh."

The subject attempted to convey information on *shichigosan* in this interaction. The delivered messages consist of the following information bits: 1) *shichigosan* is a ceremony, 2) it is related to children's ages, and it is held at a shrine. Some subjects added further information bits, mentioning the reason why this ceremony was held and stating that it was a 'traditional' ceremony.

The elicited utterances were changed to numerical scores by giving one point to one information bit. Tables 9 to 12 summarize group totals of information bits for the target items.

Table 9: Group total of information bits on *shichigosan*

	C	A	P	R	T
H-FD	4	5	2	3	
H-FI	4	5	4	2	4
L-FD	1	3	1		
L-FI	5	4	1	1	

Information bits
C= ceremony
A= ages
P= place where it is held
R= reason
T= traditional

Table 10: Group total of information bits on *chitoseame*

	C	L	W	T	R
H-FD	5	4	1	0	1
H-FI	5	4	0	2	1
L-FD	3	2	0	0	0
L-FI	5	4	0	0	0

Information bits
C=candy
L=long
W=white
T=taste
R= reason why this candy is given

Table 11: Group total of information bits on *ama*

	D	C	W	NT
H-FD	4	4	4	0
H-FI	5	5	5	1
L-FD	3	3	3	
L-FI	3	5	5	

Information bits
D=dive or swim
C=catch
W=what they catch
NT=without using tanks

Table 12: Group total of HOCO and an information bit on *oke*

	HOCO	U
H-FD	1	5
H-FI	4	5
L-FD	2	2
L-FI	1	4

Information bits
U=what it is used for

Source	df	SS	MS	F-ratio
Between Groups				
Proficiency (A)	1	7.20	7.20	6.55*
FD/FI (B)	1	7.20	7.20	6.55*
A x B	1	0.20	0.20	0.18
Within Groups	16	2448.38	153.02	

Table 13: Results of ANOVA for *shichigosan*
*p<.05

Source	df	SS	MS	F-ratio
Between Groups				
Proficiency (A)	1	3.20	3.20	6.73*
FD/FI (B)	1	0.80	0.80	1.68
A x B	1	0.20	0.20	0.42
Within Groups	16	2448.38	153.02	

Table 14: Results of ANOVA for *chitoseame*
*p<.05

Source	df	SS	MS	F-ratio
Between Groups				
Proficiency (A)	1	3.81	3.81	6.50*
FD/FI (B)	1	1.18	1.18	2.01
A x B	1	0.42	0.42	0.72
Within Groups	16	2448.38	153.02	

Table 15: Results of ANOVA for *ama*
*p<.05

Each subject's scores of information bits were counted, and an ANOVA for a 2 x 2 design was also run to investigate the influence of the proficiency factor and the FD/FI factor on our informants' utterances. The results are shown in Tables 13 to 15.

These tables indicate that proficiency is a significant factor in all of the target items, and, judging from the results from Tables 9 to 11, obviously more able learners can

convey more detailed information than less able learners. This fact makes the interpretation of Hypothesis 1 further complicated. As mentioned in the previous section, the results of Task 1 support Hypothesis 1, while the results of Task 2 reject it. Here in Task 3, no conclusion for the kinds of CSs can be made, but it can be said that the amount of information is positively influenced by learners' proficiency.

Another important finding from the analyses of Task 3 is that the cognitive style difference of FD and FI is a significant factor in the utterances for *shichigosan* ($p<.05$), although no statistical significance is observable in the other two items. This provides us with a further research question regarding to Hypothesis 2. This hypothesis was rejected from the results of Tasks 1 and 2. The results of Task 3, however, partially support this hypothesis even though it cannot be confirmed from the present study.

IV. Discussion

The present study was carried out under the assumption that L2 learners' proficiency was not the only determinant factor for the use of CSs, and that individual differences deriving from the differences of their cognitive styles would be another important factor for CS use. Ironically, however, the obtained results did not present strong evidence to back up this assumption; instead, it was found that learners' proficiency was a key factor affecting their communicative performance in less controlled tasks.

One optimistic result regarding Hypothesis 2 was, however, found in one of the analyses in Task 3. This result can be interpreted in several ways, and one plausible interpretation is that the FD/FI difference may affect L2 learners' CS use in a natural interactional setting. On the other hand, strictly controlled circumstances as in Tasks 1 and 2 would not be appropriate to observe the differences of CS use affected by the cognitive factor.

Needless to say, this interpretation should be taken cautiously because no affirmative evidence was gained from the analyses in this study. Furthermore, it goes without saying that the FD/FI variable is not the only factor representing individual cognitive styles. In this research, two other cognitive tests to measure learners' ambiguity tolerance and reflection/impulsivity were given to the twenty subjects, and their scores varied to a great extent within each group. Further research is necessary to examine the relationship between cognitive style differences and the use of CSs.

Promising findings were obtained from this study regarding the influence of proficiency on CS use. Although the results of Task 1 were in favor of Hypothesis 1, Tasks 2 and 3 provided us with enough evidence to reject it. It was found that the proficient learners relied on the strategy of ANCO more frequently than their counterparts (Task 2), and that

their utterances contain much more information than less proficient learners (Task 3).

These findings are, however, not surprising because proficient learners have more means to deliver what they want to say. To use the strategy of ANCO, a speaker has to have not only analytical ability but also linguistic means to express what he or she analyses. In fact, many of the utterances that the proficient learners produced in Task 2 belong to the category of paraphrase in Tarone's product-oriented CS taxonomy. The less proficient learners, on the other hand, tended to find a right word or rely on the effort saving strategy (HOCO) more frequently. This is probably because less proficient learners have too many linguistic deficits to verbalize what they actually want to say. This difference between the proficient learners and the less proficient learners is reflected on the amount of information they delivered, which is observed in the results of Task 3.

V. Conclusion

Personal traits present intangible and complicated psychological questions. However, it is very interesting and challenging to know how language use is affected by them. An effort was made in this study to examine the relationship between the cognitive style difference in terms of FD and FI and the use of CSs. Although this study could not make concrete conclusions about their relationship, it does not reject the possibility that FD and FI have something to do with learners' CS use. It also revealed that a proficiency factor affects the kinds of CSs the learners use and the amount of information they give in less controlled communication settings.

Many research questions for future studies have derived from this study. One is that only one of the cognitive styles was investigated here, so, undoubtedly, other styles have to be examined. The number of subjects should be increased in future studies to raise the reliability of statistical analyses. Also, no time restriction was given to the experiment of this study. The author of this paper now has another assumption that the FD/FI difference is reflected on how fast learners can process what they want to say, rather than what CSs they would use. Finally, it is also necessary for future research to clarify the relationship between cognitive factors and CS use in their first language.

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[Notes]
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1 The CS taxonomy of the Nijmegen project has two main categories: conceptual strategies and linguistic strategies. The former consists of a holistic strategy (HOCO) and an analytic strategy (ANCO) as subcategories, and the latter also has two subcategories. Linguistic strategies were excluded from the analyses of the present study because their occurrences were extremely few in the obtained data.

2 These were the cases where subjects knew the target words, e.g., the sun's ray, in English and, therefore, did not have to use any CSs.

3 In fact, many subjects used the strategy of HOCO to explain *oke*. The most typical utterance was that first they described it by using HOCO such as "big bowls" or "big bags" and then stated what they were used for. No statistical analysis was run to this item.

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[Appendix A] Pictures used for Task 1 (from *Jiji Eigo Kenkyu* (Kenkyusya), p. 97, August, 1995)

[Appendix B] The story used in Task 2. (The underlined words indicate the investigated words. The comic strip is omitted.)

長い間スミスさんは老人ホームの管理人として仕事をしたいと思っていました。あちこちに履歴書を出して、ついに仕事を手に入れました。そこで奥さんと一緒に近くのマンションに引っ越しました。次の日花屋さんからカードのついたきれいな花束が届けられました。カードには「心からお悔やみ申し上げます」と書かれていました。当然ながら驚いたスミスさんは、花屋さんに電話を入れ、このメッセージはどういうことか尋ねてみました。花屋さんは間違いに気付き、すぐにスミスさんに謝りましたしかし、花屋さんはスミスさんに送られるはずだった花束がある人の葬式の方に送られたことがもっと心配になりました。そこには「新天地おめでとうございます」と書かれていたのでした。