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Linguistic Representation of English Vocabulary Attrition

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ABSTRACT

This study aimed to identify vocabulary attrition and the linguistic representation of English vocabulary attrition. One hundred and twenty-one participants were randomly selected to participate in the vocabulary tests. The results of vocabulary attrition tests were measured through non-parametric 2-related samples tests and linguistic analyses in terms of phonology, morphology, and semantics. The authors identified a statistically significant vocabulary attrition during a two-month holiday. In the field of phonology, the authors reached the conclusion that medial segments of words are easily attrited, while words with similar onsets are easily attrited and the words with similar general rhythms are easily attrited. Furthermore, in the morphological area, it was argued that suffixes are subject to attrition, while words with similar onsets and general rhythms are easily attrited. As far as semantic representation of lexical attrition is concerned, the authors purport that the participants tend to mix synonyms, antonyms, and the words coordinately associated, superordinately related, or affectively connected. The affective factors, including active, passive and associative imagination, may cause lexical attrition as well.

Keywords: Linguistic representation, English language attrition, vocabulary attrition

INTRODUCTION

This study, aiming at vocabulary attrition and linguistic representation of vocabulary attrition, is worthwhile to be attached importance to. In China, vocabulary attrition has not aroused much concern. Most of the studies on attrition stress the linguistic structure (Anderson, 1999), and only limited studies have investigated into the experiences which surround and permeate the attrition of foreign language (Guardardo, 2000). As Schmid and Köpke (Köpke *et al*., 2007, p. 4) noted, "the field of attrition is still far less extensive, less theoretically sophisticated." Among those research into attrition of language skills, abundant studies have explored the area of vocabulary. Nevertheless, very few have investigated the differences of vocabulary attrition in terms of linguistic representation. Hence, via this study, the author hopes to elucidate this infrequently discussed field of attrition.

The research question proposed is "do English skills attrite after a two-month holiday in terms of vocabulary knowledge and linguistic

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representation of English vocabulary?" The objectives of this study were to determine if there is any vocabulary attrition during a two-month holiday and to investigate the linguistic representation of vocabulary attrition. In response to these objectives, a null hypothesis proposing that any vocabulary attrition over the holiday does not exist was therefore postulated.

LITERATURE REVIEW

While language attrition has generally gained attention in the recent years (e.g. Schmid, 2002), lexical attrition has not, despite the importance of lexicon in many communities for linguistic self identity (Hill, 1993). In the cases where lexical attrition has been examined, various contradictory contentions have been made. For example, lexical attrition in a target language is common and significant (Schmidt, 1985, p.170), resulting in decreased overall vocabulary range (Trudgill, 1976/1977); it has also been reported that vocabulary loss can be minimal (Hutz, 2004, pp.191-192; Schmid, 2002). Lexical attrition has been characterized in terms of loss of vocabulary, loss of semantic distinctions, and in reduced performance ability. Performance-related attrition may include difficulty in lexical recall (Olshtain, 1989; Leyew, 2003, p.108; Sasse, 1992) and increased uncertainty of lexical judgments (Giacalone Ramat, 1979). Semantic changes may include increased polysemy (Leyew, 2003, p. 118) and increased generic usage of terms (Fabunmi & Salawu, 2005; Leyew, 2003), with changes occurring in the designation, connotation, and range of application of words. Schmid & de Bot (2003) have argued that the evidence for lexical attrition is difficult to find, despite the fact that it is generally considered to be existing. The loss of content morphemes is argued to precede the loss of irregular forms (Ecke, 2004), noun classes (Schmidt, 1985), sub-categorization patterns and case markers (Polinsky, 1997), adpositions and relational words (Trudgill, 1976/1977), as well as allomorphic variation (Schmid & de Bot, 2003). Despite its appeal, the hypothesis postulating that content morphemes are lost before grammatical morphemes has little or no supporting quantitative data (Myers-Scotton, 2002, pp. 206-207).

The issue of morphological structure in the mental lexicon has long been a controversial topic in psychological and neurological linguistics. Generally, two major contrasting models claim different forms of representation. Full-listing models (e.g. Butterworth, 1989; Dell & O'Seaghdha, 1992) assume that the lexical storage or access unit is the whole word. In these models, each morphologically unique word has its own form in the mental lexicon. Parsed models (e.g. Taft & Forster, 1975; Taft, 1994) put forward single morphemes as the storage or access unit. In such models, every morpheme in the language (i.e. each root and each affix) has its own form.

Kim *et al*. (2004) addressed that the level of orthographic representation phonology was linked in the lexicon by comparing the two scripts used in Korean, logographic "hanja" and alphabetic/syllabic "hangul," on a task where judgments were made about the phonology of a visually presented word. It was concluded that the process of making a homophone decision reflected the relationship between orthography and phonology, as mediated through the sub-lexical units activated from orthography to phonology, and vice versa (called "Orthography-Phonology-Orthography Rebound" or "OPO Rebound").

It is indicated in the above mentioned frequency of phonological variant representation that the lexical representation in human mind may be subject to the output of the related lexicon. The more frequently it occurs in the environment, the deeper impression the receiver may have. The notion of variant frequency differs from typical experienced lexical frequency metrics (simple frequency counts) that have been used to predict performance in a wide variety of word recognition tasks (Balota, 1994). The robust and ubiquitous nature of lexical frequency effects has shaped theoretical assumptions about the representation of lexical form (Lively, Pisoni & Goldinger, 1994). Furthermore, a single lexical recognition may

be greatly influenced by the frequency of the phonological input. As a result, a highly frequent phonological variant may be deeply rooted in our mind so that we may recognize the lexicon by matching the phonological characteristics with the lexical form.

In the framework of cohort model proposed by Marslen-Wilson (1984), the word onset is considered to play an important role in the process of lexical retrieval. Taft (1986) has demonstrated that lexical access takes place when sensory information is matched to lexical information, while non-words take longer to classify as non-words if they form the onsets of real words, regardless of the syllable structure. It has been concluded that the access code that activates lexical information in spoken word recognition is the first few phonemes regardless of the syllable structure, whereas in printed word recognition, the access code is the first (orthographically defined) syllable. Studies on word recognition strongly suggest that the psychologically most salient part of any word is its onset. The evidence is of two kinds; the onsets are the most effective cues for successful recall or recognition of a word, and the effects of distorting the onset of a word are much more severe than the effects of distorting later portions (Hawkins & Cutler, 1988). In correctly pronounced words, greater attention paid to word onsets has as a consequence a reduced likelihood of slips of the ears occurring on initial segments, the most likely part of the word for a hearing slip to occur is the middle (Browman, 1978). Based on this theory, Marslen-Wilson & Welsh (1978) proposed a theory of left-to-right auditory word recognition. Under this model, the first portion of a spoken word activates the lexical elements related to all words beginning with that portion. This set of lexical elements forms the "initial cohort". As subsequent lexical elements are sensed by human auditory nerves, they drop out of all words that do not include them and those including them are recognized as the matched words. This model would be very convincing if there were few words with the same onsets. On the contrary, if several other words have the same onsets as the sensed ones, this model will then most likely bring about confusing results.

In the theory of the bathtub effect, both the beginning and the ending parts are considered important for word recognition. It is not the case that only word onsets are important in word recognition. The strict form of, say, the cohort model, or any other model of lexical access which allows only left-to-right word search, will hold the latter parts of the word—segments following the uniqueness point—are entirely redundant. Yet, the evidence clearly shows that although onsets are unquestionably the most salient word parts, endings are more salient than middles (Hawkins & Cutler, 1988). Endings are better recall prompts than middles in Horowitz *et al*.'s (1968; 1969) experiments described above, whereas reversal of letters at the end of a word disrupts recognition more than word-medial reversal (Bruner & O'Dowd, 1958). Both of these are visual word recognition effects, and one may argue that in reading, where the entire word is presented simultaneously in space, the recognizer can afford to attend to other parts of the word. Recall, however, that slips of the ear happens less often on endings than on the middle of words (Browman, 1978).

Aitchison (1994, p.143) proposed a general rhythmic pattern which is inextricably linked with the sounds. Words are possibly clumped together in groups, with those having a similar onset, similar ending and similar rhythmic pattern clustered together. These similar-sounding words sometimes aid recall of one another. However, they can compete for selection, as shown by "blocking" — a familiar, annoying experience when a required word gets pushed back by another like-sounding one.

Word recognition can be realized not only through phonological aid but also morphological identification. Cross-linguistic studies of morphology have demonstrated that there is an asymmetry in the type of affixation preferred; languages which would be predicted on independent structural grounds to prefer suffixes to prefixes do so, but languages which would be predicted to prefer prefixes to suffixes

also show a tendency toward suffixation. In other words, independently of other structural considerations, there is an overall preference for suffix morphology (Cutler *et al*., 1985).

METHODOLOGY

The design of this study involves two vocabulary tests (pre-and post-tests) which were conducted before and after the holiday, respectively.

Participants

The participants are all sophomores from Nanjing University of Posts and Telecommunications (NUPT) who are non-English majors and have learned English for two semesters. The population from which 121 students were selected has all learnt the same English subject which includes the vocabulary in College English Book III (A textbook for junior students in NUPT) in the second semester of 2007-2008 academic year. Their English level is under the category of Interagency Language Roundtable (ILR) scale (Level 1 - Elementary proficiency). The Interagency Language Roundtable (ILR) scale is a set of descriptions of abilities to communicate in a language. It was originally developed by the Interagency Language Roundtable, which included representation by United States Foreign Service Institute, the predecessor of the National Foreign Affairs Training Centre (NFATC). It consists of descriptions of five levels of language proficiency, and is the standard grading scale for language proficiency in the Federal service (ILR online resource, 2010).

Participants Sampling

There were a total of 3556 students in the same semester, among which 167 students were randomly selected using SPSS 13.0. Among 167 students, 121 students had indicated their willingness to participate in the study. As a result, the final number of the participants was 121, which is considered as large enough to conduct a non-parametric 2-related samples test.

TABLE 1
Vocabulary knowledge scale

Self-report categories
I. I don't remember having seen this word before.
II. I have seen this word before, but I don't know what it means.
III. I have seen this word before, and I think it means _____ (synonym or translation).
IV. I know this word. It means _____ (synonym or translation).
V. I can use this word in a sentence: _____ (Write a sentence).

TABLE 2
Vocabulary knowledge scale used in this study

Please answer the following questions according to the following requirements
If you choose A, please mark A behind the word.
If you choose B, please mark B behind the word.
If you choose C, please mark C behind the word and explain the word or provide its synonym in English.
A. I don't remember having seen this word before.
B. I have seen this word before, but I don't know what it means.
C.I have seen this word before, and I think it means _____ (synonym or translation).

The Vocabulary Test

The vocabulary test was designed based on the following table, "Vocabulary knowledge scale" proposed by Wesche & Paribakht (1996). Although this scale has received some criticisms, it is feasible in this study.

As described in Table 1, it is suggested that vocabulary knowledge be measured through five categories. The participants were required to choose the corresponding items according to their understanding.

Since this study aimed to explore the linguistic representation of vocabulary attrition rather than the range of vocabulary, the first, second and third items were chosen as the scales of the vocabulary assessment.

As described in Table 2, A means *I don't remember having seen this word before*; B means *I have seen this word before, but I don't know what it means*; CW means *I have seen this word before, and I think it means* _____ (*synonym or translation*). The translation is wrong; CR means *I have seen this word before, and I think it means* _____ (*synonym or translation*), and the translation is right.

The participants were required to translate the words in the following table from English.

As described in Table 3, 63 words were randomly selected from the glossary in College English Book III, in which around 700 words were enclosed. To begin with, 117 words were randomly selected, and these included some proper nouns, such as address names, people names, fixed collocations and phrases, etc. After removing the proper nouns, 63 words remained as the tested vocabulary. The frequent errors the participants made in the vocabulary tests are listed based on which the sequence of vocabulary is arranged. Nonetheless, the infrequent ones are not listed.

The vocabulary test was conducted twice, one at the end of the academic year 2007-2008, the other at the beginning of the semester of the academic year 2008-2009. The time limit was 20 minutes. The answers were classified into four categories; A: retrieval failure; B: difficult retrieval; CW: wrong retrieval and CR: right retrieval. If the question remained unanswered, then it would be marked A, i.e. *I don't remember having seen this word before*. If the participant chose B (*I have seen this word before, but I don't know what it means.*), it would then be classified into B: difficult retrieval. If the participant chose C: *I know this word. It means* _____ (*synonym or translation*) and provided a correct explanation, it would be marked as CR: right retrieval. If the participants chose C but gave a wrong explanation, it would then be marked as CW: wrong retrieval. For each choice, the participant would obtain one point.

After marking the answers, all the data, including those from both pre-test and post-test would be entered into SPSS 13.0. The vocabulary attrition would be measured through the non-parametric 2-related samples tests. Moreover, the frequent errors in C: wrong retrieval would also be summarized and analyzed through the non-parametric T test, based on which, vocabulary attrition in terms of phonological, morphological and semantic representation would be analyzed as well.

RESULTS

This section presents the results of the vocabulary tests and identifies if there is any significant attrition in terms of vocabulary. In addition, linguistic representation of vocabulary attrition is also identified. The following table shows the data produced from the non-parametric two-related-samples tests in SPSS 13.0.

As shown in Table 4, the first column is the *items*, in which four pairs are listed. The first pair means the result of A1 minus A2, in which A1 means the scores of the participants who chose A (I don't remember having seen this word before.) in the pre-test and A2 means the scores of the participants who chose A in the post-test. The second pair indicates the result of B1 minus B2, in which B1 means the scores of the participants who chose B (I have seen this word before, but I don't know what it means.) in the pre-test, while B2 means the scores of the participants who chose B in the post-test. The third pair refers to the result of CR1 minus

TABLE 3
Classified data for measured vocabulary

No	Vocabulary	Acceptable Explanation	Frequent Error	Total
1	Saucer	浅碟 茶托Plate	用碟者(a person who uses a sauce)	121
2	Barrier	障碍 栅栏 Obstruction	持棒者(a person who carries a bar)	121
3	Hamburger	汉堡包	吃汉堡者(a person who eats hamburger)	121
4	Equality	平等 均等 Equivalence sameness	Quality	121
5	Liberate	解放 释放 Free Rescue	Literate	121
6	Convention	大会 集会 Conference Meeting	Invention	121
7	Chew	咀嚼 咬 Bite nibble	Crew	121
8	Sauce	酱汁 调味汁 Condiment Seasoning	Source	121
9	Conservation	交谈 会话 Dialogue Discussion	Reservation	121
10	Throat	咽喉 嗓子 Larynx Gorge	Throw	121
11	Rack	支架Framework	Rock	121
12	Coast	海岸 Beach Seaside	Beach	121
13	Enthusiastic	热情的Interested Keen	Unwilling	121
14	Reliant	依赖的Dependent	Independent	121
15	Improvement	改进改善Promotion Development	Damage	121
16	Freelance	自由职业者Contributor	Writer	121
17	Oversee	监督Supervise Preside	See	121
18	Venus	金星	Planet	121
19	Character	角色 品质 Actor Nature	Personality	121
20	Neighbor	邻居 朋友 Friend Fellow	Classmate	121
21	Fancy	空想 Imagine	Fans	121
22	Honey	蜂蜜 宝贝 Sweetheart Lover	Money	121
23	Shatter	粉碎 Smash	Latter	121
24	Behave	表现 Perform Conduct	Have	121
25	Undergo	经历 Experience	Go under	121
26	Surgeon	外科医生	Surgery	121
27	Ironical	冷嘲的 Cynical Caustic	Of iron	121
28	Prohibit	禁止 阻止 Prevent Forbid	Profit	121
29	Generate	生成 产生 Produce Create	General	121

Table 3 *(continued)*

30	Insurance	保险 保险业	Assurance	121
31	Specific	明确的 具体的 Definite	Special	121
32	Pad	护垫 Cushion	Pat	121
33	Paste	粘贴 Glue	Taste	121
34	Grief	悲伤 Sadness Sorrow	Brief	121
35	Immerse	沉浸 Engross	Immense	121
36	Flutter	颤动 Tremble	Flatter	121
37	Band	带 箍	Bank	121
38	Conservative	保守的 Protective	Conversation	121
39	Flourish	繁荣 Prosper	Furnish	121
40	Prospect	前途 景色 View	Respect	121
41	Successive	相继的 Consecutive	Successful	121
42	Veteran	老兵 Ex-soldier	Vegetable	121
43	Compromise	妥协 让步 Concede Yield	Complex	121
44	Champagne	香槟酒	Champion	121
45	Capture	俘获 俘虏 Seize Arrest	Captain	121
46	Curse	咀咒Anathema		121
47	Pearl	珍珠		121
48	Prayer	祈祷 祈祷文		121
49	Retail	零售		121
50	Solemn	庄严的 Serious		121
51	Strain	绷紧 Stretch		121
52	Waterproof	防水的 不透水的		121
53	Perfume	香水 香气		121
54	Racial	种族的		121
55	Switch	开关 转换 Shift		121
56	Transport	运送 运输		121
57	Wicked	邪恶的 Vicious		121
58	Feature	特征 特色 Characteristic		121
59	Conclude	断定 Infer		121
60	Fantastic	荒谬的Quixotic		121
61	Reliable	可靠的 Dependable		121
62	Construct	创建 Build		121
63	Resist	抵抗 Oppose		121

Note: The infrequent errors are not listed

TABLE 4
Non-parametric two-related-samples tests on linguistic representation of vocabulary attrition

Item		Mean difference	Z	Asymp. Sig. (2-tailed)
Pair 1	A1- A2	-.24	3.873	.000
Pair 2	B1- B2	.20	3.606	.000
Pair 3	CR1 - CR2	.09	2.449	.014
Pair 4	CW1 - CW2	-.13	2.828	.005

CR2. CR1 means the scores of the participants who chose C: right retrieval (I know this word. It means _____ (synonym or translation) and made the right choice in the pre-test, whereas CR2 means those in the post-test. The fourth pair refers to the result of CW1 minus CW2. CW1 means the scores of the participants who chose C (I know this word. It means _____ 'synonym or translation') but made the wrong choice in the pre-test, whereas CW2 means those in the post-test. The second column indicates the mean differences of each item.

In this study, it was found that there is a relationship between attrition and phonological features which could be exemplified by the phenomenon that some light ending syllables tend to be easily mistaken or some weak syllables are subject to attrition. This phenomenon may be accounted for by the hypotheses which can be tested through the cohort model (Marslen-Wilson, 1984), Bathtub Effect (Cutler, Hawkins & Gilligan, 1985) and general rhythmic pattern (Aitchison, 1994). The following table shows the results which were obtained from the vocabulary tests.

Rayner (1992) has reported that the eyes move farther into a word when the information that uniquely identifies the word is at the end of the word, rather than at the beginning. Not until all the segments of the word are reviewed does sound of the word begins to take effect in the word recognition. The participants must have first focused on the end of the word, and will judge the rough idea if the end is familiar to them, regardless of the exact pronunciation of the word, which is evidenced in Table 5.

Semantic representation of the lexical attrition is also explored in this study, and the data are shown in Table 7.

DISCUSSION

This part is divided into two sub-parts, namely; (1) vocabulary attrition, and (2) linguistic representation of vocabulary attrition in terms of phonology, morphology, and semantics.

Vocabulary Attrition

As shown in Table 4, the probabilities for the four tests are all below 0.05. Therefore, the hypothesis for this non-parametric test, i.e. there are no significant differences between the four pairs, can be rejected. As a result, it can be concluded that over the two-month holiday, the frequencies of choosing CW1 and A1 have significantly increased, but it decreased in choosing B1 and CR1. In other words, the participants made significantly more "wrong retrievals" and "retrieval failures", while obtaining much significantly less "right retrievals" and "difficult retrievals" after the holiday. Although the frequencies of the "right retrievals" and "difficult retrievals" decreased, it does not mean that no "right retrievals" or "difficult retrievals" remained. Some impressions of the vocabulary are still intact and not completely attrited, which can be analyzed through linguistic representation of vocabulary attrition.

Linguistic Representation of Vocabulary Attrition

Phonological representation of lexical attrition

As described in Table 5, *liberate* and *literate* have the same "initial cohort", so do *throat* and *throw*, *immerse* and *immense*, *flatter* and *flutter*, and *band* and *bank*. Consequently, it is not surprising that the participants mistook *liberate* for *literate*, *throat* for *throw*, *immerse* for *immense*, *flatter* for *flutter* and *band* for *bank*, which demonstrates that the onsets of real words, regardless of the syllable structure, are more resistant against attrition than the ending parts. This evidence purports that the onset is so impressive that the participants might have judged their corresponding meanings based on the onset, causing them to mix the semantically different words carrying similar onsets.

Finally, consider also the fact that one could retrieve words successfully given only an ending (think of a word ending with -vark). This is true even in the auditory modality. Nooteboom's (1981) subjects still achieved 60% successful word recognition given only the latter parts of the words. This can simply not be done if words could only be accessed from the lexicon in the left-to-right order. Thus, it appears that although word onsets are most important for word recognition, word terminations can be quite important as well. This phenomenon is referred to as the *bathtub effect.*

The bathtub effect is well-proven in Table 5. Both *rack* and *rock* have the same onset *r* and the same ending *ck*; *flutter* and *flatter* have the same *fl* and *tter*; *chew* and *crew* have the same *c* and *ew*; *Liberate* and *literate* have the same *li* and *rate*. The participants seemed to make similar mistakes in recognizing all the words with the same onsets and endings.

The general rhythmic pattern is also demonstrated in Table 5. As shown in Table 5, five pairs of words; *convention* and *invention*, *conservation* and *reservation*, *paste* and *taste*, *grief* and *brief*, and *paste* and *taste,* have similar sounds and rhythms, which stimulated the participants to plunge into confusion and misunderstanding.

In summary, the words with similar sounds are subject to attrition. Specifically, the medial segments are easily attrited, whereas the words with similar onsets/endings are easily attrited, and the words with similar general rhythms are easily attrited.

TABLE 5
Phonological representation of the attrited words

Vocabulary	Frequent errors	Phonological characteristics
Liberate	Literate	Light; middle; consonant;
Convention	Invention	Onset; light;
Chew	Crew	Middle; consonant; stress
Sauce	Source	Homophone
Conservation	Reservation	Initial syllable
Throat	Throw	Ending; light
Rack	Rock	initial syllable; vowel; stress;
Pad	Pat	Ending; consonant; light;
Paste	Taste	Onset; consonant; stress;
Grief	Brief	Onset; consonant; stress;
Immerse	Immense	middle; consonant; light;
Flutter	Flatter	Middle; vowel; stress;
Band	Bank	Ending; consonant; light;

Morphological representation of lexical attrition

As described in Table 6, the participants mistook *ironical* for the adjective of *iron*. The reason for this may be that the end of the word *al* which tends to form an adjective has caught the participants' prompt attention. The word *barrier* which ends with *er* can be taken as an example. The participants frequently mistook it as *a person who runs a bar* since the suffix *er* often refers to *a person*. The misunderstanding of *saucer* and *hamburger* as *a person who uses sauce* and *a person eats hamburger* further demonstrates this theory.

Finally, the confusion between three pairs of words, namely; *equality* and *quality*, *insurance* and *assurance*, and *honey* and *money*, may be caused by their similar endings. These three pairs also have similar pronunciations in their endings, which may also contribute to the attrition of word recognition. Additionally, the light prefixes are also attrited in Table 6. In the word *insurance*, it is a light prefix that could have led the participants to incorrectly take it for *assurance*. It may also have been the light prefix *be* in *behave* that made participants mistake it for *have*.

Generally, morphological features also constitute a significant phenomenon of attrition in word recognition. To state this in detail, it is important to note that suffixes are subject to attrition, while words with similar endings (specifically when similarly pronounced) are easily mistaken, and light prefixes are easily attrited.

In the mental lexicon, L1 and L2 lexica within the same speaker are clearly linked phonologically, semantically, and associationally. According to Aitchison (1994, p. 97), two links appear salient especially in the mental lexical dictionaries of English native speakers' mind. One is co-ordinate link that refers to the semantically coordinated words which are connected each other. Among the examples are the connections between *salt* and *pepper*, *hawk* and *swallow*, *truck* and *car*, and *butterfly* and *moth*, etc. The other is the collocational link. For instance, frequent collocations such as *salt water*, *blonde hair*, *traffic jam*, *a slender figure, a hot dog*, and *a sweet dream* give rise to the tendency that in human mind these words are memorized in the form of collocation. Aitchison (1994, p. 97) has put forward two further links known as super-ordination and synonymy,

TABLE 6
Morphological representation of the attrited words

Vocabulary	Frequent errors	Morphological characteristics
Fancy	Fans	Ending
Honey	Money	Onset
Shatter	Latter	Onset
Behave	Have	Prefix
Undergo	Go under	Compound word
Surgeon	Surgery	Ending
Ironical	Of iron	Suffix
Prohibit	Profit	Prefix
Saucer	A person who uses sauce	Suffix
Barrier	A person who runs a bar	Suffix
Hamburger	A person who eats hamburger	Suffix
Equality	Quality	Ending
Insurance	Assurance	Prefix
Specific	Special	Ending
Generate	General	Ending

although both links occur less frequently. The former means that if one word semantically includes the other, the two words will then possibly be linked and kept in human mind in this super-ordinate relationship. Some examples of these are *butterfly* and *insect*, *tree* and *plant*, *zebra* and *animal*, *cupboard* and *furniture,* and so on. The latter link means the two synonyms may be linked together and deeply rooted in human mind. Some instances for this are *starving* and *hungry*, *worried* and *anxious*, *hope* and *expect* and so forth. Sokmen (1993) argued that in the mental lexicon of non-native speakers, affective associations are more frequently observed than links of coordinates and collocations. Based on Sokmen's explanation, there is an affective element that presents a certain visual image, an opinion, an emotional response, or a personal past experience, such as *desk, learning, bright* and *explore*. When learners see the word *desk*, they may think of *learning*, and *a bright classroom* for *learning* will then occur to them, in which they explore the sea of knowledge. This demonstrates that students develop word links or associations according to the emotion, attitudes, or deep impressions and strong memories.

Semantic representation of lexical attrition

As demonstrated in Table 7, semantically associated mental lexicon is convincing. The participants mistook *enthusiastic*, *reliant* and *improvement* for *unwilling*, *independent* and *damage* respectively. All of the misperceived words have the adverse meanings with the participants' misconception, which supports the antonymic links in the mental lexicon. In addition, the participants were also found to have confusion about the exact meanings of these pairs of words; *freelance* and *writer, oversee* and *see, Venus* and *planet,* whose meanings are super-coordinately associated. In addition, the participants also failed to distinguish the differences between these coordinately connected pairs: *character* and *personality*, *neighbour* and *classmate*, *coast* and *beach*, *physicist* and *physician.*

Finally, the participants tend to associate with other affective factors when judging meanings of words. When they catch sight of the word *settlement* (which means 'the act or process of settling or living in some place'), they associate the act or process of coming into some place to live. Consequently, they tend to mistake

TABLE 7
Semantic representation of the attrited words

Vocabulary	Frequent error	Semantic relationship
Enthusiastic	Unwilling	Antonym
Reliant	Independent	Antonym
Improvement	Damage	Antonym
Freelance	Writer	Super-ordinate
Oversee	See	Super-ordinate
Venus	Planet	Super-ordinate
Character	Personality	Coordinate
Neighbour	Classmate	Coordinate
Coast	Beach	Coordinate
Physicist	Physician	Coordinate
Settlement	Immigration	Affection: associated
Frustration	Disappointment	Affection: passive
Resemble	Love	Affection: active

settlement for *immigration*. A sort of passive affection influences the participants when they read the word *frustration*. According to Merriam-webster's online dictionary (Merriam-webster's online dictionary, n.d.), *frustration* refers to *a deep chronic sense or state of insecurity and dissatisfaction arising from unresolved problems or unfulfilled needs*, while *disappointment* means *the state or emotion of being disappointed.* Both of them contain some passive meaning which leads the participants to misjudge *frustration* as *disappointment*. On the contrary, the active affection can mislead readers as well. *Resemble* refers to '*to be like or similar to*' (e.g. he resembles his father) and '*love* means *strong affection for another arising out of kinship or personal ties*' (e.g. maternal love for a child) (Merriam-webster's online dictionary, n.d.), whose meanings are both active. As a result, the participants interpreted *resemble* as *love*. Thus, the participants are subject to confusion between two words with active meanings. In other words, in the process of word recognition, the participants tend to mix synonyms, antonyms, and the words which are coordinately associated, and superordinately related or affectively connected. The affective factors such as active, passive and associative imagination may also increase the possibility of lexical attrition.

To sum up, vocabulary attrition has been described in this study in terms of phonology, morphology and semantics. In the field of phonology, it is concluded that the medial segments of words are easily attrited, while words with similar onsets are easily attrited and words with similar general rhythms are easily attrited. Furthermore, in the morphological area, the authors argue that suffixes are subject to attrition, whereas words with similar endings (specifically when they are similarly pronounced), are easily mistaken and light prefixes (those not stressed in pronunciation) are easily attrited. As far as semantic representation of lexical attrition is concerned, the authors purport that the participants tend to mix synonyms, antonyms, and the words which are coordinately associated, and superordinately related or affectively connected. The affective factors, including active, passive and associative imagination, may cause lexical attrition as well.

Based on the above results, an English language programme during the holiday was designed as follows:

Fifty-minute vocabulary lessons which focus on vocabulary training should be conducted based on China's College English textbooks. More light is shed on words with similar endings, especially when the endings are similarly pronounced, light prefixes, synonyms, antonyms; the words that are coordinately associated, superordinately related or affectively connected; and the words stimulating active, passive and associative imaginations.

It is undeniably true that a study of language attrition is worthwhile and interesting. While language attrition has been investigated mainly in western contexts, it is relatively new in China, particularly in higher institutions and over a holiday period. Therefore, to some extent, this study opens a new window to studies in language attrition in China. In that sense, the data could give accountability to language planning and curriculum designers. Finally, the data derived in this study cannot claim to be exhaustive, but it can be seen as helping to advance knowledge with regard to attrition and the learning of English as a foreign language, especially in China which is fast expanding its contact with the English speaking communities in the world.

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