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Using Pictures to Facilitate EFL Students' Comprehension and Recall of Unillustrated Prose Information in Listening Comprehension Practice

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要　旨

この小論は、大学生英語学習者のリスニングにおける画像提示の効果を二重符号化説(dual coding theory) に基づき行った実証研究である。二つの独立変数を設定し、二要因の分散分析を行った。まず画像提示の違いにより四つの条件—(1)画像なしで英文を一度聞く、(2)画像なしで英文を二度聞く、(3)画像を見てから英文を一度聞く、(4)英文を一度聞いてから画像を見る—を設定した。また、もう一つの変数として英語のリスニング能力をとりあげ、JACET リスニングテストによって、学生を(1)中位学力群と(2)下位学力群に分けた。288名の大学生が被験者としてこの実験に参加し、任意に四つの条件のどれかのグループに入れられた。実験後のコンプリヘンションとリコールを確認するため、12の数字等を聞く事実に関する質問と12の推論的な質問、計24からなる事後テストを行った。また、同じ内容のテストを１週間後保持テストとして行った。

結果としては、次の二点が指摘できる。まず画像提示により学生は、画像に示された情報だけでなく画像に直接示されていない情報を、より正確に理解し記憶することができた。また画像なしで英文を二度聞いた学生の理解と記憶は当然ながら高く正確であったが、英文を一度しか聞いてなくても画像を提示することにより（特に画像を後に提示することにより)、ほぼ同じ理解の高さと記憶の正確さを得ることができた。

Key Words: listening, dual coding, pictures, mathemagenic functions, unillustrated information, comprehension, recall

ABSTRACT

This study investigated the effects of dual coding using pictures on measures of listening comprehension and recall of EFL university students. A4×2 factorial design was used to examine the effects of two independent variables. The pictorial variable consisted of four conditions: (1) no pictorial support while

listening to the prose once; (2) no pictorial support while listening to the prose twice (repetition effect); (3) seeing pictures before listening to the prose (dual coding); (4) seeing pictures after listening to the prose (dual coding). The listening comprehension proficiency variable consisted of two levels: (1) intermediate and (2) low, assessed by the JACET LISTENING TEST. Two hundred and eighty-eight university students participated in the 8 treatment groups. Comprehension and recall were measured by (1) a post-test that consisted of 12 factual and 12 inferential questions; and (2) a retention test of the same questions that was administered a week later. Results showed that dual coding using pictures facilitated and enhanced students' comprehension and recall of unillustrated prose information. Specifically, students who saw pictures after listening to the prose once scored as high as those who listened to the prose twice.

1. INTRODUCTION

English language teachers have long believed that seeing pictures is always beneficial to learning English. However, according to Hojo (1989), little research has been conducted to clarify the effects of using pictures. Research investigating the relationship between pictures and listening or reading has shown contradictory results. This is due to the fact that many of the studies focused on different research questions. Since there are many studies to indicate the effects of visual aids, the question of "Do pictures aid" should be changed to "Under what conditions do pictures aid?". Specifically, in which location the presenting of pictures will be effective with different types of information should be investigated. Moreover, as Kiji (1993) points out, most studies so far have dealt only with relationships between listening and visual aids and much less research has been conducted on the effects of pictures on memory retention. This paper investigates the effects of pictures and listening on memory retention as well as on comprehension in listening practice.

2. EFFECTS OF USING PICTURES

Research investigating the effects of pictures has shown contradictory results. Samuels (1970), reviewing the results of picture experiments from the

1930s through 1960s, reported the possibility that pictures might interfere with comprehension, while Levin and Lesgold (1978) suggested pictures might be beneficial to learning. The two studies focus on different proficiency. The former is mainly concerned with reading skill, while the latter focuses on listening skill. In spite of the claims of Samuels (1970), Levin and Lesgold (1978) conclude that pictures facilitate prose learning. They offer five ground rules to document the positive values of pictures. In one of the five rules, they point out that while reading skill with pictures is not easily controlled, oral presentation produces more positive results. Indeed, most recent studies dealing with listening comprehension with pictures show positive effects (Mueller, 1980; Peeck and Jans, 1987; Kiji, 1993; Small et al. 1993).

Recent studies support the idea that student learning is affected positively by reading text and seeing pictures together (Dean and Enemoh, 1983; Waddill et al., 1988; Hojo, 1989; Hojo, 1991). Though oral presentation is superior to reading text to induce the effects of using pictures, there are some factors which apply for reading as well as listening practice. One of them is the nature of the textual materials used in the lesson. Dean and Enemoh (1983) state that pictures aid students in easily understanding abstract text. The null findings of Samuels (1970) are due to the concrete nature of the texts and thus there was no effect in using pictures. Moreover, Waddill et al. (1988) show that the effects of pictures vary depending on the nature of the text and on the type of information depicted in the pictures. They suggest that relational pictures help students comprehend and recall narrative passages.

Next, more attention should be paid to the mathemagenic functions proposed by Brody and Legenza (1980), which are defined as any behavior that increases learning. One of the most important mathemagenic functions used to document the effectiveness of pictures is their optimal location. Pictures have two different functions, i.e. an advance organizer and a synthesizer. Some prior studies indicate that superior comprehension and recall for learners occur in the presentation of pictures in the primary position (Mueller, 1980; Dean and Enemoh, 1983), while others report that subjects who see a picture after reading the passage have higher comprehension and recall. In simpler terms, pictures can facilitate comprehension and recall, but it is not clear under what conditions pictures work as an advance organizer or a synthesizer.

The effects of pictures on memory retention should be also understood. Levie and Lents (1982) offer guidelines for research, in which they emphasize the need to clarify the functions of pictures in facilitating learning information in the text by not only improving comprehension, but also by improving the retention of the information. Indeed, some studies exist to support the theory that pictures help more in delayed recall than in immediate recall (Levie and Lentz, 1982; Peeck and Jans, 1987; Hojo, 1991).

The most critical problem is finding what kind of information pictures will facilitate. Since most studies conducted so far have agreed that learning information in the text is facilitated by showing pictures, research investigating the effect of pictures on comprehension and recall for unillustrated text has shown positive results (Dean and Enemoh, 1983; Waddill et al., 1988; Small et al., 1993). For example, Small et al. (1993) demonstrated that 1st and 3rd graders' recall for unillustrated expository prose was better if pictures accompanied the description.

But unfortunately, most of the studies mentioned above are concerned with practices conducted in first language. Surprisingly few studies have so far been made at clarifying the effects of pictures in second language learning. The possibility of using pictures for EFL college students in listening comprehension practice should be explored. This experiment was conducted based on the dual-coding theory and was worked from the different angles discussed above. The dual-coding theory supports the effects of using pictures in listening comprehension practice. Picture learning occurs when students understand information presented in two ways--such as visual aids and verbally presented narration. The repetition condition where students hear a passage two or more times is superior to the condition in which students hear it only once, but there is evidence to support that recall in a passage using pictures is much better than passage repetition only (Small et al., 1993). Small et al. (1993) attribute the positive effects of picture learning to dual coding, in which the information can be encoded both verbally and visually. The two codings are interconnected with each other, which should increase the possibility of comprehending the passage correctly and recalling the response.

3. METHOD

(1) Purpose

As was noted, the effects of pictures are complex, and include factors such as: the nature of the text, the type of information depicted in the picture, the location of the picture and the type of recall. The purpose of this experiment was to determine effective conditions using pictures on the listening process. More specifically, the research hypothesis was that the presentation of pictures with the listening passage would enhance and facilitate EFL university students' comprehension and recall of the unillustrated prose information. This experiment had four subsidiary aims: (1) to clarify the dual-coding effect in comparison with repetition practice; (2) to establish an effective location for pictures; (3) to measure in what type of recall pictures work more effectively; and (4) to investigate to what degree the results of the above aims vary with students' listening comprehension proficiency. These results were analyzed by tests asking for unillustrated prose information only.

(2) Subjects and Design

The subjects were 288 first and second year students at the Faculty of Liberal Arts, Nagasaki University. They were randomly assigned to four condition groups. Two factors, pictorial condition and level of listening proficiency, were combined to form eight experimental groups. Thus, the design was 4 different pictorial supports (no picture, no picture but listening to the passage twice, picture before listening and picture after listening) $\times$ 2 levels of listening comprehension proficiency (intermediate and low level). Condition and listening level were between-subject variables and this design had 36 subjects per cell. The distinction between intermediate and low levels was based on the students' scores above or below 20 points of the JACET LISTENING COMPREHENSION TEST administered as a pre-test. Table 1 shows the means and the standard deviations of the test. The two-way ANOVA on conditions and proficiency levels shows a significant effect for the proficiency factor. There were no significant effects for conditions and interactions. So there are significant differences between the intermediate and low levels in each group. To put it another way, homogeneities among the four intermediate groups and among the four low groups were con-

firmed (Table 2).

TABLE 1. Means and Standard Deviations for the Pre-Test.

(n=36, N=288, Points=120)

	Condition (Pictorial Support)							
	Group I (No Picture, Listening Once)		Group II (No Picture, Listening Twice)		Group III (Picture Before, Listening Once)		Group IV (Picture After, Listening Once)	
Listening Level	Mean	SD	Mean	SD	Mean	SD	Mean	SD
Intermediate	35.56	12.04	32.83	14.67	36.78	17.44	36.00	14.40
Low	4.44	12.72	2.89	10.79	2.89	11.31	7.06	9.52

TABLE 2. Two-Way ANOVA for the Pre-Test

Source	SS	df	MS	F_0	F
A	488.55	3	162.85	0.926	n.s.
B	69068.05	1	69068.05	392.677	$p<.01$
A×B	246.51	3	82.17	0.467	n.s.
Error	49250.00	280	175.89		
Total	119053.11	287			

A: Condition
B: Proficiency Level

(3) Materials and Procedure

The text material for the study consisted of a 320-word passage entitled "Charles A. Lindbergh" which was adapted from *Right Reading* (Curry, 1990). The material was recorded with a reading speed of 120 wpm. The main theme consisted of two parts; half the article explained Lindbergh's personal history as a mail pilot and the history of the development of airplanes, and the other related some information about his solo crossing of the Atlantic in 1927 with some interesting stories regarding his preparations for his flight. Two pictures were presented to the students of the pictorial support groups, one showing Lindbergh and the other his plane soaring over a field near Paris. Twenty-four multiple-choice questions written in Japanese (12 factual, 12 inferential), which consisted of 4 choices for each question, were developed to assess different types of learning. These questions were restricted to the contents of the unillustrated prose information which means subjects in the picture groups could not get the correct answers from the pictures themselves.

Before this experiment, it was confirmed that all subjects had no knowledge of Lindbergh. They were told before testing that they should listen carefully to

the recorded story because they would be asked many multiple-choice questions in Japanese. They were not allowed to take notes. This experiment used an intermediate group I, II, III and IV, and a low level group I, II, III and IV. Both group Is listened to the audio tape one time without pictorial support (control group). The group IIs had the same condition as the group Is with the exception that the subjects were allowed to listen to the audio tape two times. The group IIIs listened to the audio tape one time and saw the pictures before listening. The group IVs listened to the audio tape one time and saw the pictures after listening. The subjects in both group IIIs and IVs saw the pictures for 15 seconds. After the subjects listened to the story, test sheets were given and they took a post-test with an interval of 30 seconds. They answered 12 factual and 12 inferential questions in 10 minutes. One week later, they took a retention test. They were not told that they would take a retention test, so they would not intentionally try to memorize the contents of the story. The items of the test were the same as those of the post-test, though the orders of the items and questions were shuffled.

4. RESULTS

(1) Results of the Post-Test

Table 3 shows the means and the standard deviations for the intermediate and low groups. A 4 (condition) × 2 (listening proficiency) design ANOVA of the number of correct answers was performed on the factual and inferential questions separately. The ANOVA for the factual questions yielded significant main effects for condition, $F=2.77$ $p<.05$, and level of listening proficiency, $F=16.69$, $p<.01$. But there was no effect for interactions (Table 4). To put it another way, there were the same picture effects between the intermediate level and the low level. To know where the significant differences occurred among the four condition groups, least significant difference (LSD) tests ($p<.05$) were conducted (Table 5).

One comparison revealed that subjects in both group IVs comprehended and recalled more correctly than those in both group Is. This finding confirmed the research hypothesis that pictures faciliate comprehension and recall of unillustrated prose information. Another comparison revealed that performance was better in the group IIs than in the group Is for the factual questions. This result

shows that repetition practice, as was predicted, is an effective technique for comprehending and recalling more factual information, such as questions which ask for names or numbers, but not necessarily for comprehending and recalling the paragraph or the whole story. The third comparison, indicating that no significant differences existed between both group IVs and IIs, and both group IIIs and IIs, was also important. Subjects in the picture groups comprehended and recalled as much factual information as those in the listening-twice groups, though the factual information was not illustrated in the pictures. Thus, pictures could facilitate comprehension and recall of unillustrated prose information, as was predicted. This shows the effectiveness of dual coding in which information,

TABLE 3. Means and Standard Deviations for the Post-Test

(n=36, N=288)

	Condition (Pictorial Support)							
	Group I (No Picture, Listening Once)		Group II (No Picture, Listening Twice)		Group III (Picture Before, Listening Once)		Group IV (Picture After, Listening Once)	
Listening Level	Mean	SD	Mean	SD	Mean	SD	Mean	SD
Factual Questions								
Intermediate	6.25	1.88	7.67	2.24	6.67	1.78	7.19	2.15
Low	5.56	1.88	5.67	2.15	6.31	1.93	6.39	1.77
Average	5.95		6.67		6.49		6.79	
Inferential Questions								
Intermediate	6.64	1.86	7.81	1.84	7.08	1.89	7.75	1.67
Low	6.17	1.55	6.03	1.98	6.83	1.66	6.11	2.02

TABLE 4. Two-Way ANOVA for the Factual Questions

Source	SS	df	MS	F_0	F
A	33.40	3	11.13	2.769	$p<.05$
B	67.09	1	67.09	16.689	$p<.01$
A×B	27.62	3	9.21	2.291	n.s.
Error	1125.47	280	4.02		
Total	1253.58	287			

A: Condition
B: Proficiency Level

TABLE 5. LSD of Each Condition

	II	III	IV
I	0.76 *	0.58 (n.s.)	0.88 *
II		0.18 (n.s.)	0.12 (n.s.)
III			0.30 (n.s.)

LSD=0.66 * $p<.05$

even though it is not illustrated, can be encoded both verbally and visually. The findings of this experiment appear to support Small et al. (1993).

Although the ANOVA for the inferential questions did not reveal a significant main effect for condition $F=1.51$ (n.s.), it revealed a significant condition × listening proficiency interaction $F=3.27$, $p<.05$ (Table 6). To examine the condition effect, the F ratio for each level of listening proficiency was found. There existed a significant difference in the groups of intermediate subjects, $F=3.33$, $p<.05$. On the other hand, there was no significant difference in the low proficiency groups, $F=1.46$ (n.s.). To know where the significant differences occurred among the intermediate proficiency groups, least significant difference (LSD) tests ($p<.05$) were conducted (Table 7). It should be noted that seeing pictures after listening (dual coding) and repetition practice did work well only for the intermediate students in the inferential questions. Specifically, seeing pictures after listening was a little bit more effective than seeing pictures before listening. However, seeing pictures was not effective for the low groups.

TABLE 6. ANOVA for the Inferential Questions

Source	SS	df	MS	F_0	F
A	15.37	3	5.12	1.510	n.s.
A at B_1	33.86	3	11.29	3.329	$p<.05$
A at B_2	14.80	3	4.93	1.455	n.s.
B	77.09	1	77.09	22.740	$p<.01$
A×B	33.29	3	11.10	3.274	$p<.05$
Error	949.97	280	3.39		
Total	1075.72	287			

A: Condition
B: Proficiency Level
B_1: Intermediate
B_2: Low

TABLE 7. LSD of Each Condition for the Intermediate Level

	II	III	IV
I	1.17 *	0.44 (n.s.)	1.11 *
II		0.73 (n.s.)	0.06 (n.s.)
III			0.67 (n.s.)

LSD=0.85 * $p<.05$

(2) Results of the Retention Test

Table 8 shows the means and the standard deviations for the intermediate and low groups. A 4 (condition) × 2 (listening proficiency) design ANOVA of the number of correct answers was performed on the factual and inferential

questions separately, as in the results of the post-test. The ANOVA for the factual questions yielded significant main effects for condition, $F=4.14$, $p<.01$, and listening proficiency, $F=8.71$, $p<.01$. But there was no effect for interactions, $F=1.01$ (n.s.), (Table 9). To know where the significant differences occurred among the four condition groups, LSD tests ($p<.05$) were conducted (Table 10). One comparison revealed that subjects in both group IVs comprehended and recalled more correctly than those in the group Is. Another comparison revealed that performance was better in both group IIs than in the group Is for the factual questions. These findings agree with those obtained in the post-test. Moreover, unlike the results of the post-test for the factual questions, there was a significant

TABLE 8. Means and Standard Deviations for the Retention Test

	Condition (Pictorial Support)							
	Group I (No Picture, Listening Once)		Group II (No Picture, Listening Twice)		Group III (Picture Before, Listening Once)		Group IV (Picture After, Listening Once)	
Listening Level	Mean	SD	Mean	SD	Mean	SD	Mean	SD
Factual Questions								
Intermediate	4.67	1.81	6.11	2.96	5.44	2.30	5.83	2.15
Low	4.08	1.95	4.56	1.82	4.94	2.13	5.39	2.14
Average	4.38		5.34		5.19		5.61	
Inferential Questions								
Intermediate	5.75	1.98	7.06	1.91	6.56	1.89	7.00	1.65
Low	5.14	1.77	5.97	1.79	6.08	1.82	6.03	1.67
Average	5.45		6.52		6.32		6.52	

TABLE 9. ANOVA for the Factual Questions

Source	SS	df	MS	F_0	F
A	60.99	3	20.33	4.141	$p<.01$
B	42.78	1	42.78	8.713	$p<.01$
A×B	14.95	3	4.98	1.014	n.s.
Error	1375.53	280	4.91		
Total	1494.25	287			

A: Condition
B: Proficiency Level

TABLE 10. LSD of Each Condition

	II	III	IV
I	0.96 *	0.81 *	1.23 *
II		0.15 (n.s.)	0.27 (n.s.)
III			0.42 (n.s.)

LSD=0.73 * $p<.05$

difference between both group IIIs and group Is. This means that using pictures is more effective for memory retention.

Next, the ANOVA was conducted for the results of the inferential questions. Unlike the results of the post-test, it revealed significant main effects for condition, $F=5.55$, $p<.01$, as well as listening proficiency, $F=13.12$, $p<.01$. But there was no effect for interactions (Table 11). With LSD tests ($p<.05$), the condition effects on the four groups were examined (Table 12). A comparison of both group Is with the group IIs revealed that subjects listening to the prose twice recalled more information. Thus, repetition practice worked well for memory retention. The other two comparisons—group Is versus group IVs, and group Is versus group IIIs—are more important. As can be seen from Table 12, the picture after and the picture-before conditions produced a significantly higher number of correct answers than did the no-picture control condition. Taking these comparisons into account, seeing pictures (both seeing before and seeing after) facilitated comprehension and recall of unillustrated prose information and worked more effectively for delayed recall than for immediate recall. Moreover, seeing pictures was effective for the low proficiency students as well as the intermediate students in the memory retention of the inferential questions.

TABLE 11. ANOVA for the Inferential Questions

Source	SS	df	MS	F_0	F
A	56.32	3	18.77	5.553	$p<.01$
B	44.34	1	44.34	13.118	$p<.01$
A×B	4.53	3	1.51	0.447	n.s.
Error	946.53	280	3.38		
Total	1051.72	287			

A: Condition
B: Proficiency Level

TABLE 12. LSD of Each Condition

	II	III	IV
I	1.07 *	0.87 *	1.07 *
II		0.20 (n.s.)	0. (n.s.)
III			0.20 (n.s.)

LSD=0.60 * $p<.05$

5. DISCUSSION

The results of this experiment provide insights into the benefits and limitations of using pictures. Four major findings are indicated. First, the students in the picture-after condition comprehend and recall as much information as the ones in the listening twice condition. It is generally believed that the more times a passage is heard, the more the students' comprehension and recall will be enhanced. In this experiment, seeing pictures after (dual coding) worked as effectively as repetition practice. There are several reasons for this finding. One possible explanation for it, as Small et al. (1993) state, rests on the assumption that pictures promote the spontaneous generation of images for prose information, called the "dual coding explanation". Another explanation is based on the assumption by Dean and Enemoh (1983), that a schema may provide an interpretative framework for comprehending and remembering connected discourse.

Second, the picture-after condition seems more effective than the picture-before condition. Though some empirical studies in both first and second language practice have supported the effects of pictures (or pictorial aids) as an advance organizer (Bransford and Johnson, 1972; Mueller, 1980; Dean and Enemoh, 1983), the findings in this experiment contradicted those results. Rather, the use of pictures in this experiment worked as a synthesizer in the same way as in studies by Brody and Legenza (1980) and Hojo (1989). It is often believed that in listening practice, pictures should be presented before listening to the prose. But some reasons can be proposed for why the picture-after condition worked well in this experiment. One possible explanation is as follows. Omaggio (1979) states that pictorial aids do not always serve as advance organizers, indicating that the best visual context is the prethematic context. Specifically, pictures providing information that can be utilized in the comprehension of the beginning paragraphs are useful. Contrary to this, the pictures used in this experiment illustrated the climax, the latter part of the non-fictional story. So, the pictures served as a synthesizer helping students with recall and memory retention. Though the pictures in this experiment provided some kind of schema, the schema was not enough to function as an advance organizer. As Brody and Legenza (1980) mention, postpictures can result in a general backward or review process. This process, called backward-processing, helps students review listening prose

that is related to, but not necessarily included in, the pictures presented. Further research is needed to determine the conditions under which pictures work as advance organizers and under which postpictures produce backward-processing. The effects may vary according to the nature of the pictures and the relationship between the text and pictures.

Third, pictures are more effective in delayed recall than in immediate recall. As was seen, the ANOVA did not reveal significant main effects for conditions in the inferential questions of the post-test (immediate recall), whereas it revealed significant main effects for conditions in the inferential questions of the retention test (delayed recall). Moreover, only in the retention test (delayed recall), the picture-before condition produced a significantly higher number of correct answers than did the no-picture control condition. As Kiji (1993) points out, only a few studies have so far been made at examining the effects of pictures on memory retention in second language learning. As Bransford and Johnson (1972) imply, related pictures are superior to unrelated pictures in memory retention. Moreover, this experiment shows that students with picture aids can recall the unillustrated information well if related pictures accompany the prose.

Fourth, the effects mentioned above appeared both in the intermediate students and the low students. However, in the inferential questions of the post-test, the picture effects appeared only in the intermediate students. Again, surprisingly few studies have so far been conducted at clarifying the effects in relationship to students' level of listening proficiency. Up to this point, few studies have ever reported on the effects of pictures on listening proficiency by using reliable test measures. Only Kiji (1993) tried to examine the effects of pictures and listening comprehension on memory retention of college students that were divided into lower and upper listening groups. Though he states visual aids are very effective for both lower and upper groups, he also reported that memory retention four weeks later in the upper group was especially high. The findings of this experiment agree with his findings and also show that effects on unillustrated prose information are apt to appear for upper level students, though it is often believed or stated that seeing pictures is more effective for lower level students than higher ones (Mueller, 1980). To put it another way, effects of pictures are connected with relationships between the level of the students and the difficulty of the listening passage. The reason why the effects appeared only in the

intermediate students in the inferential questions of the post-test is that the materials used in this experiment were designed for an intermediate-level students. Thus, pictures will only be effective if the level of the listening passage is consistent with that of the students.

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APPENDIX

POST TEST

FACTUAL QUESTIONS

1 飛行に関する関心・興味が高まったのは、いつごろでしたか。
A. 1910年代 B. 1920年代 C. 1930年代 D. 1940年代
2 リンドバーグは、どんなパイロットになりましたか。
A. 空軍のパイロット B. 測量用飛行機のパイロット C. 郵便飛行機のパイロット D. 観光飛行機のパイロット
3 リンドバーグが、パイロットになったのはいつですか。
A. 1914年 B. 1924年 C. 1934年 D. 1944年
4 リンドバーグが挑戦した飛行の賞品はいくらでしたか。
A. $25,000 B. $250,000 C. $2,500 D. 飛行機一台
5 リンドバーグは、どこから飛び立ちましたか。
A. ボストン B. ニューヨーク C. ワシントンDC D. フィラデルフィアー
6 リンドバーグの目的地はどこですか。
A. ロンドン B. ベルリン C. パリ D. ベルサイユ
7 両都市間の距離は、およそどのくらいですか。
A. 500キロ B. 5,000キロ C. 600キロ D. 6,000キロ
8 リンドバーグの飛行機の名称は：
A. The Spirit of Saint Louis B. The Lone Eagle C. The Atlantic D. Long Island
9 リンドバーグが出発したのは、何年ですか。
A. 1917年 B. 1927年 C. 1937年 D. 1947年
10 リンドバーグが出発したのは、何月ですか。
A. 4月 B. 5月 C. 6月 D. 7月
11 飛行時間は、およそどのくらいでしたか。
A. 15時間 B. 25時間 C. 30時間 D. 35時間
12 リンドバーグは、その後どう呼ばれましたか。
A. The Spirit of Saint Louis B. The Lone Eagle C. The Atlantic D. Long Island
解答 1___ 2___ 3___ 4___ 5___ 6___ 7___ 8___ 9___ 10___ 11___ 12___

INFERENCIAL QUESTIONS

1 当時、飛行士になるのにどうして勇気がいったのですか。
A. 飛行機は小さくて危険だったから。 B. 空を飛ぶのに高所恐怖症を克服しなければならなかったから
C. パイロットは、生活の保障がなかったから。D. 当時飛行機の爆発事件が多発していたから。
2 リンドバーグと同じ時代の飛行士が試みていたことは：
A. 飛行機の改良。 B. 飛行の新しい記録をつくること。
C. 賞金をかせいで金持ちになる。 D. 飛行機の協会を作ること。
3 リンドバーグはどのような人でしたか。
A. 飛行士になれるほど勇気がなかった。 B. 飛行士になりたくはなかった。
C. 飛行士になったのは、父の影響が大きかった D. 勇気ある人物であるが、計画性のある人間ではなかった。
4 リンドバーグは、どのようなことに挑戦しましたか。
A. 大西洋を飛行機で妻と横断する。 B. 大西洋を飛行機で一人で横断する。
C. 大西洋を飛行機で子供と横断する。 D. 大西洋を飛行機で父と横断する。
5 当時の飛行機がかかえていた一番の問題はなんですか。
A. 長距離を飛ぶための十分なガソリンがつめなかった。 B. ガソリンによく引火して爆発をよく起こした。
C. 機体が大きすぎた。 D. 離着陸の時によく飛行機のタイヤがパンクした。
6 長距離飛行を試みた飛行機は、いつ事故を起こしましたか。
A. 離陸のとき。 B. 水平飛行をしている時。 C. 着陸のため高度を下げている時。 D. 着陸の時。
7 リンドバーグは、どうしてお金が必要だったのですか。
A. 長距離を飛ぶための飛行機を借りるため。 B. 飛行のための莫大なガソリン代を支払うため。
C. 自分の飛行機を長距離飛行用に改造するため。 D. 長距離を飛ぶための特別の飛行機を作るため。
8 リンドバーグは、どのようにしてお金を用意しましたか。
A. ミズリー州のある富豪から寄付してもらった。 B. 父に調達してもらった。
C. ミズリー州の複数のひとからお金を借りた。 D. 貯金と仕事の退職金でまかなった。
9 大西洋横断飛行を試みたとき、リンドバーグは：
A. 自信はあったが、怖かった。 B. 自信がなく、とても怖かった。
C. 自信はなかったが、なぜか怖くはなかった。 D. 自信があり、怖くもなかった。
10 リンドバーグが、目的地についた時：
A. 目的地の郊外だったので、ほとんど人はいなかった。 B. 数千人のひとが、かれを熱烈にでむかえた。
C. フェスティバルと重なり、およそ数千人のひとがかれをでむかえた。 D. 夜に着陸したので、だれもいなかった。
11 リンドバーグは、大西洋横断飛行をするまで、どのくらいテスト飛行をしましたか。
A. 数回テスト飛行を行い、飛行機の調子を確認した。B. いちかばちかぶっつけ本番で行い、テスト飛行はしなかった。
C. 何度もテスト飛行を行い、飛行機の耐久性を確認した。D. 2度テストを行い、本番に備えた。
12 リンドバーグは、目的地のどこに着陸しましたか。
A. 目的地の都市の中心部。 B. 目的地の都市にある飛行場。
C. 目的地の都市の郊外の原っぱ。 D. 目的地の都市のそばの陸軍の運動場。
解答 1___ 2___ 3___ 4___ 5___ 6___ 7___ 8___ 9___ 10___ 11___ 12___