



L1 and L2 lexical network of Chinese EFL learners: Focusing on the effects of semantic category relationship and L2 vocabulary knowledge

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論文要旨

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専攻 グローバル文化専攻・外国語教育システム論

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論文題目 (外国語の場合は日本語訳を併記すること)

L1 and L2 lexical network of Chinese EFL learners: Focusing on the effects of semantic category relationship and L2 vocabulary knowledge

(中国人英語学習者の L1 と L2 語彙ネットワーク形成における意味カテゴリー及び L2 語彙知識の影響)

論文要旨

Second language (L2) misuses at lexical and syntactic levels often occur for L2 learners. This kind of misuses of language comprehension and production are thought to be related not only to vocabulary size and depth of L2 vocabulary knowledge, but also to the lexical network structure of L1 and L2 in the learners' mental lexicon. However, it has not been clarified yet how the lexical network structure formed, and what the relationship between the first language (L1) and L2 lexical networks is in the brain.

To explore the lexical network structure of L1 and L2 in Chinese English learners' brain, especially how the word relations and the differences in the range of semantic categories between L1 and L2 words affect L2 vocabulary acquisition, Experiment 1 in present study investigated the features of Chinese EFL learners' lexical networks in both L1 and L2 by analyzing the number and types of word association responses in Word Association Tasks. Experiment 1 also tried to investigate how it is different or similar in word association responses between L1 and L2, between the association responses produced earlier and later, and between stimulus words with different part of speech. Furthermore, Experiment 1 focused on whether the results of word association differ according to the relationship between the semantic categories of L1 and L2. It means that this experiment tried to research if there are some differences between the results of words like "drink" which in L1 Chinese have a broader semantic category, and the results of words like "wear" and "break" which in L2 English have a broader semantic category. 34 Chinese university students as learners of English were administered two word association tasks (word association tasks in L1 and L2, respectively). The association responses elicited by all participants were categorized into seven categories (equivalent meaning, nonequivalent meaning, meaning and collocation, collocation, form and meaning, form and others) according to the lexical relationships between stimulus words and association responses. The results showed that there was no significant difference between L1 and L2 in terms of the number of associative words and the number of associated words by association types. There was a correlation but no significant difference between the number of association responses in L1 and L2 in general. Interaction between language and category to the number of association responses, significant simple main effect of language to category in equivalent meaning category and meaning and collocation category, and significant simple main effect of category to language in both L1 and L2 were observed. The results also showed a decrease tendency of the number of association responses from the first association to the later ones in both L1 and L2. In a word, the results suggested that the category types and number of word association responses did not varies very much with

languages. However, word class (words' part of speech, e.g., nouns or verbs) of stimulus words led to different types of associated words. Most importantly, the difference in the range of semantic category between L1 and L2 was reflected in the associated words: Among association of words concerning "drink" (including "medicine", "soup," and "porridge"), which in L1 Chinese have a broader semantic category, some items which are considered to be incorrect in L2 English collocations but only correct in L1 Chinese collocations ("eat medicine"; 吃药, for example) were observed. However, among association of words concerning "wear" (including "coat", "jeans," and "shoes"), which in L2 English have a broader semantic category, items which are considered to be incorrect in L1 Chinese collocations but only correct in L2 English collocations ("wear glasses"/ 穿眼镜*, for example) were observed. These results confirmed the mediation of L1 vocabulary knowledge in the construction of L2 lexical network and suggested that the influence of L1 vocabulary knowledge to L2 word association is different in light of the different relationships of semantic categories between L1 and L2. These findings were discussed together with the construction of word network in mental lexicon and the process of L2 vocabulary acquisition. Based on these results, this study depicted L2 learners' network centered by some representative words which L1 and L2 semantic categories are different and discussed the necessity of positive and negative evidence in L2 vocabulary acquisition as pedagogical implications.

In word association tasks, vocabulary knowledge of L2 stimulus words were said to affect the results of responses (Fitzpatrick, 2006, 2007; Nissen & Henriksen, 2006; Wolter, 2001; Namei, 2004). On account of the fact that in Experiment 1, the vocabulary knowledge of L2 stimulus words were not taken into full consideration, Experiment 2 continued the line of attempting to get a better understanding of what the mental lexicon looks, with the underlying intention of trying to demonstrate that the L2 mental lexicon is not structured loosely or randomly but deeply related with both vocabulary size and the depth of vocabulary knowledge of each word. To investigate the influence of both breadth and depth of L2 vocabulary knowledge to the features of Chinese EFL learners' lexical networks, participants' vocabulary size, and the depth of vocabulary knowledge were estimated and word association responses of some representative words were collocated. Experiment 2 also attempted to investigate how it is different or similar in word association responses between stimulus words with different part of speech. 40 adult Chinese learners of English were administered the Vocabulary Knowledge Scale (VKS, a scale to measure the depth of vocabulary knowledge), the Vocabulary Size Test (VST), and L2 word association tasks through an online website Wenjuanxing. The association responses elicited were categorized into seven categories (equivalent meaning, nonequivalent meaning, meaning and collocation, collocation, form and meaning, form and others) according to the lexical relationship between stimulus words and association responses same as in Experiment 1. The results showed that there was a correlation between the number of valid responses and vocabulary size and there was a significant difference between HIGH and LOW vocabulary size groups. When the participants' vocabulary size enlarging, the number of associations increases overall, the meaning-related links (equivalent meaning, nonequivalent meaning, meaning and collocation) increase as well, while the form-based links decrease. In addition, the types of association response changes according to the extent of how well a word is known. The meaning-based association increases, while form-based association decreases when the word become better-known for learners. In addition to a fair amount of support for the notion that while both the breadth and the depth of word knowledge of the stimulus word appear to be important factors that influence the type of word association, the word class also said to affect the associations of equally well-known words. However, the word class effects were null based on the results of this experiment. The possible reasons for this result were mentioned. Then the collocational links in L2 mental lexicon were mainly discussed. Pedagogical implications about collocation learning and teaching and the relationship of vocabulary learning and reading in the practice of L2 education are proposed.

Putting all results of Experiment 1 and 2 together, to gain insight into the way in which Chinese English learners represent their two languages in mental lexicon in more depth, especially to know more about the strength and directions of both intralingual (collocational words in one language) and interlingual (equivalent words in two languages) links between words as depicted in Experiment 1, a collocation decision task was implemented in Experiment 3. Then, to explore how semantically related word pairs and translation word pairs would be recognized, a lexical decisions task with experimental priming paradigm under masked condition was implemented, too. Based on Experiment 1, collocations concerning "drink", "open", which in L1 Chinese have a broader semantic category and "wear", "break", which in L2 English have a broader semantic category were used in collocation decision task, while more words which have either the kind of relation between L1 and L2 semantic category ($L1 > L2$ or $L1 < L2$) were additionally selected as items for lexical decisions task. 20 adult Chinese learners of English participated in this experiment by a remote way online. The accuracy and reaction time (RT) data collected in the decision tasks were analyzed. The results of accuracy in collocation decision task confirmed the mediation of L1 vocabulary knowledge in construction of L2 lexical network, and indicated that the influence of L1 vocabulary knowledge to L2 lexical network is distinguishing by different relationships of the semantic categories between L1 and L2. According to the results of RTs which providing some information about the strength of links between two words in a collocation, learners' lexical networks of some representative words were depicted more detailed in Experiment 3 on the basis of Experiment 1. In the lexical decision task, for the semantic category relationship $L1 > L2$, the RTs in L2-L1 direction is faster than in L1-L2 direction; while for the semantic category relationship $L1 < L2$, the RTs' difference in two directions is not significant. The results of accuracy in the lexical decision task are not significantly different in both L1-L2 and L2-L1 directions and among all kinds of pairs. However, the RTs in L2-L1 direction is significantly faster than in L1-L2 direction overall. A weak translation priming effect is appeared in only L1-L2 direction. As for the L2 proficiency effect, in both L1-L2 and L2-L1 directions, the HIGH and LOW proficiency participants have a similar accuracy in L2-L1 direction, while HIGH proficiency participants showed a significantly higher accuracy in L1-L2 direction. All participants response to translation targets with similar RTs. The direction information of links between equivalent words in L1 and L2 is further added into learners' lexical networks of representative words depicted earlier according to the results in lexical decision task. These results are discussed regarding typical models of bilingual memory representation (RHM & BIA+).

To sum up all three experiments in this study, as one of the most important findings, both associated words in word association tasks in Experiment 1 and the accuracy and RT data in collocation decision tasks in Experiment 3 provided the evidence that L1 word knowledge affect L2 vocabulary recognition and acquisition in some different way in light of the range relationship of semantic category between L1 and L2. Even the mental lexicon seems highly complex and further far from known-well, this study attempted to portray lexical network of L2 learners taking representative words as examples. The direction and strength information of links within language and interlanguage in L2 learners' mental lexicon become clear in the depicted network figure. Then, the influence of L2 vocabulary knowledge (learners L2 proficiency, generally speaking) to L2 word association in Experiment 2 and to lexical decision in Experiment 3 were also confirmed in the present study. In a word, this study took advantage of Word Association Task and online Recognition Task and verified the effects of semantic category relationship between L1 and L2 and L2 vocabulary knowledge in L1 and L2 lexical network of Chinese EFL learners. Results of this study will provide evidence about L1 and L2 lexical network for L2 mental lexicon research area and give support to semantic transfer in L2 learning in the SLA research area. Then, it is expected that this study could promote further research on words' semantic category or on vocabulary semantic analysis from the perspective of linguistics, which may offer new orientations to research of vocabulary recognition in mental lexicon and

vocabulary acquisition in return. Furthermore, this study may give some pedagogical enlightenment to education field as words with different types of semantic category relationship between L1 and L2 may need to be taught in different ways.

論文審査の結果の要旨

氏 名	畢 奇			
論文題目	L1 and L2 lexical network of Chinese EFL learners: Focusing on the effects of semantic category relationship and L2 vocabulary knowledge (中国人英語学習者の L1 と L2 語彙ネットワーク形成における意味カテゴリ及び L2 語彙知識の影響)			
判 定	合 格 ・ 不 合 格			
論文チェックシートによる確認	☒ 確認 ☐ 未確認 理由:			
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要 旨				
1. 本論文の目的および考察対象 本論文は、言語習得において重要な役割を果たす語彙に焦点をあて、中国人英語学習者を対象に、母語である中国語と外国語である英語の語彙が脳内でそれぞれどのように表象されているのか、両者はどのような関係にあるのかについて、単語連想課題やマスク下のブライミング法を用いた語彙性判断課題などの心理言語学実験を通じて、バイリンガルレキシコンの観点から明らかにしたものである。 2. 本論文の構成と内容 1. INTRODUCTION では、外国語学習者が言語理解・産出の際に起こす誤用は、語彙サイズや語彙知識の深さだけでなく、学習者のメンタルレキシコンにおける第一言語と第二言語の語彙ネットワークが大きく関与しているとし、母語と外国語が脳内でどのように表象されているのか、そ				

の両者の関係をバイリンガルレキシコンの観点から、また、単語間のネットワークのあり様とそのリンクの強度を、心理言語学的手法を用いて明らかにすることの意義と必要性が述べられている。

2. LITERATURE REVIEW では、バイリンガルレキシコンモデル、第二言語習得における語彙習得モデルを本研究の拠り所として概観し、単語連想研究における知見、語彙知識と単語連想の関係、さらに、脳内の単語ネットワークを明らかにするためのブライミング実験の知見について広範囲の検討を行い、後に続く心理言語学実験の理論的基盤が整備される。

3. EXPERIMENT 1 では、中国人英語学習者を対象に、中国語と英語の単語自由連想課題を実施し、連想順に連想数が低減すること、意味カテゴリによる連想数や連想語の種類の違いなどの傾向には言語間の違いは見られないことなど観察されたほか、外国語では誤用となるコロケーションの連想語が出現したことから、第二言語語彙ネットワークの構築において第一言語語彙知識が媒介することが明らかになった。

4. EXPERIMENT 2 では、実験 1 で十分考慮されていなかった第二言語の語彙力（語彙サイズおよび語彙知識の深さ）と語彙ネットワークとの関係を明らかにすることを目的として、実験 1 同様、単語連想課題を実施した。その結果、語彙サイズが大きくなるにつれて連想数が増加すること、意味関連の連想語が増え、形式関連の連想語が減少すること、また、語彙知識が深くなるのに伴って連想語の種類に違いが見られることなどが明らかになった。

実験 1 および 2 では、単語連想ネットワーク構造に第一言語と第二言語の意味カテゴリのずれ、第二言語の語彙知識が影響していることを明らかにしたが、5. EXPERIMENT 3 では、言語内および言語間で語と語がどのような強度と方向性によって結合しているのかについてさらに語彙ネットワークのあり様を詳細に検討するため、共起語判断課題およびマスク下ブライミングパラダイムを用いた語彙性判断課題を行った。その結果、第一言語語彙知識が第二言語語彙ネットワークの構築に寄与していることが確認され、第一言語と第二言語の意味カテゴリの関係の違いにより区別されることを示した。また、第一言語の方が意味範囲が広い語では、L2-L1 方向の判断時間が L1-L2 方向よりも速く、その逆の場合には言語の方向性による判断時間の違いは見られなかった。これらの結果は、第一言語と第二言語における語の意味カテゴリの関係により、第二言語語彙ネットワークの一部は第一の語彙ネットワークに依存して形成されるが、一部は第二言語独自に形成されることを示唆している。さらに、実験 1 から 3 の結果に基づき、第一言語と第二言語で意味カテゴリのずれがあるいくつかの単語について、第二言語の語彙知識による違いを反映したバイリンガル語彙ネットワークの描写を試み、語彙習得の発達、語彙教授について議論している。

なお、査読付き論文を含め学術論文 4 本、学術発表 2 件の業績を有する。

3. 本論文の独創性と意義

本論文は、外国語習得途上にある学習者に生じる語彙的・統語的誤りを、脳内に形成されている語彙ネットワークのあり様にあるという仮説のもと、第一言語および第二言語の意味カテゴリの違いに注目し、両言語の語彙ネットワークを単語連想課題によるのみならず、共起語判断課題、語彙的ブライミング実験などオフライン法およびオンライン法により解明しようとした点に新規性がある。本研究で得られた知見は今後の心理言語学分野におけるバイリンガルレキシコン研究および外国語習得の分野の発展に貢献するものであり学術的にも意義のある論文であると認められる。よって、学位申請者の畢奇氏は、博士（学術）の学位を得る資格があると認める。