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# The complex, dynamic development of L2 lexical use: A longitudinal study on Chinese learners of English



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## ABSTRACT

This longitudinal study examined the one-year development of 15 university-level Chinese students' English lexical use from a Complex Dynamic Systems (CDS) perspective. Four measures were employed to gauge the participants' L2 lexical development in terms of their use of individual words and lexical bundles. Data analysis at both the group and individual levels, combined with several CDS analytic methods, illustrate that the learners' lexical sophistication, diversity, density and use of lexical bundles followed diverging paths of development. When lexical sophistication stabilized, indicative of the occurrence of the lexical plateau, a more synchronous development was captured by separate lexical measures. The relationships between different lexical measures fluctuated during the course of development with individual learner differences, and the development of lexical bundle use deviated from that of individual words. The findings suggest that different dimensions of lexical use interactively constitute the complex, dynamic L2 lexical system, and the CDS perspective provides a useful framework for examining long-term lexical development.

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## 1. Introduction

To build a solid vocabulary is an essential part of successful second language (L2) learning. Previous research has confirmed that vocabulary knowledge is a multifaceted construct and its development is fluctuating and incremental (Nation, 2001, 2011; Schmitt, 2010; Zheng, 2014). An increasing number of studies have also contended that proficient and fluent language use is premised on the use of formulaic language (Granger & Meunier, 2008; Hyland, 2012; Paquot & Granger, 2012; Schmitt & Carter, 2004; Wray, 2002, 2008). However, the majority of L2 vocabulary studies have focused on individual words and little research has connected individual words with formulaic language. Even less is known as to how these two types of lexical use co-develop in the long term.

For these reasons, one goal of this study is to use multiple lexical measures to address the multidimensional nature of vocabulary knowledge and to better capture a range of the knowledge dimensions (Nation, 2001, 2007; Schmitt, 2010). The relationship between individual words and multi-word lexical items is inconclusive, although they are equally important parts of lexical use (Schmitt, 2010; Schmitt, Dörnyei, Adolphs, & Durow, 2004). To address this issue, this study intends to

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closely examine how the use of individual words is related to the use of a type of formulaic language, i.e. lexical bundles (Biber, Johansson, Leech, Conrad, & Finegan, 1999).<sup>1</sup> Another goal of this study is to investigate the long-term development of L2 learners' lexical use. Considering the incremental nature of lexical development (Schmitt, 2010), L2 lexical use is best explored by a longitudinal design through a series of measurements.

To these ends, this study used untimed written compositions collected from 15 learners at 8 different time points over a period of 10 months. Drawing on a complex dynamic systems (CDS) perspective (de Bot, Lowie, & Verspoor, 2007; Larsen-Freeman & Cameron, 2008; Van Geert, 2008; Verspoor, de Bot, & Lowie, 2011), the study seeks to bring together several strands of extant L2 vocabulary research and to generate some insights into the multifaceted and incremental L2 lexical development. In the coming section, this paper first reviews the relevant research on L2 lexical development and then justifies taking a CDS perspective in studying L2 lexical use.

## 2. Literature review

### 2.1. The development of individual words

The productive use of individual words is traditionally measured by lexical richness (Read, 2000), including lexical diversity (the ratio of different word types to the total number of word tokens in a given text, i.e. Type—Token Ratio), lexical sophistication (the proportion of low frequency words in a text) and lexical density (the ratio of content words to the total words used). Specific to written lexical use, the ability to produce a word in writing requires different aspects of word knowledge (Nation, 2001) and L2 lexical choices are restricted by the cognitive, motivational and sociocultural resources (Churchill, 2008; Zheng, 2012). Sufficient exposure to the academic genre and familiarity with the topic can also significantly increase lexical diversity (Coxhead, 2012; Yu, 2010).

Different aspects of lexical richness follow different paths in long-term development. Lexical diversity and density tend to increase as the learner becomes more proficient (Jarvis, 2002; Malvern, Richards, Chipere, & Durán, 2004; Polat & Kim, 2014); lexical sophistication, on the other hand, progresses very slowly and may even stop growing once it reaches a certain level (Horst & Collins, 2006; Laufer, 1998; Laufer & Nation, 1995; Laufer & Paribakht, 1998; Morris & Cobb, 2004; Muncie, 2002; Zheng, 2012). This phenomenon is referred to as the lexical plateau. The occurrence of lexical plateaus can be viewed as a phase of “stabilization” in L2 development (Long, 2003), which has been discussed with reference to psycholinguistic, cognitive and motivational variables (e.g. Jiang, 2000; Mondria & Wiersma, 2004; Zheng, 2012, 2014). A point worth noting is that lexical plateaus are usually discussed with reference to lexical sophistication and thus further knowledge regarding how other lexical measures develop when lexical sophistication stabilizes is necessary to better understand lexical plateaus.

### 2.2. The development of lexical bundles

It is becoming increasingly clear that formulaic language is as important as individual words (e.g. Paquot & Granger, 2012; Schmitt, 2010). Lexical bundle, a recurrent type of formulaic language, is defined as the most frequently recurring sequences of words in a given genre as identified from corpus analysis based on pre-set cut-off frequencies (Biber, et al., 1999). Research has shown that lexical bundles provide processing advantages for the user (Conklin & Schmitt, 2012) and serve important discourse functions as a specific genre feature (Biber, Conrad, & Cortes, 2004; Cortes, 2004; Hyland, 2008b; Paquot & Granger, 2012).

Investigations into the relationship between lexical bundles and L2 proficiency have presented a less clear picture, though. A number of studies have shown that L2 learners at the more advanced proficiency level tend to use a larger number and a wider range of bundles compared to learners at a lower level (Ädel & Erman, 2012; Chen & Baker, 2010; Qin, 2014), so an abundant and varied use of lexical bundles is associated with successful and expert academic writing. By contrast, some others suggest that the number of lexical bundles decreases as language proficiency advances (Hyland, 2008a; Reppen, 2009; Staples, Egbert, Biber, & McClair, 2013) or the time spent in an English-speaking country increases (Groom, 2009).

It needs to be noted that most studies on lexical bundles are based on cross-sectional corpus data, whereas very few seem to have looked into learners' long-term development of lexical bundles. Two longitudinal studies on acquisition of lexical phrases have shown that the process is rather slow. Li and Schmitt (2009) studied the lexical phrases produced by a Chinese advanced-level student learning in a British university throughout a year. They found that the increase in mastery of the lexical phrases is mainly of partially known phrases becoming more appropriately used rather than the acquisition of new phrases. Similarly, Schmitt et al.'s (2004) three-month study revealed that the learners' receptive as well as productive knowledge of lexical phrases increased but that there was no connection between the ability to learn lexical phrases and to enlarge the receptive knowledge of individual words. They concluded that the relationship between individual words and formulaic language is not straightforward.

Considering these incompatible and contradictory findings, it becomes necessary to adopt multiple lexical measures and a longitudinal design to further look into L2 learners' use of individual words and lexical bundles. The newly-

<sup>1</sup> Formulaic language has been researched under different terms. In line with the relevant research covering Chinese EFL learners (Chen & Baker, 2010; Qin, 2014), the present study adopts the term lexical bundles to refer to recurrent multi-word expressions.

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