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Morphological Awareness and Advanced EFL Learners' Listening Comprehension

by

Xu Bian

Dissertation

Presented to the Faculty of the

Graduate School of Education at

Seattle Pacific University

In Partial Fulfillment of the Requirements for the

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Seattle Pacific University

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Morphological Awareness and Advanced EFL Learners' Listening Comprehension

by

Xu Bian

A dissertation submitted in partial fulfillment

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Approved by _____ William Nagy _____

(Chairperson of the Dissertation Committee)

_____ Scott Beers _____

(Committee Member)

_____ Nyaradzo Mvududu _____

(Committee Member)

Program Authorized to Offer Degree ____ Doctor of Philosophy _____

Date _____ October 17th, 2017 _____

_____ Rick Eigenbrood _____

(Dean, School of Education)

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Date 12/20/2017

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Seattle Pacific University

Abstract

Morphological Awareness and Advanced EFL Learners' Listening Comprehension

by

Xu Bian

Chairperson of Dissertation Committee:

William Nagy

This study explored the relationship between morphological awareness and advanced EFL learners' listening comprehension by deconstructing three multi-dimension constructs, morphological awareness, vocabulary knowledge and listening comprehension. The variables under morphological awareness were compounding and derivational morphology; vocabulary knowledge included both reading and listening vocabulary; listening comprehension was assessed by two different listening tasks whose aural texts and response formats were interviews and multiple choices, and one mini lecture and the gap-filling. Participants were 152 third-year English-majors in two universities in China. The main findings were (1) morphological awareness was a significant predictor of listening comprehension when the latter was measured by the gap-filling task, but not by the other task, when reading and listening vocabulary were controlled for. (2) Finding One was true for the overall measure of morphological awareness, and also for derivational awareness; but not for compound awareness. (3) In a parallel analysis predicting reading comprehension, compound awareness, but not derivational awareness, was a significant predictor. (4) Morphological awareness was more strongly correlated with reading vocabulary than listening vocabulary. Significance

of these findings to research and the need for additional morphological instruction within educational settings are discussed.

Chapter One

Introduction

Listening comprehension research is fairly young. Scholars have been striving to define it and build the theoretical framework (Bodie, Janusik, & Valikoski, 2008).

Listening has been considered as a fundamental communicative competency since Ralph G. Nichols's dissertation (1948). Subsequently, research in this field has been conducted in contexts of the first language and second/foreign language. The foreign language listening comprehension is the focus of the current study.

Listening comprehension is an active process of constructing meaning. Buck (2001) stated that linguistic knowledge is one of the three critical factors contributing to listening comprehension. Flowerdew and Miller (2005) detailed linguistic variables, claiming that they entail knowledge of the sound system, grammar, vocabulary, and contextual influences on interpretation of the second language. The literature in the field of listening comprehension has shown that vocabulary and grammar have been the two linguistic components dominating the prior research. The practice and available understanding on linguistic factors provide a limited view about their contributions to the process of comprehending the spoken input because of the absence of other linguistic variables. It is necessary to include linguistic components related to comprehension in the listening research so that it could broaden the understanding of the covert process.

Listening and reading comprehension are twins having both commonalities and distinctiveness. Reading research has advanced rapidly and garnered many scholars' attention, so it may shed light on listening research. The past three decades have witnessed increasing research concerning the relationship between English morphological

awareness (MA) and literacy development of both native English speakers and varieties of English learners. A number of studies not only have confirmed the strong link between MA and literacy skills but also have provided further evidence supporting that MA is a predictor of literacy performance such as spelling, vocabulary knowledge, and reading comprehension. A fact worth noting is that prior research has tapped into the issue with written as opposed to spoken texts. Thereby, the role of MA in listening comprehension remains arguably the least well understood and researched.

“Listening comprehension is now becoming a more prominent area in L2 teaching and testing” (Matthews & Cheng, 2015, p. 1), so scholars have directed efforts to deepening understandings about components underlying English as a second or foreign language (ESL/EFL) learners’ comprehension of aural text. Andringeuning, Olsthoorn, van Beuning, Schoonen, and Hulstijn (2012) reported that to non-native speakers listening comprehension was a function of knowledge and reasoning ability. Knowledge in their research referred to linguistic knowledge, but they just measured participants’ vocabulary knowledge. Morphemes, the smallest meaningful units, have been less studied in listening comprehension research given that they have been found to be involved in a substantial proportion of the words in English whose meanings can be induced from parts (Nagy & Anderson, 1984). Chomsky and Halle (1968) pointed out that morphemes provide clues for word pronunciation and semantic relationships. Thus, morphological knowledge is applied to the understanding and use of oral and written language (see Chomsky, 1970). These raised a question about how MA functions in listening comprehension of EFL/ESL learners, which has not been addressed thoroughly by scholars in the field of either morphology or L2 listening comprehension.

As is known, China is home to the largest number of English learners. English is a required subject in elementary, secondary and post-secondary education in China despite the fact that the emphasis on English education emerged in China in the late 1970s. Additionally, English is one of the high-stakes tests and the listening section is included in the majority of standardized English exams. Listening comprehension is the most challenging to EFL learners due to the limited exposure to the target language. Previous foreign language listening research has identified some of the difficulties confronting learners and examined strategies listener utilized in the comprehension process. However, little is known about why comprehension breaks down and how listener arrived at the right answer (Vandergrift, 2007). Hence, Vandergrift suggested that listening processes should be one of the future research's foci. Investigating Chinese EFL learners' listening process would add insights to the field.

The present study examined the role of MA in the listening comprehension of Chinese advanced EFL learners. I hypothesized that MA would be a predictor to advanced ESL learners' listening skill. Because of the multi-facets of morphology, this study took a close look at the impact of derivational and compounding morphology on EFL learners' listening comprehension. Meanwhile, in the context of Chinese advanced EFL learners, two types of questions and response formats are usually used to assess their listening skill, interviews and the multiple-choice, and one mini lecture and the gap-filling, so another interest of this study was MA's influence on learners' performance on the two different tasks.

Chapter Two

Literature Review

Overview of MA and Reading Comprehension

Literacy is a multi-layered concept. The National Assessment of Adult Literacy (NAAL) has defined it from two perspectives. The conceptual definition is that “literacy is the ability to use printed and written information to function in society, to achieve one’s goals, and to develop one’s knowledge and potential.” The operational definition says that “successful use of printed material is a product of two classes of skills—word-level reading skills and higher level literacy skills” (https://nces.ed.gov/naal/fr_definition.asp). The two definitions highlight the salience of reading ability in literacy. Reading skills involve the ability to understand spoken words, decode written words, and understand texts. Its development is associated with a range of complex language underpinnings including phonology, orthography, semantics, syntax and morphology, all of which provide a necessary platform for reading fluency and comprehension.

Recently, an increasing body of research in the field of morphological awareness has provided evidence supporting the fact that morphological awareness is contributory to literacy development, especially reading comprehension. Morphological awareness is the ability to reflect on and manipulate morphemes, that is, the ability to chunk a word into meaningful parts which carry information about the whole word (Bowers, Kirby, & Deacon, 2010; Nagy, Carlisle, & Goodwin, 2014).

Reading in English requires the knowledge of words and grammar. Morphemes, the smallest meaningful units in a word, play a critical role in both words and grammar

because their meanings do not change regardless of its irregular pronunciation. For example, -ion is a noun suffix which goes after a verb and it results in the change of pronunciation sometimes (i.e., decide and decision). Another suffix, -ed, is typically a symbol of simple past while following a verb although its pronunciation depends on the last letter of a word. Morphological knowledge provides readers with a tool to overcome the hardships involved in reading and caused by their limited vocabulary and grammar knowledge. Findings from an increasing body of research conducted on English native speakers (Nagy, Berninger, & Abbott, 2006; Nunes, Bryant, & Barros, 2012), English language learners (ELL) (Deacon & Kirby, 2004; Foorman, Petscher, & Bishop, 2012; Goodwin, Huggins, Carlo, August, & Calderon, 2013) and English as a second language learners (ESL) (Jeon, 2011) has provided evidence supporting the fact that morphological awareness outperforms the other factors in predicting one's passage reading comprehension. The contributions morphological awareness makes to reading comprehension can be illustrated on three aspects—word recognition, syntax and vocabulary.

Word recognition/ word reading. English orthography entails both phonemic and morphemic rules. Every English word could be chunked into phonemes and morphemes. Knowledge on both of them is beneficiary to word reading. The literature in this area has shown that morphological knowledge makes a significant unique and independent contribution to word reading, which includes word recognition, word pronunciation, word decoding, and word identification (Nunes et al., 2012), if words are multi-morphemic (Fowler & Liberman, 1995; Nagy et al., 2006). Some characteristics of English account for the finding. First, it is estimated that over 60% of printed words in

school textbooks are morphologically complex so that the acquaintance with various morphemes enables learners to recognize the novel ones (Nagy & Anderson, 1984). Second, Fowler and Liberman stated that structures in many English words are beyond the phonemic rules, but rather are sensible from a morphological perspective. For example, the pronunciation of the plural morpheme –s depends on the ending of a noun and could be /s/, /z/, /ɪs/ and so on. Yet its morphological meaning does not change in any word. The prior research conducted on different types of English learners has provided rich evidence supporting the claim.

Evidence from research with native speakers. Studies regarding the relation of morphological knowledge and word reading date back to the 1980s. The consensus achieved by researchers prior to the year of 2000 is that morphological knowledge other than phonological and orthographical knowledge plays a role in word reading (Carlisle, 1995; Fowler & Liberman, 1995; Mahony, 1994). The research conducted in the following years has deepened and expanded the finding. First, the strong link between morphological knowledge and word reading has been found in student populations ranging from early elementary years through high school years. Carlisle and Stone (2005) documented the significant contribution of morphemic structure to the accuracy of elementary students' reading low-frequency derived words, and their correlation ranges from .48-.74. Findings showed that the base frequency and syllables jointly explained 53% of the variance in word-reading accuracy. Results from Wolter, Wood and D'zatko's (2009) study indicated that elementary students' performance on an oral morphological production task accounted for 9.6% significant and unique variance in word reading. Nagy et al. (2006) found the strong link between word reading and morphological

awareness in the 4th – 9th graders. Such a relation exists among high schoolers and the correlation between high schoolers' MA and scores of the reading test including both vocabulary and passage comprehension was above .50 (Mahony, 1994). The wide range of ages of subjects involved in the past studies highlights the salience of morphological knowledge in word reading. Second, the significance of morphological knowledge is further confirmed in research employing different designs. The fourth, sixth, and eighth graders' real word reading and pseudo word reading and their morphological knowledge were significantly correlated, $r = .727, p < .01$ and $r = .548, p < .01$, after researchers controlled for phonological awareness, naming speed, and orthographic knowledge (Roman, Kirby, Parrila, Wade-Woolley, & Deacon, 2009). Likewise, the significant relationship still emerged when Clin, Wade-Woolley, and Heggie (2009) controlled for phonological awareness, prosodic sensitivity, working memory, general language ability, and nonverbal intelligence. Furthermore, Nagy et al. (2006) provided more evidence supporting the unique contribution of morphological knowledge to word reading by using the structural equation modeling. The path weight of morphological knowledge to word reading of every grade involved in the study was significant. The prior research points out the fact that morphological knowledge, independent of the other related factors, is beneficiary to word reading ability of participants from K12 through colleges.

Evidence from ELL research. The limited research concerning the role morphological knowledge plays in ELLs' word reading has indicated that MA accounts for a unique variance in learners' word reading performance. Ramirez, Chen, Geva, and Kiefer (2010) located the contribution English morphological awareness made to Spanish-speaking English language learners after controlling for reading related variables

and the two English morphological awareness instruments in combination explained about 6% of the unique variance in English word reading. It is aligned with the finding from Siegel's (2008) study, wherein the author reported no differences between the ELL and the English native students on morphological knowledge contribution to word reading skills.

Evidence from ESL research. The contribution of morphological knowledge to word reading has not been the focus in the increasing corpus of research conducted on ESL learners, which has primarily investigated the relation between MA and reading comprehension. Word reading as a variable, however, is included and measured in some studies, so there is evidence supporting that MA is a contributor to ESLs' word reading. For instance, Wang, Cheng, and Chen's (2006) study has documented the strong link between ESL's word reading and their morphological awareness although their study examines contribution of morphological awareness to Chinese-English biliteracy acquisition. The correlation between derivational morphology and English word reading was .74 ($p < 0.001$). Likewise, Jeon (2011) reported the robust link between morphological knowledge and ESLs' pseudo-word reading albeit the study was aimed to examine contribution of MA to second-language reading comprehension. The correlations between two morphological awareness tasks and word reading were .371 and .297 ($p < 0.01$).

In sum, scholars in the field have conducted research with varieties of learners at a wide range of ages. Their findings in general have suggested that the contribution of morphological awareness to word reading and recognition performance is universal among learners regardless of their age and English proficiency.

Syntax. Information contained in derivational suffixes is multi-layered, such as grammatical, lexical, and syntactic. For instance, -ion indicates that the derived word is a noun; it denotes action or condition; it can be either the subject or the object in a sentence. It used to be controversial whether derivational suffixes play an independent role in reading. Tyler and Nagy (1990) addressed the issue and provided evidence supporting that syntactic information entailed in derivational suffixes was deployed by readers in their reading comprehension. It is either facilitative or inhibitive to reading. Compared with lexical information provided by derivational syntaxes, syntactical information was not fully used by readers. High-ability readers outperformed lower-ability readers on using syntactic information. The syntactic function of morphological knowledge is noteworthy. Subsequent research (e.g., Carlisle, 2000; Nagy, Diakidoy, & Anderson, 1993) has shown the constant growth of awareness of syntactic information in derivatives is evident in mid-elementary graders upward. Participants' failure to use syntactic information leads to poor performance on sentence comprehension. The study by Tong, Deacon, and Cain (2013) has provided further evidence supporting that morphological awareness and syntactic awareness were moderately correlated and the correlations between two morphological tasks and one syntactic task were .49 and .55 ($p < .0001$). In addition, all three measures were either moderately or strongly linked with reading comprehension, .42, .59, .67 ($p < .0001$). The prior research has confirmed the relation of syntactic awareness and morphological awareness and their contribution to literacy.

Vocabulary. An overview of literature pertinent to the relation between knowledge of morphology and vocabulary indicates a robust link between them. The

view widely held by the majority of scholars in this area is that morphological knowledge and vocabulary knowledge are probably distinct yet highly correlated constructs (Tighe & Schatschneider, 2015). Morphological knowledge should facilitate the process of inferring and retrieving meanings of multi-morphemic words. It is estimated that over 60% of unfamiliar words students encounter in texts from grades 3 through 9 can be chunked into morphemes that give clues about the meaning of the whole word (Nagy & Anderson, 1984). Findings from Anglin's (1993) thorough analysis concerning how elementary students determined the meanings of derived words demonstrate that morphological problem solving is employed more extensively and effectively by fifth graders than third and first graders. Prior research (e.g., Carlisle & Fleming, 2003; Pacheco & Goodwin, 2013; Tyler & Nagy, 1990) has documented that root word and affix knowledge contributes to knowledge of the definitions of larger morphologically complex words. Another piece of evidence comes from Sandra's (1994) study, which drew our attention to a view shared by both psychologists and linguists, that is, economy of representation. Word structure makes it easier to access meanings of words and withdraw words from memory although the structure of some derivational words and compounds may not facilitate the process. Studies conducted on varieties of English learners provide a panoramic view on the issue.

Evidence from research with native speakers. Morphological research carried out among English native speakers has been taking the lead in this field. An increasing body of research has reported the significant contribution of morphological knowledge to vocabulary growth and knowledge. Results from Carlisle's (2000) study demonstrated that performance on morphological awareness tasks accounted for 41% of the variance in

third-grade vocabulary scores and 53% of the variance in fifth-grade vocabulary scores. The subsequent study by Carlisle and Fleming (2003) showed that third-grade morphological knowledge explained 41% of the variance in fifth-grade reading vocabulary scores, but such contribution was absent in scores of first-grade morphological knowledge and third-grade vocabulary. Thereafter, McBride-Chang, Wagner, Muse, Chow, and Shu (2005) found that morphological structure awareness and morpheme identification together predicted an additional unique 10% of variance in kindergarten and second-grade vocabulary. This evidence supports the strong association between MA and vocabulary development. Such a moderate and large correlation exists in Nagy et al.'s (2006) study although it dwindled in magnitude by grade level.

Evidence from ELL research. Researchers have been interested in whether the relation of morphological knowledge and vocabulary discussed above can be evidenced by ELL students since their discovery was chiefly achieved among English native speakers. The limited research has been mainly conducted on Spanish-speaking ELLs (e.g., Goodwin, 2011; Kieffer & Lesaux, 2012). Goodwin documented that the correlation between vocabulary and four MA tasks ranged from .41--.57. Additionally, she reported that morphological awareness made direct contribution to oral vocabulary knowledge for fifth-graders ($r = .81, p < .001$). The longitudinal study by Kieffer and Lesaux suggested the strong association of .67 between rapid growth in derivational morphological awareness and rapid growth in vocabulary. Findings from the ELL research are consistent with those from the English native speakers counterpart, so the unique contribution of morphological knowledge to vocabulary is solidified.

Evidence from ESL research. The increasing body of research concerning the relation of morphological and vocabulary knowledge conducted on English native speakers and ELLs leads to the upsurge of interest in ESL learners. Learning English is challenging to the majority of ESL students and one of the hardships is the large amount of vocabulary required in listening, speaking, reading, and writing. Studies consistently show moderate to large contribution of morphological knowledge to vocabulary. For instance, Schmitt and Meara (1997) empirically demonstrated the correlation between word association knowledge and suffix knowledge for the first time in a second language context by observing Japanese young adult ESL learners, which was in the .3--.5 range ($p < .05$). Additionally, findings in their study have indicated the overall link of the two factors with participants' vocabulary size is significant and the highest correlation reaches .62 ($p < 0.05$). Jeon's (2011) study investigating the relationship between Korean tenth-graders' morphological awareness and reading comprehension showed the two morphological tasks correlated with vocabulary knowledge at .537 and .629 ($p < .01$). Thereafter, Zhang and Koda's (2012) study provided evidence supporting the robust correlation between MA and vocabulary size and depth, .429 and .326 ($p < .001$), and the unique contribution MA made to vocabulary knowledge. Their subsequent study (2013) conducted on young Chinese EFL students further confirms the robust link between two kinds of morphological relation--inflection and derivation--and vocabulary knowledge, .394 and .407 ($p < .001$).

Overall, the extensive research tackling morphological awareness of different types of learners and their literacy proficiency confirms the contribution of MA by employing various designs and analysis approaches. The wide range of participants' age

conveys a two-fold message. On the one hand, facets of MA impacting learners' literacy development vary from age to age; on the other hand, the association between MA and literacy trumps the factor age.

The Relationship of Listening Comprehension and Reading Comprehension

The relationship between listening comprehension and reading comprehension ability has garnered an increasing amount of attention from literacy scholars in the past over four decades. Sticht and James (1984) thoroughly discussed two types of transfer, oracy to literacy transfer and literacy to oracy transfer. The former stated that people develop their reading skills by applying what they have already heard to the written text; the latter that new vocabulary and conceptual knowledge learned by reading are transferred to auditing and speaking. The listening and reading processes are distinct because of the different input modalities. Yet the commonalities between them cannot be denied, that is, both share the same lexicon and syntax. The relationship between them, becomes complicated. In general, it is acknowledged that listening proficiency is a predictor of reading comprehension ability in spite of nuanced findings from the prior research (e.g., Chen & Vellutino, 1997; Hagtvet, 2003; Hoover & Gough, 1990; Joshi, Tao, Aaron, & Quiroz, 2012; Kendeou, van den Broek, White, & Lynch, 2009; Kim, Park, & Park, 2015; Song, 2008).

How listening proficiency contributes to reading comprehension. The simple view of reading (SVR) proposed by Hoover and Gough (1990) has been a prominent theory addressing the relationship between reading and listening. An increasing body of research, subsequently, expands the knowledge and perception pertaining to the two skills. An overview of the previous research gives us a big picture.

The SVR formula involving three components, reading, decoding, and listening, is expressed as $\text{Reading} = \text{Decoding} * \text{Linguistic comprehension}$.

Linguistic comprehension is the ability to take lexical information and derive sentence and discourse interpretations. Its measure must assess the ability to understand language (e.g., by assessing the ability to answer questions about the contents of a listened to narrative). (Hoover and Gough, 1990, p. 131).

Hoover and Gough's (1990) study provided evidence supporting the characterization of skill in reading as the product of skill in decoding and linguistic comprehension. They assessed three hypotheses, which pertain to the contribution of the linear combination of decoding and listening comprehension to reading performance, the correlations between decoding and listening comprehension, and the pattern of linear relationships between listening and reading comprehension. The findings regarding the third prediction indicated a positive relationship between listening comprehension and reading comprehension at the caveat of a high level of decoding skill. Empirical research (e.g., Gernsbacher, Varner, & Faust, 1990; Palmer, MacLeod, Hunt, & Davidson, 1985) in this field has manifested the significant correlation between comprehension of written text and spoken language among college students, .92 and .82 in the two studies respectively. The finding from the research conducted on English Spanish bilingual children has surfaced in the research carried out among children speaking various native languages, such as Spanish, Chinese, Norwegian, Swedish, French and so on (Joshi et al., 2012). Chen and Vellutino (1997), nevertheless, modified the model to $R = D + L + D*L$. They argued that decoding and language comprehension would tend to combine additively and nonadditively in predicting reading comprehension, whereas the original model stresses

that decoding and language comprehension combines nonadditively. Results from their study indicated that the revised model could provide better account of reading ability than did the original model. The difference between the two models does not deny the robust correlation between listening and reading, however. A few studies have corroborated the strong interdependence between listening and reading comprehension by investigating English native speaking children, Korean speaking children, and English as a second language learners (Hagtvet, 2003; Kendeou et al., 2009; Kim et al., 2015; Song, 2008; Verhoeven & Leeuwe, 2012). The previous research has confirmed the equal validity of the Simple View of Reading for native speakers and non-native speakers. In the meantime, Verhoeven and Leeuwe pointed out that the reciprocal relationship between listening and reading in non-native speakers is not as strong as in native speakers. The reciprocity of the relationship between listening comprehension and reading comprehension emerged in the group of native speakers, but results from the group of non-native speakers implied that reading comprehension development was more strictly dependent on their oral language proficiency.

How listening comprehension differs from reading comprehension. Given the fact that the distinction has not been clear-cut, scholars all acknowledge the differences between listening proficiency and reading comprehension while stressing the similarities. On the one hand, comprehension is centrally determined function operating independent of the mode of presentation, so some scholars believe that overlap in the comprehension process minimalizes the difference between listening and reading comprehension. On the other hand, some differences between the two skills are obvious. For example, the suprasegmentals represented in speech are absent in written language; the previous input

is always available in written language rather than in spoken language (Hoover & Gough, 1990); written language does not involve intonation, stress and pause revealed in oral language (Sticht & James, 1984). Another difference relevant to the present study is that morphological relationships are often represented more clearly in orthography than in phonology. Subskills underlying the listening and reading processes, thus, should be different despite the overlap of some cognitive skills. Researchers have neither reached an agreement concerning the numbers and types of subskills nor supported their claims with sufficient experimental evidence (Song, 2008). A few correlational studies investigating divisibility of listening and reading skills have suggested that the two skills are separable, although they are correlated and share common features (Bae & Bachman, 1998; Song, 2008). Song has documented that decoding processes distinguish the second language listening and reading which share a common comprehension process. The scholar also pointed out that participants' L2 proficiency and task characteristics may affect the relation of listening and reading.

Tests of listening comprehension vs. tests of reading comprehension. Tests of listening proficiency and tests of reading comprehension are administered for different purposes, such as to collect data for research or to test learners' language ability. The purpose determines the population of test takers. For instance, if it is to collect data for research, both native speakers and non-native speakers are administered tests of listening comprehension and reading comprehension; yet native speakers of a language are usually tested on their reading comprehension proficiency rather than listening proficiency in a language aptitude exam. The simple view of reading is a theory concerning the relation between reading and listening and the prior research has been conducted on native

speakers of different languages. Tests of listening comprehension and reading comprehension are administered to participants. It is necessary to review what tests have been employed in the body of research.

Hoover and Gough (1990) designed parallel materials for both the listening comprehension tests and the reading comprehension tests. Namely, these narrative passages were parallel in structure. In the reading comprehension test, participants were required to read aloud or silently according to the difficulty level of the passage and then retell as much as they could remember. Clues then would be provided to help participants recall more information. Listening comprehension was assessed in the same way. In contrast, Chen and Vellutino (1997) and Joshi and colleagues (2012) used tests developed and published by experts. The Spache Diagnostic Reading Scales were employed by Chen and Vellutino; Bateria III and Woodcock-Johnson III Diagnostic Reading Battery were deployed to evaluate Spanish and English participants' listening and reading proficiency in Joshi et al.'s study. In the same study, materials for Chinese tests of reading and listening comprehension were taken from Reading Assessment for Primary School Students and Guidelines for Reading in Primary School.

In the context of English as a second language, tests of listening proficiency and reading comprehension are usually in the model of the standard English test such as TOEFL. In the listening section, test takers are required to listen to some dialogues, long conversations and passages and then answer the multiple-choice questions. The reading section is of the similar format, and the only difference is that passages are read by test takers rather than for them.

Review of Listening Comprehension in the Foreign Language

Understanding the spoken input has been deemed as the most important skill among the four language skills and its development benefits the development of other skills (Long, 1985). The survey done among U.S. and Canadian professors of engineering, psychology, chemistry, computer science, English and business suggested that the receptive skills of listening and reading were rated highly (Dunkel, 1991). Interestingly, it is the skill that is the least understood and researched in the past several decades (Vandergrift, 2007; Vandergrift & Goh, 2012). Thus far research pertaining to listening comprehension has focused on two types of listening, one in the native language and the other in the foreign language (L2). Due to the topic of the present research, this section is chiefly dedicated to prior studies concerning listening comprehension in L2.

The primary goal of listening should be for understanding according to Nord (1981). The previous research has documented myriad factors that either contribute to or hinder L2 listeners' understanding. Scholars have categorized the factors using different terms. For example, Dunkel (1991) grouped the numerous factors listed in her research into internal and external factors; factors were divided into the text-based, the context-based, and the listener-based in Kobeleva's (2012) study; Rost (2014), one of the leading scholars in the field, categorized factors into three domains: affective, cognitive, and interpersonal; factors in Goh and Aryadoust's (2016) study consisted of the listener-related, task-related, and speaker-related factors. In the meantime, Dunkel pointed out that the majority of these factors have not been examined in empirical studies and the existent knowledge was built upon the combination of logico-deductive speculation and class-room teaching. Andringa et al. (2012) echoed this view, drawing our attention to

another fact that correlational approach is rarely employed in listening comprehension research.

Since the 1990s, limited research has provided empirical evidence regarding predictors and L2 listening comprehension. A few factors investigated in the majority of the prior research include vocabulary, grammatical knowledge, working memory and metacognitive awareness.

Vocabulary knowledge is central to language learning and it is one of keys to successful comprehension. Wilkins (1972) wrote that "... without vocabulary nothing can be conveyed" (pp. 111-112). Its robust link with comprehension of written texts has been examined thoroughly, but it has merely garnered little attention from scholars in the field of listening comprehension. Its effect on foreign language listening performance has surfaced in the prior research.

Aryadoust (2015) assessed participants' lexical-grammatical knowledge and listening comprehension performance. Findings indicated a significant contribution of vocabulary and grammar knowledge to listening ability. Yet the effect of vocabulary itself on listening ability is unclear due to the combined instrument which comprised two sections: a vocabulary knowledge subtest and a grammatical knowledge subtest.

Knowledge of vocabulary is one of predictors examined in the study by Andringa et al. (2012). The link between lexical knowledge and non-native speakers' listening performance was strong ($r = .68, p < .05$).

Wolfgramm, Suter, and Goksel (2016) evaluated participants' knowledge of vocabulary and listening comprehension by using three vocabulary batteries and two listening tests. Findings showed the moderate effect of vocabulary on listening

performance, which trumped the other predictors examined in the study, such as concentration, working memory and academic self-concept.

Matthews and Cheng (2015) employed another lexical measurement, Word Recognition from Speech, to explore the relation of vocabulary and listening comprehension. The instrument requires students' comprehensive knowledge of a word, including pronunciation, meaning, and spelling. The research has demonstrated that recognition of the most frequent 3,000 word family level is very critical for listening because of the significant correlation, .72 ($p < .01$) and the power of accounting for 54% of the variance.

Mecarty (2000), exploring the relationship between lexical and grammatical knowledge to reading and listening comprehension, provided evidence supporting the moderate association between lexical knowledge and listening comprehension ($r = .50$, $p < .05$). The instrument assessing participants' lexical knowledge included a word-association task and a word-antonym task. The hierarchical regression analysis showed that 13-14% of variance in listening comprehension was attributed to lexical knowledge.

Mehrpour and Rahimi (2010) compared the impact of general vocabulary knowledge and familiarity with specific vocabulary and found that participants' knowledge of difficult lexical items benefitted their performance on listening comprehension whereas their general vocabulary knowledge failed to influence their listening performance. The instrument employed to measure participants' general vocabulary knowledge was adopted from an old version of TOEFL sample tests, whereas the majority of researchers have used the vocabulary tests designed by experts with high

validity and reliability, so this may account for the discrepancy between the finding in the research and the other.

In the longitudinal study by Vandergrift and Baker (2015), the data collected from three cohorts from 2008-2010 near the end of their first year in the foreign language immersion program manifested the robust link between vocabulary and listening comprehension ability ($r = .42, .47, .54, p < .01$). Authors measured participants' breadth of vocabulary by asking them to point to the correct image of the spoken stimulus word rather than choose from written alternatives. Although it is a reliable test according to the scholars, it is worth questioning what percentage of vocabulary 7th graders have encountered can be presented by picture. It is plausible that the high overlap between 7th graders' vocabulary and the instrument can confirm the finding from the study.

Milton, Wade, and Hopkins (2010) deployed two kinds of vocabulary measures, orthographic and phonological, and two analysis approaches, linear and binary logistic regression. In the orthographic vocabulary test participants saw the word on computer screen but the words were not heard. Reversely, in the phonological vocabulary test subjects heard but did not see words. Both vocabulary tests measured learners' vocabulary size. Significant contribution of two kinds of lexical knowledge to listening comprehension performance surfaced, and phonological vocabulary knowledge had more impact on listening comprehension scores according to the binary logistic regression.

Bonk (2000), differing from the rest of the research corpus, examined the relationship between lexical knowledge and listening comprehension ability by administering dictation of four passages of increasing lexical difficulty. The number of total words and unique words in the four texts was similar so that participants'

vocabulary performance on the texts. A statistically significant positive correlation was located between lexical recognition and comprehension ratings.

Stæhr (2009) and Teng (2014, 2016) explored the relation of listening comprehension and two kinds of vocabulary knowledge, breadth and depth. Findings from their research provided evidence supporting the contribution of lexical repertoire to listening comprehension performance. Correlations between listening test scores and measures of vocabulary size and depth in Staehr's study were .70 and .65 respectively, and vocabulary explained 51% of listening variance. Likewise, Teng (2014, 2016) found the robust bond between listening performance and vocabulary size and depth ($r = .86, .91, p < .05; r = .70, .75, p < .01$). However, the two scholars' findings differ on which aspect of vocabulary could explain more variance of listening scores. The former concluded that vocabulary breadth was more predictive than vocabulary depth, but the latter found the opposite. The divergence may be attributed to their measures of vocabulary size and listening comprehension. The vocabulary size test used by Staehr comprised of five sections, each section containing 60 words and 30 definitions; Teng's vocabulary size test consisted of 140 multiple-choice items. In addition, the audio was played twice in Staehr's study, but it was played only once in Teng's.

In general, previous research has shown the consensus regarding the contribution of lexical knowledge to ESL learners' understanding of oral texts. The finding should not surprise educators, scholars, and learners because words are the core of language learning. Nation argued that a text coverage of 98% would be needed by most learners to achieve adequate comprehension of either reading or aural texts based on Hu and Nation's (2000) study. Put in other words, vocabulary knowledge is critical to listening

comprehension, but it has to work with other predictors to guarantee a proficient listening skill.

Working memory is another factor most examined in the prior studies in the field of listening comprehension. It is known that in a listening task the aural text fades instantly and listeners could not access it again, so a prevalent belief held by some scholars has been that working memory plays a unique role in listening comprehension performance. However, findings from extant research concerning the role of working memory in non-native listening comprehension do not provide support to the claim (e.g., Andringa et al., 2012; Marx & Roick, 2012, cited in Wolfgramm et al., 2016; Vandergrift & Baker, 2015).

One of the striking results from Andringa et al.'s (2012) study whose participants included non-native speakers of Dutch is that working memory did not account for any unique variance in listening comprehension. Five working memory tests were administered, and the correlation between all the tests and listening comprehension was very weak.

Wolfgramm et al. (2016) used Structural Equation Modeling to investigate the effect of working memory on listening comprehension of Swiss students and results did not show that working memory was a predictor of listening comprehension. The relation between the two factors is very weak. Additionally, authors referred to Marx and Roick's (2012) study as evidence against the strong effect of working memory on listening comprehension for second language learners.

Vandergrift and Baker (2015) observed three cohorts enrolled in a French immersion program and located the significant relationship between working memory

and listening comprehension performance in merely one cohort, so working memory was not strong enough to account for variance in listening comprehension.

Kormos and Safar (2008), focusing on secondary students enrolled in a Hungarian-English bilingual program, documented the correlation between working memory and their listening comprehension skill at the beginning level. The study also assessed learners' other language skills such as reading, writing, and speaking and findings implied that working memory was linked with all components except writing.

It is worth noting that a similar task, the digit span test, has been deployed in the previous research mentioned above to assess participants' working memory. Listening comprehension tests adopted in those studies are of the similar format, the multiple-choice or brief open-ended questions. Different results, however, imply that working memory may be a controversial variable in research concerning listening comprehension.

Metacognitive awareness is one of factors researchers in this field are very interested in and have conducted a number of studies investigating its effect on listening comprehension performance. The instrument heavily used in the previous research is the metacognitive awareness listening questionnaire (MALQ). Overlap and differences emerge from results of the body of research.

Aryadoust's (2015) study has confirmed the important role of metacognitive awareness to foreign language listening comprehension by using latent differential item functioning. The metacognitive awareness listening questionnaire included five sections, problems solving, planning and evaluation, mental translation, person knowledge, and directed attention. Results in the study indicated that high-ability listeners outperformed low-ability listeners on these five aspects measured in the questionnaire, which therein

suggests the effect of metacognitive awareness across different levels of foreign language learners.

Tafaghodtari and Vandergrift (2008) found that evaluation and planning, the two metacognitive variables, following two linguistic predictors, made a significant contribution to the performance on foreign language listening comprehension.

Goh and Hu's (2014) study lends support to the positive relationship between scores in the metacognitive test and scores in the test of listening performance. However, the specific role of each metacognitive variable on understanding oral texts is different from the study by Tafaghodtari and Vandergrift (2008).

Metacognitive awareness was one of variables examined in the study by Vandergrift and Baker (2015). The instrument assessed five factors related to participants' listening comprehension, such as problem-solving, planning and evaluation, mental translation, person knowledge, and directed attention. Its correlation with three cohorts respectively was weak, but the combined effect was significant. In the meantime, findings suggest that the relation of one metacognitive element and listening performance varies from cohort to cohort.

Finally, researchers are interested in how grammatical knowledge contributes to the listening comprehension process when its effect on reading comprehension, despite the lack of congruence, has been located. Results from Mecarty's (2000) study revealed the correlation between grammatical knowledge and listening comprehension performance, but grammatical knowledge was not a predictor of listening comprehension. Andringa et al. (2012) also conducted a study in which grammatical accuracy was one of variables. The findings showed a significant association between grammatical accuracy

and listening performance ($r = .77, p < .05$) and it combined with vocabulary and segmentation accuracy explained 98% of variance. However, the research did not provide specific evidence regarding the unique contribution of grammatical accuracy to the listening comprehension ability.

The research mentioned above has enhanced our understanding on the covert process of listening, the most critical and less known area. According to Rost (2014), when the ausing proceeds, “the listener processes input at remarkable speed, recognizing words, parsing speech into grammatical units, drawing inferences, making connections, and building coherent mental representations that are relevant to the listener personally” (p. 135). That is, many factors are involved in the procedure but they remain critically underresearched. The mechanics and complexity of listening calls for a process-oriented approach to investigating L2 listening, which can eventually provide useful insights into the process (Vandergrift, 2007). Andringa et al. (2012) argued that non-native listening proficiency depended on linguistic knowledge chiefly and less on reasoning ability. The view as such has been echoed by other empirical studies (e.g., Field, 2008, s & Cheng, 2015, Tsui & Fullilove, 1998, Wu, 1998) whose findings indicate the primary role of lower order linguistic competence. As is known, English is a morphophonemic language and morphology, a part of linguistic knowledge, plays a critical role in the process of comprehending the written text, so arises a question whether it would impact the process of understanding the spoken discourse.

Morphological Awareness and Listening Proficiency

Given the increasing body of research pertaining to morphological awareness (MA) in the past three decades, the overview of literature demonstrates that it focuses on

the relation of MA and literacy. On the other hand, the relationship between MA and listening proficiency has garnered little attention among scholars. Listening proficiency, however, is a variable controlled for in a few prior studies exploring the relation of reading comprehension and MA. Interestingly, findings from some studies have documented the opposite relationship between MA and listening comprehension ability. It is necessary to review the limited research.

Review of the existing evidence. Word recognition and syntactic parsing in fluent speech are basic and critical in spoken language comprehension (Rost, 2011). Morphological knowledge is of salience in both processes. On the one hand, word recognition requires a relational database for a particular word containing lemma, part of speech, word forms and collocations with other words (Lonneker-Rodman & Baker, 2009). Morphological knowledge is involved in order to judge part of speech and word forms. On the other hand, syntactic parsing is that the listener maps incoming speech onto a grammatical model of the language (Baggio, 2008). A number of syntactic and morphological cues influence how the listener processes meaning, according to Rost. The relation of morphological knowledge and L2 listening proficiency has not garnered much attention from researchers, but a few studies investigating morphological knowledge have measured subjects' listening performance as a variable and provided divergent evidence.

Contradictions in the literature. In regard to the relationship between MA and listening comprehension ability, both the study by Droop and Verhoeven (2003) and Jeon's (2011) study demonstrated a high correlation. Droop and Verhoeven, observing language minority learners at lower grades in Netherland, found the high correlation between their performance on the oral text comprehension and morphosyntactic

knowledge, which were .66, .97, and .70 in the three measurements respectively. Jeon, examining the relation of Korean EFL high schoolers' listening comprehension and morphological knowledge, found the significant correlation between the scores of two morphological tests and the listening test ($r = .527, p < .01$; $r = .416, p < .01$). Another commonality between the two studies is the instrument assessing the comprehension of oral texts is in multiple-choice format. Unlike scholars discussed above, Karimi (2013) investigated the relationship between L2 students' listening transcription ability and morphological awareness. Findings indicated that morphological awareness is a strong predictor in listening transcription and consequently listening comprehension. In addition, Li and Kirby (2014) reported that both morphological awareness and listening comprehension distinguished expected average comprehenders from unexpected good comprehenders. Given that the relation of the two is not explored in the study, it suggests that it may be worth more attention.

However, Kieffer, Biancarosa, and Mancilla-Martinez (2013) offered opposing findings in terms of the relationship between MA and listening comprehension of non-native English speaking learners. They stated that "there was no evidence of a correlation between MA and listening comprehension" (p. 710). Measures of listening comprehension and MA may account for the divergent findings. Kieffer et al. (2013) and Droop and Verhoeven (2003) did not deploy any printed cues in the listening tests, but Jeon (2011) did. MA measures in studies by Kieffer et al. and Jeon have commonalities, which is that the derivational awareness was assessed. Task format, however, varied. Kieffer et al. asked participants to complete sentences by using derivational words. On the contrary, Jeon employed isolated derivational words. Alternatively, the morphology

test in the study by Droop and Verhoeven consisted of plurals, conjugation of verbs, and pronominal reference.

In sum, to date, research suggesting a positive link between listening comprehension ability and MA outnumbers that with opposite findings. The variance among measuring instruments may result in discrepant findings. Another reason may lie in the proficiency of participants involved in the previous research, which is correlated with the number of years they have learned a foreign language and have stayed in a target-language country.

Gaps in the literature. The overview of literature in regard to morphological knowledge and listening proficiency demonstrates that the relation of the two skills has not drawn much of scholars' attention. Researchers do not disagree on the contribution of morphological knowledge to learners' word recognition, syntax and vocabulary expansion, which in turn is beneficiary to their reading comprehension. Although it is uncertain what are the common subskills required in both reading and listening, word recognition, vocabulary, and syntax are the foundation of language skills such as listening, speaking, reading, writing, and translation, and definitely influence the development of each skill. It is plausible to speculate that morphological knowledge may be one of predictors of listening ability. In addition, prior research shows that the strong link between MA and listening comprehension emerges with the caveat that subjects are advanced learners of a target language. Participants involved in the limited existent research in the field, however, were either middle schoolers or pre-university students, whose language proficiency had not been explicitly articulated. Finally, listening comprehension ability measured in a standardized language exam is different than

listening ability in daily life. In the former setting, written cues are usually provided and the format of the listening section is similar to that of the reading comprehension. In contrast, in the latter setting, no visual clues are available to listeners. Hence, it is reasonable to conjecture that the contribution of MA may be different in the two situations.

The research hypothesis, and the rationale for it. This study aimed to further understanding about the relationship between morphological awareness and advanced English as a foreign language (EFL) learners' listening proficiency. Morphological awareness develops incrementally. That is, the longer language learners have been involved in language study, the more significant the effect morphological awareness may have on literacy and listening ability. Advanced EFL learners' exposure to morpheme-constructed low-frequency words is considerable so that the morphological structure of words strengthens learners' morphological awareness and morphological awareness is heavily used during language learning. Based on the findings from the early research, it was hypothesized that morphological awareness is one of predictors of listening comprehension ability of advanced ESL learners. The present study addressed the following questions:

1. What is the relationship between morphological awareness measures and listening comprehension?
2. Does the knowledge of derivations and compounds make equal contribution to advanced EFL learners' listening proficiency?
3. Does morphological awareness have similar impacts on advanced EFL learners' performance on multiple-choice questions and the gap-filling task?

4. Does morphological awareness make a unique contribution to the listening comprehension ability of advanced EFL learners?

Chapter Three

Research Methodology

Participants

The study comprised 191 Chinese EFL learners who were third-year English-majors, 113 (104 female and 9 male) of them from a university located in Guangzhou and 78 (76 female and 2 male) of them from another university in Dalian, with an average age of 21. Both universities are of Tier 2 and students started their formal English education when they were in Grade 3 in elementary school. However, data from 39 of the students in the Dalian group were excluded eventually with the consideration that their English proficiency is higher than the rest of the participants, because the cutoff score of the program they were matriculated into was as high as that of Tier 1 universities.

Additionally, it is required that the English majored should take the Test for English Majors Band 8 (TEM 8) at the beginning of the eighth semester. Put in other words, participants were fairly advanced learners of English and their English proficiency was of the same level.

Measures

The participants completed six paper-and-pencil tests within 90 minutes: a suffix knowledge test, a compound knowledge test, a reading vocabulary knowledge test, a listening vocabulary knowledge test, a listening comprehension test, and a reading comprehension test. Scoring was based on a correct-incorrect response format. All instruments were pilot tested with a group of students whose language proficiency was similar to participants in the present research. A few tests including compounding, listening vocabulary, and reading comprehension were revised based on the pilot testing

outcome. Items that were inappropriate in terms of level of difficulty and level of discrimination were discarded.

Suffix choice test. The instrument was adopted from Mahony's (1994) study. It was designed to assess subjects' knowledge of the syntactic category of common Latin and Greek suffixes. It consists of two parts, the suffix real test and the suffix pseudo test. Each part is composed of 27 sentences containing a blank and followed by four real words or pseudo words which are different derivations of the same stem; that said, the answer choices differ from each other only in their suffixes. For example, The cost of _____ keeps going up. A. *electric* B. *electrify* C. *electricity* D. *electrical*. The meeting was highly _____ and invigorating. A. *loquarial* B. *loquarify* C. *loquarialize* D. *loquarialism*. The answer choices in the suffix pseudo test are made up of a real Latin or Greek bound stem and a real suffix between which a nonsense syllable is inserted. The knowledge of three types of suffixes is measured: nouns, verbs, and adjectives. The purpose of the suffix pseudo test was to diminish the confounding effect of existing lexical knowledge that is more related to real-word morphology and contextual clues. The test was presented visually only, that is, students read it silently and administrators did not read aloud questions for them. The reason lay in the fact that the present research examined the relationship between MA and listening comprehension, so orally presenting the test might have confounded the findings.

The rationale for selecting this particular test was threefold. First, Mahony (1994) administered it among English-native speaking college students, so it fit participants involved in the study. Second, it was based on the measure created by Tyler and Nagy (1989) who piloted it before administering it officially. Third, given the fact that MA is a

multi-dimension construct, Tighe and Schatchneider (2015) found that inflectional and derivational morphology did not represent separate facets of MA. Thus, the measure deployed in the present study focusing suffixes sufficed to assess participants' knowledge about parts of a word.

Compound knowledge. The task was adapted from Nagy, Berninger, Abbott, Vaughn, and Vermeilen (2003), Pasquarella, Chen, Lam, and Luo (2011), Ramirez, Chen, Geva, and Luo (2011), Wang et al. (2006), and Zhang and Koda (2013). The reliability reported in the last four studies ranged from .61 to .91. Participants chose a better compound fitting the riddle. For example, Which is a better name for a bee that lives in the grass: a grass bee or a bee grass? The correct answers in each pair of riddles had reversed modifier-head relationships. The task consisted of twelve riddles, plus two practice items. The reliability in the current study was .704.

The variable morphological awareness (MA) combined both the suffix choice test and compound knowledge test.

Reading vocabulary (RV) test. The Vocabulary Levels Tests designed by Schmitt, Schmitt, and Clapham (2001) was used to assess participants' knowledge of written words. Five parts constituted it, representing five levels of word frequency in English: 2,000 words, 3,000 words, 5,000 words, university word level, and 10,000 words. Three of the five levels, 2,000, 3,000, and 10,000, were excluded because they were unable to effectively measure participants' vocabulary knowledge. There were 10 clusters in each section and each cluster contained six words and three brief definitions. Furthermore, one practice item was included. The reliability of the two sections reported

by authors in previous research was .927 and .960 respectively, and the actual one in the current study was .806.

Listening vocabulary (LV) test. The Listening Vocabulary Levels Test designed by McLean, Kramer, and Beglar (2015) was deployed to evaluate participants' knowledge of words presented aurally. Like the written vocabulary knowledge test, it consisted of five sections as well, the first five 1,000-frequency levels and the Academic Word List (AWL). Due to participants' English proficiency, only the 5,000 level and AWL were adopted in this study. The test used the multiple-choice format and each item had four choices, from which each examinee chose the response with the closest meaning to the target word. The four choices were provided in examinees' native language in order to control the confounder of foreign-language reading ability. For example, examinees heard: 'School: This is a big school.' A. 银行 (bank); B. 海洋动物 (sea animal); C. 学校 (school); D. 家 (family). The audio was heard once only.

The original test was modified to meet the needs of the study. It was originally created to measure Japanese EFL learners' listening vocabulary knowledge, that is, the four choices after each sentence were in Japanese. Hence, the author of the current study wrote up all choices in Chinese based on the principle that distractors should be semantically, phonologically, or orthographically close to the correct answer. Second, a few items in the original measurement were deleted in order to improve its reliability. The Chinese version instrument was piloted and the SPSS analysis implicated that a few sentences affected the reliability. Without those items, the actual reliability was .723, and the one reported by authors was .97 based on the Rasch item analysis.

Listening vocabulary knowledge was assessed with a few considerations in mind. First, recognizing the spoken form of a word is one of the multiple facets of knowing a word according to Nation (2001). Second, empirical studies have documented difference between spoken and written vocabulary knowledge of EFL learners. For example, Milton and Hopkins (2006) reported the gap between the phonological and orthographic vocabulary sizes of Greek and Arabic EFL learners. Greek EFL learners' vocabulary knowledge tends to be more orthographical, but Arabic learners' aural vocabulary knowledge is better than the written. Mizumoto and Shimamoto's (2008) study also suggested that Japanese EFL learners' reading vocabulary size was higher than the listening across groups of various language proficiency.

Listening comprehension. Participants' listening proficiency was assessed by using the listening section from TEM-8 2017. Xiao's (2015) study provided evidence supporting the high reliability of the test. The listening section was made up of two subsections, mini-lecture and interview. In the mini-lecture part, the lecture was played once only and students completed the gap-filling task using no more than three words in each gap while listening to it. Students had 30 seconds to preview the gap-filling task and three minutes to check their work when it was over. In the interview section, students heard two interviews followed by five questions respectively and completed the multiple-choice task. At the end of each part, five questions were asked about what was said. Both the interview and the questions were spoken once only. After each question, there was a 10-second pause, and students had 30 seconds to preview choices. The listening material was read at the rate of 140-170 wpm.

This particular test was selected with a few considerations in mind. First, this test belongs to the well-established Ministry of Education examination and has therefore undergone thorough validation. Second, the participants in the study were advanced learners of English and required a high-proficiency listening test. The TEM-8 listening section appeared to cover the appropriate proficiency level. Third, this test addressed different listening skills and contained various text types so that it could function as a general measure of advanced listening comprehension.

Three variables were derived from the listening comprehension test deployed in this study: Listening Multiple Choice (LMC), based on the multiple-choice task in the interview; Listening Gap Filling (LGF), based on the gap-filling task in the mini lecture; Listening Comprehension (LC) Total, the sum of the two previous variables.

Reading comprehension (RC). The reading comprehension section from a practice TOEFL test published by the Princeton Review was adopted to assess students' written texts understanding. Questions involved in the measure were modeled after Zhang and Koda's (2012) study, including the word supply question, the conjunction question, the co-reference question, the textual inference, and the gist question. In pilot testing there were four passages, each followed by five questions. Based on the results three passages and thirteen questions constituted the final test. The reliability was .692. The length of three passages was about 2,000 words. The variable based on this test was named as RC.

Chapter Four

Results

Table 1 displays descriptive statistics of the variables of interest. All indicators have acceptable skewness and kurtosis for the normal distribution, which range from -1 to +1 and -3 to +3 respectively, with few exceptions consisting of LV Total, RV Academic, Suffix Real, Suffix Pseudo, Suffix Total, and MA. Analyses using the transformed variables were not different from analyses using the original data; therefore, only the latter are reported.

Table 1

Descriptives of Observed Variables including Means, Standard Deviations, and N

Measure	LV	LMC	LGF	LC	RV	Compound	Suffix	MA	RC
Mean	32.92	5.32	3.37	8.54	49.15	9.2	48.06	57.26	7.61
<i>SD</i>	4.46	1.67	2.47	3.639	7.25	2.22	7.12	8.11	2.45
<i>N</i>	149	151	147	152	152	152	152	152	147

To address the first three research questions, the correlation analysis was performed. Table 2 presents the relationship among variables mentioned in those three questions.

Table 2

Correlations of Observed Variables

	1	2	3	4	5	6	7	8	9
1 LMC	--								
2 LGF	.46**	--							
3 LC Total	.79**	.91**	--						
4 RC	.13	.25**	.25**	--					
5 Compound	-.07	.09	.06	.37**	--				
6 Suffix	.13	.37**	.34**	.39**	.32**	--			
7 MA	.10	.35**	.31**	.44**	.56**	.97**	--		
8 LV	.23**	.45**	.41**	.45**	.15	.33**	.33**	--	
9 RV	.19*	.34**	.34**	.44**	.23**	.52**	.52**	.62**	--

* $p < .05$; ** $p < .01$

First, MA correlated significantly with listening comprehension (LC Total) ($r = .311, p < .01$). Second, with regard to the specific relation of listening comprehension and two kinds of morphological knowledge, a significant correlation only emerged between derivational knowledge and the performance on listening tasks ($r = .337, p < .01$). The derivational task consisted of real words and pseudo words and the correlation between the real-word suffix subtest and listening performance was stronger than that with the pseudo-word subtest. The correlation between the score on the compound test and that on the listening test was nonsignificant. Third, in terms of the relationship between MA and two kinds of listening tasks, the results showed that MA was significantly correlated with the gap-filling listening task ($r = .353, p < .01$) rather

than the interview (multiple choice) listening task. A close look at the relationship between the gap-filling task and the two morphological tasks, compounding and derivation, demonstrates that scores of the derivational test and the gap-filling task were strongly associated ($r = .373, p < .01$). In addition, derivational knowledge of both real words and nonsense words was linked with the gap-filling task performance.

In short, there are three core messages revealed in the results: a) morphological awareness and listening comprehension were linked; b) the correlation between derivational awareness and listening comprehension was significant; c) the gap-filling task performance was influenced by morphological awareness.

To answer the last research question, a few hierarchical regression analyses were carried out. Results are summarized in Table 3-5. In the first two regression analyses, the dependent variable was listening comprehension (LC Total); the dependent variable in the last regression analysis was the gap-filling task. MA and derivational awareness (Suffix Total) all made unique contributions to students' performance on listening comprehension. According to Table 3, MA accounted for 2.4% of variance in listening comprehension when reading vocabulary was controlled for. Table 4 displays that MA explained an additional 3.1% of the variance in listening comprehension as both reading and listening vocabulary were controlled for. The last regression analysis presented the effect of derivational awareness on the gap-filling task. As shown in Table 5, derivational awareness made a unique and significant contribution to the gap-filling task score and explained about 4.7% additional variance after the reading and listening vocabulary. Overall, the above results suggest that MA, particularly derivational awareness, was a unique and independent contributor to EFL listening comprehension.

Table 3

*Hierarchical Regression Analysis for Two Variables Predicting Listening**Comprehension*

Model	Predictor	R^2	Adjusted R^2	R^2 change	Beta	Sig
1	RV	.118	.113	.118	.250	.006
2	MA	.142	.130	.024	.180	.045

Table 4

*Hierarchical Regression Analysis for Three Variables Predicting Listening**Comprehension*

Model	Predictor	R^2	Adjusted R^2	R^2 change	Beta	Sig
1	RV	.113	.106	.113	.022	.833
2	LV	.182	.171	.070	.335	.000
3	MA	.211	.194	.029	.200	.023

Table 5

Hierarchical Regression Analysis for Three Variables Predicting the Gap-filling Task

Model	Predictor	R^2	Adjusted R^2	R^2 change	Beta	Sig
1	RV	.117	.111	.117	-.026	.796
2	LV	.207	.196	.091	.374	.000
3	Suffix	.254	.239	.047	.258	.003

Chapter Five

Discussion

Foreign language listening is a fundamental component of learning a foreign language. Listening comprehension is a complex cognitive activity. Andringa et al. (2012) study comparing listening comprehension of native and non-native speakers suggested that listening comprehension for non-native speakers was a function of knowledge and reasoning ability. One of the basic knowledge sources involved in the process is linguistic knowledge (Vandergrift & Baker, 2015). Vandergrift (2007) also pointed out that linguistic knowledge was a hurdle to the listening ability of foreign language learners. The primary goal of the present study was to examine the potential relationship between linguistic knowledge on morphemes and listening comprehension, that is, whether MA could be a variable affecting listening comprehension and a significant predictor to listening performance in the context of foreign language learning.

Morphological Awareness and EFL Listening Comprehension

Findings from the present study echo a few previous studies (Droop & Verhoeven, 2003; Jeon, 2011; Karimi, 2013) documenting the correlation between MA and listening comprehension but also extend understanding by locating the unique contribution made by MA to listening comprehension. It was found that MA accounted for a significant proportion of the variance in listening comprehension after controlling for both reading and listening vocabulary.

Several reasons can be offered to explain why MA plays a role in listening comprehension. First, the listening process like the reading one involves the use of a variety of linguistic knowledge. Morphemes are the basic building blocks of language.

Altmann (2012) found that mental lexicon is stored under stems and affixes rather than as individual wholes. The same morpheme could activate words which are semantically unrelated. For example, hearing the word happiness can activate the word darkness. Thus morphemes, part of words, are distinguished from vocabulary and can aid the comprehension process regardless of the modality of the input. Second, morphemes carry semantic and syntactic information which is required to comprehend and process discourse (Nagy et al., 2014). Semantic clues facilitate the process of deriving meaning of a word, the basic propositional content of a sentence; syntactic information is utilized to figure out the structure of a sentence.

Furthermore, the present study has provided details concerning the role that compounding and derivational morphology plays in EFL listening comprehension respectively. The correlational analysis showed that only derivational knowledge significantly correlated with participants' listening performance. The association between compounding knowledge and listening comprehension was weak. The result is in line with Jeon's (2011) study whose morphological measures focused on derived words. Interestingly, Kieffer et al. (2013) assessed participants' derivational awareness as well, but its correlation with listening comprehension was nonsignificant. One reason may lie in the various formats of listening tests administered in the three studies. The listening instrument used in both the current study and Jeon's included the printed materials, however, no printed cues were provided in Kieffer et al.'s. Yet it would be absurd to conclude that visual information is the prerequisite of the significant relationship between morphological awareness and listening comprehension.

The effect of different kinds of morphemes on comprehension of aural texts has been rarely studied, but their impact on reading comprehension has been a popular topic and may shed light on the research in listening context. A few studies exploring the relationship between compounding and derivational morphology and reading comprehension in EFL context (e.g., Wang et al., 2006; Zhang & Koda, 2013, 2014) reported the significant correlation between both morpheme variables and reading comprehension. In English, there is a prevalence of derived words and the percentage is particularly high in academic English. Although derivation results in phonological and/or orthographic shift (Carlisle & Katz, 2006), derivational awareness still influences listening comprehension. That indicates that derivational awareness can be activated in advanced EFL learners' mind despite the changes at the lexical level mentioned above. Additionally, it can be argued that language proficiency may be a factor determining the relationship between derivational awareness and comprehension of aural texts.

In terms of the impact of MA on different types of response and form, none of previous research has addressed it to date. Examination of the literature shows that multiple-choice formats remain a popular design for assessing listening comprehension. Participants scored high on multiple-choice questions and low on open-ended questions (Cheng, 2004), which aligned with subjects' performance in the present research. That is, their performance on the multiple-choice was better than that on the gap-filling task. The current research confirmed the finding in Cheng's study. However, findings in this study showed that MA was significantly linked to the score of the gap-filling task rather than the multiple-choice questions. Likewise, Karimi (2013) provided evidence supporting the relationship between MA and listening transcription ability by observing Iranian pre-

university students. It may not be safe to conclude that morphological knowledge might be utilized more in difficult listening task. The commonality between the gap-filling task and the transcription task, nevertheless, is that participants have to write down words and sentences. The literature about MA and literacy of both English monolinguals and non-native speakers has documented that MA is a predictor of English spelling and vocabulary knowledge, which are fundamental to the listening-writing task. Hence, the correlation between the performance on this kind of listening task and MA emerged. Another possible explanation for the result may lie in the fact that more written clues were provided in the gap-filling task, that is, this kind of listening task involves a substantial amount of reading. Thus, test takers need morphological knowledge to facilitate their understanding on the written and spoken texts and complete the task. Although the preview of options in the multiple-choice section was available to participants, the amount of information made available to test takers did not lead to the significant effect of MA. Another interpretation of the findings is that in academic setting MA would help non-native English speaking students understand lectures better if appropriate amount of visual aid could be offered. This effect may not occur in everyday communication where only verbal clues are available.

Finally, findings in the present study showed that MA accounted for unique variance of listening comprehension after partialling out both reading and listening vocabulary. Specifically, derivational awareness explained additional variance of the score of the gap-filling task after two types of vocabulary knowledge were controlled for. Previous research in the field of EFL listening comprehension has focused on some linguistic factors and suggested that vocabulary knowledge play a salient role in the

process. This study offered another insight regarding what linguistic factor contributes to the comprehension of aural texts. The unique impact of morphological knowledge and derivational knowledge on reading comprehension has surfaced in prior research conducted with English native speaking students and students of speaking other languages. Nagy et al. (2006) pointed out two facts leading to the contribution: a) high levels of MA enables readers to decode morphologically complex words accurately and fluently; b) syntactic clues provided by suffixes facilitate readers to parse the sentence structure. It need be cautious to translate the first reason into the comprehension of spoken texts. In the listening context, the phonological shift in derived words may be an obstacle to successful decoding. The difficulty of utilizing morphemic clues is negatively associated with language proficiency. However, one could deal with morphologically complex words encountered in the auding process if one has advanced language proficiency.

Meanwhile, the contribution of derivational awareness to EFL listening comprehension confirms that successful listening comprehension is the result of a complex interaction between top-level and bottom-level cues (Staehr, 2009). Understanding the spoken input to EFL learners is an inferential process, so information provided by the smallest meaningful unit could facilitate their comprehension.

In regard to the effect of compounding and derivational morphology, findings in this study differ from what research about reading comprehension has found. The divergence lies in the impact of compounding. It is reported that it made a unique contribution to EFL reading comprehension, but this research located neither its correlation with nor contribution to the performance on any listening task. There are a

large number of compounds in both English and Chinese. Additionally, compounds in the two languages share commonalities (e.g., the right-head structure). It warrants further research to examine the relation of compounding and EFL listening comprehension.

Vocabulary Knowledge and Listening Comprehension

Linguistic knowledge at the word level is one domain of knowledge that is a vital element of skilled foreign language listening comprehension (Graham, Santos, & Vanderplank, 2010). Vocabulary knowledge is the main contributor to comprehension and a prerequisite for success. The strong link is well documented in an enormous body of research dealing with the written texts and a limited research focusing on the oral texts (Kobeleva, 2012).

One finding in the present study aligns with prior listening research (e.g., Mecarty, 2000; Staehr, 2009), highlighting the important role of reading vocabulary in tasks assessing listening skills. Results showed that reading vocabulary accounted for 11% of the variance in listening comprehension. It made a unique contribution to performance on both the multiple-choice and the gap-filling task, but its contribution to the former was weaker than to the latter.

In addition, this study has filled in the gap pointed out by Staehr (2009) that an instrument involving an auditory presentation of a word rather than a visual presentation of its orthographic form should be used to assess participants' vocabulary knowledge in order to examine the relationship between vocabulary and listening comprehension. Staehr gave an explanation that a word recognized in its written form would not guarantee that it would be recognized in its spoken form. Vandergrift and Baker (2015) deployed a listening vocabulary measurement, but words were presented isolated rather

than in a sentence. They also realized the limitation of the tool that recognition of the oral form of a word does not mean that the word is recognized in concatenated speech. Their findings indicate the robust link between listening vocabulary and listening comprehension, yet the study did not report whether listening vocabulary was a predictor to listening comprehension due to the analysis approach.

In regards to listening vocabulary, results in the current research have demonstrated that its association with listening comprehension was slightly stronger than reading vocabulary, which is in line with the finding in Mizumoto and Shimamoto's (2008) study. Besides, it was displayed in the present study that listening vocabulary knowledge explained additional 6% of the variance in listening comprehension and 9% of the variance in the score of the gap-filling task respectively after controlling for reading vocabulary. However, listening vocabulary did not appear to be a predictor of performance on the multiple-choice task according to the regression analysis. It suggests that the impact of listening vocabulary varies from one response format to another. Cheng (2004) verified that there was variation in subjects' listening performance for the different categories and formats of response. It is reasonable to argue that listening vocabulary and other linguistic elements may function nuancedly as listeners deal with each unique listening task.

Another finding worth noting is that both 5,000-level listening vocabulary and academic listening vocabulary were more strongly correlated with the gap-filling task than the multiple-choice one. This can serve as evidence supporting the argument that the role of each linguistic factor depends on the listening task.

In sum, both the aural and written vocabulary had moderate correlations with the score of listening comprehension, but they differed on their specific roles in processing different listening tasks. It provides further motivation for exploring their effect on handling different types of listening materials and questions.

Listening Comprehension and Reading Comprehension

The simple view of reading has posited the correlation between reading and listening comprehension and empirical studies conducted with English native speakers and non-native speakers have provided evidence supporting the claim (e.g., Hoover & Gough, 1990; Kieffer, Petscher, Proctor, & Silverman, 2016). The results of the current study are congruent with previous findings and confirm the association between the two kinds of comprehension.

Furthermore, the present research has expanded on linguistic components involved in the two comprehension processes by examining reading and listening vocabulary, compounding and derivational morphology separately. These factors differentiated between their impacts on the two kinds of comprehension.

The general morphological awareness contributed unique variance to both listening and reading comprehension. It accounted for 3.1% of the variance of listening comprehension and 6.5% of the variance of reading comprehension (Table 6) after two types of vocabulary knowledge were controlled for. The statistical analyses provided details about the role of compounding and derivational morphology in the two comprehension skills. Compound awareness and derivational awareness played reversed roles in the two processes. Derivation was a unique predictor to the performance on the gap-filling listening task according to Table 5. By contrast, compound appeared to

explain the variance of the reading task above and beyond derivational morphology based on Table 7. The findings indicated that different facets of morphological awareness would be primarily utilized to process the input presented visually or aurally given than morphological awareness correlated with both kinds of comprehension. As to the reasons that knowledge on compounds and derived words made distinctive effects on comprehension processes, it calls for more research to look into the fact.

Table 6

Hierarchical Regression Analysis for Three Variables Predicting Reading Comprehension

Model	Predictor	R^2	Adjusted R^2	R^2 change	Beta	Sig
1	RV	.192	.186	.192	.097	.336
2	LV	.243	.232	.051	.288	.002
3	MA	.303	.288	.060	.295	.001

Table 7

Hierarchical Regression Analysis for Four Variables Predicting Reading Comprehension

Model	Predictor	R^2	Adjusted R^2	R^2 change	Beta	Sig
1	RV	.192	.186	.192	.129	.199
2	LV	.243	.232	.051	.287	.001
3	Suffix	.276	.261	.033	.139	.114
4	Compound	.333	.314	.057	.253	.001
3	Compound	.321	.306	.078	.253	.001
4	Suffix	.333	.314	.012	.139	.114

With regard to contributions of listening and reading vocabulary to comprehension, the majority of previous research typically used reading vocabulary to represent subjects' overall vocabulary knowledge although Wolvin and Coakley (1992) stated that there were four types of vocabulary, reading, listening, speaking and writing. The results of the current study revealed that the two vocabularies not only correlated the two types of comprehension but also explained unique variances in comprehension scores. Statistics analyses showed that listening vocabulary was a significant predictor to both listening and reading comprehension and its prediction was stronger in listening than in reading. The simple view of reading may provide one reason for the unique contribution of listening vocabulary to comprehension. As posited in the SVR, reading comprehension is the product of listening comprehension and decoding. Listening vocabulary and listening comprehension overlap, so it could be linked with reading comprehension. Meanwhile, vocabulary has been found to be an important factor in reading comprehension, so it is reasonable that listening vocabulary can make a contribution to comprehension of written texts.

Finally, the juxtaposition of the two comprehension processes suggests that morphological awareness and vocabulary are correlated but distinct constructs, which echoes prior research (e.g., Carlisle & Goodwin, 2013). Gottardo, Mirza, Koh, Ferreira, and Javier (2017) pointed out the difference between the two concepts that "vocabulary knowledge contributes a pure meaning component whereas morphological awareness includes the metalinguistic component, which would result in these variables also contributing unique variance to reading comprehension" (pp. 7-8). Future research need measure the multidimensional and complex constructs thoroughly and separate

constituents involved in each construct if it focuses on linguistic elements involved in comprehension.

Morphological Awareness and Vocabulary Knowledge

Vocabulary knowledge is a multi-dimension construct, but the majority of measurements employed in previous listening comprehension and literacy research assessed subjects' reading vocabulary. Thus, the relationship between morphological awareness and each specific type of vocabulary is obscure. This study showed that MA was more strongly correlated with reading vocabulary including academic and 5,000 level than listening vocabulary. The association between MA and listening vocabulary is congruent with Goodwin's (2011) study which also reports that MA is a predictor of English language learners' oral vocabulary. Meanwhile, this study provided details by examining both academic and 5,000 level vocabulary. It is revealed that MA's contribution to academic vocabulary was stronger than 5,000 level in both listening and reading vocabulary. This implicates that there may be more morphologically complex words in academic lexis than the 5,000 level. As a matter of fact, the number of morphologically complex words in the academic vocabulary test is twice as many as that in the 5,000 level test across both listening and reading vocabulary.

Research Significance

The process of comprehending spoken input has been a conundrum to educators and scholars. Recent studies have focused on a few linguistic variables that contribute to the process. The current research added a few insights to the domain by looking at the role of morphological awareness in foreign language listening comprehension. Results of this study have revealed the correlation between MA and EFL learners' performance on

different listening tasks. Additionally, derivational awareness is a predictor to the gap-filling listening task. That being said, morphology, a linguistic variable, impacts EFL learners' listening comprehension and the effect varies from task to task. A path potential for future foreign language listening research is to investigate how different linguistic factors function in specific listening tasks.

This study also broadened our understanding of morphological awareness which has been primarily studied in written text. Findings of the present research demonstrate that MA aids EFL learners' comprehension of aural input, particularly the gap-filling task. Although listening modality is different than reading, MA is still activated in the auditing process and facilitates listeners' comprehension. This may serve as evidence supporting that morphology is an independent linguistic component and exists in listeners' mind.

Finally, this research has manifested that EFL learners' listening and reading vocabulary should be differentiated in future research. Listening vocabulary has explained additional variance of both listening and reading comprehension. Moreover, its contribution to listening comprehension is stronger than that to reading comprehension. Nevertheless, there are only a few instruments to assess listening vocabulary, so more research efforts need be directed toward it.

Educational Significance

In order to improve EFL learners' listening skills, researchers must determine which linguistic components contribute to the listening processes. The findings that morphological awareness predicted listening comprehension, especially derivational

awareness predicted the performance on the gap-filling task, suggest that morphological instruction may benefit EFL learners' vocabulary and listening skills development.

In addition, the finding that the correlation between academic listening vocabulary and reading comprehension was stronger than 5,000-level vocabulary suggests the importance of this type of lexical knowledge. English is well known for its considerable vocabulary size, which to EFL learners is an enormous hurdle, so appropriate guidance on vocabulary learning would enable them to grasp the language effectively.

General Conclusions

This study suggests the roles of general morphological awareness and two specific types of MA in listening and reading comprehension, and listening and reading vocabulary, but further research is necessary to clarify their involvement in these processes of EFL learners. For instance, while this study reported the relationship between derivational awareness and listening comprehension, particularly the gap-filling task, future research should explore the relationship in order to ascertain whether they are reciprocal or not. Future research should also include other confounders, such as phonological awareness, so that the impact of morphological awareness on listening comprehension could be more detailed.

The instruments of listening and reading vocabulary used in this research are of different formats, although they assessed the same categories of vocabulary (academic and 5,000). Future research should adopt listening and reading vocabulary tests with similar response formats, which may diminish the gap between difficulty levels.

The findings of the study have important implications for research and classroom instruction. Understanding how the multi-facet constructs, morphological awareness and vocabulary, contribute to listening comprehension helps educators and researchers design interventions to improve listening skills. Nunes, Byrant, Pretzlik, and Hurry (2006) stated, “Some of the most important correspondences between spoken and written language are at the level of the morphemes” (p. 157). Thereby, investigating morphological awareness in listening context deserves more attention and efforts.

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Appendix 1: Listening Vocabulary Test

English Test A---Listening Vocab Tests

Examples: You hear: School: This is a big school.

请选择一个最恰当的答案。

- a. 银行 b. 海洋动物 c. 学校 d. 家

Part 5 请把答案写在题号的左边! 谢谢! 特别注意: 第 9, 15, 17, 18, 23, 24 题已删除!

- | | | | |
|-------------|---------|---------|----------|
| 1. a. 擦洗 | b. 描述 | c. 挖 | d. 清理 |
| 2. a. 动物 | b. 恐龙 | c. 昆虫 | d. 龙 |
| 3. a. 朋友 | b. 和尚 | c. 无人 | d. 修女 |
| 4. a. 土壤 | b. 肥料 | c. 化学原料 | d. 作文 |
| 5. a. 大臣 | b. 会议记录 | c. 迷你裙 | d. 微型复制品 |
| 6. a. 螃蟹 | b. 垃圾 | c. 猫 | d. 寿司 |
| 7. a. 帮助 | b. 时间 | c. 帽子 | d. 词汇 |
| 8. a. 课程 | b. 杯子 | c. 尸体 | d. 包 |
| 9. | 此题已删除 | | |
| 10. a. 转移 | b. 潜水员 | c. 阻塞 | d. 污染 |
| 11. a. 意图 | b. 帐篷 | c. 沟渠 | d. 趋势 |
| 12. a. 技术人员 | b. 工程师 | c. 师傅 | d. 牙医 |
| 13. a. 码头 | b. 好奇 | c. 奇妙 | d. 问题 |
| 14. a. 茶杯 | b. 地毯 | c. 抹布 | d. 车 |
| 15. | 此题已删除 | | |
| 16. a. 屠杀 | b. 柜子 | c. 事故 | d. 灾难 |
| 17. | 此题已删除 | | |
| 18. | 此题已删除 | | |
| 19. a. 沙发 | b. 椅子 | c. 肥皂 | d. 柔软 |
| 20. a. 地点 | b. 逻辑 | c. 本地 | d. 标识 |
| 21. a. 纪念 | b. 评价 | c. 补偿 | d. 报告 |
| 22. a. 厨师 | b. 乌鸦 | c. 骗子 | d. 小溪 |
| 23. | 此题已删除 | | |
| 24. | 此题已删除 | | |

Part 6 请把答案写在题号的左边! 谢谢! 特别注意: 第 17, 22, 25, 29 题已删除!

- | | | | |
|------------|---------|---------|--------|
| 1. a. 概念 | b. 音乐会 | c. 想法 | d. 合同 |
| 2. a. 暗喻 | b. 迂回的 | c. 不吉祥的 | d. 相似 |
| 3. a. 想法 | b. 句子 | c. 条目 | d. 段落 |
| 4. a. 组成成分 | b. 对手 | c. 朋友 | d. 系 |
| 5. a. 教育 | b. 比较 | c. 补偿 | d. 惩罚 |
| 6. a. 教授的 | b. 专业的 | c. 业余的 | d. 全职的 |
| 7. a. 外在的 | b. 极端的 | c. 永恒的 | d. 现存的 |
| 8. a. 车 | b. 壁炉 | c. 原因 | d. 从句 |
| 9. a. 冬眠 | b. 迁移 | c. 劳作 | d. 增加 |
| 10. a. 以前 | b. 首要事情 | c. 优越感 | d. 财产 |
| 11. a. 修改 | b. 交谈 | c. 看 | d. 颠倒 |
| 12. a. 武断的 | b. 军队 | c. 客观的 | d. 仓促的 |
| 13. a. 壁画 | b. 强烈的 | c. 积极的 | d. 中性的 |
| 14. a. 选择 | b. 本地人 | c. 终点站 | d. 书架 |
| 15. a. 朋友 | b. 同事 | c. 大学 | d. 家人 |
| 16. a. 忠诚的 | b. 安全的 | c. 合法的 | d. 合适的 |
| 17. | 此题已删除 | | |
| 18. a. 建立 | b. 协会 | c. 学院 | d. 评价 |
| 19. a. 保留 | b. 依然 | c. 奖赏 | d. 再培训 |
| 20. a. 问题 | b. 脸面 | c. 短语 | d. 阶段 |
| 21. a. 达到 | b. 女士包 | c. 设定 | d. 追求 |
| 22. | 此题已删除 | | |
| 23. a. 不同 | b. 分歧 | c. 区别 | d. 拐弯 |
| 24. a. 现象 | b. 问题 | c. 君主制 | d. 阶层 |
| 25. | 此题已删除 | | |
| 26. a. 积累 | b. 认识 | c. 拜访 | d. 疏远 |
| 27. a. 敬佩 | b. 改善 | c. 接收 | d. 放弃 |
| 28. a. 寒冷的 | b. 严格的 | c. 合理的 | d. 有效的 |
| 29. | 此题已删除 | | |
| 30. a. 人品 | b. 目的 | c. 侦探 | d. 观点 |

Appendix 2: Listening Comprehension Test

NAME _____

Test B---TEST FOR ENGLISH MAJORS (2017)

-GRADE EIGHT-

PART I LISTENING COMPREHENSION [25 MIN]

SECTION A MIN-LECTURE

In this section you will hear a mini-lecture. You will hear the min-lecture ONCE ONLY. While listening to the mini-lecture, please complete the gap-filing task on ANSWER SHEET ONE and write NO MORE THAN THREE WORDS for each gap. Make sure the word(s) you fill in is (are) both grammatically and semantically acceptable. You may use the blank sheet for note-taking.

You have THIRTY seconds to preview the gap-filing task.

Now listen to the mini-lecture. When it is over, you will be given THREE minutes to check your work.

SECTION B INTERVIEW

In this section you will hear TWO interviews. At the end of each interview, five questions will be asked about what was said. Both the interviews and the questions will be spoken ONCE ONLY. After each question there will be a ten-second pause. During the pause, you should read the four choices of A), B), C) and D), and mark the best answer to each question on ANSWER SHEET TWO.请把答案写在题号的左边!谢谢!

You have THIRTY seconds to preview the choices.

Now, listen to the first interview. Question 1 to 5 are based on the first interview.

1. A. Comprehensive. B. disheartening C. Encouraging. D. Optimistic.
2. A. 200 B. 70 C. 10 D. 500
3. A. Lack of international funding.
B. Inadequate training of medical personnel.

- C. Ineffectiveness of treatment efforts.
 - D. Insufficient operational efforts on the ground.
4. A. They can start education programs for local people.
B. They can open up more treatment units.
C. They can provide proper treatment to patients.
D. They can become more professional.
5. A. Provision of medical facilities.
B. Assessment from international agencies.
C. Ebola outpacing operational efforts.
D. Effective treatment of Ebola.

Now, listen to the second interview. Questions 6 to 10 are based on the second interview.

6. A. Interpreting the changes from different sources.
B. Analyzing changes from the Internet for customers.
C. Using media information to inspire new ideas.
D. Creating things from changes in behavior, media, etc.
7. A. Knowing previous success stories.
B. Being brave and willing to take a risk.
C. Being sensitive to business data.
D. Being aware of what is interesting.
8. A. Having people take a risk.
B. Aiming at a consumer level.
C. Using messages to do things.
D. Focusing on data-based ideas.
9. A. Looking for opportunities.
B. Considering a starting point.
C. Establishing the focal point.
D. Examining the future carefully.
10. A. A media agency.
B. An internet company.
C. A venture capital firm.

D. A behavioral study center.

Test B---ANSWER SHEET ONE

NAME _____

The Modes of Language

Three modes of language

- Speech
- Writing
- (1) _____ (1) _____

Speech and writing

- Speech is considered (2) _____ because (2) _____
 - all languages are spoken
 - children acquire spoken language first
 - (3) _____ requires reading and writing. (3) _____
- Speech and writing have (4) _____ roles (4) _____
 - legal contracts are written for
 - providing permanent records
 - (5) _____ disputes over oral contracts (5) _____
- Speech is more appropriate in (6) _____ (6) _____
 - face-to-face casual conversations
 - business transactions in stores
 - discussions in a classroom
- (7) _____ of speech and writing (7) _____
 - immediate clarification in speech
 - (8) visible _____ in conversation (8) _____
 - sense of (9) _____ in writing (9) _____
 - use of intonation to express (10) _____ (10) _____
 - writing seen to be more (11) _____ (11) _____
 - lack of (12) _____ in on-line written "chat" (12) _____
- (13) _____ between speech and writing (13) _____
 - linguistic markers of interactivity vary with (14) _____ (14) _____
 - how language is structured depends more on (15) _____ (15) _____

Conclusion

As two different modes of language, speech and writing have their own characteristics.

Appendix 3: Reading Vocabulary Test

English Test C ---- Reading Vocabulary Tests

Student instruction sheet for the Levels Test

This is a vocabulary test. You must choose the right word to go with each meaning. Write the number of that word next to its meaning. Here is an example.

- 1 business
- 2 clock _____ part of a house
- 3 horse _____ animal with four legs
- 4 pencil _____ something used for writing
- 5 shoe
- 6 wall

You answer it in the following way.

- 1 business
- 2 clock 6 part of a house
- 3 horse 3 animal with four legs
- 4 pencil 4 something used for writing
- 5 shoe
- 6 wall

Some words are in the test to make it more difficult. You do not have to find a meaning for these words. In the example above, these words are *business*, *clock* and *shoe*.

If you have no idea about the meaning of a word, do not guess. But if you think you might know the meaning, then you should try to find the answer.

- | | | | |
|--------------|---|------------------|---|
| 1 area | _____ written | 1 adult | _____ end |
| 2 contract | _____ agreement | 2 vehicle | _____ machine used |
| 3 definition | _____ way of doing | 3 exploitation | to move |
| 4 evidence | _____ something | 4 infrastructure | people or |
| 5 method | _____ reason for | 5 termination | goods |
| 6 role | believing
something is
or is not true | 6 schedule | _____ list of things
to do at
certain times |

1	debate	_____	plan	1	alter	_____	change
2	exposure	_____	choice	2	coincide	_____	say something
3	integration	_____	joining	3	deny	_____	is not true
4	option	_____	something	4	devote	_____	describe
5	scheme	_____	into a	5	release	_____	clearly and
6	stability	_____	whole	6	specify	_____	exactly
1	access	_____	male or	1	correspond	_____	keep
2	gender	_____	female	2	diminish	_____	match or be
3	psychology	_____	study of the	3	emerge	_____	in agreement
4	license	_____	mind	4	highlight	_____	with
5	orientation	_____	entrance or	5	invoke	_____	give special
6	implementation	_____	way in	6	retain	_____	attention
							to something
1	edition	_____	collecting	1	bond	_____	make smaller
2	accumulation	_____	things over	2	channel	_____	guess the
3	guarantee	_____	time	3	estimate	_____	number or
4	media	_____	promise to	4	identify	_____	size of
5	motivation	_____	repair a	5	mediate	_____	something
6	phenomenon	_____	broken	6	minimize	_____	recognizing
			product				and naming
			_____				a person or
			feeling a				thing
			strong reason				
			or				
			need to do				
			something				
1	explicit	_____	last	1	abstract	_____	next to
2	final	_____	stiff	2	adjacent	_____	added to
3	negative	_____	meaning	3	neutral	_____	concerning
4	professional	_____	'no' or 'not'	4	global	_____	the whole
5	rigid	_____		5	controversial	_____	world
6	sole	_____		6	supplementary	_____	

1	analysis	_____	eagerness	1	artillery	_____	a kind of tree
2	curb	_____	loan to buy a	2	creed	_____	
3	gravel	_____	house	3	hydrogen	_____	system of
4	mortgage	_____	small	4	maple	_____	belief
5	scar	_____	stones	5	pork	_____	large gun
6	zeal	_____	mixed with sand	6	streak	_____	on wheels
1	cavalry	_____	small hill	1	chart	_____	map
2	eve	_____	day or night	2	forge	_____	large beautiful
3	ham	_____	before a	3	mansion	_____	house
4	mound	_____	holiday	4	outfit	_____	place where
5	steak	_____	soldiers who	5	sample	_____	metals are
6	switch	_____	fight from horses	6	volunteer	_____	made and shaped
1	circus	_____	musical	1	revive	_____	think about
2	jungle	_____	instrument	2	extract	_____	deeply
3	trumpet	_____	seat without	3	gamble	_____	bring back to
4	sermon	_____	a back or	4	launch	_____	health
5	stool	_____	arms	5	provoke	_____	make
6	nomination	_____	speech given by a priest in a church	6	contemplate	_____	someone angry
1	shatter	_____	have a rest	1	decent	_____	weak
2	embarrass	_____	break	2	frail	_____	concerning a
3	heave	_____	suddenly into	3	harsh	_____	city
4	obscure	_____	small	4	incredible	_____	difficult to
5	demonstrate	_____	pieces	5	municipal	_____	believe
6	relax	_____	make someone feel shy or nervous	6	specific	_____	
1	correspond	_____	exchange	1	adequate	_____	enough
2	embroider	_____	letters	2	internal	_____	fully grown
3	lurk	_____	hide and wait	3	mature	_____	alone away
4	penetrate	_____	for someone	4	profound	_____	from other
5	prescribe	_____	feel angry	5	solitary	_____	things
6	resent	_____	about something	6	tragic	_____	

Appendix 5: Suffix Test

English Test E

PART 1

Instructions. Each of the next 27 sentences contains a blank and is followed by four words. Each word of the four words has the same root (base) with a different suffix (endhag). For each sentence choose the word which best fits in the blank.

EXAMPLE: John wants to make _____ a good on his date.

- A. *impressive* B. *impressionable* C. *impression* D. *impressively*

Complete all of the sentences. 请把答案写在题号的左边。谢谢!

1. Fortunately, age improved his _____.
A. *personality* B. *personal* C. *personify* D. *personalize*
2. My assistants will _____ the new procedure.
A. *demonstration* B. *demonstrate* C. *demonstrative* D. *demonstrable*
3. The secret police arrested the ___ before he could give his speech.
A. *active* B. *activist* C. *activate* D. *activize*
4. They _____ those fields early in the spring.
A. *fertilizer* B. *fertility* C. *fertilization* D. *fertilize*
5. John didn't anticipate the harshly ___ response to his work.
A. *criticism* B. *criticize* C. *critical* D. *critically*
6. The committee was not persuaded by the arguments of the ____
A. *reductionist* B. *reduce* C. *reductive* D. *reductional*
7. Frank broke down under the highly _____ questioning.
A. *intensive* B. *intensity* C. *intensify* D. *intensification*
8. The _____ of the geese was complete by Thanksgiving.
A. *migration* B. *migratory* C. *migrate* D. *migrational*
9. The success of the entire _____ depends on Bob.
A. *operative* B. *operational* C. *operation* D. *operationalize*
10. All four studies produced nearly _____ results.
A. *identity* B. *identical* C. *identify* D. *identification*
11. They _____ their own desires at the expense of the group.

- A. gratification B. gratify C. gratuity D. grateful
12. Three separate agencies the traffic in that sector.
- A. regular B. regularity C. regulation D. regulate
13. They hope to _____ their investments.
- A. diversity B. diversion C. diversify D. diversionary
14. It is impossible to _____ people's thoughts.
- A. legislate B. legislative C. legislature D. legislation
15. The _____ of their approach prevented many errors.
- A. systematic B. systematicity C. systematize D. systematically
16. The cost of _____ keeps going up.
- A. electric B. electrify C. electrical D. electricity
17. His consistently _____ behavior eventually destroyed his family.
- A. adultery B. adulterate C. adulterous D. adulterousness
18. They should _____ that room if they plan to grow orchids in there.
- A. humidity B. humid C. humidifier D. humidify
19. Only the most _____ males survived the winter.
- A. activity B. active C. activation D. activate
20. You can't _____ results from studies done only on rats.
- A. generalization B. generality C. generalize D. generalizable
21. The new owners turned the failing business into a highly _____ operation.
- A. production B. produce C. productive D. productivity
22. The _____ targeted the new administration.
- A. satiric B. satirical C. satirist D. satirize
23. They planned to _____ the entire southern coast.
- A. colonist B. colonize C. colonial D. colonization
24. Only the most _____ farmers showed any profit that year.
- A. industrious B. industry C. industrialize D. industrialization
25. Continued food shortages finally caused the _____ to revolt
- A. popular B. popularity C. popularize D. population
26. It was an overwhelmingly _____ conclusion.
- A. glorify B. glorification C. gloriousness D. glorious

27. We all appreciate the tremendously _ _____ part you played in securing the grant.
 A. *instrumental* B. *instrumentation* C. *instrumentality* D. *instrument*

PART 2

Instructions. Complete the following section of the test in the same manner that you did in the section you just finished. Simply choose the one that fits best into the blank.

Complete all 27 sentences. 以下选项里的单词你或许不认识，但并不影响你做出选择。请把答案写在题号的左边。谢谢！

1. They ____ the data in the back office.
 A. *curfamic* B. *curfamation* C. *curfamate* D. *curfamity*
2. All those models are strictly ____ and outdated as well.
 A. *ambilemptify* B. *ambilemptivist* C. *ambilemptity* D. *ambilemptive*
3. In spite of his _____, he did an outstanding job.
 A. *dispribize* B. *dispribation* C. *dispribational* D. *dispribify*
4. Desert animals are not normally _____.
 A. *commalianization* B. *cornmalious* C. *commalianism* D. *commalianize*
5. He is so ... _____. that he offends almost everyone.
 A. *dictopithify* B. *dictopithification* C. *dictopithial* D. *dictopithity*
6. You can't even begin to _____ without modern equipment.
 A. *equamanize* B. *equamanizable* C. *equamanity* D. *equamanive*
7. They presented the highly ____ evidence first.
 A. *credenthive* B. *ceredenthification* C. *credenthicism* D. *credenthify*
8. They hope to _____ the two sides together.
 A. *uniromosity* B. *uniromify* C. *uniromous* D. *uniromative*
9. He wants to _____ while he still can.
 A. *fidamoration* B. *fidamorian* C. *fidamorational* D. *fidamorate*
10. Please try to be as totally ____ as possible.
 A. *progenalism* B. *progenalize* C. *progenious* D. *progenify*
11. Please _ _____ these forms as soon as possible.
 A. *scribsumptist* B. *scribsumptious* C. *scribsumptian* D. *scribsumptize*
12. The story of the _____ was repeated every year.

- A. *vergalize* B. *vergalicious* C. *vergalify* D. *vergalist*
13. The most _____ samples were discarded.
- A. *birendal* B. *birendment* C. *birendalize* D. *birendify*
14. We hope we can overcome its inherent _____ on schedule.
- A. *antiflidify* B. *antiflidian* C. *antfliidacious* D. *antiflidicity*
15. Dr. Jones, a well-known _____, is speaking tonight.
- A. *circumtarious* B. *circumtarist* C. *circumtarify* D. *circumtarize*
16. We should _____ that money by the end of the year.
- A. *relaptification* B. *relaptian* C. *relaptify* D. *relapmble*
17. His _____ is greatly admired.
- A. *superfilize* B. *superfilive* C. *superfilial* D. *superfilation*
18. The meeting was highly _____ and invigorating.
- A. *loquarify* B. *loquarial* C. *loguarialize* D. *loquarialism*
19. Too much _____ is bad for the economy.
- A. *malburuity* B. *malburuify* C. *malburnicious* D. *malburuable*
20. Their progress was stopped by an unexpected _____.
- A. *postramify* B. *postramic* C. *postramity* D. *postramicize*
21. Their approach to the problem is deceptively _____
- A. *torbatify* B. *torbative* C. *torbativize* D. *torbature*
22. The breeders _____ their stock every four generations.
- A. *genilify* B. *genility* C. *genilification* D. *geniliar*
23. She met her first _____ when she moved out west.
- A. *benedumptist* B. *benefumptyfy* C. *benedumptyze* D. *benedumptyuous*
24. Everyone resented the obvious _____ on the manager's part.
- A. *spectitious* B. *spectitionalize* C. *spectition* D. *spectitive*
25. You must _____ them quickly or you'll ruin the colors.
- A. *premanicism* B. *premanicize* C. *premanicity* D. *premanic*
26. All the suspiciously _____ specimens are kept in a separate tank.
- A. *tribacize* B. *tribacion* C. *tribacism* D. *tribacious*
27. The new equipment will _____ everything automatically.
- A. *transurbate* B. *transurbativity* C. *transurbatist* D. *transurbative*

Appendix 6: Reading Comprehension Test

Name _____

Score _____

Test F---READING COMPREHENSION

[20 MIN]

In this section there are three passages, each followed by four or five multiple choice questions. For each multiple choice question, there are four suggested answers marked A, B, C and D. Choose the one that you think is the best answer. 请把答案写在题号的左边！谢谢！

Passage 1

(1) Rachel Louise Carson received her degrees in marine biology from the Pennsylvania College for Women and in zoology from the Johns Hopkins University. Her true calling turned out to be much broader in range than the academic study of wildlife, however. As Carson's career as a scientific writer progressed, she became interested in the effects of artificial chemicals on the natural environment. Through her published research, she was the first to direct public attention to the environmental damage caused by the indiscriminate use of pesticides in agriculture. She is thus regarded as the public figure who launched the environmentalist movement.

(2) Upon enrolling in college, Carson had initially intended to major in English and become a journalist or novelist. Her attentiveness to presentation allowed her to convey even rather dry facts in an evocative prose style that held the attention of the general reader. Wedded to her extensive academic training in biology, Carson's talent for expressive writing positioned her ideally to bring scientific findings about ecology to a mass audience. She published a famous trilogy about the delicate and complex ecology of the sea, beginning with *Under the Sea-Wind*. That first volume took a large-scale approach, describing the living systems of the ocean in everyday, easily understood terms. *Under the Sea-Wind* was only a moderate commercial success, but it, along with Carson's writings for the United States Fish and Wildlife Service, set the stage for her second volume, published ten years after the first. *The Sea Around Us* made Rachel Carson a household name, it became not only a bestseller but also a National Book Award winner. In it, Carson examined more explicitly than before the effects of human action on the creatures of the ocean. The last book in the trilogy was *The Edge of the Sea*, in which Carson trained her writerly and scientific gaze on the shoreline of the East Coast to examine the endangered organisms that populated it.

(3) These books established Carson as a public figure who advocated respect for the environment, but the work that would be her most lasting legacy was yet to come. She began to examine data on the effects of agricultural pesticides, spurred in part by a letter from two friends who owned a farm in Massachusetts and expressed concern that sprayed pesticides were causing harm to local wildlife. Carson's research convinced her

that high exposure to pesticides such as DDT threatened not only beneficial insects and birds but also people. She put her conclusion in a landmark fourth scientific volume, *Silent Spring*. In the famous image that gave the book its title, Carson hypothesized about an ecosystem in which the calling of birds had been silenced by poison in soil and groundwater.

(4) Carson alleged that the regulations governing use of these chemicals were inadequate, though her positions were not as extreme as they are sometimes now characterized. She did not support the outright banning of pesticides. _____, she objected to “indiscriminate” use, which is to say, use without any thought for caution and moderation. Eventually, Carson’s views were taken seriously at the highest levels of government. President John F. Kennedy’s Science Advisory Committee solicited her advice on how to improve rules about pesticide use. She also testified before Congress. Through her influence, she assisted in bringing about far stricter controls on toxic chemicals such as DDT, which deteriorates slowly and thus remains in soil and groundwater for very long periods of time.

(5) Although Carson’s fame meant that she was in demand as a public speaker, she much preferred the solitude of research and writing. She employed assistants but frequently did even tedious archival research herself to avoid wasting time reviewing material with which she was already familiar. The same concern with clarity and elimination of waste characterized her writing itself. Though Carson died in 1964, two years after the publication of *Silent Spring*, that book is still frequently cited in environmental policy recommendations by analysts and regulators. Her best-selling work, it also remains a staple of high school and college science classes. Indeed, more than one major publication has deemed Carson one of the most influential figures of the twentieth century.

1. The underlined word “launched” in the paragraph 1 is closest in meaning to
A. wrote about B. reorganized C. began D. researched
2. It can be inferred from the passage that DDT is especially dangerous because
A. it is most commonly used pesticide B. its taste attracts birds
C. It does not disappear quickly D. It takes a long time to kill insects
3. Which word fits in the blank in paragraph 4?
A. Besides B. Finally C. Rather D. Likewise
4. The best title of the passage is
A. Politics of Pollution B. Feminism of Science

C. The Ocean in Danger
Carson

D. The First Environmentalist: Rachel Carson

Passage 2

(1) The flag, the most common symbol of national identity in the modern world, is also one of the most ancient. The traditional flag of fabric is still used to mark buildings, ships, and diplomatic caravans by national affiliation, but its visual design makes it adaptable for other roles as well. Most flags have a compact, rectangular shape and distinct visual symbolism. Their strong colors and geometric patterns are usually instantly recognizable even if miniaturized to less than a square centimeter. Images of flags can thus serve as identifying icons on airliners, television broadcasts, and computer displays.

(2) Despite its simplicity, the national flag as we know it today is in no way a primitive artifact. It is, rather, the product of millennia of development in many corners of the globe. Historians believe it had two major ancestors, of which the earlier served to indicate wind direction. Early human societies used very fragile shelters and boats. Their food sources were similarly vulnerable to disruption. Even after various grains had been domesticated, people needed cooperation from the elements to assure good harvest. For all these reasons, they feared and depended on the power of the wind, which could bring warmth from one direction and cold from another.

(3) Ascertaining the direction of the wind using a simple strip of cloth tied to the top a post was more reliable than earlier methods, such as watching the rising of smoke from a fire or the swaying of field grasses. The association of these prototypes of the flag with divine power was therefore a natural one. Tribes began to fix long cloth flutters to the tops of totems before carrying them into battle, believing that the magical assistance of the wind would be added to blessings of the gods and ancestors represented by the totem itself.

(4) These flutters may seem like close kin of our present-day flag, but the path through history from one to the other wanders through thousands of years and over several continents. The first known flag of a nation or ruler was unmarked: The king who established the Chou Dynasty in China (around 1000 B.C.E.) was reputed to have a white flag carried ahead of him. This practice may have been adopted from Egyptians even further in the past, but it was from China that it spread over trade routes through India, then across Arab lands, and finally to medieval Europe.

(5) In Europe, the Chinese-derived flag met up with the modern flag's second ancestor, the heraldic crest. The flags used in Asia may have been differentiated by color, but they rarely featured emblems or pictures. European nobles of the medieval period had, _____, developed a system of crests (symbols or insignias specific to

particular families) that were commonly mounted on hard surfaces; shields to be used in battle often displayed them especially prominently.

(6) The production of these crests on flags permitted them to be used as heralds, meaning that they functioned as visual announcements that a member of an important household was present. While crests began to appear on flags as well as shields, the number of prominent families was also increasing. They required an ever greater number of combinations of stripes, crosses, flowers, and mythical animals to distinguish themselves. These survived as the basic components of flag design when small regional kingdoms were later combined into larger nation-states. They remain such for many European countries today.

(7) Some nations, particularly those whose colors and emblems date back several hundred years, have different flags for different official uses. For example, the flag of Poland is a simple rectangle with a white upper half and red lower half. The colors themselves have been associated with Polish nationalism since the 1700s. They originated as the colors of the Piast family, which during its rule displayed a crest bearing a white eagle on a red field. Homage is paid to the Piast Dynasty in the Polish ensign, the flag officially used at sea. Unlike the familiar plain flag flown on land, the ensign has a red shield with a white eagle centered on its upper white stripe.

5. The underlined word “miniaturized” in paragraph 1 is closest in meaning to

- A. publicized B. colored C. made brighter D.
made smaller

6. The underlined word “they” in paragraph 2 refers to

- A. grains B. people C. elements D.
harvests

7. Which word fits in the blank in paragraph 5?

- A. however B. nevertheless C. furthermore D.
similarly

8. According to paragraph 6 of the passage, the number of flag designs increased because

- A. fewer shields were being made for battle
B. nation-states were becoming larger
C. artists had greater freedom in creating flags
D. more families wanted their own symbols

Passage 3

(1) Although it seems like the proliferation of spam—junk E-mails sent unsolicited to millions of people each day—is a recent problem, spam has been around as long as the internet has. In fact, the first documented case of spam occurred in 1978, when a computer company sent out 400 E-mails via the Arpanet, the precursor to the modern Internet. Now, spam E-mails account for more than two-thirds of all the E-mail sent over the internet, and for some unlucky users, spam makes up 80 percent of the messages they receive. And, despite technological innovations such as spam filters and even new legislation designed to combat spam, the problem will not go away easily.

(2) The reason spammers (the people and businesses that spread spam) are difficult to stop is that spam is so cost-effective. It costs a spammer roughly one-hundredth of a cent to send spam, which means that a spammer can still make a profit even with an abysmally low response rate, as low as one sale per 100,000 E-mails sent. This low rate gives spammers a tremendous incentive to continue sending out millions and millions of E-mails, even if the average person never purchases anything from them. With so much at stake, spammers have gone to great lengths to avoid or defeat spam blockers and fillers.

(3) Most spam filters rely on a fairly primitive “fingerprinting” system. In this system, a program analyzes several typical spam messages and identifies common features in them. Any arriving E-mails that match these features are deleted. But the fingerprinting defense proves quite easy for spammers to defeat. To confuse the program, a spammer simply has to include a series of random characters or numbers. These additions to the spam message change its “fingerprint” and thus allow the spam to escape detection. And when programmers modify the fingerprint software to look for random strings of letters, spammers respond by including nonrandom content, such as sports scores or stock prices, which again defeats the system.

(4) A second possible solution takes advantage of a computer’s limited learning abilities. So-called “smart filters” use complex algorithms, which allow them to recognize new versions of spam messages. These filters may be initially fooled by random characters or bogus content, but they soon learn to identify these features. _____, spammers have learned how to avoid these smart filters as well. The smart filter functions by looking for words and phrases that are normally used in a spam message, but spammers have learned to hide words and phrases by using numbers or other characters to stand in for letters. For example, the word “money” might appear with a zero replacing the letter “o.” Alternatively, spammers send their messages in the form of a picture or graphic, which cannot be scanned in the same way a message can.

(5) Another spam stopper uses a proof system. With this system, a user must first verify that he or she is a person before the E-mail is sent by solving a simple puzzle or answering a question. This system prevents automated spam systems from sending out mass E-mails since computers are often unable to pass the verification tests. With a proof system in place, spam no longer becomes cost-effective because each E-mail would have to be individually verified by a person before it could be sent. So far, spammers have been unable to defeat proof systems, but most E-mail users are reluctant to adopt these systems because they make sending E-mails inconvenient. A similar problem prevents another effective spam blocker from widespread use. This system involves charging a minimal fee for each E-mail sent. The fee, set at one penny, would appear as an electronic check included with the E-mail. Users can choose to waive the fee if the E-mail is from a legitimate source; however, users can collect the fee from a spammer. A fee system would most likely eliminate a great deal of spam, but unfortunately many users find such a system too intrusive and inconvenient.

(6) In some ways, the battles being fought over intrusive E-mails are very much an arms race. Computer engineers will continue to devise new and more sophisticated ways of blocking spam, while spammers will respond with innovations of their own. It is unfortunate that the casualties in this technological war will be average E-mail users.

9. The underlined phrase “The program” in paragraph 3 refers to

- | | |
|--------------------------|----------------------------------|
| A. spam messages | B. random characters and numbers |
| C. a type of spam filter | D. common features |

10. Which word fits in the blank in paragraph 4?

- | | | | |
|------------------|--------------|------------|-----------|
| A. Unfortunately | B. Otherwise | C. Finally | D. Indeed |
|------------------|--------------|------------|-----------|

11. The underlined word “automated” in paragraph 5 most nearly means

- | | |
|--------------------|-------------------------|
| A. computerized | B. authorized |
| C. ineffectiveness | D. violation of privacy |

12. In paragraph 6, the author implies that

- A. Though spamming will continue, it will be only a minor inconvenience.
- B. E-mail users suffer the greatest costs from the fight over spam.
- C. It is only a matter of time before a permanent solution to spam is found.

D. Spam will become an increasingly serious threat to communication by email.

13. The best title of the passage is

A. Internet Security

B. Solutions to Spam

C. Why is Spam Profitable

D. The Problems of Spam