# Field-dependence/independence as a Factor Affecting Performance on Listening Comprehension Sub-skills: the Case of Iranian EFL Learners

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*Abstract*—The purpose of this study was to determine if field- dependence/ independence (FD\I) cognitive style was related to the performance of Iranian EFL learners on listening comprehension sub-skills. More specifically, the study attempted to focus on three listening comprehension sub-skills, namely listening for main idea, listening for specifics, and making inference. The choice of these sub-skills was based on Weir' (1993) taxonomy. The study also tried to investigate the effect of FD\I on listening comprehension in general. In the first stage of the study eighty freshmen students majoring in English literature in Isfahan University took the First Certificate of English (FCE) test, the listening section. A homogenized group of fifty two students were selected as the sample group for the study. To determine the degree of FD\I, the Group Embedded Figures Test (GEFT) was run and based on the results of this test the subjects were divided into two groups, FD and FI. The results of the t-tests showed that there was no difference in the performance of FD and FI students on general listening comprehension; furthermore, no difference was observed in the performance of the two groups, FD vs. FI, considering the listening comprehension sub-skills which were the focus of this study.

*Index Terms*—field-dependence, field-independence, listening comprehension sub-skills, listening for specifics, listening for main idea, making inference

# I. INTRODUCTION

Students bring different cognitive styles with them to their learning experience. These styles may play an important factor in how effective they learn the language. Kang (1999) believed that students can enhance their learning power by being aware of style areas in which they feel comfortable and by working on the development of these areas, they can foster their intellectual growth. He also believed that teachers should identify strong style patterns in their classes and devise lesson plans which accommodate individual learning style preferences. Graham (2006) mentioned that all learners face difficulties when listening in target language; nevertheless, the type and the extent of difficulty differ and much listening comprehension research must be conducted to investigate the differences. She also believed that before teachers can hope to improve learners listening skill, they need to be aware of the beliefs learners hold. In her study, she found that many learners see themselves less successful in listening than in other language areas. To be aware of and find about the differences among learners, one may focus on individual differences, one aspect of which is the differences in cognitive styles.

Ngeow (1999) summarizes three main benefits of knowing cognitive styles:

1. Learners who are conscious of their style make better use of their learning opportunities.

2. Learners learn better when they are provided with learning opportunities that enhance and extend their learning preferences.

3. Learners work better with new learning styles when they are given guided opportunities to practice them.

These principles suggest that learning is enhanced and enriched when cognitive styles are properly addressed both before and during instruction.

Chapelle (1995) believed that with the advent of learner-centered approaches, future teachers have the responsibility of training students to be capable of deciding what their best learning path is. They should be ready to assist and guide students through the process of reflecting on how they learn best. "Teachers should make learners aware of the need of strategic, autonomous learning and should train them in the effective use of those strategies" (p. 161).

The purpose of this study is to focus on field-dependence/independence, as one part of cognitive styles, and its effect on listening comprehension sub-skills. Witkin *et al.*, (1962) stated that a field-independent person tends to experience his surrounding analytically, with objects experienced as discrete from their backgrounds, while a field-dependent person tend to experience his surroundings in a global fashion. Based on the specification mentioned here for the two groups, it can be supposed that the FI will be better at hearing specific points while their FD counterpart will be better at general point of a listening text. So, these characteristics of field-dependent/independent learners are the base of making hypotheses in this study.

Considering the aforementioned problems, the present study was an attempt to provide plausible answers to the following research questions:

1. Is there any difference in the performance of field-dependent/independent students on FCE listening test?

2. Is there any difference in the performance of field-dependent/independent students on listening for the main idea?

3. Is there any difference in the performance of field-dependent/independent students on listening for the specifics?

4. Is there any difference in the performance of field-dependent/independent students on making inferences?

Based on the aforementioned research questions and the related literature, the following research hypotheses were made:

1. There is no difference in the performance of field-dependent/independent students on FCE listening test.

2. Field-dependent students outperform field-independent students on listening for main idea.

3. Field-independent students outperform field-dependent students on listening for specifics.

4. There is no difference in the performance of field-dependent/independent students on making inferences.

#### II. REVIEW OF THE LITERATURE

The history of the study of the individual differences in second language learning comes back to the first teacher of a second language in the history who noticed some differences in L2 learning by different learners Gass *et al* .( 1994). This means that the variation in L2 learning was noticed a long time ago. Nevertheless, Stern (1983) refers to the early seventies as the starting point of scientific research into the role of learner factor in SLA. This attention to the learner factor was probably due to the fact that success or failure in L2 learning was consistently observed to be dependent on learner variables, Stern (1983). During the past decades, especially during the seventies and eighties, a large number of studies were conducted by researchers to find out in what ways L2 learning was influenced by learner variables. Krashen (1975), Hansen (1984), Carter (1988), Ellis (1990), Larsen- Freeman (1997)

One of the categories of learner variables in Ellis (1985) classification is cognitive styles. He defined this characteristic as "the manner in which people perceive, recall, and organize information" (p. 114). Brown (2000) defined cognitive styles as the joint function between personality and cognition that helps us learn things in general. Other researchers have defined cognitive styles rather similarly. Ausubel (1968) defined this attribute as "self-consistence and enduring individual differences in cognitive organization and functioning." (p. 170). Aiken (1985) defines cognitive styles as "the strategies or approaches to perceiving, remembering and thinking that a person comes to prefer in attempting to understand and cope with the world (p. 455)." Also, Wenden (1988) has categorized cognitive variables as a part of metacognitive knowledge of learners about their ability to achieve specific learning goals.

Educators and psychologists have identified numerous cognitive styles. Hill (1972), for instance, defined 29 different factors that make up the cognitive style map of a learner. Ausubel (1968) identified at least 18 different types. Stern (1983) stated that such a superfluity may be due to the fact that people's cognitive styles are determined by the way they internalize their total environment, and since the internalization process is not strictly cognitive, we find that physical, affective and cognitive domains merge in cognitive styles.

Among the possible number of cognitive styles, only a few have received the attention of second language researchers. These are ambiguity tolerance, left/right brain functioning, reflectivity/impulsivity and field-dependence/independence Brown (2000). Of these only field-dependence/independence (FD/I) is the focus of this study.

The notion of Field-dependence/independence (FI/D) came out of the cognitive science of literature and referred to the extent to which a person can perceptually separate an object from the surrounding field rather than treating it as embedded within the field Gass and Selinker (1994). Messick (1989) believed that FD\I refers to a consistent way of processing the environment, whether analytically or globally, within the field. Brown (2000) pointed out that the field may be perceptual or it may be more abstract in referring to a set of thoughts, ideas or feelings. He argued that a person may show a tendency to perceive specific relevant subsets more easily than the whole field in a unified way and visa versa. The tendency of distinguishing parts from a whole, a field-independent style, makes it possible for us to concentrate on something, and to analyze separate variables without the contamination of neighboring variables, Brown (2000). A field-dependent style on the other hand, is the tendency to be dependent on the total field such that the parts embedded within the field are not easily perceived, Brown (2000). People perceive the whole picture, the large view, the general configuration of the problem, idea or event. As Gass and Selinker (1994) have put it, the FD people tend to pay great attention to context. Ehrman *et al.*, (2003) mentioned that field-independence (FI) addresses the degree to which an individual focuses on some aspects of experience and separate it from the background and conducts abstract cognitive operations on the materials that receive focus. Saracho (1989) pointed that FD students tend to be more global or undifferentiated while FI students tend to be more articulated. Morgan (1997) believed that when the field is not

clearly organized, individuals who tend to field-independence are relatively likely to impose their own structures on materials whereas a FD often accepts it as it is. Ehrman (1997) indicated that a FI learner is adept at focusing a spotlight on data, distinguishing and focusing deeply on some specific aspects of materials being learnt. Such learner can look at a forest and pick out exactly the kind of tree in which she/he is interested. He believed that since FD is always measured by the test of field-independence, it can safely be defined as the absence of field-independence or awareness of the entire field. In his idea, a field-dependent learner makes a skilled use of floodlight to maintain awareness of the entire forest, registering the moment to moment changes in the environment. The cognitive characteristics of field-dependence/independence have attracted researchers for a long time. It was firstly in 1970s when scientific studies suggested that field-dependence/independence may play a potentially important role in second/foreign language acquisition Tucker, Hamayan & Genesee (1976), Seliger (1977). Based on some researches and the intuitive appeal of a cognitive style relationship with second language acquisition, field-dependence/independence continued to be discussed and included in research throughout 1980s and 1990s.

Genesee and Hamayan (1980), in their study of first grade English speaking students in a French immersion program in Canada, reported significant and positive correlations between field-independence and both general achievement in French and French listening comprehension skills. Chapelle and Roberts (1986) investigated the relationship between two learners' characteristics: ambiguity tolerance and field-independence and adult learners' acquisition of English as a second language in the United States. The results indicated that students who were highly field-independence did better on all of the language measures; moreover, the correlation between field-independence and the end of semester scores were typically stronger than the correlation between field-independence and the beginning semester scores, thus indicating that field-independent students were likely to score higher on the proficiency measures after a semester of L2 study. Jamison (1992) designated a study in which the results showed that field-independence was moderately related to high scores for all of the language measures. The analysis of the results indicated that field-independence was a more important contributor to proficiency rather than reflectivity/impulsivity. Boutin and Chinien (2005) in a quasiexperimental longitudinal study about field-dependence/independence and ICT mediated testing of listening and speaking ability in L2 found that," it appears that there is no interactive effect of learners' cognitive style (FD/I) and ICT mediated testing of listening comprehension and speaking ability" (p. 7). Altun and Cakan (2006) in a study of undergraduate students' achievement, field-dependence/independence cognitive styles and attitudes toward computers found no significant association between academic achievement of students and their cognitive styles and also they found that students' attitudes toward computers seem to be independent of cognitive styles. Vahabi (2006), in a study of the relationship between EFL learners FD/FI cognitive style, proficiency, and communication strategies in writing concluded that there is not any relationship between Iranian English language learners FD/FI cognitive styles and the number and the type of conceptual strategies they use in writing. Salmani (2006), in his study attempted to account for the probable effects of FD/FI cognitive style on subjects' scores on task-based reading comprehension tests. The results showed that cognitive styles imposed their strongest effects on test performance when test takers were most proficient. Also he found that holistic tasks correlated positively with FD style and negatively with FI style; analytic tasks, by way of contrast, correlated positively with FI style and negatively with FD style.

Another factor important in this study is listening comprehension sub-skills. "Listening comprehension is a complex, multidimensional process and a number of theorists have attempted to describe it in terms of taxonomies of sub-skills that underlie the process. However, it should be stressed at the outset that the empirical support for those taxonomies is usually lacking" Buck (2004). While there is no doubt that many of the components are crucial in listening, there is no evidence to suggest that any of these taxonomies constitute a complete unified description of the listening process. Buck (2004) believed that "Collectively they are useful because they tell us what scholars in the field have come to think is important in listening comprehension." (p. 51). As it was mentioned, the taxonomy used for this study was the one developed by Weir (1993). The rationale for the selection of this taxonomy is that the taxonomy is from among communicative taxonomies. Other types of the communicative taxonomies were either too detailed or too general to be used as a base in a research. He divided listening sub-skills as follows:

### Direct meaning comprehension

- 1. Listening for gist
- 2. Listening for main idea(s) or important information; and distinguishing that from supporting detail, or examples
- 3. Listening for specifics, including recall of important details
- 4. Determining a speaker's attitude or intention towards a listener or a topic
- Inferred meaning comprehension
- 1. Making inferences and deductions
- 2. Relating utterances to their social and situational contexts
- 3. Recognizing the communicative function of utterances
- 4. Deducing the meaning of unfamiliar lexical items from context
- Contributory meaning comprehension
- 1. Understanding phonological features
- 2. Understanding grammatical notions such as comparison, cause, result, degree, etc.
- 3. Understanding discourse markers

- 4. Understanding the main syntactic structure of clauses or idea units
- 5. Understanding cohesion, especially reference
- 6. Understanding lexical cohesion, especially lexical set membership and collocations
- 7. Understanding lexis
- *Listening and taking notes*
- 1. Ability to extract salient points to summarize the text
- 2. Ability to select relevant key points

Since it was not possible to deal with all the sub-skills in just one study, three of them namely listening for main idea, listening for specifics, and making inferences were selected for the purpose of the present study. The reason for the selection of these three sub-skills not others was that the difference between the FD/I is in dealing with the whole, main idea, or the specifics, specific questions. Also considering inference, which in the idea of the researcher and considering the definitions provided by the scholars is the ability in using available information to guess the meaning of the new items, predict outcomes or fill in missing information, it would not make a difference for the two groups since both are equipped with tools to use the information in a text, whether analytically or holistically.

#### III. METHODOLOGY

80 freshmen students, both male and female with the mean age of 22, majoring in English literature in Esfahan University who had passed a listening comprehension course were selected. They were familiar with listening skill and at the time of the research they were passing their second listening course. All 80 students took part in the FCE test. But 52 homogenized were chosen as the participants of the study. The reason for having a homogenized group is to control for the effect of the differences in the performance due to different proficiency levels. In other words, proficiency level was controlled to just observe the effects of FD/I. To find the homogenized group, the mean score of all those who took the tests was calculated and those who scored above the mean participated in the study.

The instruments used for the present study were:

1. Buck (2004) wrote that "The First Certificate of English (FCE) is published by the University of Cambridge Local Examination Syndicate (UCLES). It is a typical representative of the British language-testing tradition. It is a general English test, and 80 percent of the test takers take the FCE at the end of a course in English study. The test has come to define the English curriculum for a considerable number of English language schools world-wide" (p. 223). The June 2002 version of this test was used in this research. Of the total 30 questions, five questions dealt with main idea, 17 questions dealt with specifics, and eight questions were testing inference sub-skill.

The Group Embedded Figures Test (GEFT) was used to identify subjects' FD/FI cognitive styles. The GEFT instrument has been developed by Oltman, Raskin, and Witkin (1971). They reported a Spearman-Brown reliability coefficient of 0.82 for their instrument. The GEFT instrument contains three sections with 25 complex figures from which participants are asked to identify eight simple forms (labeled A to H). Section one of GEFT includes seven complex figures and sections two and three include nine complex figures each. The respondents are asked to find the simple forms (A to H) in the complex figures, and to trace them in pencil directly over the lines of the complex figures. The simple forms are present in the complex figures in the same size, the same proportions, and facing in the same direction as when they appear alone. The total number of questions or better to say figures were 18 since the seven beginning figures were for the purpose of practice and familiarizing students with the test. So the maximum score would be 18. The criterion for the dichotomization of the participants into either FD or FI was 11. Above 11 were FI students and below it were FD students.

2. To collect the data, the freshmen students majoring in English literature in Isfahan University were selected as the participants. After the selection of the participants, two tests were administered. First, the listening comprehension section of the FCE test, version June 2002, the time of the test was fixed and determined in the test itself so no more time was devoted to the test. The second stage was administration of the Group Embedded Figures Test (GEFT). This test has 14 pages and the two first pages are for the test instruction; for a better and easier understanding of the test procedure, the first two instruction pages were translated into Persian, the subjects' first language. The time devoted to the test was 15 minutes which was again fixed. The scoring procedure was the same for the two tests. For every correct answer, they got one point. There was no penalty for the wrong answers.

To analyze the data, four independent samples t-tests were run to find the answer to the research questions.

#### IV. FINDINGS

To find the answer to the first question, an independent sample t-test was run.

In the independent-samples t-test output box, the results of Levene's test for the equality of variances are presented (table 1). Levene's test shows whether the variance of scores for the two groups (FI and FD) is the same. Because the Sig. value of Levene's test is .337 which is larger than .05, the first line of the table which refers to Equal variances assumed should be considered. Under the section labeled t-test for equality of means, the column labeled Sig. (2-tailed) shows the value of .165. It means that there was no significant difference in the performance of either FD or FI groups

considering FCE listening comprehension scores. The magnitude of the differences in the means was very small (Eta squared=.03). So the first research hypothesis was confirmed.

 TABLE 1:

 INDEPENDENT SAMPLE T-TEST FOR FEC TEST

		Levene's Test for Equality of Variances		t-test for Equality of Means								
		F	Sig.	t	df	Sig. (2- tailed)	Mean Differen ce	Std. Error Differe nce	95% Conf Interval of Difference Lower	idence the Upper		
scores	Equal variances assumed Equal variances not assumed	.941	.337	1.410 1.401	50 46.149	.165 .168	1.09595 1.09595	.77738 .78219	46545 47837	2.65736 2.67028		

To confirm or reject the second hypothesis, another t-test was used.

In the independent-samples t-test output box, the result of Levene's test is .979, so the Sig. (2-tailed) for equal variances which is .471, should be taken into account. The results revealed that there was no significant difference in the performance of either FD or FI groups considering main idea. The magnitude of the differences in the means was very small (Eta squared=.01). So the second research hypothesis was rejected.

TABLE 2:

INDEPENDENT SAMPLE T-TEST FOR LISTENING FOR MAIN IDEA											
Levene's Test for Equality of Variances			t-test for Equality of Means								
					Sig. (2- tailed	Mean Differen	Std. Error Differen	95% Confid Interval of t Difference	lence he		
		F	Sig.	t	df	)	ce	ce	Lower	Upper	
mainidea	Equal variances assumed	.001	.979	.726	50	.471	4.66267	6.42381	-8.23993	17.56527	
	Equal variances not assumed			.732	48.590	.468	4.66267	6.37364	-8.14837	17.47371	

The results of the t-test for the third hypothesis revealed that there was no significant difference in the performance of either FD or FI groups considering specifics (table 3), since Sig value of the Levene's test was .413 and the Sig. (2-tailed) for equal variances assumed was .250. The magnitude of the differences in the means was very small (Eta squared=.02). So the third research hypothesis was rejected.

TABLE 3:	
INDEPENDENT SAMPLE T-TEST FOR LISTENING FOR SPI	ECIFICS

		Levene' Equality Varianc	s Test for y of ees	t-test for	t-test for Equality of Means								
		F	Sig.	t	df	Sig. (2- tailed)	Mean Differen ce	Std. Error Difference	95% Confidence Interval of the Difference Lower Upper				
details	Equal variances assumed	.683	.413	1.165	50	.250	4.60510	3.95291	-3.33455	12.54474			
	Equal variances not assumed			1.185	49.587	.242	4.60510	3.88634	-3.20246	12.41265			

Considering the last research hypothesis, since the Sig value of the Levene's test, which is .571, is larger than .05, the results on table 4 revealed that there was no significant difference in the performance of the two groups considering making inference. The magnitude of the differences in the means was very small (Eta squared=.03). So the forth research hypothesis was confirmed.

TABLE 4: INDEPENDENT SAMPLE T-TEST FOR MAKING INFERENCES

		Levene' for Equ	s Test ality									
of Variances			t-test for Equality of Means									
						Sig. (2-	Mean Differen	Std. Error Differenc	95% Confidence Interval of the Difference			
		F	Sig.	t	df	tailed)	ce	e	Lower	Upper		
inference	Equal variances assumed	.326	.571	1.315	50	.195	5.97301	4.54251	-3.15089	15.09692		
	Equal variances not assumed			1.289	43.060	.204	5.97301	4.63360	-3.37115	15.31717		

## V. DISCUSSION

The first research question addressed the differences in the performance of FD/I students on FCE listening test. In response to this question, t-test was used to analyze the data. The results showed no difference in the performance of FD/I students on the FCE listening test (see table 1).

The finding of this research question is in line with Boutin and Chinien (2005). In a quasi-experimental longitudinal study about field-dependence/independence and ICT mediated testing of listening and speaking ability in L2, they found that," it appears that there is no interactive effect of learners' cognitive style (FD/I) and ICT mediated testing of listening comprehension and speaking ability" (p. 7).

Salamian (2002) on a study of the relationship between FD/I and performance on listening comprehension global and local questions found no relationship between FD/I and the students' performance on the listening test.

Seliger (1977) on the study of interaction patterns and L2 competence found no significant correlation between FD/I and 7<sup>th</sup> grade French learners listening comprehension ability. Also Bialystok and Flöhlich (1978) in the study of variables affecting classroom achievement in second language learning found no significant correlation between FD/I and French high school students listening ability. The difference may be due to the differences between EFL and ESL students.

Contrary to the findings of the aforementioned researchers and also the findings of this study, Chapelle & Roberts (1986) in a study of ambiguity tolerance and field-independence as predictors of English proficiency found a significant correlation (r=.73) between TOEFL listening test and college ESL students who were FI. In line with the finding of Chapelle & Roberts (1986), Hwang (1997) in the study of FI and English listening comprehension of Taiwanese students, found a significant positive relationship between listening comprehension and FI.

The discussion now turns to the second question focusing on the differences between the performance of FD/I students on the listening for the main idea.

Saracho (1989) believed that FD students tend to be more global or undifferentiated while FI students tend to be more articulated.

Brown (2000) stated that FD style is the tendency to be dependent on the total field so that the parts embedded or hidden in the field are not easily perceived. So the total field is perceived as the unified whole. He also believed that FD individuals are able to perceive the whole picture, the large view, or the general configuration of the problem or event.

Based on the literature mentioned, the research hypothesis was that FD students outperform FI counterparts on listening for main idea. But the results of t-test showed no difference in the performance of the two groups on listening for the main idea (see table 2).

The finding of the second question may be in line with Olson (1984) on the study of interaction of cognitive style and auditory learning. He concluded that FD is not significantly related to listening comprehension although FD subjects generally scored lower than FI subjects. Salamian (2002) in the study of the relationship between FD/I and performance on global and local questions found no significant relationship between FD/I and the students performance on global questions.

The third research question aimed to uncover the differences between FD/I students on listening for specifics.

Messick (1976) stated that the traits associated with FI would enhance listening comprehension. The hypothesis for this research question was that FI students outperform FD students on listening for specifics. The rationale for stating this hypothesis was, as Messick (1976) stated, that FI students are likely to approach the environment in analytical as opposed to global terms. This means that FI persons have tendency to perceive figures as discrete from the backgrounds and the facility in differentiating objects from the embedded context.

Contrary to the available literature, the answer to this question was negative. In other words, there was no significant difference in the performance of FD/I students on listening for specifics (see table 3). Maybe the theories of FD/I and the specifications proposed for each group need more research.

The final research question of this study tried to find whether there is any difference in the performance of FD/I students on making inferences.

Brown (2000) defined inference as the ability in using available information to guess the meaning of the new items, predict outcomes or fill in missing information.

In the same way, Chastain (1988) defined inferencing as the process of arriving at the meaning on the basis of the context; furthermore, this is an especially valuable skill for language learners to develop, and language teachers should include inferencing exercises and activities in their classes. Moreover, Brown and Yule (1983) described inference as "the process which the reader/hearer must go through to get from the literal meaning of what is written/said to what writer/speaker intended to convey" (p. 256).

Based on the definitions provided above, inferencing is using context to find the intention of the speaker or writer. Based on this idea, the hypothesis was that there is no difference in the performance of FD/I students considering making inferences. The results of the t-test confirmed the hypothesis (see table 4). In other words, both groups performed the same on inferencing since both groups could use the context whether analytically or globally to make inferences.

#### VI. CONCLUSIONS

In sum, the results of the present study offered that field-dependence/independence did not affect listening comprehension in general and listening comprehension sub-skills in special.

The results seem to be against Brown (2000)-cited in Salmani (2006)-ideas that field-dependence is a cognitive style in which an individual tends to look at the whole of the learning task which contains many items. The FD individuals have difficulty studying a particular item when it occurs within the field of other items. Field-independence, on the other hand, refers to a cognitive style in which an individual is able to identify and focus on particular items or events and is not discredited by other items in the background. The results also seem to be against Witkin (1977) ideas that consider FI learners as analytical versus global FD learners.

In this study, the main idea sub-skill needs a global understanding of the text or what called by Brown (2000) and Witkin (1977) field or event. So based on their ideas FD learners should be better at global or wholistic abilities and this may help them to deal with the main idea sub-skill of listening comprehension better than FI students, but as some other researchers mentioned, these definitions and classifications of the specifications of each group are theories and need more experimental and practical research . Morgan (1997), Ehrman (1997). Their claims were rejected in this study and no difference was observed between the two groups. The same was true about listening for specifics. Based on the claims proposed by Witkin (1977), FI learners are analytic and highly detailed. So, they might be able to perform better on listening for specifics sub-skill. It seems that more research should be done to confirm or reject the theories.

It is worth mentioning that these findings could be perceived in the light of participants seemingly high level of listening ability since the participants were all those who got the highest score on listening test. In other words, proficiency may affect their performance; a high level of proficiency is a tool that helps learners to compensate for the cognitive differences exists.

On the whole, the results were consistent with Salamian (2002) and Boutin and Chinien (2005) in such a way that there is no interactive effect of learners cognitive styles (FD/I) and listening comprehension.

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