

Lexical gap between high school textbooks and the Center Test

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The Center Test is one of the most widely taken English Tests in Japan, and textbooks are the main material that Japanese learners of English use in secondary school. In EFL environments such as Japan, where there is no strong need to use English, the Center Test and needing to pass their English classes are the main reasons that students study. Despite their importance, little empirical research has been conducted on the test and the textbooks. Considering the fact that lexical knowledge seems to play a larger role in second language proficiency than previously expected (Ellis, 2003; Pawley & Syder, 1983; Schmitt & Celce-Murcia, 2002), investigating the gap between the lexical profiles of high school textbooks and the Center Test is useful for teachers in Japan. In this study, the gap between them is analyzed using the Lexical Frequency Profiler (LFP) (Laufer & Nation, 1995) from a vocabulary perspective.

センターテストは日本で最も広く受験されているテストであり、教科書は日本の中等教育学校で英語を学ぶ日本人学習者にとって主要な教材である。日本のような英語を使う強い需要がないEFL環境において、センターテストと教科書は生徒に英語を学習する強い理由を提供している。このような重要性にもかかわらず、このテストや教科書に関しての実証的な研究は少ない。語彙に関する知識は第2言語運用能力において、以前考えられてきたよりも大きな部分を占めているようである(Ellis, 2003; Pawley & Syder, 1983; Schmitt & Celce-Murcia, 2002)という事実を鑑みると、高校の教科書とセンターテストの語彙情報のギャップを精査することは日本の教師にとって有益である。本研究ではLFP (Lexical Frequency Profiler) (Laufer & Nation, 1995)を使って、両者の語彙におけるギャップを検証する。

The Center Test is a standardized high-stakes test used by almost all public and many private universities and colleges in Japan to test students' English ability. It began being used in 1990 and is a multiple-choice test which focuses on grammar and vocabulary. In 2006, a listening test was introduced to the Center Test to examine test takers' English proficiency more accurately. The introduction of the listening test seems to be in line with the trend shift to communication-oriented teaching reflected in an "Action Plan to Cultivate 'Japanese with English Abilities'" (MEXT, 2003). Although the number of test



takers has decreased since 2003, as more and more private colleges decide to use this test as a criterion for admissions to the school, the importance of this test seems to have increased.

The Center Test is a big reason for students in secondary schools to study English in Japan where there is no strong need to use English in authentic settings and they mainly use textbooks to prepare for the test. These two facts, passing the Center Test and understanding the textbooks, are the two main factors by which students are motivated to study English. However, the gap between the level of difficulty in the textbooks and that of the Center Test seems to be large. This is reflected in the large number of preparatory books explaining vocabulary, grammatical points, and how to grasp overall meaning in a limited time in order to get high scores on the Center Test.

In spite of their importance, to my knowledge, only limited research has been conducted on the gap between textbooks and the Center Test other than, for example, studies by Hasegawa (2003) and Sakaguchi (1996). Hasegawa investigated relatively difficult high school textbooks and the Center Test and found that in only two years between 1993 and 2002, did the vocabulary in the textbooks cover more than 95 % of the passages that appeared in the Center Test. Considering that 95% can be said to be a benchmark for readers to understand the overall meaning (Nation, 2001), there is a relatively large gap between the textbooks' vocabulary and the Center Test's. Sakaguchi examined 22 kinds of textbooks and the Center Test and argued that only 49% of the vocabulary types could be found both in textbooks and the Center Test, and 51% of them could be

found only in the Center Test. This study also revealed that the gap is too large to be able to compensate for this discrepancy easily.

The vocabulary gap between the textbooks and the Center Test has not yet been researched sufficiently despite the fact that lexical knowledge can account for large parts of second language proficiency (Ellis, 2003; Pawley & Syder, 1983; Schmitt & Celce-Murcia, 2002).

If the Center Test is reflecting the trend shift to more communication-oriented teaching, the style of questions, passages, vocabulary and so forth should have changed from year to year. Thus, before examining the vocabulary gap between textbooks and the Center Test, it is necessary to investigate the changes to the test between the years of 1990, when the Center Test was first implemented, and 2007. Then, the vocabulary gap between textbooks and the Center Test can be examined. In short, this study is set as an attempt to shed light on the consistency of the Center Test and the gap between textbooks and the Center Test in terms of vocabulary.

Background

The Center Test

The Center Test is one of the biggest and most important entrance examinations for students in Japan to enter colleges and universities after their high school graduation. The standardized national test is developed and administered by the independent National Center for University Entrance Examination (NCU). Many private universities as well as almost all of the public colleges and universities require

applicants to take this test. In the 2007 school year, 450 junior colleges and 134 private junior colleges used this test to select applicants (NCU, 2007). In the 2003 school year, the number of applicants topped 602,887. Since then, the number has gradually decreased to 553,352 in the 2007 school year (JC Educational Institute, 2007). Although the English section of the Center Test includes several types of questions, most of these have not been changed since 1990. The questions mainly focus on pronunciation and accent with some comprehension questions based on a few long passages, and listening tasks which were added in the 2006 school year.

English study in high school

In many high school settings, English courses entitled: English 1, English 2, Oral Communication 1, Oral Communication 2, Reading, and Writing are offered to students. English 1 and 2 are for improving comprehensive English proficiency, while Oral 1 and 2 focus on developing learners' speaking and listening abilities. Reading and Writing concentrate on enhancing each skill respectively. Because English is considered an important subject, even for the students who will not take the Center Test, many students take English class at least once a day during their 1st and 2nd year of high school. Most English courses require students to take in-class tests several times a year, which make up a large part of their overall grade for the course.

In the 2008 school year, 36 different textbooks in English 1, 37 in English 2, 28 in Reading, 23 in Writing, 20 in Oral Communication 1 and six in Oral Communication 2 were adopted by the Ministry of Education, Culture,

Sports, Science and Technology (MEXT) to be used in senior high schools (MEXT, 2008b). Students are required to study at least one of the two courses, English 1 or Oral Communication 1, while attending high school. The number of credits students can receive from the two courses are 3 and 2 respectively and all of the other courses are 4 credits. New vocabulary words high school students should learn are announced in "The Course of Study" (MEXT, 2009) of English 1, English 2 and Reading. Considering Reading is not always offered to students in all high schools, English 1 and English 2 can be said to be the core courses offered in many senior high schools.

Vocabulary knowledge

Lexical knowledge seems to account for larger parts of second language proficiency than previously expected (Ellis, 2003; Pawley & Syder, 1983; Schmitt & Celce-Murcia, 2002). In addition, Hayashi (2006) concluded that vocabulary knowledge was the best predictor of a learners' reading ability. In spite of its importance, vocabulary is not taught as an independent subject such as Reading and Writing. Words and phrases tend to be treated as supplementary items partially because grammar and translation seem to be the main focus of English classes.

Among the various methods of measuring vocabulary knowledge, such as vocabulary size, vocabulary depth, and the speed of mental processing (Mochizuki, Aizawa, & Tono, 2003), Laufer and Nation (1995) proposed a measurement called Lexical Frequency Profiler (LFP). The program called RANGE is convenient for calculating LFP. RANGE classifies three categories of words. The first is made up of

the 1st 1,000 most frequent words in English and the second is comprised of the 2nd 1,000 most frequent words. The source of these words is the General Service List (GSL) (West, 1953). Together these word families constitute what is commonly referred to as the high frequency vocabulary of English. West (1953) helped us notice the fact that a small number of words account for a high percentage of the words used receptively and productively. For instance, the 2,000 high frequency word families are represented by the headwords in the GSL (West, 1953). It provides coverage for up to 80% of academic passages. This means that approximately four out of five words in academic passages can also be found in the GSL. In other words, only one out of five words is not found on the list. The third category is made up of words not found among the high frequency words described above, but which frequently occur across a wide range of academic subjects. The source of these words is the Academic Word List (AWL) (Coxhead, 2000). AWL is made up of 570 general academic word families and it occupies 8.5% of academic passages (Coxhead, 2000). Finally, in addition to the three categories of words mentioned above, RANGE indicates which words in a passage are not covered by any of the above lists. The fourth category of low frequency vocabulary is automatically created by the program and will be referred to in this paper as Not-in-the-List vocabulary. Using this program, LFP is calculated with the proportion of each of the four levels of frequency. LFP is suitable for measuring free active vocabulary because the measurement can examine passages' lexical complexity without any prompt (Laufer & Nation, 1995).

Method

Research question

Taking all of these factors into consideration, this study's purpose is to draw insight on the consistency of the Center Test and the gap between textbooks and the Center Test from a vocabulary perspective. Thus, the research questions are set as follows:

1. How consistent are passages in the Center Test from one administration to the next from a vocabulary perspective?
2. How large is the lexical gap between passages in textbooks and in the Center Test?

Material

In order to conduct this research, a variety of materials were used. One is a CD-ROM called Database Center Ten 2007 English (JC Educational Institute, 2007), which was used for the analysis of the Center Test. It contains passages used in the English section of the Center Test between 1990 and 2007. Because this research focused on how a learner deals with passages, questions where students are asked to select the correct pronunciation and accent for specific words were excluded. Consequently, only questions including relatively long passages were analyzed (see Appendix 1).

The other materials used in this study were the textbooks *Vivid I* and *Vivid II*. The textbooks are used as the main texts in English 1 and 2 in many high schools throughout Japan. Because this research concentrated on the way a learner deals with passages, vocabulary occurring only in reading

passages was analyzed and other parts of the textbooks such as the table of contents, vocabulary lists, and songs were not investigated.

Procedure

The passages of the Center Test and textbooks were put into the RANGE program (the GSL and the AWL version) downloaded from the University of Victoria at Wellington's website (<http://www.vuw.ac.nz/labs>).

Using this program, the consistency of the Center Test from year to year was investigated. First, token, and type were calculated in the Center Test. Token is the number of words in total, and type is the number of unique words in a certain passage. After that, the LFP for the percentage of words at each of the four frequency levels (the 1st 1,000, the 2nd 1,000, the AWL, and the Not-in-the-List vocabulary) was calculated. In order to calculate LFP, proper nouns were omitted from the passages of the Center Test.

After the analysis of the Center Test from year to year, type, and TTR (Type/Token Ratio) in the textbooks and the Center Test were calculated in order to examine the gap between them. TTR is the ratio between the different words in the passage and the total number of running words. The ratio is an important bench mark to show some hints of redundancy and density in a given passage. Finally, LFP was calculated between the textbooks and the Center Test. In order to calculate it, proper nouns were omitted from the passages of the Center Test and the textbooks.

Results

Consistency in passages from one administration to the next

As seen in Figure 1, the number of tokens in the Center Test jumped suddenly from 1997 to 1998, and has increased gradually to 2005 though there is a slight decrease from 2001 to 2002 and from 2005 to 2007. Considering the unchanged time (80 minutes) test takers have been given to complete a test, students have had to cope with more and more words and phrases within the same time frame. In contrast to the tokens, the number of types has not changed so much.

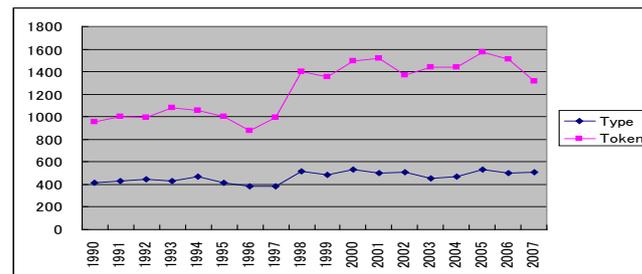
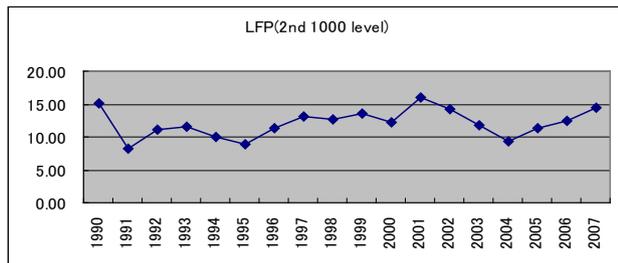


Figure 1. Change in the number of tokens and types in the Center Test.

Figure 2 shows the change in LFP over the years in each level. LFP has changed considerably from one year to the next. For example, the rate of 1st 1,000 vocabulary and Not-in-the-List vocabulary went up and down from 1993 to 1995 and from 1998 to 1999. Also, the rate of 1st 1,000



vocabulary increased from 2002 to 2004, and the rate of Not-

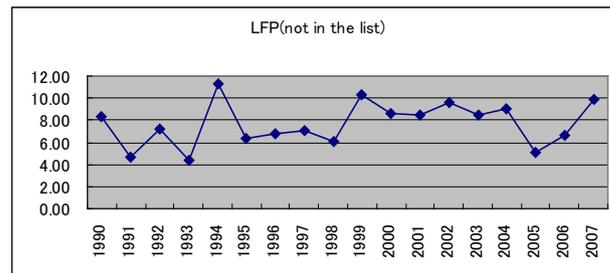
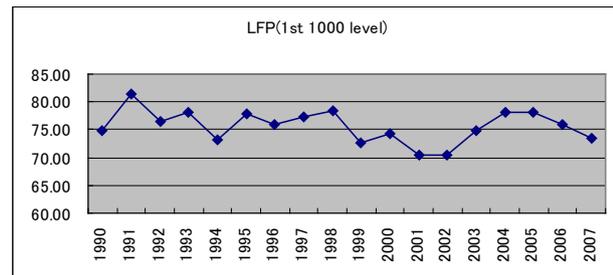
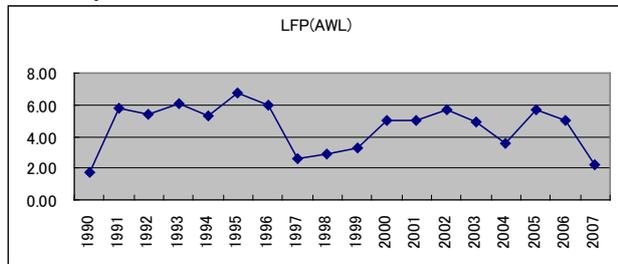


Figure 2. Change in LFP in each level

in-the-List vocabulary went down from 2004 to 2005, but then went up again from 2006 to 2007. Moreover, 2nd 1,000 words continued to decrease from 2001 to 2004, and then continued to increase from 2004 to 2007. Finally, for AWL vocabulary, the gaps between 1990 and 1991, 1996 and 1997, and 2006 and 2007 are particularly large.

Laufer (1994) comments, the LFP can be converted into a condensed profile consisting of the percentage of basic 2,000 words, which is the sum of scores on the first two lists and the percentage of beyond 2,000 words, which is the sum of scores on the AWL and Not-in-the-List vocabulary. Since she insists that beyond 2,000 is a good way to measure the lexical complexity, I condensed the first 1,000 and the second 1,000 into one category called the basic 2,000 level, and put the AWL and Not-in-the-List vocabulary into one category named the beyond 2,000 level as in previous studies (Laufer, 1994; Laufer & Nation, 1995; Laufer & Paribakht, 1998).

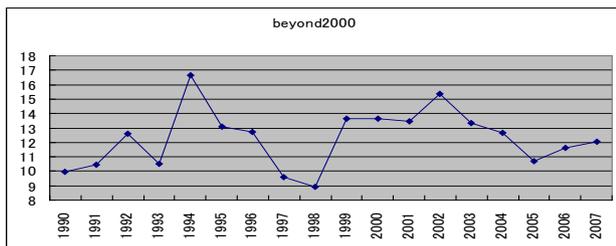


Figure 3. Change in beyond 2,000

As seen from Figure 3, the number of beyond 2,000 words from 1993 to 1994, from 1994 to 1995, from 1996 to 1997, and from 1998 to 1999 underwent a surprising change.

Gap between textbooks and the Center Test

The change in difficulty in the Center Test in terms of lexical quality (LFP) has been explained so far. Now, the gap between passages in textbooks and in the Center Test will be discussed.

Table 1 is the number of types in the textbooks and the Center Test. As Table 1 indicates, the gap in types between textbooks (2,024 types) and the Center Test (3,120 types) is around 1,000. What should be mentioned here is that the number 2,024 includes types appearing in supplementary reading sections. Thus, if a teacher decided not to teach those two sections, the number of vocabulary words learnt by students would decrease to 1,730, which increases the gap between students' status quo and the level they need to reach.

Table 1: Types and TTR in textbooks and the Center Test

	Textbook	The Center Test
Type	2,024	3,120
TTR	16.35	13.94

Table 1 also displays the difference of TTR between textbooks and the Center Test. Considering TTR is a yardstick for examining density of passages, the vocabulary in textbooks is denser than that in the Center Test. What does this mean? Does it mean textbooks have much more difficult words than the Center Test does? Considering the importance of repeated vocabulary learning in redundant passages, suggested for instance by Nation (2001), dense passages with a lot of new vocabulary in textbooks may overwhelm learners. However, TTR has been criticized because of its inaccuracy at measuring the difficulty of passages (Laufer & Nation, 1995). In other words, TTR does not show how difficult the words and phrases in passages are. Thus, instead of TTR, LFP was calculated to examine the level of difficulty of the words and phrases in the given passages.

As can be seen in Figure 4, the percentage of 1st 1,000 vocabulary in textbooks is larger than that in the Center Test, and in contrast, the percentage of 2nd 1,000, AWL, and Not-in-the-List vocabulary in the Center Test is larger than that in the textbooks. Also, as Figure 4 illustrates, the Center Test includes beyond 2,000 level vocabulary. Thus, the Center Test has more lexically difficult passages than the textbooks. This seems to contradict the fact that the TTR in textbooks

is higher than that in the Center Test. In reality, however, because textbooks have been the main material for teachers to introduce new words and phrases, they include many new vocabulary words from 1st 1,000 level in relatively short passages, which leads to an increased TTR. On the other hand, the Center Test includes certain types of beyond 2,000 level vocabulary in comparatively long passages, and these appear several times as key words in a passage. This leads to the somewhat lower TTR and to a quite large number of beyond 2,000 words.

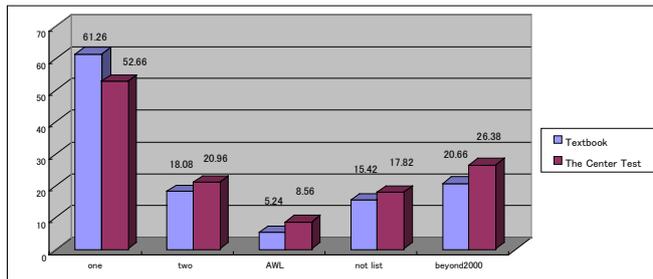


Figure 4. Differences in frequency for the four levels and beyond 2,000 words

Discussion and conclusion

In this study, before investigating the vocabulary gap between textbooks and the Center Test, the consistency of the Center Test over an eighteen year period was researched. This is because there is a possibility that the Center Test is too sensitive to reflect the recent trend shift to a more communication-oriented style, which may cause it to be

inconsistent in approximately ten years. It turns out that while type in the center test has been consistent, token and LFP have been changing from year to year. It also turns out that the Center Test cannot be said to be consistent in terms of LFP. As Figure 1 revealed, tokens have gradually increased from year to year while types have remained relatively stable. This means that testers would like students to process more long passages within the same time frame. It also reflects the test's expectations to push test takers to grasp overall meaning without analyzing each sentence too accurately. Therefore, because of the inconsistency of LFP, the aims of the writers of the Center Test cannot be seen. Aizawa and Iso (2007) showed that the scores of the vocabulary level test based on JACET 8000 and word count judged as "difficult" by teachers were in direct proportion. Therefore, selecting and adapting passages in the Center Test in order to consider the consistency of LFP rate is crucial because how difficult the students find the passages and how smoothly they process the passages depends on the frequency of the vocabulary occurring in a huge corpus such as the GSL or the British National Corpus.

However, there is some good news. First, the 900 words students should learn in junior high school will increase to 1,200 from the next *Gakushu Shido Youryo* [(Foreign language in secondary school:) The course of study] (MEXT, 2008a). Also, by including more types in the textbooks of Reading, in addition to English 1 and 2, the average number of types in those Reading textbooks has gradually been increasing for about 3 decades, which has led to a decrease in the gap between the vocabulary in textbooks and that in the Center Test (Chujo & Hasegawa, 2004).

Though Chujo, Yoshimori, Hasegawa, Nishigaki, and Yamazaki (2007) reveal that types and tokens are different from one textbook to another, future research with sufficient data from a variety of textbooks would be able to further clarify the vocabulary gap between high school textbooks and the Center Test.

In order to bridge the gap between the vocabulary students learn while in high school and that which they have to deal with in the Center Test, high school students should be given passages whose LFP rate is similar to that of the Center Test. Also, since the types in textbooks are much less than those in the Center Test, the types students learn should be increased. Nonetheless, even if the number of types increases, unless the LFP rate is unchanged, students will find it difficult to deal with passages in the Center Test. Considering the process by which learners acquire vocabulary from most frequent to infrequent, this frequency should be taken into account in order to make the benchmark equal from one year to the next, and to make the Center Test's difficulty level similar from one year to the next. In a nutshell, it is necessary not only to increase the number of types in textbooks but also to make the LFP rate in textbooks similar to that of the Center Test.

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Appendix

An example of questions examined in this study

(question 6 of the Center Test in the 2007 school year) (JC Educational Institute, 2007).

【6】

次の文章を読み、以下の問い(A・B)に答えよ。

(配点43)

The white-haired old man was sitting in his favorite chair, holding a thick book and rubbing his tired eyes. When his nineteen-year-old granddaughter, Valerie, came into the room, he looked up and smiled. His eyes instantly brightened with happiness to see her.

“Hi, Grandpa. What are you reading?” she asked, pulling up a chair beside him.

“Oh, it’s a book on the architecture of Spain. But I’m not really reading. Mostly I am just falling asleep over the pictures,” he said, laughing. “Are you finished packing your bags yet?” he asked. The following morning Valerie and two of her friends were flying to Europe for a two-week holiday.

“Almost. I need to travel light, you see, so I can buy lots of new dresses and shoes in Paris and Barcelona.” They both laughed because Valerie was not actually interested in fashion at all. She loved foreign languages, music, art, good food, and many other things—but not shopping for clothes.

“Have the three of you finally decided what you want to do on your trip?”

Valerie thought for a moment and then replied, “Well, Naomi really wants to see the Eiffel Tower and we all want to visit

the Louvre Museum. Mika and I want to see the wonderful buildings in Barcelona, too. But, basically, we still don’t have much of a plan. Do you have any suggestions? You’ve been to Europe so many times.”

Valerie’s grandfather paused, and then replied slowly, “You know, sometimes it may be best not to have a detailed plan. I remember when your grandmother and I first went to Barcelona. We went to museums or concerts every day. We saw bullfights and soccer matches. We ate wonderful food and met many interesting people. But one of my greatest memories from that trip was completely unexpected.” Grandpa paused again, and then said, “We had come especially to see the famous works of art, but one day just for a change we went to the zoo. And there I met someone who had a great effect on me.”

“His name was Snowflake,” he continued, “and he was a gorilla, a very special albino gorilla, with white fur and pink skin. When only three years old, Snowflake was captured in the forests of Africa and then brought to the zoo. Because of his rare color he had become quite famous. Many people lined up to see him behind a glass wall in the exhibit hall.”

“In fact,” Grandpa said, “I did not think he was real when I first saw him. When I moved closer, though, he turned slowly toward me and calmly looked directly into my eyes. For the first time ever, I felt intelligence and awareness in the eyes of another species. It made an impression on me that I will never forget.”

“So, what did you do?” Valerie asked.

“Actually, Snowflake was the one who did something. As we gazed into each other’s eyes, the 140-kilogram gorilla suddenly slapped his hand flat against the glass wall, making

a loud, forceful sound that made all the people in the room cry out in surprise. Snowflake seemed rather pleased with our reaction, turning away casually and snacking on some leaves.”

“So, he surprised you. He had a sense of humor, it seems,” Valerie said. “But isn’t it sad for such a wonderful animal to live in a cage?”

“Yes, maybe,” Grandpa replied. “But in the wild so many gorillas are killed by hunters or disease that it is difficult to say which way of life is better. And Snowflake did live a long life for a gorilla, about forty years, which is equivalent to eighty years for a human.”

“So, he’s dead now?” Valerie asked.

“Yes, he died of skin cancer in 2003. He had very pale skin, of course, so sunlight was very dangerous for him. It was a painful end, but I believe he had some happy memories, too. You know, he had three mates, several ‘children,’ and 22 ‘grandchildren,’ so that must have been nice.”

Grandpa smiled at Valerie and said, “Anyway, maybe it’s best not to plan everything. All kinds of wonderful, unexpected encounters may be waiting for you on your trip.”

A week or so later, Grandpa heard from Valerie and her friends. They were having a wonderful time, enjoying many new activities. They even made an unscheduled trip to the Barcelona Zoo, where they saw one of Snowflake’s grandchildren. This baby gorilla didn’t have white fur, but he did have bright, intelligent eyes which Valerie said she would never forget.

A次の問い(問1～5)に対する答えとして最も適当なものを、それぞれ以下の①～④のうちから一つずつ選べ。46～50

問1 Why did Valerie and Grandpa laugh?46

- ① Vale finished her preparation.
- ② Valerie had too many things in her suitcase.
- ③ They both knew that what Valerie said was not true.
- ④ They both understood that Valerie had very little money.

問2 What valuable advice did Grandpa give about Valerie’s travel plan?47

- ① Go to the zoo.
- ② Travel light.
- ③ Eat authentic dishes.
- ④ Don’t plan everything.

問3 What unexpected experience did Grandpa describe from his first trip to Barcelona?48

- ① Meeting many strange people.
- ② Viewing various shocking works of art.
- ③ Enjoying very spicy Spanish food.
- ④ Encountering an unusual gorilla.

問4 Why was Snowflake a popular exhibit at the zoo?49

- ① He had a unique name.
- ② He was an unusual color.

- ③ He played many different tricks.
- ④ He was kept behind a glass wall.

問5 According to Grandpa, what is one serious danger for gorillas in Africa?50

- ① There is a high risk of getting skin cancer.
- ② Air pollution causes damage to their health.
- ③ They are threatened by human violence.
- ④ Lions and other animals commonly attack them.

B本文の内容と合っているものを、次の①～⑧のうちから三つ選べ。ただし、解答の順序は問わない。51～53

- ① Grandpa said he wanted to go to Europe with Valerie, but he was too busy.
- ② The trip Valerie had been planning would keep her very busy.
- ③ Grandpa went to the zoo especially to see Snowflake.
- ④ Grandma did not have a chance to visit the Barcelona Zoo.
- ⑤ Snowflake lived in the zoo, but was born in Africa.
- ⑥ Snowflake died when he was eighty years old.
- ⑦ Snowflake had a very big family.
- ⑧ One of the gorillas at the zoo greatly impressed Valerie.