Learning from the L2 Expository Text*

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This study questioned what happens in L2 reading comprehension of the expository text, as measured by recall and inference-making abilities, when a L2 reader was induced to develop a content schema about the topic of a target text, but the structure of that schema departs from the structure of the target text Seventy-four Korean university students read either the same version text twice (consistent condition) or two different version texts (inconsistent condition) with a three-day interval between the two readings The results of a verification test indicate that, for those subjects with higher L2 reading proficiency, the inconsistent condition was more beneficial than the consistent condition for the inference-making task On the other hand, for lower-level L2 readers, the consistent condition was more favorable for the recall task It was concluded that inducing a structurally inconsistent schema through an L2 pre-reading would be beneficial only when the reader's L2 linguistic ability is proficient enough to produce necessary propositions from the pre-reading

[foreign language reading/schema theory, 외국어 읽기/선험지식구조 이론]

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I. INTRODUCTION

Reading involves the ability to read not only from the language of the text, but also from the reader's own prior knowledge and perspective Scholars agree that synthesizing a reader's prior knowledge and perspective with the information and perspective held by the text makes reading more comprehensible, deepening and broadening understanding about the topic (Barnitz, 1986, Carrell & Eisterhold, 1983, Smith & Swinney, 1992)

The interaction mechanism between the new textual information and the reader's prior knowledge system has been a matter of interest both in cognitive psychology and reading education In general, it is said that the prior knowledge that a reader brings to the text affects comprehension by providing expectations about the forthcoming content and structure of the text When the content and structure of the text conform to those expectations, comprehension may proceed smoothly However, it has been questionable whether or not this smooth comprehension necessarily means 'better' comprehension at every level

Some researchers have investigated the effect on L1 reading comprehension when a reader has a content schema about the topic of a text, but the structure of that schema is not consistent with the text In other words, the research question of those studies was what takes place when the schema that the reader possesses is informationally appropriate for the target text that the reader will read, but structurally different from the text The structural difference may result when the perspective or macrostructure of the context from which the knowledge was first acquired is different from that of the target text For example, Mannes and Kintsch (1987) constructed two versions of an information outline about bacteria to provide background knowledge to the students who were supposed to read a text about bacteria The two versions were identical in content, but were different in their structures One version presented information in the order consistent with the order in which the target text presented it, with subheadings directly corresponding to the macrostructure of the target text (consistent outline) The other version presented the same information, but in the order following the encyclopedic entry (inconsistent outline) Therefore, subjects in the study were provided with a background knowledge either informationally and structurally appropriate for the forthcoming

target text, or informationally appropriate but structurally inappropriate for the target text The results showed that subjects in the consistent-outline condition recalled more text details and wrote summaries more closely following textual order, when compared with subjects in the inconsistent-outline condition However, the inconsistent-outline subjects outperformed the consistent-outline subjects on verification of inference statements as well as problem-solving tests which required deeper understanding of the text They also performed as well as the consistent-outline subjects when the task was the verification of verbatim and paraphrased statements. Mannes and Kintsch concluded from these results that prior knowledge related to a topic, but with different structure from the text, eventually deepens reader's comprehension

The same pattern of results was found in McDonald (1987). Instead of outlines, McDonald created another text which is informationally similar, but macrostructurally different from the target text Subjects read either this text followed by the target text (inconsistent reading condition) or the target text twice (consistent reading condition) The results showed that readers who were in the inconsistent reading condition performed significantly better on inferences than did those in the consistent reading condition, supporting Mannes and Kintsch's (1987) conclusion that the schema structurally different from the target text is more effective for a deeper level comprehension No significant difference was found on the memory of the text between the two groups as measured by verification of verbatim and paraphrased statements

The current study questions the relationships between the structure of the prior knowledge and reading comprehension abilities in the L2 case The primary goal of the study is to investigate what happens in an L2 reader's reading comprehension, especially in inference and recall ability, when s/he was induced to develop a prior knowledge through an L2 pre-reading of the topic of the target text, but its structure is not consistent with the target text Since the positive effects of the inconsistent reading condition on inference-making have already been found in L1 studies, this study may be viewed as an effort to test the extent to which findings in L1 research can apply to the L2 setting Level of L2 reading proficiency will also be added as a key variable to the present study.

II. BACKGROUND

1 Van Dijk and Kintsch's Situation Model

In L1 reading research, van Dijk and Kintsch (1983) hypothesize different levels of text comprehension to clarify which aspects of comprehension rely more on the text language and which ones on the reader Comprehension as recall of the text and comprehension as learning from the text. A recall of the text depends on two different types of memory surface memory and text-based memory Surface memory is the verbatim encoding of actual words and phrases used in the text, and the text-based memory is the memory of the meaning of the propositions of the text The surface memory provides a basis for the text-based memory representation On the other hand, comprehension as learning from the text requires the integration of the textual information into the reader's own schematic system This integration process involves not only recall but reconstruction of textual information according to the prior knowledge and perspective of the reader This process is referred to as 'situation model' by van Dijk and Kintsch The situation model goes beyond information directly presented in the text It not only involves the meaning of the text and the situation described by the text, but also relates reader's knowledge or belief about the world

The reading processes assumed by van Dijk and Kintsch's comprehension model were basically the following When words and phrases from the text can develop propositions, they enter the reader's short term memory (STM) buffer, and when possible, interpropositional connections are formed, which is essential for the coherence of the text comprehension When input is made, every segment in STM is checked for coherence by searching for the propositions that were held in the working memory buffer from previous input If this attempt to connect the new proposition with the old ones in STM fails, the reader scans the long-term memory (LTM) to see if the new proposition can be related to any proposition in LTM A search of LTM is called a 'reinstatement search'

The results of Mannes and Kintsch's (1987) study introduced in the previous section, in which the inconsistent-outline subjects outperformed the consistent-outline subjects on verification of inference statements, can be explained in

terms of the interconnections between propositions. The inference process, compared to the memory process, depends more on rich interconnections between information in the reader's knowledge base because the construction of interconnection means the construction of new relation that has not been presented explicitly in the texts These richer interconnections are produced in the inconsistent reading condition, rather than in the consistent reading condition, as more connections are needed to reconcile the target text with the organization of the pre-existing content schema When the pre-existing content schema is consistent with the target text in its organization, however, no such rich interconnections are produced, leading to a poorer inference-making ability

2 Pre-reading in L2 Reading Comprehension

The effects of schema in L2 reading comprehension have been widely studied in previous decades Many studies have reported positive effects of schema in L2 comprehension, and have found that providing background information as a pre-reading activity is beneficial to L2 readers Carrell and Eisterhold (1983), for example, claimed that offering the semantic content component or providing illustration as a pre-reading activity helped L2 English readers, especially the less proficient L2 students Hudson (1982) reported that induced content schema developed through pre-reading activities such as cue picture discussion and writing predictions about the following reading text worked positively, especially for the beginning and intermediate level L2 English readers, while reading and taking the same text and test twice was more effective for advanced L2 English readers However, the results with the advanced L2 readers were somewhat obscured in this study due to a testing effect (taking the same test twice)

Some studies, however, suggested that prior knowledge is not necessarily beneficial to all aspects of comprehension For example, Dahl (1991) found that her L2 subjects were able to have a text-based understanding of a passage without being familiar with the topic Furry (1990) also found that background knowledge did not necessarily result in better comprehension These results suggested the need for more study on the relationship between the nature of schema and the representations of comprehension

III. METHODOLOGY

1 Subjects

The subjects were 74 students from a university in South Korea. Sixty nine of them were English majors, the others business and other liberal arts majors[1] They included sophomores, juniors, and seniors, aged from 19 to 28 They were divided by their cloze test scores into two groups 37 readers in the higher-level group and 37 readers in the lower-level group Subjects in each level group were then randomly assigned to one of the two reading condition groups The consistent reading condition group (n=19 for each level) and the inconsistent reading condition group (n=18 for each level)

Initially 76 students agreed to participate in the study, but two students were proven to have a background in violin, which is the topic of the forthcoming experimental texts, and excluded from the further participation [2]

2 Materials

1) Experimental Texts

Two expository texts written in English were used in the experiment The two texts were based on the ones originally developed by McDonald (1987) for L1 reading research, but edited to allow a shorter reading time for the L2 readers in the present study [3] Both texts share the same information about the

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1) The subjects are from an undergraduate class offered mainly for English majors and minors, but also open for non-English majors

2) A music questionnaire was used to distinguish music experts who would have a prior knowledge of the violin that would be sufficient to affect the results of the test Because the experimental texts contained information about the violin with many terms specific to music, anyone who has a background in the violin or in music may have an unfair advantage over other subjects in comprehending the texts and, therefore, should not participate in the experiment The questionnaire contained five questions asking the subjects' experiences and knowledge in violin, other musical instruments, and symphony orchestras It was written and answered in Korean

3) Although the original texts were shortened for the present study, there was no modification of vocabulary and syntactic structures See appendix 1 and 2 for the excerpts from the texts

violin but were organized according to different themes One text described some aspects of the violin from a historical perspective (historical version) For example, bows, strings, and types of wood used in the violin were described in terms of historical development The other text provided the same information about those aspects of the violin, but from a structural and functional perspective (categorical version) In this text, information about bows, strings, and types of wood was organized based on their physical qualities and functions Because of the different macrostructures, the two texts had to contain some ideas different from each other, but shared much of the essential information about aspects of the violin The two texts were similar in length and each text contained eight factual sentences that were identical

2) Verification Test

The researcher used the true/false verification test to measure subjects' comprehension of the categorical version text, which was the target text in the present study The test was devised to measure both comprehension as a recall of text (surface memory and text-based memory) and comprehension as learning from the text (situation model) It consisted of 32 true/false statements in Korean which were divided into two types Recall and inference The recall statements consist of verbatim and paraphrase type statements A verbatim statement was the direct Korean translation of a sentence from the text, and a paraphrase statement was a statement expressing a meaning of a selected sentence, but in a different way from the original sentence Inference statements were the statements that logically follow from the arguments presented in the text and that could be verified correctly if only the categorical text had been read Each verification type equally had 16 statements

3) Cloze Test

A cloze test was administered to rank the subjects' English reading proficiency. The test passage and cloze items were the same ones that Lee (2002) used to measure the L2 students' reading comprehension level The passage itself was based on a passage from an intermediate-level reading

source, *More Reasons for Reading* (Dobbs & Dobbs, 1992), and carried a topic about 'culture'.[4] The passage contained 20 blanks and students were to choose a vocabulary item for each blank from the entry of 20 correct answers and 10 distracters supplied after the passage

3 Procedure

A total of three experimental sessions were held for the present study At the first session, subjects were first asked to complete the music questionnaire Upon being recognized as non-experts in music, they were given the cloze test. The cloze test results were scored by the test administer after the subjects were released from the first session

In the second session, subjects were divided into two proficiency level groups according to the results of the cloze test The two groups were named as lower-level group and higher-level group[5] Then subjects in each level were assigned to one of the two reading condition groups consistent and inconsistent reading groups The subjects in the consistent group received the categorical version text and those in the inconsistent reading group received the historical version text in the second session Subjects were instructed to read the text as accurately as possible for a potential quiz However, no subsequent quiz was given after this first reading Although subjects were allowed to use as much time as they needed, no subjects exceeded 50 minutes to finish reading and return the text

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4) Lee (2002) used the close test to clarify the validity of the cloze through analyzing the test-taking strategies adopted by the students He reported that the results indicated moderately high correlation between the cloze and summary task, and concluded that "the cloze can be deemed as a valid tool, measuring global reading comprehension ability as well as local linguistic proficiency" (p 213)

5) The classification of the lower- and higher-level groups in the present study was based on the subjects' relative rankings in a test, not on the standardized proficiency levels (This is the reason why the terms "higher" and "lower" are used instead of "high" and "low") Caution is needed when generalizing the proficiency levels of the subjects in the current study

The third session was held three days later[6] In this session, all subjects in both the inconsistent and consistent reading group received the categorical version text That is, the consistent group subjects received the same text as they had read three days before, but the inconsistent group subjects received different text from the one that they read before(historical version text) They were told to read the texts as fast and as accurately as possible, but no time limit was set for the task After completing the text reading, subjects took the true/false verification test designed to measure their comprehension of the categorical text Subjects were instructed to verify the statements as fast and as accurately as possible and they were never allowed to turn back to refer to the texts Wild guesses were discouraged and subjects were advised not to mark anything on the answer sheet for those statements where they could not make a reasonable guess In this experiment design, the categorical text provided in the third session was the target text of which the subjects' reading comprehension were to be tested, and therefore, the verification test contained statements that could be verified only if the categorical text had been read

IV. RESULTS

Table 1 presents the means and standard deviations of the scores of the recall and inference verification tasks by the lower- and higher-level L2 readers in the consistent and inconsistent conditions

In total, the higher-level L2 readers performed significantly better than the lower-level L2 readers $F(1, 72)=26.94$, $p < .001$ No significant difference was found, however, between the consistent and inconsistent condition groups as a whole $F(1, 72)= 18$, $p> .05$ MANOVA analysis of the scores for each verification statement type showed that a statistically significant main effect of L2 reading proficiency existed for both recall and inference verifications For recall, $F(1, 72)=18.80$, $p< .001$, for inference, $F(1, 72)=19.43$, $p< .001$ No main effect of consistency was shown for either recall and inference verifications For recall,

6) The interval between the second and third sessions was given in order to avoid the subjects' use of the short-term memory from the first reading, rather than a schema developed in the long-term memory, for the comprehension of the second reading

F(1, 72)=3.80, p>.05, for inference, F(1, 72)=1.43, p>.05. That is to say, when overall results were considered, the subjects' L2 reading proficiency (lower vs higher-level) affected scores of the both recall and inference verification tasks, but the consistency variable(consistent vs inconsistent condition) did not lead to significant difference in subjects' scores for either recall or inference verification tasks.

TABLE 1

Means and Standard Deviations of Recall and Inference Verification Scores by Groups

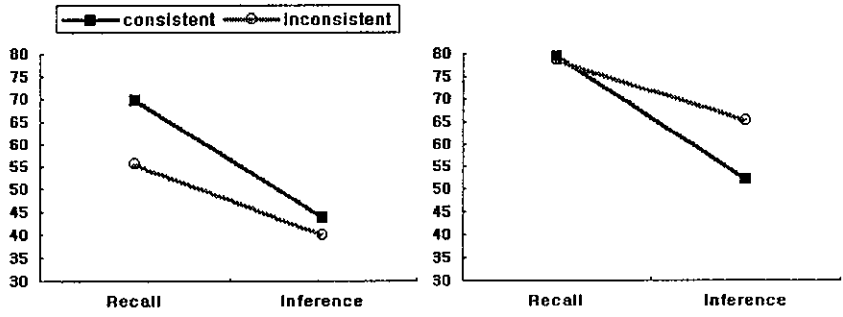
		Recall	Inference	Overall	Total
Lower-Level L2 Readers	Consistent Condition	69.53 (20.90)	43.79 (18.54)	56.66 (23.45)	52.40 (20.89)
	Inconsistent Condition	55.83 (16.24)	40.00 (14.05)	47.92 (16.98)	
Higher-level L2 Readers	Consistent Condition	79.31 (12.50)	52.31 (15.98)	65.82 (19.68)	68.76 (18.27)
	Inconsistent Condition	78.44 (13.08)	65.28 (16.96)	71.86 (16.35)	
Overall	Consistent Condition	74.42 (17.70)	48.05 (17.61)	61.24 (22.00)	60.58 (21.21)
	Inconsistent Condition	67.14 (18.51)	52.64 (20.00)	59.89 (20.48)	
Total		70.88 (18.34)	50.28 (18.82)	60.58 (21.21)	

( ) Standard Deviation

The analysis indicated, however, a significant interaction effect on the inference scores between the reading proficiency variable and the consistency variable (F(1, 72)=4.77, p<.05). No such a significant interaction effect was shown on the recall scores between the reading proficiency and consistency variables at the significance level of .05. Nonetheless, the interaction effect on the recall scores also called for our attention since the results found the interaction significant at the significance level of .10 (p=.091). These results indicate that there is need for closer examination on the relationships among the

variables Graphic representations of the means of the recall and inference verification scores for each group are shown in Figure 1

FIGURE 1
Consistency, L2 Reading Proficiency, and Verification Type



For the lower-level subjects, there was a significant difference between the consistent and inconsistent groups in the verification of recall statements, but not in the verification of inference statements[7] In other words, for the lower -level L2 readers, those who were in the consistent reading condition outperformed those in the inconsistent reading condition in verifying recall items (verbatim and paraphrase), while no such difference was found in verifying inference items These results indicate that reading the same text twice was more beneficial for the lower-level subjects' recall of the text, compared to reading the two informationally same, but structurally different texts

For the higher-level subjects, on the other hand, the opposite outcome pattern was produced Higher-level subjects in the inconsistent condition performed as well as those in the consistent condition in verifying the recall items, while they performed significantly better in verifying inference items than did the readers

7) ANOVA analysis showed that the lower-level consistent condition group scored significantly better than the lower-level inconsistent group in the verification of recall statements ($F(1, 35)=4.91$, $p<.05$), the but not in the verification of inference statements ($F(1, 35)=.49$, $p>.05$)

in the consistent condition[8] That is, the subject with a higher-level L2 reading ability benefited from the inconsistent reading condition in verifying the inference statements, when compared to the consistent reading condition

The above results may also be summarized in the following way With regard to inference making-ability, the inconsistent reading condition is more beneficial than the consistent reading condition for the higher-level L2 readers, but not necessarily for the lower-level L2 readers, With regard to surface and text-based memory, consistent reading condition was better than the inconsistent reading condition for the lower-level L2 readers, but not necessarily for the higher-level L2 readers

V. DISCUSSION

The results shown by the higher-level L2 readers in the current experiment were basically the same as the results of the L1 studies in the same topic (Mannes and Kintsch, 1987, McDonald, 1987), in that readers who were in the inconsistent reading condition performed significantly better on inferences than did those in the consistent reading condition As mentioned before, the high inference making-ability of the inconsistent reading condition group in L1 research was explained by the construction of richer interconnections That is, when the organization of the prior knowledge developed through the reading of the first text was inconsistent with that of the target text, readers need to produce more interconnections between information to reconcile the target text content with the pre-developed knowledge, resulting in better conditions for inference processing

The reason why the results shown by the higher-level L2 readers in the current study were identical to those shown by the L1 studies may be found in terms of use of the proposition in comprehension Since the basic unit of the

8) No significant difference was found between the higher-level consistent condition group and the higher-level inconsistent group in the verification of recall statements ($F(1, 35)= 043$ $p> 05$) In the verification of inference statements, the higher-level inconsistent condition group scored significantly better than the higher-level consistent group ($F(1, 35)=5 73$, $p< 05$)

text comprehension process is the proposition (Carpenter and Just, 1975; Kintsch and Keenan, 1973; Ratcliff and McKoon, 1978), and not a syntactic form which is different from one language to another, once propositions are constructed in the reader's knowledge base, the same inference-making process will occur regardless of the surface form of the language In this sense, for expository texts which do not reflect cultural factors, the difference between the first language and second language reading will exist only before propositions are formed Since the higher-level L2 readers had relatively advanced L2 linguistic proficiency, they might not have much difficulty in producing propositions Once propositions are produced, there would be no substantial difference between L2 and L1 reading in their process of inference-making

The lack of difference in the inference-making ability between the lower-level consistent and inconsistent condition groups may also be explained in terms of the deficient production of propositions In our study, the first text was to serve to induce the readers to develop a prior knowledge on the topic, while the second text was the target text about which the readers' recall and inference were to be tested In order to develop a better inference processing, readers should first construct a prior knowledge structure from their reading of the first text For the lower-level L2 readers, their limited L2 linguistic ability might prevent them producing sufficient propositions from the first text reading, and these insufficient propositions, consequently, might obstruct the construction of a relevant and well-organized knowledge structure on the topic Without a well-organized schema, the structure of which the target text structure needs to reconcile with, no better inference-making ability would be developed Readers might also be disadvantaged in producing propositions for the target text due to their limited L2 linguistic proficiency, making the inference-making process more difficult

On the other hand, enhanced text recall in the lower-level consistent condition group seems to suggest the positive effect of rereading for the readers with low L2 reading proficiency As the subjects in the lower-level inconsistent reading condition could not construct a well-organized schema by reading the first text, neither could the subjects in the lower-level consistent reading condition However, for text recall, compared to the inference process, the need of well-organized prior knowledge structure is diminished because relatively less

reconciliation between the structures of the prior knowledge and target text is needed for simple memory and recall Therefore, even though less interconnected, some propositions produced in the same order as the target text may have worked positively for recall That is, the second reading of the same text may fortify the subjects' memory at the word and phrase level, because they have previously seen the same words and phrases in the same order The positive effect of rereading on the memory and recall was also reported by Andrianantenaina (1993) for L2 cases According to him, repeated readings help foreign language learners enhance the processing of text-based data at the word and propositional level He reported that repeated readings of a foreign language text have significant effects on the reader's recall as well as grammar discrimination and vocabulary recognition ability

VI. CONCLUSION

The present study questioned what happens in L2 reading comprehension, as measured by recall and inference-making abilities, when a L2 reader was induced to develop a content schema about the topic of a target text, but the structure of that schema departs from the structure of the target text The results of the study may be interpreted as showing that inducing a structurally inconsistent schema through an L2 pre-reading would be beneficial only when the reader's L2 linguistic ability is proficient enough to produce sufficient propositions from the pre-reading The higher-level L2 readers were able to construct content schema about a topic through pre-reading a text and could use that schema to develop deeper level comprehension of a target text Lower-level L2 readers did not have such ability Instead, pre-reading the same text turned out to be more beneficial to the lower-level L2 readers' recall ability

One pedagogical implication of these results may be found in the ways of presenting pre-reading activities Current approaches to L2 reading comprehension instruction tend to start by tapping into the readers' knowledge system through the use of the techniques such as pre-reading questions and advance organizers. Use of these techniques is based on the belief that

activating or providing knowledge that is relevant to the subsequent reading passage would contribute to comprehension (e g , Carrell & Eisterhold, 1983) The results of the current study seem to suggest that the organization of knowledge provided as a pre-reading activity to L2 readers does not have to be identical with that of the target text Rather, in order to draw deeper comprehension of the text, providing knowledge with different macrostructure would be preferred When an L2 is used for pre-reading activities, however, readers' L2 linguistic ability must be taken into consideration Lower-level L2 readers may not benefit from the pre-reading activities that requires production of sufficient propositions through L2 For them, simple rereading would be more beneficial for the purpose of recalling from the text

Another practical implication of the findings of this study could be found in a situation where learning takes place through reading materials written in a foreign language Such a case is not uncommon in Korean colleges as many college textbooks and reading materials are written in English, and students are often expected to comprehend a content from their reading in English Now suppose there is a professor who wants her/his students to comprehend some concepts from their reading in English, and the professor has two reading materials written in English which contain similar information on the concepts, but written with different macrostructures Should the professor choose one reading material and have the students read it repeatedly, or should s/he ask the students to read both materials once? Which way is better for the students to comprehend the concepts? The results of current study seem to directly contribute to the knowledge needed to answer to a question like this Students' L2 reading proficiency level and the goal of the reading, (i e , reading for memory of text-based data or reading for deeper level comprehension including inference) are two of the important factors that must be considered to answer the question

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APPENDIX

1 Excerpt from the Historical Version Text

No one knows who invented the violin The violin descended from older string instruments imported to the West from the Arab countries during the Middle Ages Among its ancestors were the vielle, which is bottle-shaped and was a favorite of the minstrels The vielle is a Near-Eastern instrument Another ancestor is the rebec, which is a thin, Arabian instrument used as an accompaniment for dancing The musician pushes the rebec string sideways with a fingernail The musician stops pushing when the sound becomes clear The rebec has been used for folk music and still exists today. Rebecs have three strings During the Renaissance, the most popular bowed stringed instrument was the viol One type of viol was held on the knee or between the legs The other type was held in the arms Eventually, due to new developments in violinmaking, the violin became a brilliant solo instrument

The earliest violin makers were Italian At the time, the Italian violinmakers enjoyed a lucrative export business to several countries In fact, the violin was perfected in Italy around 1700 by three great violin makers, one of which was Stradivari Those men made hundreds of beautiful instruments and experimented with factors that cause variation in sound They experimented with sizes, shapes, woods, glues, and varnishes The Italian varnishes of 200 years ago or so, had a great transparency and highly saturated coloration Concerning the wood of the violin, 'figure' refers to patterns in the wood, such as curls Figures tend to run through the wood vertically If the wood is cut in layers, then it is said to be 'cut on the slab' A Stradivari violin called 'The Messiah' has a 2-piece back Curls are not continuous in 2-piece backs The great violin makers usually kept their discoveries a secret It is thought that these instrument makers used calculations based on the Golden Number to design the shape of the violin Methods of design were confined to their workshops Ever since these men died, violin makers have not known exactly how they created their masterpieces For example, Stradivari never repeated a design exactly, but

always introduced small changes in design or material The shape of the violin is not merely ornamental Stradivari made over 1200 instruments and about half that many still exist. It can be said that, if a violin was made by Stradivari, then it improves with age If an old instrument improves with age, then it costs a lot If a violin was made by Stradivari, then it costs a lot of money Whether old violins are better than modern ones is still debated, however Some players still prefer the sound of a well-made modern violin

To judge from the paintings of the 17th century, the body length of the violin is *the same as it is today* The length of the present day violin is about 35 5 centimeters Since the death of Stradivari in 1737, the violin has actually changed very little If a violin bridge is made higher, more brilliant tone is obtained form the strings One change since 1737, was that the bridge was made higher Another change was that the strings have now been made mostly from metal Before the death of Stradivari, they were mostly made from sheep gut Finally, the wood of the bow used to curve away from the string, as in a hunter's bow, but it was modified to curve inward. A bow curving inward gives the player better control

2 Excerpt from the Categorical Version Text

In spite of all the variety, instruments are often grouped into four main categories called woodwinds, brasses, strings, and percussion instruments Woodwinds are among the oldest type of instrument Wood wind is a general term for several types of instruments that produce sound by setting a column of air vibrating Examples of woodwinds are flutes, oboes, and clarinets With *finger holes*, the player varies the length of a column of air Making the column longer causes lower notes to be produced Brass instruments also use a vibrating column of air, but the air column is set in motion when the player blows and buzzes the lips into a cup-shaped mouthpiece. The pitch is varied by lip tension Of interest here is the fourth category, the stringed instruments. The largest group of instruments in an orchestra is the string family The sound of the string instruments is made by the vibrating strings

The violin is part of the family of stringed instruments The violin can be compared with another member of the string family, the viol Viols have six strings, while violins have four Violin necks are smooth, as opposed to the

necks of viols, which are divided into metal frets somewhat like guitars Frets guide the player's finger positions Furthermore, the back of a viol is flat, but the back of a violin is curved. The viols also have a softer, darker sound than the violins

The shape of the violin is either merely ornamental or is functional To judge from the paintings of the 17th century, the body length of the violin is the same as it is today The length of the present-day violin is about 35 5 centimeters. Most instruments were developed by artists and craftsmen The really good violin makers of Europe were all from the same small town The small town, called Cremona, produced three of the most famous violin makers The master violin makers enjoyed a lucrative export business to several countries Although acoustical science cannot explain why an instrument took the form it did, it is possible to account for the properties of an instrument in terms of its construction The violin is made from about seventy pieces of different kinds of wood Wood for instrument making is cut down in the winter, and cut into quarters and dried, either naturally or artificially During the process of drying, the sap evaporates and the gums oxidize Moulds are constructed that help in the formation of the shape of the instrument The mounting of the mould is done by gluing in place the small blocks of wood destined to form the frame of the instrument In a very complex process, the pieces are glued together and then varnished The famous varnishes used 200 years age or so, gave a moist-appearing surface and shimmered in the light The characteristics that make a violin a superior one are still debated by music experts

The strings have about 96 pounds of tension on them and stretch the whole length of the instrument Elastic materials become deformed in time if they are subjected to pressures Violin strings are under pressure due to the act of playing Furthermore, the sound spectrum of a string is modified according to the degree of humidity The timbre is the tone that is distinctive of a musical instrument Humidity alters timbre Humidity also affects the muting coefficient of gut strings A thin, wooden bridge holds up the vibrating part of the strings The bridge has four small grooves in it An ebony fingerboard under the strings on one end, provides a hard surface against which the player presses the strings with the fingers The body of the violin is a hollow box consisting

of an arched belly and an arched back, joined by sides or ribs The edges of the belly and back slightly overhang the ribs. The sound holes of the violin box operate as a complementary acoustical system If you examine a violin's belly, you will see it's made of European spruce If something is made of European spruce, then it's made of soft wood If you examine the back and sides, then you'll see they're made of maple If something is made of maple, then it's made of hard wood The 'grain' of wood refers to the arrangement of direction of fibers of the wood. The grain runs longitudinally

3 Excerpt from the verification test

앞에서 읽은 영어지문에 근거하여 아래의 진술이 맞으면 T, 틀리면 F에 표시하시오

1) 오케스트라에서 가장 큰 그룹은 현악기 그룹 (Strings family)이다 ---T F
   (Verbatim statement)
2) violin과 viol을 비교했을 때 viol이 violin보다 더 부드러운 소리를 낸다 ---T F
   (Paraphrase statement)
3) violin의 배(belly)는 부드러운 나무로 만들어져있다 ---T F
   (Inference statement)

Examples in English
Applicable Language: English
Applicable Level: College

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