

**EXAMINING CHINESE EFL LEARNERS'
INCIDENTAL VOCABULARY LEARNING
THROUGH SUBTITLED VIDEOS**

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by

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LIST OF ABBREVIATIONS

CEE	College Entrance Examination
EFL	English as Foreign Language
IVL	Incidental Vocabulary Learning
L1	First Language
L2	Second Language
SLA	Second Language Learning
VKS	Vocabulary Knowledge Scale

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MENKAKI PEMBELAJARAN KOSA KATA PELAJAR EFL CINA SECARA INSIDENTAL MELALUI VIDEO DENGAN SARI KATA

ABSTRAK

Sarikata dwibahasa agak biasa digunakan dalam kalangan pelajar Bahasa Inggeris sebagai Bahasa Asing (EFL) dalam kalangan pelajar Cina. Namun begitu, kajian yang membandingkan kesan antara sarikata satu bahasa (monolingual) dan sarikata dwibahasa masih terhad. Tambahan pula, kebanyakan kajian mengenai kesan sarikata dwibahasa terhadap pembelajaran kosa kata secara insidental (IVL) dalam kalangan pelajar bahasa kedua (L2) menunjukkan penemuan yang bercanggah. Ada kajian yang mengesahkan kelebihan sarikata dwibahasa, manakala ada juga yang menafikannya. Selain itu, kajian-kajian lepas yang meneroka kesan pelbagai jenis sarikata terhadap IVL pelajar EFL Cina melalui tontonan video banyak bergantung kepada soal selidik sendiri dan temu bual. Walaupun maklumat yang diperoleh berguna, kaedah ini bergantung kepada persepsi subjektif pelajar, yang mungkin tidak begitu boleh dipercayai. Oleh itu, penjejakan mata (eye-tracking) telah dipilih dalam kajian ini sebagai teknik pengumpulan data untuk memberikan bukti yang lebih objektif dalam meneliti bagaimana pelajar L2 memproses kosa kata semasa proses tontonan video. Kajian ini menilai keberkesanan empat jenis sarikata — sarikata L1 (bahasa ibunda), sarikata L2 (bahasa sasaran), sarikata dwibahasa, dan tanpa sarikata — terhadap IVL pelajar EFL Cina. Ia juga menilai semula kesan pemoderat tahap kemahiran bahasa Inggeris serta kesan jenis sarikata terhadap peruntukan perhatian. Di samping itu, kajian ini menyiasat hubungan antara peruntukan perhatian dan IVL serta persepsi pelajar terhadap kesan keempat-empat jenis sarikata terhadap IVL. Data dikumpulkan melalui ujian kosa kata, penjejakan

mata, dan temu bual separa berstruktur. Kajian mendapati bahawa sarikata dwibahasa adalah paling berkesan dalam meningkatkan IVL pelajar EFL Cina dari segi kedalaman kosa kata, pengecaman bentuk, dan pengecaman makna, diikuti oleh sarikata L2, sarikata L1, dan tanpa sarikata. Pelajar berkemahiran tinggi mendapat manfaat daripada sarikata dwibahasa dan tanpa sarikata, manakala pelajar peringkat pertengahan lebih bergantung kepada sarikata dwibahasa dan L1. Data penjejakan mata menunjukkan bahawa sarikata dwibahasa menarik perhatian paling banyak terhadap perkataan sasaran dan terjemahannya, manakala sarikata L2 lebih menarik perhatian kepada perkataan sasaran berbanding sarikata L1. Tahap kemahiran tidak mempengaruhi jumlah penetapan pandangan (fixation count) dan masa pandangan kedua (second pass time), tetapi pelajar tahap tinggi menghabiskan kurang masa pada terjemahan L1, manakala pelajar pertengahan menumpukan lebih lama kepada perkataan sasaran dalam L2. Ujian pasca tertunda mengesahkan bahawa sarikata dwibahasa paling berkesan untuk pengekalan kosa kata dalam jangka panjang. Oleh itu, kajian ini menekankan kelebihan sarikata dwibahasa dalam meningkatkan pembelajaran dan pengekalan kosa kata. Guru-guru EFL boleh mengoptimumkan penggunaan sarikata berdasarkan tahap kemahiran pelajar — menggalakkan pelajar tahap tinggi untuk lebih berinteraksi dengan input dalam L2, manakala menyediakan sokongan dwibahasa untuk pelajar tahap pertengahan. Di samping itu, pengintegrasian data penjejakan mata dalam strategi pengajaran boleh membantu menyesuaikan persekitaran pembelajaran multimedia untuk memaksimumkan perhatian dan pembelajaran kosa kata pelajar.

EXAMINING CHINESE EFL LEARNERS' INCIDENTAL VOCABULARY LEARNING THROUGH SUBTITLED VIDEOS

ABSTRACT

Bilingual subtitles are quite common among Chinese EFL learners. However, limited studies were conducted to compare the effects of monolingual subtitles and bilingual subtitles. Further, most of the studies on bilingual subtitles on L2 learners' incidental vocabulary learning (IVL) have given conflicting findings. While some have confirmed the advantages of bilingual subtitles, others have denied these advantages. In addition, previous studies that have explored the effects of different types of subtitles on Chinese EFL learners' IVL through viewing have often depended on self-reporting questionnaires and interviews. Though informative, they relied to learners' subjective feelings, which might not be that reliable. Hence, eye-tracking was selected in this study as a data collection technique to provide more objective evidence to examine how L2 learners process vocabulary during video-viewing process. The study examined the effectiveness of four types of subtitles (L1 subtitles, L2 subtitles, bilingual subtitles, and no subtitles) on Chinese EFL learners' IVL. It also re-examines the moderating effects of English proficiency and the impact of subtitle types on attention allocation. Additionally, the study investigated the relationship between attention allocation and IVL and learners' perceptions of the effects of the four subtitle types on IVL. Data were collected using vocabulary tests, eye-tracking, and semi-structured interviews. The study found that bilingual subtitles were the most effective in promoting Chinese EFL learners' IVL across vocabulary depth, form recognition, and meaning recognition, followed by L2 subtitles, L1 subtitles, and no subtitles. High-proficiency learners benefited from bilingual

subtitles and no subtitles, while intermediate learners relied more on bilingual and L1 subtitles. Eye-tracking data showed that bilingual subtitles attracted the most attention to target words and translations, while L2 subtitles directed more attention to target words than L1 subtitles. Proficiency did not affect fixation count and second pass time, but high-level learners spent less time on L1 translations, whereas intermediate learners fixated longer on L2 target words. Delayed post-tests confirmed bilingual subtitles as the most effective for long-term vocabulary retention. Hence, the study highlights the benefits of bilingual subtitles in enhancing vocabulary learning and retention. EFL teachers can optimize subtitle use based on learners' proficiency levels, encouraging high-level students to engage with L2 input while providing intermediate learners with bilingual support. Additionally, integrating eye-tracking data into instructional strategies can help tailor multimedia learning environments to maximize students' attention and vocabulary learning.

CHAPTER 1

INTRODUCTION

1.1 Chapter Introduction

This chapter provides a comprehensive introduction to the study. It begins with an overview of the research background, introducing the general field of inquiry. This is followed by a detailed statement of the problem, which identifies the core issues addressed in the study. Based on the problem statement, the research objectives are outlined, along with their corresponding research questions. The chapter also highlights the potential significance and contributions of the study, emphasizing its relevance and expected impact. Subsequently, the limitations of the study are discussed to identify aspects considered during the research process. However, these limitations are revisited in Chapter Five, where they are re-evaluated in light of the study's findings. This re-examination frames the limitations in relation to the study's contributions and the broader implications of its results. Finally, the organization of the study is outlined to provide a roadmap for the subsequent chapters.

1.2 Background to the Study

In mainland China, the Ministry of Education mandates that nearly all children begin learning English from Grade Three (Zeng et al., 2022), with some children even starting English instruction in kindergarten. In theory, this early exposure suggests that Chinese EFL (English as a Foreign Language) learners should have attained a reasonable level of English proficiency by the time they enter university. However, research consistently indicates that the English proficiency of Chinese EFL learners remains unsatisfactory (e.g., Ma, 2009; Luo, 2013; Zeng et al.,

2022). Vocabulary learning plays a pivotal role in the development of language proficiency for EFL learners (Gu, 2002). Studies have shown that a learner's vocabulary size is significantly correlated with their overall language proficiency; learners with larger vocabulary size tend to perform better in language tasks, whereas those with smaller vocabulary size often face challenges (Nation, 2001; Yuksel & Kavanoz, 2010). Despite this, vocabulary learning remains a significant challenge for many Chinese EFL learners at the tertiary level (Yang & Dai, 2011).

A limited English vocabulary can adversely impact students' comprehensive language skills, including listening, speaking, reading, and writing (Yuan, 2019). Scholars have suggested that Chinese students' inadequate vocabulary knowledge may be attributed to their learning strategies, with rote memorization being the most commonly employed method (Gu, 2002; Gan et al., 2004; Li, 2004). Given these challenges, it is imperative to explore effective strategies and interventions to help Chinese EFL learners in expanding their vocabulary and improving their overall language proficiency.

The significance of vocabulary has been echoed by many linguists and researchers in various language learning contexts (e.g., Nation, 1990, 2001; Folse, 2004; Peter, 2018; Vu & Peter, 2019; Zhu & Huang, 2021; Lai & Chen, 2023). For example, Folse (2004) argued that the shortage of vocabulary may make language learners' communication full of limitations. In relation to this claim, the significance of vocabulary learning to language learning cannot be denied in any language learning context, whatever the language being learnt. Other researchers have also emphasized the significance of vocabulary in language learning. For example, Schmitt (2010) pointed out that vocabulary is one of the basic constituents of Second Language Learning (SLA). Further, Webb and Nation (2017) have argued that

vocabulary is considered to be the “building blocks” in any language learning instruction (p. 5).

Although various scholars have emphasized the significance of vocabulary, vocabulary learning poses a significant challenge to some language learners, especially EFL learners. This phenomenon has been noticed by many researchers who have further shown that the biggest barrier of language learning is vocabulary learning (e.g., Gu & Johnsonhy, 1996; Lawson & Hogden, 1996; Nation, 2022; Teng et al., 2024).

It is widely acknowledged that vocabulary learning occurs through two primary approaches: intentional learning and incidental learning (Hulstijn, 2003). Intentional vocabulary learning refers to a deliberate effort by learners to acquire vocabulary, typically involving activities such as memorizing word lists, consulting dictionaries, and engaging in targeted vocabulary exercises. In this approach, vocabulary learning is the central focus of the learner’s attention. In contrast, incidental vocabulary learning occurs when learners acquire vocabulary as a byproduct of engaging in other activities, such as reading, listening, or participating in communicative tasks, where the primary objective is not vocabulary learning (Hulstijn, 2003). This process involves the unintentional assimilation of new vocabulary while focusing on a different primary goal. Both intentional and incidental vocabulary learning are considered essential for fostering the development of a robust vocabulary base. Research highlights their complementary roles in promoting vocabulary growth, with intentional learning offering explicit knowledge and control over vocabulary, while incidental learning enriches learners’ lexical repertoire through contextualized exposure (Laufer & Nation, 2012).

Research indicated that the vocabulary typically taught in EFL classrooms is notably limited. For example, Webb and Nation (2017) suggested that most classroom instruction focuses on the most frequent 3,000 word-families. Similarly, Malone (2018) estimated that EFL teachers primarily target this range, despite evidence that learners need knowledge of approximately 8,000 word-families (equivalent to about 35,000 individual words) to comprehend written texts effectively (Nation, 2001; Schmitt, 2008, 2010). Consequently, much of the vocabulary necessary for achieving academic fluency in a second language (L2) is acquired outside the classroom through activities such as reading and listening. Malone (2018) noted that the significant gap between explicitly taught vocabulary and the lexical knowledge required for academic competence implied that many less frequent lexical items were learned incidentally through exposure to language in other contexts.

This acknowledgment of the limitations of explicit vocabulary instruction in EFL classrooms has shifted scholarly attention toward the incidental learning of L2 vocabulary. An increasing number of second language acquisition (SLA) researchers have focused on this area in recent years (e.g., Vidal, 2011; Vu & Peters, 2019; Xu, 2021; Yanagisawa & Webb, 2021; Perez, 2022; Wei & Fan, 2022; Teng, 2024a; Teng, 2024b). The effectiveness of incidental vocabulary learning (IVL) has been widely demonstrated (e.g., Wesche & Paribakht, 1999; Hill & Laufer, 2003), prompting numerous studies that examined IVL in diverse learning contexts (e.g., Laufer & Rozovski-Roitblat, 2011; Vanrandi & Faezi, 2013; Teng, 2016, 2021, 2022; Ajabshir, 2022).

1.3 Statement of the Problem

According to the *College English Teaching Guide* issued by the College Foreign Language Teaching Steering Committee (2020), Chinese college EFL learners are expected to acquire a vocabulary size of approximately 5,500 words and 1,000 phrases to effectively communicate in English for personal development and international exchange. This aligns with the overarching goals of college English courses, which emphasize improving students' comprehensive English proficiency while fostering independent learning.

However, research indicates that the vocabulary size of Chinese EFL tertiary learners remains insufficient to meet these requirements (Ma, 2009; Chen & Zhao, 2022; Zeng et al., 2022). Direct vocabulary instruction is relatively rare in Chinese college English classrooms. Although explicit teaching of new words and expressions occasionally occurs, the amount of vocabulary gained through such methods is limited (Yao, 2021). Instead, most vocabulary learning occurs incidentally through integrated language activities, such as listening, speaking, reading, and writing (Yao, 2021). Given these challenges, further empirical research on incidental vocabulary learning (IVL) among Chinese EFL learners is essential. Such studies could provide valuable insights into strategies for helping college students expand their vocabulary and achieve the proficiency goals outlined in national teaching guidelines.

With the advancement of mobile technologies and multimedia, second language (L2) videos, films, and television programs have garnered significant attention from second language acquisition (SLA) researchers (e.g., Hsu et al., 2013; Hsu, 2018; Puimège & Peters, 2019; Teng, 2022; Teng, 2024a). Compared to visual or audio input alone, audio-visual input provides simultaneous visual and auditory

stimuli, offering a more integrated learning experience for L2 learners (Hsu et al., 2013). Research has demonstrated that multimedia learning materials, such as L2 videos, films, and television series, are more effective in promoting incidental vocabulary learning (IVL) than written texts. Furthermore, these multimedia materials are often preferred by L2 learners (e.g., Mayer & Moreno, 2002; Neuman et al., 2021).

A variety of factors influencing L2 learners' IVL through exposure to L2 videos or films have been identified. These include word exposure frequency (e.g., Teng, 2018, 2019a, 2019b), cognateness, word relevance, prior vocabulary knowledge (e.g., Peter & Webb, 2018), and proficiency in the target language (e.g., Teng, 2022). Among these factors, subtitles (or captions) have received particular scholarly attention. Numerous studies have indicated that the presence of subtitles significantly enhances L2 learners' IVL by providing additional visual information on-screen (e.g., Koolstra & Beentjes, 1999; Perez et al., 2014; Peters et al., 2016; Teng, 2019c; Fievez et al., 2021; Perez, 2022; Kurokawa et al., 2024).

The most commonly used types of subtitles in L2 classrooms are L1 subtitles, L2 subtitles, and bilingual subtitles (Li & Hennebry-Leung, 2022). L1 subtitles offer learners a translation of foreign language content into their native language, facilitating comprehension (Peters et al., 2016). Studies have found that L1 subtitles are particularly beneficial for intermediate-level learners (e.g., Bianchi & Ciabattoni, 2008) as they enhance understanding (e.g., Pujadas & Muñoz, 2019; Dizon & Thanyawatpokin, 2021). Conversely, L2 subtitles, which are presented in the same language as the audio input, provide learners with the written form of the target language. These subtitles enable learners to establish form-meaning

connections for unfamiliar words (Wang & Pellicer-Sánchez, 2022) and facilitate word recognition (Winke et al., 2013).

Bilingual subtitles, defined as “the simultaneous presentation of L1 and L2 subtitles” (Wang & Pellicer-Sánchez, 2022, p. 766), have been less frequently examined but hold potential for enhancing IVL. Research suggested that L1 lines in bilingual subtitles provide learners with semantic meanings, while L2 lines reinforce form-meaning connections (Lwo & Lin, 2012; Li, 2016). These combined functions may improve learners’ ability to acquire unfamiliar L2 vocabulary (e.g., Mohsen, 2016).

However, theoretical frameworks suggest that bilingual subtitles may also have limitations. According to the Depth of Processing Theory (Craik & Lockhart, 1972), L1 lines in bilingual subtitles may reduce the cognitive processing required for unfamiliar words, resulting in shallower memory traces and limited vocabulary gains. Additionally, the Cognitive Theory of Multimedia Learning (Mayer, 2009) posits that the human cognitive system has limited capacity for processing information within a single channel. Consequently, the simultaneous presentation of multiple types of visual information in bilingual subtitles may overwhelm learners and hinder the vocabulary learning process.

To date, only a limited number of empirical studies have compared the effects of bilingual subtitles with those of monolingual subtitles (i.e., L1 subtitles and L2 subtitles) on EFL learners’ incidental vocabulary learning (IVL) (e.g., Dizon & Thanyawatpokin, 2021; Lo, 2022; Li & Hennebry-Leung, 2022). However, the findings from these studies are inconsistent. For instance, some studies have reported that bilingual subtitles provide greater benefits for L2 learners’ IVL compared to monolingual subtitles (e.g., Li, 2016; Lo, 2022; Li & Hennebry-Leung, 2022). In

contrast, Lwo and Lin (2012) found no significant advantages of bilingual subtitles over monolingual subtitles in facilitating L2 learners' vocabulary gains.

In addition to the paucity of research comparing the effects of bilingual, L1, and L2 subtitles on EFL learners' IVL, there is a lack of understanding regarding how learners process visual information presented on the screen during the viewing of L2 videos, films, or television programs, and how this processing relates to incidental vocabulary learning. Previous research on EFL learners' IVL has predominantly relied on offline measurements, such as vocabulary tests (e.g., Pigada & Schmitt, 2006; Brown et al., 2008; Pellicer-Sánchez & Schmitt, 2010). While offline measurements are useful for assessing learning outcomes, they provide limited insights into the cognitive processes underlying vocabulary acquisition. Consequently, studies that integrate offline and online measurements are needed to better understand the mechanisms of vocabulary learning (Pellicer-Sánchez & Perez, 2024).

Eye-tracking technology offers a valuable tool for exploring how L2 learners process different types of subtitles in real time. This equipment provides direct, real-time measurements of learners' visual behavior, offering an objective lens into cognitive effort and attentional allocation. Metrics such as fixation duration on target words and transitions between subtitles and visual scenes yield quantifiable data on how learners engage with vocabulary. Consequently, eye-tracking does not merely document viewing behavior; it reveals the intricate dynamics of how different subtitle types guide attention and influence the initial stages of lexical acquisition, thereby addressing a crucial gap left by offline assessments (Pellicer-Sánchez & Perez, 2024). Nevertheless, only one eye-tracking study has specifically examined the effects of bilingual and monolingual subtitles on L2 learners' IVL during the

viewing of L2 videos (e.g., Wang & Pellicer-Sánchez, 2022). This highlights the need for further empirical studies using eye-tracking technology to analyze the differential effects of bilingual, L1, and L2 subtitles on EFL learners' IVL.

In light of these research gaps, the present study aims to employ eye-tracking technology to investigate the effects of various types of subtitles on Chinese EFL learners' IVL through the viewing of English videos. Given that learners' L2 proficiency has been identified as a significant factor influencing IVL in the context of L2 audio-visual materials (e.g., Lwo & Lin, 2012; Winke et al., 2013; Teng, 2019c; Teng, 2022; Teng, 2024b), this study also seeks to address a gap in the existing literature. Specifically, the only eye-tracking study to date (Wang & Pellicer-Sánchez, 2022) did not account for the moderating effects of learners' L2 proficiency. By incorporating this variable, the current study aims to provide a more comprehensive analysis of how subtitle types and attention allocation interact with learners' proficiency levels to influence IVL outcomes.

1.4 Research Objectives

In a bid to explore the effects of subtitle type, learners' L2 proficiency and learners' attention allocation on Chinese EFL learners' IVL through viewing English videos and provide useful instructions to Chinese EFL learners and teachers, this study aims to accomplish the subsequent research objectives:

1. To examine the effects of viewing English videos with different types of subtitles (i.e., no subtitles, L1 subtitles, L2 subtitles or bilingual subtitles) on Chinese EFL learners' IVL.

2. To analyse how Chinese EFL learners' English proficiency moderate the effects of viewing English videos with different types of subtitles on their IVL.
3. To examine the effects of viewing English videos with different types of subtitles on Chinese EFL learners' attention allocation.
4. To analyse how Chinese EFL learners' English proficiency moderate the effects of viewing English videos with different types of subtitles on their attention allocation.
5. To examine the effects of Chinese EFL learners' attention allocation on their IVL through viewing English videos under different subtitling conditions.
6. To examine the effects of Chinese EFL learners' English proficiency and different types of subtitles on their incidental vocabulary retention through viewing English videos.
7. To explore Chinese EFL learners' perceptions on the effects of four types of subtitles on their IVL while watching subtitled English videos.

1.5 Research Questions

In order to achieve the seven research objectives mentioned above, this study aims to address the research questions listed below:

1. How does viewing English videos with different types of subtitles (i.e., no subtitles, L1 subtitles, L2 subtitles or bilingual subtitles) affect Chinese EFL learners' IVL?

2. To what extent does Chinese EFL learners' English proficiency moderate the effects of viewing English videos with different types of subtitles on their IVL?
3. How does viewing English videos with different types of subtitles affect Chinese EFL learners' attention allocation?
4. To what extent does Chinese EFL learners' English proficiency moderate the effects of viewing English videos with different types of subtitles on their attention allocation?
5. To what extent does Chinese EFL learners' attention allocation affect their IVL when they are exposed to English videos with different types of subtitles?
6. How do Chinese EFL learners' English proficiency and different types of subtitles affect their incidental vocabulary retention through viewing English videos?
7. What are Chinese EFL learners' perceptions on the effects of different subtitles on their IVL?

1.6 Research Hypotheses

In order to better answer the above-mentioned questions, some null and alternative hypotheses are formulated. It is important to note that following six pairs of hypotheses were formulated according to the research questions. The last research question was answered through interviews, which is one of the most common qualitative methods of data collection. In other words, there are no hypotheses for this particular research question. The six pairs of hypotheses for this study are:

- H₀1. Viewing English videos with different types of subtitles has no effect on Chinese EFL learners' IVL.
- H₁1. Viewing English videos with different types of subtitles has significant effects on Chinese EFL learners' IVL.
- H₀2. Learners' English proficiency has no influence in moderating the effects of viewing English videos with different types of subtitles on Chinese EFL learners' IVL.
- H₁2. Learners' English proficiency has significant influences in moderating the effects of viewing English videos with different types of subtitles on Chinese EFL learners' IVL.
- H₀3. Viewing English videos with different types of subtitles has no effect on Chinese EFL learners' attention allocation.
- H₁3. Viewing English videos with different types of subtitles has significant effects on Chinese EFL learners' attention allocation.
- H₀4. Learners' English proficiency has no influence in moderating the effects of viewing English videos with different types of subtitles on Chinese EFL learners' attention allocation.
- H₁4. Learners' English proficiency has significant influences in moderating the effects of viewing English videos with different types of subtitles on Chinese EFL learners' attention allocation.
- H₀5. Chinese EFL learners' attention allocation has no effects on their IVL through viewing English videos with different types of subtitles.
- H₁5. Chinese EFL learners' attention allocation has significant effects on their IVL through viewing English videos with different types of subtitles.

H₀₆. Chinese EFL learners' English proficiency and different types of subtitles have no effects on their incidental vocabulary retention through viewing English videos.

H₁₆. Chinese EFL learners' English proficiency and different types of subtitles have significant effects on their incidental vocabulary retention through viewing English videos.

1.7 Significance of the Study

This study aims to understand more comprehensively and deeply the effects of subtitle type, learners' English proficiency and learners' attention allocation on Chinese EFL learners' IVL through viewing English videos with different types of subtitles (i.e., no subtitles, L1 subtitles, L2 subtitles, bilingual subtitles). The findings of this thesis made pedagogical, empirical, theoretical and methodological contributions to Chinese EFL learners, teachers and SLA researchers.

Pedagogically speaking, the results of this study offer practical insights for Chinese EFL learners to expand their vocabulary. By analyzing the effects of four different types of subtitles on IVL, this research can provide learners and teachers with a broader understanding of how subtitled videos impact vocabulary learning. Consequently, the findings assist EFL teachers in selecting appropriate subtitled videos tailored to students' English proficiency levels for both classroom and extracurricular learning. Additionally, the results can inform English course designers, such as curriculum planners or school administrators, on the benefits of incorporating audio-visual materials into language courses. This could encourage the development of courses that leverage subtitled videos to enhance vocabulary learning.

Empirically speaking, this empirical study contributes to the growing body of research on the effects of subtitle types on EFL learners' IVL. It specifically examines how viewing English videos with different subtitles (i.e., no subtitles, L1 subtitles, L2 subtitles, or bilingual subtitles) influences vocabulary learning among Chinese EFL learners. Moreover, the study employs eye-tracking technology to investigate learners' attention allocation, providing valuable insights into how cognitive resources are distributed during subtitle processing. This methodological approach enables the study to better explain the relationships between subtitle types, attention allocation, and IVL outcomes. Furthermore, by examining the moderating effects of learners' English proficiency, this research offers new evidence on the role of proficiency in subtitle-mediated vocabulary acquisition.

Theoretically speaking, the findings of this study contribute to the theoretical understanding of the Noticing Hypothesis, which posits that increased attention enhances learning (Schmidt, 2000). By analyzing the relationship between learners' attention allocation and IVL, this study provides empirical support for the hypothesis. Additionally, the research deepens our understanding of the Cognitive Theory of Multimedia Learning and the Depth of Processing Theory in the context of subtitle use in language learning. According to the Cognitive Theory of Multimedia Learning, excessive information within a single cognitive channel can hinder processing (Mayer, 2005). While subtitles—especially bilingual ones—may facilitate form-meaning connections by providing visual cues (i.e., pictures, L1, or L2 subtitles), they may also overwhelm learners' cognitive capacities, potentially impeding vocabulary learning. Similarly, the Depth of Processing Theory (Craik & Lockhart, 1972) suggests that bilingual subtitles reduce the need for learners to process the meaning of unknown words actively, thereby leading to weaker memory traces.

However, some studies (e.g., Liao et al., 2020; Dizon & Thanyawatpokin, 2021; Wang & Pellicer-Sánchez, 2022) have reported positive effects of bilingual subtitles on vocabulary acquisition. This study further tests the applicability of these theories by empirically analyzing the effects of subtitle types on IVL.

Methodologically speaking, this study adopts an explanatory sequential mixed-methods design, integrating a quantitative analysis with qualitative interviews to provide a more comprehensive and nuanced understanding of the effects of subtitle types, learners' English proficiency, and attention allocation on IVL. The quantitative phase involves an in-depth analysis of subtitle effects using eye-tracking technology, which offers precise measurements of learners' attention allocation. The subsequent qualitative phase employs interviews to explain and contextualize the quantitative findings, yielding a deeper and more holistic interpretation of the data videos.

1.8 Delimitations of the Study

The present study probes into the effect of subtitle type, learners' L2 proficiency and learners' attention on Chinese EFL students' IVL through viewing English videos. Though the answers to the seven research questions can have significant contributions to vocabulary learning, there are still some delimitations that can be improved in the future research.

First, the participants in this study are only Chinese college EFL students and caution should be paid when applying the results of this study to learners with other L1 backgrounds. In other words, it is difficult for one researcher to cover a large number of samples. Thus, future researchers can collaborate to include a wide

range of learners from different colleges and examine the effect of viewing on their acquisition of English vocabulary.

Secondly, this study investigates only learners' IVL through viewing English videos. Other input modes such as reading, listening, reading-while-listening are not included. Further studies can be done to contrast the effect of other input modes on EFL learners' IVL.

Thirdly, in addition to subtitle type, learners' English proficiency and learners' attention allocation, and other variables such as students' learning motivation, learning environment, input tasks and output tasks are not included in this study.

Furthermore, the eye-tracking experiment was conducted in a lab and all the participants watched English videos with their chin on the chin holder, which is different from normal learning environment and practice. Therefore, related studies in normal learning circumstances are encouraged to be done in the future.

In addition, this study was limited to high- and intermediate-level learners, as the input material consisted of an English video clip. Low-level learners were excluded because instructional materials deemed appropriate for high-level learners are too challenging for those at low proficiency levels, and conversely, materials suitable for low-level learners lack the necessary rigor for high-level learners.

1.9 Definition of Key Terms

In this section, the definitions of the major terms used in this thesis are presented in an attempt to serve as a guide to the readers. These key terms are defined here alphabetically, and they are in bold in this section.

Attention Allocation: In SLA studies, attention is a crucial concept since Schmidt (1990) first presented the Noticing Hypothesis. Attention allocation in this thesis refers to the cognitive focus that Chinese EFL learners direct toward visual information on the screen when they are watching English videos with four types of subtitles. The allocation of attention in this study was measured by four indicators (i.e., first pass reading time, second pass reading time, total fixation duration and fixation count).

Dimensions of Vocabulary Knowledge: In the opinion of Nation (2001), the learning of a word involves more than just knowing what is its meaning and how to spell it and vocabulary knowledge has many dimensions, including grammar and collocations. The dimensions of vocabulary knowledge considered in this thesis include the form, meaning and depth of the vocabulary.

EFL learners: EFL learners refers to those students who learn EFL (Gu, 1994). In this thesis, Chinese EFL learners refer to the freshmen of a university in China who have learned EFL for more than nine years.

English Proficiency: In this study, English proficiency concerns about Chinese EFL learners' English levels and their English scores in College Entrance Examination are employed as the measure of their English proficiency.

Eye-tracking: Eye-tracking is a sensory technology that can detect a participant's eye-movements in real-time, "in particular their eye fixations (i.e., where and for how long a participant is looking) and their eye movements (i.e., where the eyes move next)" (Godfroid et al., 2013, p 489). Eye-tracking technology converts participants' eye movements into a data stream, revealing details such as pupil position and gaze location. The use of eye-tracking data in cognitive research is

grounded in the assumption of the “eye-mind link” (Reichle et al., 2006, p 4). Under this assumption, eye movements and attention are tightly linked.

Incidental Vocabulary learning (IVL): Hulstijn and Laufer (2001) claimed that native language learners usually acquire vocabulary in the process of listening and reading with the purpose of acquiring meaning. In this thesis, IVL refers to a vocabulary learning method, by which EFL learners can acquire the vocabulary knowledge unintentionally when they are watching English videos and their purpose is to understand the content of the video.

Intentional vocabulary learning: According to Hulstijn and Laufer (2001), if language learners consciously and intentionally learn new vocabulary such as reciting glossary, the learning method is called as intentional vocabulary learning. In this thesis, this vocabulary learning method is use as a concept which tells the differences between intentional vocabulary learning and incidental vocabulary learning. The focus of this study is IVL.

Subtitle type: Subtitles are “permanently affixed on-screen text that presents narration, dialogue, music, or sound effect in a program. Subtitles are typically placed at the bottom of the centre of the television screen” (Zarei, 2009, p67). Subtitles in this thesis refer to on-screen texts when learners are exposed to English videos or films. Subtitle type in this thesis includes no subtitles, L1 subtitles, L2 subtitles and bilingual subtitles (L1+L2).

Vocabulary: Schmitt (2010) poses that vocabulary research should include both individual words and formulaic language. The present study adopted his view and looked into the learning of lexical units at both word and phrase levels.

1.10 Organisation of the Thesis

This thesis consists of five chapters. This is a common practice in the context where this research is done. The content and focus of each chapter are summarized in this section. **Chapter One** is the introduction, which mainly introduces the background, research objectives, research questions and hypothesis of this thesis, briefly explains the research methods and ideas, and clarifies the significance and limitations of this study.

Chapter Two is the literature review. It is divided into two major parts. In the first part, the influencing factors of IVL are classified and discussed, which lays a good foundation for the focus of this research. Then, a comprehensive and systematic review of previous related studies on IVL through viewing would be done in an attempt to find the research gap. The second part mainly expounds the theories and SLA hypotheses related to this study. These theories and SLA hypotheses are Input Hypothesis, Noticing Hypothesis, Depth of Processing Theory, and Cognitive Theory of Multimedia Learning. These theoretical aspects can help the researcher to build the research design and research hypotheses for a production of a scientific research that is done systematically. Chapter Two also provides a theoretical basis for the explanation of the research results and makes the conclusion more convincing. At the same time, through the verification of some hypotheses, a deeper understanding of related theories and hypotheses as well as incidental learning of L2 vocabulary can be presented.

Chapter Three is the methodology part. It mainly presents the research design and the justifications for its selection. The selection of participants and video clips as well as target words, the selection and use of measurement tools and the

research procedure are also described in detail in Chapter Three. In addition, data collection and analysis are presented in this chapter.

Chapter Four mainly reports the answers to the seven research questions. For the sake of the needs of answering research questions, SPSS is used to conduct intra-group and inter-group one-way analysis of variance, correlation analysis and regression analysis on the quantitative data. Excel and Word software programs are used to study and analyse the qualitative data. In addition, eye-tracking equipment is used in the study to observe subjects' eye movements in a bid to find out how their attention are allocated when viewing English videos with different types of subtitles. Combined with these, the research questions are systematically answered.

Chapter Five provides the discussion and the overall conclusion of the study. The chapter starts with a summary of the major findings of this thesis are summarized. More importantly, based on relevant theories, the research findings are interpreted in Chapter Five. Interpretations of the results are done based on the relevant findings of previous studies. Further, Chapter Five discusses the important topics related to IVL through viewing English videos. The corresponding practical suggestions are put forward for EFL teaching in the Chinese universities. Further, the chapter reflects on the limitations of this study and put forward some recommendations for upcoming studies.

1.11 Chapter Summary

Vocabulary learning is crucial for L2 learners and has been a burden among Chinese EFL learners (Luo, 2013; Zeng et al, 2022). Since vocabulary taught in the classroom is limited (Malone, 2018), IVL has increasingly gained researchers' attention from around the world (e.g., Xu, 2021; Yanagisawa & Webb, 2021; Perez,

2022; Wei & Fan, 2022). With the popularity of the multimedia and online resources, English videos or films have frequently been used as teaching materials in Chinese EFL classes (Teng, 2022) and IVL through viewing English videos or films has also become a hot topic for SLA researchers.

The present study investigated the impact of four subtitle types (no subtitles, L1 subtitles, L2 subtitles, and bilingual subtitles) on Chinese EFL learners' IVL. It examined how English proficiency moderated these effects and explored how subtitle types influenced attention allocation. The study also examined the role of attention allocation in IVL and analysed the combined effect of proficiency and subtitle types on vocabulary retention. Lastly, it explored learners' perceptions of how the different subtitle types affected their IVL while watching subtitled English videos. Chapter One provided an overview of the research background, the research problem, research objectives, and significance of the study, along with the research objectives, questions, and hypotheses.

CHAPTER 2

LITERATURE REVIEW

2.1 Chapter Introduction

This chapter reviews and discusses related studies on IVL and systematically defines and explains key concepts relevant to this study. In this chapter, the importance of IVL is presented, coupled with variables that affect L2 learners' IVL and previous studies on IVL through viewing. In addition, this chapter introduces related theories, which are Comprehensible Input Theory, Noticing Hypothesis, Eye-Mind Link Hypothesis, Depth of Processing Theory, and Cognitive Theory of Multimedia Learning. Finally, based on the explanation of the related theoretical and empirical studies, this chapter builds a theoretical framework for this research, so as to lay the theoretical foundation of this research and guide the subsequent study design.

2.2 Vocabulary Knowledge

Vocabulary knowledge can be characterized in terms of two aspects: breadth and depth. The breadth of vocabulary knowledge, also called the second language (L2) vocabulary size, refers to the number of words that is known by a language learner (Webb, 2020b). Estimates suggest that a native speaker's vocabulary size typically encompasses approximately 20,000 English word families after graduating from university (Goulden et al., 1990). A word family consists not only of its base form but also includes its inflected versions and semantically related derived words (Nation & Waring, 1997). As for L2 language learners, according to Nation (2006), they need to gained 8,000–9,000 word-families in order to comprehend a wide range

of written texts and 6,000–7,000 word-families for understanding various spoken texts.

The depth of vocabulary knowledge, on the other hand, indicates an individual's understanding of a word (Webb, 2012). Yanagisawa and Webb (2020) presented three approaches to measure depth of vocabulary knowledge. Table 2.1 presents a summary of the three main approaches to assessing the depth of vocabulary knowledge, including their key features.

Table 2.1 Approaches to measuring depth of vocabulary knowledge

Approach	Brief Description
Developmental Approach	Views vocabulary knowledge as a continuum from no knowledge to full mastery, using scales to signify developmental stages. The VKS is a widely used tool combining self-reporting and performance tests.
Lexical Network Approach	Focuses on learners' understanding of word relationships, such as synonyms and collocates. The Word Associates Format test is a common example but lacks assessment of aspects like spelling, pronunciation, and grammar.
Component/Dimensions Approach	Breaks vocabulary knowledge into three aspects: form, meaning, and use, each divided into receptive and productive knowledge.

First, depth of vocabulary knowledge can be measured by the developmental approach, which regards vocabulary knowledge as a continuum from zero to full knowledge and employed scales to signify developmental stages (Schmitt, 2010; Yanagisawa & Webb, 2020). The Vocabulary Knowledge Scale (VKS) which was proposed by Paribakht and Wesche (1997) is the most extensively applied example of the developmental approach (Yanagisawa & Webb, 2020). As shown in Table 2.2, the VKS functions as a blend of self-reporting and performance tests, assessing learners' recognition of word forms, understanding of word meanings, and the learners' gains in words' grammatical and semantic use (Wesche & Paribakht, 1996).

This VKS is employed in this thesis as a self- report to choose target vocabulary and the first part of vocabulary test.

Table 2.2 Vocabulary Knowledge Scale (Paribakht & Wesche, 1997)

Self- report categories	
I	I do not remember having seen this word before.
II	I have seen this word before, but I do not know what it means.
III	I have seen this word before, and I think it means_____. (synonym or translation)
VI	I know this word. It means_____. (synonym or translation)
V	I can use this word in a sentence: _____. (Write a sentence.) (If you do this section, please also do Section IV.)

The second approach for assessing the depth of vocabulary knowledge is the lexical network approach (Yanagisawa & Webb, 2020). A commonly used example of this approach is the Word Associates Format test, developed by Read (1993, 1998). In this test, participants are presented with eight individual words and asked to select four words that are either synonyms or collocates of the target word. However, this test has some limitations. First, it does not assess other aspects of vocabulary knowledge, such as spelling, pronunciation, and grammatical functions (Yanagisawa & Webb, 2020). Second, the test may not accurately reflect learners' word knowledge, as low scores may result from either a lack of response or an incorrect response, making it difficult to determine the underlying reason for poor performance (Read, 1993).

The third approach to measure depth of vocabulary knowledge is the component approach, also referred to as the dimensions approach (Yanagisawa & Webb, 2020). In accordance with this approach, Nation (2001) presented the most widely recognized and thorough description of word knowledge. Nation (2001) suggested that a word can be comprehended from three general aspects: form, meaning, and use. Additionally, each of three sub-aspects can also be distinguished