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Self-Efficacy and Attitudes for Vocabulary Strategies Among English Learners and Native Speakers

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READING HORIZONS

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Abstract

This study examined university students' self-efficacy and attitudes for employing vocabulary strategies in four learning contexts. The contexts are characterized by input modality (reading vs. listening) and purpose (academic vs. leisure). Another goal was to compare the self-efficacy and attitudes between English learners (ELs) and native speakers. A total of 112 participants responded to four short scenarios by rating their self-efficacy and attitudes toward employing vocabulary strategies under each scenario. Among the results, students reported higher self-efficacy using morphological analysis and dictionary use when reading and higher self-efficacy to seek help when learning for academic purpose. There were no differences in their attitudes. ELs reported lower self-efficacy for using morphological analysis, contextual analysis, and help-seeking than native speakers, but no difference in using dictionaries.

Keywords: **self-efficacy, attitudes, vocabulary, English learners, input modality, purpose**

Introduction

The task of developing an extensive discipline lexicon has long been considered critical for independent reading and academic success for university students (Francis & Simpson, 2009; Gorzycki, Howard, Allen, Desa, & Rosegard, 2016; Nassaji, 2006; Nation, 2001). Empirical studies indicate that university students often struggle with general and technical vocabulary that are critical for comprehending discipline-specific texts and lectures (Gorzycki et al., 2016; Perin, 2013). A recent study by Thonney (2016) reported that college textbooks are compacted with new vocabulary at a high "rate of occurrence" (p. 391). She calculated that biology, chemistry, accounting, art history, and computer programming textbooks have one to three new terms in each page. Thonney continued to note that students struggle with this onslaught of new vocabulary because they have "only recently been introduced to the underlined [new] terms" (p. 393), and these terms are used to identify key concepts. Without the understanding of these key-words, the comprehension in the discipline suffers.

In the present study, we focused on university students' self-efficacy and attitudes

for employing vocabulary strategies, because one of the most important concerns for learning at the postsecondary level is the attempt to understand how students feel about and respond to academic challenges. That is, why some students avoid challenging academic tasks and stop trying when facing difficulties, whereas others demonstrate persistence when faced with obstacles. Research on individual differences has led to a theoretical and empirical discussion of the importance of students' self-efficacy and attitudes for both first and second language learning (e.g., Dörnyei, Henry, & Muir, 2016; Guthrie et al., 2006; Isakson, Isakson, Plummer, & Chapman, 2016). Students' self-efficacy and attitudes toward a specific task impact their subsequent learning behaviors, interaction with the environment, and outcome performance (Bandura, 1986; Pajares, 1997). Postsecondary students should have efficacy and positive attitude to develop effective strategies for learning new vocabulary so they can benefit from lectures and academic conversations, comprehend textbooks, and convey their understanding through oral presentation and essay writing (Elder, 2013; Francis & Simpson, 2009). This is especially critical for university English learners (ELs) because researchers and educators have long been suggesting that vocabulary knowledge is one of the most important factors for their academic success (Elder, 2013; Nation, 2001; Schmitt, 1997, 2010).

Specifically, we sought to examine university students' self-efficacy (Bandura, 1986) and attitudes (Ajzen, 2005) for using strategies to learn vocabulary in four learning contexts typical in postsecondary settings. We characterize the hypothetical learning situations by input modality (i.e., reading vs. listening; Diakidoy, Stylianou, Karefillidou, & Papageorgiou, 2005) and purpose (i.e., academic vs. leisure; Linderholm & van den Broek, 2002). We also examined students' language background (i.e., English as L1 and L2) as a possible factor that influences students' self-efficacy and attitudes. Last, we examined the relationship among students' self-efficacy and attitudes for using vocabulary strategies and their academic achievement.

Theoretical Framework

Our framework is guided by Albert Bandura's (1986) self-efficacy theory and Icek Ajzen's (2005) concept of attitudes, as well as well-accepted vocabulary learning strategies in reading research community and second language research community (i.e., dictionary use, help-seeking, morphological analysis, and contextual analysis; Graves, 2009; Karabenick & Newman, 2013; Nation, 2001; Willingham & Price, 2009). The theoretical framework in Figure 1 conceptualizes the significance of students' self-efficacy and attitudes for vocabulary learning strategies in postsecondary learning context that is featured by input modality and learning purpose. The importance for self-efficacy (e.g., Honicke & Broadbent, 2016; Pajares, 1997) and attitudes (Bussert-Webb & Zhang, 2018; Fishbein & Adjzen, 1980; Osborne, Simon, & Collins, 2003; Pekrun & Linnenbrink-Garcia, 2012) on students' academic engagement and performance is well documented. In our framework, students' self-efficacy and attitudes for specific vocabulary strategies are expected to directly affect their engagement in vocabulary learning in the university learning context. At the same time, the impact of self-efficacy and attitudes for vocabulary strategies on vocabulary learning engagement can be moderated by vocabulary-related classroom instruction, although this type of instruction is typically not required or available in postsecondary classrooms (Perin, 2013). Students' vocabulary learning engagement should lead to vocabulary acquisition which, in turn, will further positively impact students' self-efficacy and attitudes for vocabulary strategies. Students' successful experiences provides the most influential source of efficacy information and raise their appraisal of self-efficacy (Bandura, 1986).

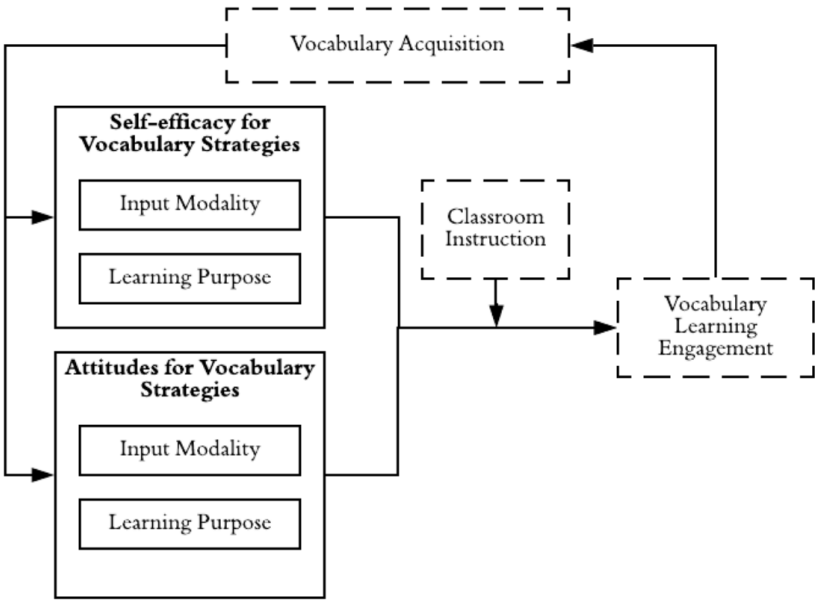

Figure 1. Theoretical model for vocabulary learning in English-medium university

Review of Literature on Vocabulary Acquisition

The Nature of Vocabulary Learning

Vocabulary knowledge is related to effective use of lexical inferencing strategy use, the mastery of discipline-specific concepts, and listening and reading comprehension in general for both native speakers and ELs at the college level (Gottardo, Mirza, Koh, Ferreira, & Javier, 2017; Jeon & Yamashita, 2014; Nassaji, 2006; Reed, Petscher, & Foorman, 2016). Most university-level discipline-specific content is packed with complex concepts featuring technical and/or new vocabulary often with Greek or Latin Roots (Francis & Simpson, 2009; Snow, 2010; Willingham & Price, 2009). The enormity of the vocabulary-learning task must be associated with the concept of incidental learning, a key for understanding the central role of vocabulary strategies in postsecondary learning environments. Incidental learning highlights the idea that learners acquire the majority of word meanings as they use strategies in different learning contexts, rather than through formal direct instruction (Graves, 2009; Nation, 2001). This notion of incidental learning emerges from the fact that researchers have observed that high school graduates typically know between 40,000 and 50,000 words (i.e., equals to learning about 100 words a week for 12 years; Graves, 2009). This vocabulary size is beyond the capability of even the most intensive K–12 programs of vocabulary instruction, which on average cover a few hundred words per year (Nagy & Anderson, 1984). As a result, researchers suggest students' vocabulary growth is achieved primarily through incidental learning. At the postsecondary level, the volume of content vocabulary learning increases, and mastering incidental learning is key to joining professional communities of practice. Such learning occurs in situated language as part of discourse communities.

As individuals in postsecondary education are expected to socialize into their communities of practice in and beyond formal classwork, the vocabulary learned embedded in sociocultural activities is crucial for academic success (Lave & Wenger, 1991). Learners acquire vocabulary most effectively through active involvement in academic environment, such as strategic academic reading, classroom discussion, asking questions, argumentation, and reflection. Incidental learning in discourse communities plays a critical role for university students because they receive little to no formal vocabulary instructional supports (Perin, 2004). Independent reading, for example, accounts for 85% of the learning that happens in academic disciplines at university settings (Bosley, 2008). Indeed, many researchers agree that incidental vocabulary learning should be encouraged among university students, both native speakers and ELs (e.g., Francis & Simpson, 2009; Hunt & Beglar, 2002; Nation, 2001; Schmitt, 2010). The amount and depth of vocabulary learned incidentally depends on the situation, self-efficacy, attitudes, and the strength of existing language schemas (Dörnyei et al., 2016; Tseng, Dörnyei, & Schmitt, 2006; Vidal, 2011).

Self-Efficacy

According to Bandura (1986), self-efficacy refers to "people's judgments of their capabilities to organize and execute courses of action required to attain designated types of performances" (p. 391). Individuals develop their self-efficacy from mastery experiences, verbal persuasions, vicarious experiences, and physiological states (Bandura, 1986). Self-efficacy is often sensitive to specific tasks, context, and domains of interest, and therefore measures of self-efficacy "must be tailored to the domain of psychological functioning being explored" (Bandura, 1986, p. 396). In educational settings, self-efficacy affects academic achievement by mediating student behaviors and cognitive patterns. More specifically, self-efficacy affects the effort students exert, the options they select, the emotional reactions they have, and the perseverance they display in the presence of challenges (Bandura, 1986; Schunk & Pajares, 2002). Highly efficacious students tend to undertake challenging tasks willingly and show increased persistence in the face of obstacles with higher intrinsic motivation and self-regulation, whereas less efficacious students tend to avoid demanding academic tasks and prefer relatively easy academic work with limited to no persistence (Pajares, 1997; Stevens, Olivarez, Lan, & Tallent-Runnels, 2004).

Empirical research suggests that self-efficacy significantly predicts use of self-regulated learning strategies; academic motivation; academic performance in such areas as mathematics, reading, and writing; and general academic performance (e.g., Kim, Wang, Ahn, & Bong, 2015; Pajares, 1997; Pajares & Miller, 1994; Pajares & Valiante, 1997). For instance, Pajares and Miller (1994) suggested that university students' self-efficacy for mathematical problem solving better predicted their ability to solve math problems and had a stronger relationship with math performance than other factors such as perception of math usefulness, math self-concept, and previous experiences with math. Though self-efficacy has been established as essential for academic achievement (Bandura, 1986; Pajares, 1997; Schunk & Pajares, 2002), work on self-efficacy in the context of language acquisition such as vocabulary acquisition is still very limited. One recent study on postsecondary Korean students' self-efficacy for learning English reported that highly efficacious students were more likely to apply language strategies and self-regulated learning strategies than students with low self-efficacy (Kim et al., 2015).

Guided by the concepts of self-efficacy and task specificity in social cognitive

theory (Bandura, 1986) and the nature of word-learning skills (Graves, 2009), we conceptualized and measured self-efficacy for vocabulary strategies as students' perception of their capabilities to independently learn new or unfamiliar words by using strategies in specific contexts. In the present study, the specificity of vocabulary learning task is further characterized by learning modality (reading vs. listening) and purpose (academic vs. leisure). For example, to measure students' self-efficacy for using morphological analysis in reading for academic purposes, we focus on how confident they are of their capabilities to learn words by breaking them down into meaningful parts while reading. This approach emphasizes independent vocabulary learning by university students. University students' self-efficacy for using strategies is vital for their independent learning and academic success as they are constantly challenged to increase the breadth (i.e., the number of words known by a student) and depth (i.e., how well the student knows these words) of their vocabulary size on their own (Francis et al., 2009). This approach also emphasizes the role of modality and purpose, which allows us to understand better the motivational nature of vocabulary acquisition in specific situations (Bandura, 1986).

Attitudes

An attitude refers to "a disposition to respond favorably or unfavorably to an object, person, institution, or event" (Ajzen, 2005, p. 3) and can be inferred from three response categories (cognition, affect, and conation) and two response modes (verbal and nonverbal; Ajzen, 2005). In the present study, we focused on the affective responses of a verbal kind where students' attitudes can be inferred from their expressions of feelings toward an attitude object of interest (e.g., using strategies to vocabulary). In educational settings, attitudes are ubiquitous and have a substantial influence on learners' cognitive processing as well as academic engagement and performance (Pekrun & Linnenbrink-Garcia, 2012). For instance, adolescents' positive attitudes in science were predictive of their further engagement in science learning, independent of their science background knowledge (Ainley & Ainley, 2011). Among university students, enjoyment, hope, and pride positively affect their motivation and self-regulated learning, and these, in turn, influence their academic performance (Mega, Ronconi, & De Beni, 2014). Positive attitudes (e.g., enjoyment, hopefulness) were found to positively predict university students' academic achievement, whereas negative attitudes (e.g., boredom, anxiety) are negatively related to academic achievement (Daniels et al., 2009). Similarly, positive attitudes (e.g., enjoyment, curiosity) among undergraduate students have also been reported to relate to their use of learning strategies and perceived task value when they read texts (Pekrun, Vogl, Muis, & Sinatra, 2016). The mediation role of positive attitudes (e.g., enjoyment, curiosity) was also reported to the relationship between undergraduate students' epistemic beliefs and learning outcomes (Trevors, Muis, Pekrun, Sinatra, & Muijselaar, 2017). Although empirical research has reported associations between academic outcome and both self-efficacy and attitudes, self-efficacy emphasizes one's perceived capabilities to achieve designated performances in given situations (Bandura, 1986) whereas attitudes focuses on one's disposition to respond to a specific object, institution, event, or person (Ajzen, 2005).

Learning Contexts

A consideration of contextual differences is necessary for conceptualizing students' self-efficacy and attitudes toward vocabulary strategies. In this study, the two contextual characteristics of interest are input modality (reading vs. listening) and learning purpose (academic vs. leisure).

Input Modality. University students make decisions regarding when and how to use learning strategies based on modality and learning context (Schmitt, 2010). *Input modality* refers to the way that information is presented to learners, and two commonly discussed modalities are auditory/listening and visual/reading (Dixon, Simon, Nowak, & Hultsch, 1982; Horowitz & Samuels, 1985; Vidal, 2011). Reading and listening in academic settings are critical sources of vocabulary acquisition for native speakers and ELs, especially for those attending "English-medium institutions who need to enhance the breadth and depth of their vocabulary knowledge in order to succeed in their academic and professional pursuits" (Vidal, 2011, p. 220). Both modalities of reading and listening provide students with rich opportunities to learn incidentally by using strategies, such as inferring word meanings by using context clues (Schmitt, 2010). Reading modality has added input that includes orthography (spelling) that are not generally available during listening (e.g., lecture, radio). The added input allows certain vocabulary strategies to be more applicable and, thus, influence students' perception of their capabilities to use the strategies. Vidal (2011) compared the effects of listening and reading modes on the incidental acquisition of vocabulary among 230 postsecondary students who either read three academic texts, watched three lectures, or received no input that lasted for 4 weeks. She reported that the students in the reading mode had more vocabulary gains than those in the listening mode regardless of learners' English proficiency levels. However, the difference in vocabulary gain between the reading and listening modes tended to decrease as students' proficiency increased. It seems that higher language proficiency enables vocabulary learning even when input is limited as in listening.

Academic vs. Leisure Purpose. Intuitively, students might treat learning tasks differently depending on their purposes. When students encounter new vocabulary that impedes them from comprehending the concepts from university textbooks or lectures, they may decide to use a dictionary or even turn to instructors or peers for help. These strategies might not be used if students face new words when reading a novel or listening to a podcast for leisure. This intuition that students are motivated differently to use strategies is supported by theoretical and empirical research (e.g., Horiba, 2000, 2013; Linderholm, 2006; Linderholm & van den Broek, 2002). Students' achievement-related behaviors are often influenced by their learning purposes (Maehr & Zusho, 2009; Schraw & Lehman, 2001). For instance, students who study for academic purposes tend to have higher motivation because they study "to meet external demands, to obtain a reward, or to avoid punishment" (De Naeghel, Van Keer, Vansteenkiste, & Rosseel, 2012, p. 1007). Literacy motivation research has often overlooked how distinct learning purposes might correspond to students' different motivational and cognitive strategies (Linderholm & van den Broek, 2002; McCrudden, Magliano, & Schraw, 2010; McCrudden, Stenseth, Bråten, & Strømsø, 2016). They tend to focus on formal achievement and downplay incidental learning that is so crucial in the case of language and vocabulary acquisition.

Two typical purposes for university students are important in accounting for different strategies and cognitive processes: leisure/recreational purpose (i.e., reading a favorite novel or listening to music) and academic/study purpose (i.e., reading required textbooks or listen to instructors as part of formal university education; Diakidoy et al., 2005; Linderholm & van den Broek, 2002; Vidal, 2011). According to Linderholm and van den Broek (2002) university students adjusted cognitive processes and strategies to fit the purposes of reading expository text (i.e., entertainment/leisure vs. study/academic). Readers reading for academic purposes created more "connecting inferences and paraphrases" (Linderholm & Broek, 2002, p.782), whereas readers reading for leisure

purposes produced more "evaluative comments and associations" (Linderholm & Broek, 2002, p. 782). Swanborn and De Glopper (2002) explored how reading texts with different purposes impacted incidental vocabulary learning, and they found that middle school students learned more words incidentally when reading for academic purpose than reading for leisure purposes.

Vocabulary Strategies

We identified four central vocabulary strategies: dictionary use, help-seeking, morphological analysis, and contextual analysis. These strategies are based on the current consensus in the reading (vocabulary) research community and second language research community (Graves, 2009; Karabenick & Newman, 2013; Nation, 2001; Willingham & Price, 2009).

Dictionary Use. Students might conveniently consult dictionaries (e.g., English-only, bilingual) as they encounter new words. This is especially true for second language learners who rely heavily on using dictionaries as they face unfamiliar words (Nation, 2001; Nesi & Haill, 2002). Many studies have suggested dictionary use can improve vocabulary acquisition and reading comprehension. In a study with Japanese English learners, students with access to dictionaries while reading learned more vocabulary (Luppescu & Day, 1993). Spanish language learners with access to a dictionary achieved higher scores in both vocabulary and reading comprehension tests (Knight, 1994). Second language learners who use a dictionary learned and retained more words than those without access to a dictionary (Nation, 2001). However, excessive use of dictionary might impede independent learning. A recent study with postsecondary ELs reported that although most intermediate and advanced learners tend to use a dictionary strategically when reading nonfiction texts, some students referred to the dictionary so excessively that about 25% of the words referred to were neither essential to reading comprehension nor frequent or useful words (Prichard, 2008).

Help-Seeking. Seeking help from others is a critical self-regulatory strategy that relates positively to student learning (Karabenick & Newman, 2013). Help-seeking is an adaptive approach for students to refer to others as resources when they encounter difficulty in their academic learning. Marchand and Skinner (2007) found that highly motivated students are more likely to seek help, and students with more help-seeking become increasingly engaged over time in challenging learning tasks, whereas students who concealed their problems become less engaged. Students less threatened by the idea of help are more likely to seek help, whereas students who perceived themselves as more threatened by help tend to stay away from seeking help. Help-seeking is also related to academic performance (Ryan & Shin, 2011). University students' positive attitudes about help-seeking when needed is related to their grades (Pintrich, Smith, Garcia, & McKeachie, 1993).

Morphological Analysis. Morphological awareness refers to individuals' "conscious awareness of the morphemic structure of words and their ability to reflect on and manipulate that structure" (Carlisle, 1995, p. 194). Morphemes are the smallest meaningful units in a word, including prefixes, suffixes, word roots and bases, inflected endings, and compounds. Word meanings can be ascertained by inspecting the known morphemes (Graves, 2009). Morphological analysis is the process of deriving word meaning by examining its morphemes. Empirical research suggests that morphological awareness contributes to vocabulary acquisition, reading comprehension, and other literacy achievement (Carlisle, 2010; Goodwin & Ahn, 2013; Scott, Nagy, Baumann, & Kame'enui, 2004).

Two meta-analyses by Goodwin and Ahn (2013) examined the effects of morphological interventions on literacy achievement for English learners. Significant effects were found for spelling, morphological awareness, phonological awareness, vocabulary knowledge, and reading comprehension. At the university level, morphological analysis is an important practice for students because many academic subjects introduce complex vocabulary with Latin and Greek origins and a complex affix system (Francis & Simpson, 2009).

Contextual Analysis. Students can use contextual clues to learn word meanings by scrutinizing surrounding text that might provide syntactic and semantic cues (Scott et al., 2004). Contextual analysis is a means for students of all ages to learn word meanings from context, and the chance of word learning increases as the encounters with the words accumulate (Graves, 2009). The use of context clues affects vocabulary acquisition and reading comprehension (Baumann, Edwards, Boland, Olejnik, & Kame'enui, 2003). A meta-analysis by Swanborn and De Glopper (1999) examined 20 studies and suggested that students can learn new words in natural context by using contextual analysis with a probability of .15. It is important to recognize contextual analysis is not necessarily always effective in natural reading text. Nevertheless, contextual clues help students learn vocabulary through reading, especially when students are exposed to a substantial amount of written texts as commonly happens in university (Scott et al., 2004).

Language Background: English Learners and Native Speakers

Vocabulary knowledge is critical for university ELs to develop both English language skills and academic knowledge (Francis & Simpson, 2009; Gorzycki et al., 2016; Li, Cummins, & Deng, 2017; Nation, 2001). In this study, we were also interested in the influence of students' English language background on self-efficacy and attitudes for vocabulary strategies. We hypothesized that native speakers have higher self-efficacy for vocabulary strategies than nonnative speakers because they have stronger English language schemes (i.e., lower cognitive load when learning vocabulary in university context). This hypothesis was based on vocabulary acquisition theory (e.g., Nation, 2001) and Bandura's (1986) four sources of self-efficacy: mastery experience, vicarious experience, verbal persuasions, and physiological states. First, native speakers have far more exposure to both written and oral language in English (Nation, 2001; Schmitt, 2010). The exposure gives native speakers the chance to gain more vicarious experiences in vocabulary learning, which further ensures their perception of the capabilities of learning vocabulary (Bandura, 1986). In addition, native speakers possess a bigger vocabulary and stronger language schemes than ELs as they entered university (Nation, 2001), which contributes to native speakers' mastery experiences. ELs face bigger challenges in vocabulary learning than native speakers attending university classes. For example, before entering university, ELs are required to provide a satisfactory test score on an English test (e.g., the Test of English as a Foreign Language [TOEFL]) that is used by colleges and universities in the United States to evaluate international students' ability to commend English in academic settings (Chujo & Oghigian, 2009). In order to pass the TOEFL, ELs need to know between 3,500 and 4,500 word-families to cover 95% of the TOEFL vocabulary (Chujo & Oghigian, 2009). When compared to the vocabulary size of high school graduates who are native English speakers (i.e., 40,000 to 50,000 words; Graves, 2009), university ELs are undoubtedly challenged to bridge the gap.

The Current Study

The primary goal of this study was to explore university students' self-efficacy and attitudes toward the use of vocabulary strategies at different learning contexts typical

in postsecondary settings. To reach the goal, we presented university students with four hypothetical scenarios describing four contexts characterized by two purposes (i.e., academic vs. leisure) and two input modalities (i.e., reading vs. listening). Thus, the four learning scenarios are academic/reading, academic/listening, leisure/reading, and leisure/listening. Following the academic/reading and leisure/reading scenarios, students rated their self-efficacy and attitudes toward using vocabulary strategies. Following the academic/listening and leisure/listening scenarios, students rated their self-efficacy for vocabulary strategies. Research questions were as follows:

1. Does students' self-efficacy for vocabulary strategies vary as a function of input modality and purpose?
2. Do students' attitudes for vocabulary strategies vary as a function of purpose?
3. Does students' language background affect their self-efficacy and attitudes?
4. How do students' self-efficacy and attitudes for vocabulary strategies relate to their academic achievement?

Method

Participants

The participants were 112 university students from a large midwestern U.S. university (55% female, 45% male). All were traditional-age undergraduate students between 19 and 25 years old. Sixty-nine (57%) participants were native English speakers from the United States, and the rest (43%) were ELs from 11 countries. The distribution of these ELs' countries of origin mirrored the demographics for international students at the university, with 29.0% of the participants from China, 5.0% from Malaysia, 5.4% from elsewhere in Southeast Asia, and 3.6% from Europe. There were 10 languages spoken by the ELs: Cantonese, French, German, Gujarati, Hindi, Japanese, Korean, Malay, Mandarin, and Thai. They learned English as a foreign language before coming to the United States to receive college education. They all passed the TOEFL before being admitted to the undergraduate programs at the university. The participants were from 54 majors in predominantly three colleges: Arts and Sciences (34.7%), Business and Management (27.3%), and Education (26.4%). Fifty-nine students (48%) identified themselves as White/Caucasian, 51 as Asian, 4 as African American, 3 as Pacific Islander, 2 as multiracial, and 2 as Latino/a.

Measures

Participants completed a researcher-developed survey to assess their self-efficacy and attitudes for vocabulary strategies. To develop the survey, we conducted a pilot study with nine students and two research faculty (content experts) where we interviewed and gathered feedback on the scenarios and survey items. We then revised the survey and received another around of feedback before finalizing the survey. In the survey, participants were asked to read four short scenarios that described typical learning contexts for university students: (1) academic/reading, (2) academic/listening, (3) leisure/reading, and (4) leisure/listening. Participants were also asked to consider English language only as they respond to the scenarios. The scenario descriptions were based on the conceptualization of learning contexts from the extant literature on *input modality* (reading vs. listening) and *purpose* (academic vs. leisure; e.g., Diakidoy et al., 2005; Vidal, 2011). The complete text for the scenarios is presented in the Appendix.

To measure self-efficacy for vocabulary strategies, following each of the four scenarios, students rated on a scale ranging from 1 (*strongly disagree*) to 5 (*strongly agree)* their perceptions of their capability to use vocabulary strategies in response to new or unfamiliar words in a specific learning context. The content of the items was based on self-efficacy theory (Bandura, 1986) and the extant research on vocabulary acquisition for both ELs (e.g., Hulstijn, 2008; Nation, 2001; Schmitt, 1997) and native English speakers (e.g., Anglin, Miller, & Wakefield, 1993; Baumann & Graves, 2010; Kieffer & Lesaux, 2012). Specifically, the vocabulary strategies included morphological analysis (e.g., I can break it down into smaller parts; Anglin et al., 1993; Carlisle, 2010; Kieffer & Lesaux, 2012), contextual analysis (e.g., I can continue reading to figure it out; Baumann et al., 2003), dictionary use (e.g., I can look it up in a dictionary; Laufer & Hulstijn, 2001; Nation, 2015; Peters, 2007), and help-seeking (e.g., I can ask someone to explain it to me; Karabenick & Knapp, 1991; Makara & Karabenick, 2014).

To measure attitudes for vocabulary strategies, following the academic/reading and leisure/reading scenarios, participants also rated their attitudes toward learning new vocabulary. Their attitudes were assessed using four items based on previous research on attitudes (Ajzen, 2005) and incidental vocabulary learning through reading (Anglin et al., 1993; Hulstijn, 2008; Nation, 2001). Two items assessed their general attitudes toward vocabulary strategies (i.e., I enjoy learning new words; I feel happy when I figure out a new word). Two items assessed their attitudes toward dictionary use and morphological analysis (i.e., I love breaking a new word down into smaller parts to understand it; I like using a dictionary to learn new words).

To examine the validity and reliability of the survey, exploratory factory analyses were conducted using the SPSS (version 23) with Maximum Likelihood extraction (the best approach when data are relatively normally distributed) and Varimax with Kaiser Normalization rotation to obtain orthogonal rotation (Osborne & Costello, 2009). Four factors were extracted for the Self-Efficacy for Vocabulary Strategies, and three factors were extracted for the Attitudes for Vocabulary Strategies. The internal consistency reliabilities using Cronbach's α ranged from .73 to .90 (see Table 1), exceeding the recommended .7 cutoff point (Nunnally & Bernstein, 1994). We then conducted confirmatory factory analyses to verify the factor structures using Mplus (version 7.1) with robust maximum likelihood estimation (robust to non-normality). Table 1 presents the results. For self-efficacy for vocabulary strategies, the chi-square was statistically significant, $\chi 2(96) = 148.46$, $p = .001$, but all other indices were satisfactory, with reasonable fit for CFI = .909, acceptable fit for RMSEA = .060 [90% CI = .047, .092], and good fit for SRMR = .069 (Hu & Bentler, 1999). For attitudes for vocabulary strategies, the fit was good, with $\chi 2(15) = 17.01$, $p = .318$, good fit for CFI = .992, good fit for RMSEA = .035 [90% CI = .000, .099], and good fit for SRMR = .036 (Hu & Bentler, 1999).

Table 1

Results of Confirmatory Factor Analyses and Reliability Analyses for Self-Efficacy and Attitudes

Factor/items	Self-Efficacy	Attitudes
Self-efficacy for morphological analysis (Cronbach's α = .83)		
Academic/reading context: I can break it down into smaller parts.	.628	
Academic/listening context: I can break it down into smaller parts.	.769	
Leisure/reading context: I can break it down into smaller parts.	.636	
Leisure/listening context: I can break it down into smaller parts.	.735	
Self-efficacy for contextual analysis (Cronbach's α = .73)		
Academic/reading context: I can continue reading to figure it out.	.516	
Academic/listening context: I can continue reading to figure it out.	.828	
Leisure/reading context: I can continue reading to figure it out.	.447	
Leisure/listening context: I can continue reading to figure it out.	.746	
Self-efficacy for dictionary use (Cronbach's α = .80)		
Academic/reading context: I can look it up in a dictionary.	.484	
Academic/listening context: I can look it up in a dictionary.	.785	
Leisure/reading context: I can look it up in a dictionary.	.573	
Leisure/listening context: I can look it up in a dictionary.	.806	
Self-efficacy for help-seeking (Cronbach's α = .82)		
Academic/reading context: I can ask someone to explain it to me.	.737	
Academic/listening context: I can ask someone to explain it to me.	.737	

Leisure/reading context: I can ask someone to explain it to me.	.697
Leisure/listening context: I can ask someone to explain it to me.	.716
General attitudes (Cronbach's α = .82)	
Academic/reading context: I enjoy learning it.	.801
Academic/reading context: I feel happy when I figure it out.	.830
Leisure/reading context: I enjoy learning it.	.606
Leisure/reading context: I feel happy when I figure it out.	.567
Attitudes for morphological analysis (Cronbach's α = .83)	
Academic/reading context: I love breaking it down into smaller parts to learn it.	.822
Leisure/reading context: I love breaking it down into smaller parts to learn it.	.862
Attitudes for dictionary use (Cronbach's α = .90)	
Academic/reading context: I like using a dictionary to learn it.	.913
Leisure/reading context: I like using a dictionary to learn it.	.420

Academic Achievement. Student-reported grade point averages (GPAs) were collected to measure their academic achievement. The letter grades ranged from A+ to F were coded into numbers using a university grading system ranging from 4 to 0. Self-reported grades are good reflections of actual grades for university-level students with relatively high grades and cognitive ability (Kuncel, Credé, & Thomas, 2005). In this study, the participants were university students with relatively high average grades on a 0–4 scale (M = 3.46, SD = .50).

Analytic Approach

The goal of the study was to examine university students' self-efficacy and attitudes for using vocabulary strategies in four contexts typical in university settings. We also examined students' English language background as a potential moderator for their self-efficacy and attitudes. Additionally, we explored the relationship between students' self-efficacy and attitudes and their academic achievement. To answer the first research question on whether students' self-efficacy for vocabulary strategies varies as a function of input modality and purpose, four separate mixed repeated measures analysis of variance were conducted; language (ELs vs. native speakers) was a between-subject variable, input modality (reading vs. listening) and purpose (academic vs. leisure) were within-subject variables. There were four dependent variables measuring students' self-efficacy for

vocabulary strategies (i.e., morphological analysis, contextual analysis, dictionary use, help-seeking). To answer the second research question on whether students' attitudes for vocabulary strategies vary as a function of purpose, three separate mixed repeated measures analysis of variances were performed to examine students' attitudes for vocabulary strategies in reading, with language (ELs vs. native speakers) as a between-subject variable and purpose (academic vs. leisure) as a within-subject variable. For the third research question on whether students' language background affects their self-efficacy and attitudes, we included students' language background as a between-subject variable in both research questions mentioned above. This approach allowed us to detect the difference between two language backgrounds and potential interaction between language background and other independent variables. To answer the last research question on the relationship between students' self-efficacy and attitudes for vocabulary strategies and their academic achievement, three linear regression analyses were conducted. To control for type I errors, we used the Bonferroni correction setting alpha at .0167.

Results

Preliminary Analyses

We conducted preliminary analyses to determine the univariate normality of each variable and the need to control the demographic information for any following analyses. Table 2 and Figures 1 and 2 present the descriptive results. To determine the normality of variables, we took three procedures: (1) Kolmogorov-Smirnov (K_S) test, (2) skewness and kurtosis, and (3) histograms, boxplots and Q-Q plots.

Table 2

Means (and Standard Deviations) for Self-Efficacy and Attitudes for Vocabulary Strategies under Different Learning Contexts

Variables	Type of Learning Contexts			
	Academic/ reading	Leisure/ reading	Academic/ listening	Leisure/ listening
Self-efficacy				
Self-efficacy for morphological analysis	3.54 (0.85)	3.71 (0.96)	3.04 (0.84)	3.06 (0.89)
Self-efficacy for contextual analysis	3.82 (0.89)	4.03 (0.87)	3.87 (0.80)	3.78 (0.82)
Self-efficacy for dictionary use	3.91 (1.02)	4.14 (0.94)	3.25 (1.16)	3.09 (1.15)
Self-efficacy for help-seeking	3.75 (0.91)	3.50 (1.03)	3.53 (1.02)	3.45 (0.97)
Attitudes				
General attitudes	3.89 (0.85)	3.98 (0.82)		
Attitudes for morphological analysis	3.31 (0.93)	3.21 (1.08)		
Attitudes for dictionary use	3.46 (1.01)	3.38 (1.21)		

Note. All responses are measured on a 5-point Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree).

Tests of normality using Kolmogorov-Smirnov indicated a normal distribution for the following variables: self-efficacy for morphological analysis (p = .06), self-efficacy for dictionary use (p = .09), self-efficacy for help-seeking (p = .06), and general attitude (p = .20), but not for the rest of the variables (i.e., self-efficacy for contextual analysis, attitude for morphological analysis, and attitude for dictionary use), with p values smaller than .05. However, using the ±2SE limits (Gravetter & Wallnau, 2016), both skewness (ranging from –.42 to .02) and kurtosis (ranging from –.74 to .10) statistics were within the acceptable range for all variables. Visual analysis using histograms, boxplots, and Q-Q plots also suggested relative normality for all variables. Given that some literature recommended not to use the K-S test regardless of sample size (Steinskog, Tjøstheim, & Kvamstø, 2007; Thode, 2002), we decided to follow the normality results from our visual inspection and analysis of skewness and kurtosis. No dependent variables correlated with student age. For most dependent variables, initial tests indicated no gender (female vs. male) or college difference (arts and sciences, business and administration, and education). However, college difference was observed for self-efficacy for contextual analysis, $F(2,107) = 6.24$, $p = .003$. Thus, college was controlled for self-efficacy for contextual analyses.

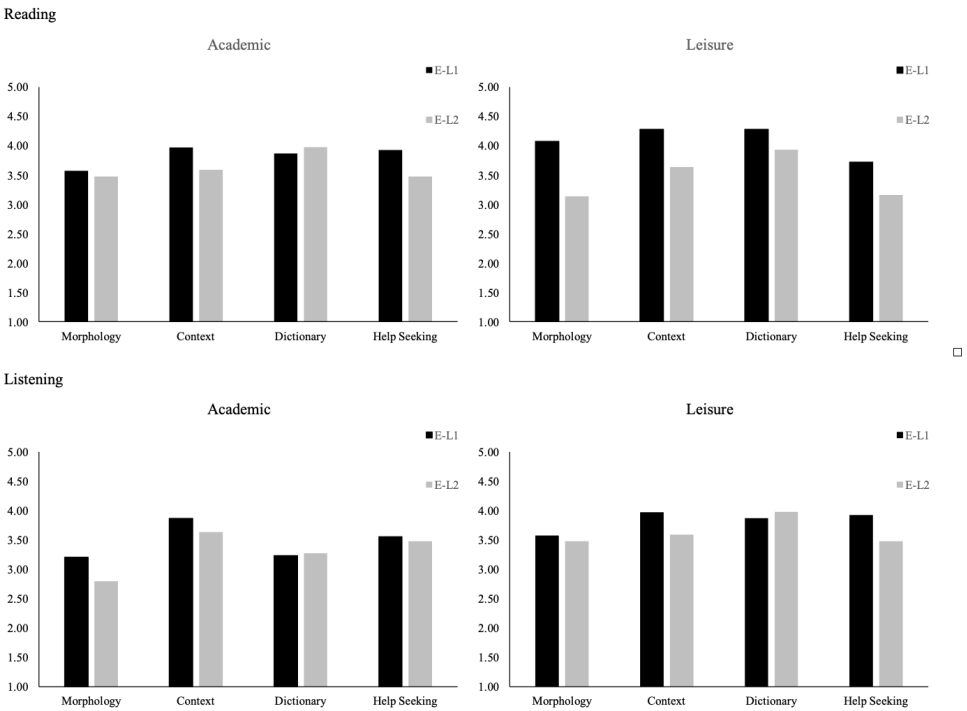

Figure 1. Mean self-efficacy for vocabulary strategies by input modality (reading vs. listening), purpose (academic vs. leisure), and language background (L1 vs. L2)

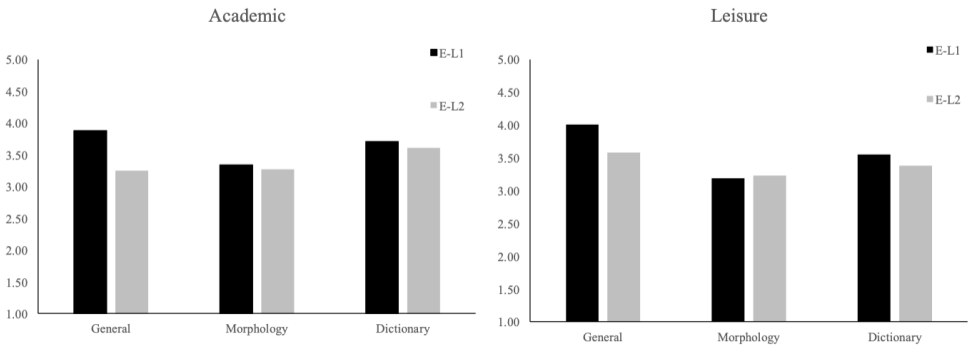

Figure 2. Mean attitudes for vocabulary strategies in reading by purpose (academic vs. leisure) and language background (L1 vs. L2)

Self-Efficacy for Vocabulary Strategies

Self-efficacy for morphological analysis. Results suggest a main effect for input modality $F(1,107) = 12.09$, $p = .001$, partial $\eta 2 = .10$ (a medium effect; Cohen, 1988), but not for purpose, $F(1,107) = .114$, $p = .74$. For the main effect of input modality, students reported that they would have higher self-efficacy to use morphological analysis in reading modality ($M = 3.62$, $SD = .77$) than listening modality ($M = 3.05$, $SD = .78$). A two-way interaction effect was significant for purpose ◊ language, $F(1,107) = 10.12$, $p = .002$, partial $\eta 2 = .09$ (a medium effect), but not for input modality ◊ language, $F(1,107) = 1.37$, $p = .24$, or purpose ◊ input modality, $F(1,107) < .001$, $p = .995$. For the two-way purpose ◊ language interaction, results from simple effects analyses suggest that native speakers reported higher self-efficacy for morphological analysis for leisure than academic purpose, $F(1,107) = 10.77$, $p = .001$, partial $\eta 2 = .09$ (a medium effect); ELs reported the same self-efficacy for morphological analysis for leisure ($M = 3.01$,$SD = .84$) and academic purpose ($M = 3.14$, $SD = .64$), $F(1,107) = 2.04$, $p = .16$. The three-way interaction was significant for language ◊ purpose ◊ input modality, $F(1,107) = 19.79$, $p < .001$, partial $\eta 2 = .16$ (a large effect). For the three-way interaction, results from follow-up simple effects analyses revealed that, for native speakers, there was a significant purpose ◊ modality interaction, $F(1,67) = 20.29$, $p < .001$, partial $\eta 2 = .23$ (a large effect). In reading modality, native speakers had higher self-efficacy to use morphological analysis in reading for leisure than academic purpose. However, ELs had higher self-efficacy in reading for academic than leisure purpose. In listening modality, no difference was observed as a function of purpose.

In addition, the between-subject effect was significant for language, $F(1,107) = 11.52$, $p = .001$, partial $\eta 2 = .10$ (a medium effect). Descriptive statistics are presented in Table 2. For the main between-subject effect of language background, native speakers' self-efficacy for morphological analysis was significantly higher in reading for leisure purpose ($M = 4.09$, $SD = .72$) compared with ELs ($M = 3.14$, $SD = 1.00$), $t(107) = 5.79$, $p < .001$, partial $\eta 2 = .24$ (a large effect), and higher in reading for academic purpose ($M = 3.23$, $SD = .82$) compared with ELs ($M = 2.80$, $SD = .82$), $t(107) = 2.70$, $p = .008$, partial $\eta 2 = .06$ (a medium effect).

Self-efficacy for contextual analysis. Results indicated no significant main

effects for purpose, $F(1,110) = 2.59$, $p = .11$, or input modality, $F(1,110) = 2.54$, $p = .11$. There were no two-way interactions or three-way interactions. Significant between-subject effect was found for language $F(1,110) = 10.10$, $p = .002$, partial $\eta 2 = .08$ (a medium effect). Native speakers reported significantly higher self-efficacy for contextual analysis than ELs in reading for leisure purpose, $t(111) = 4.06$, $p < .001$, partial $\eta 2 = .13$ (a large effect). Descriptive statistics are presented in Table 2.

Self-efficacy for dictionary use. Results suggest significant main effects for input modality, $F(1,110) = 85.32$, $p < .001$, partial $\eta 2 = .44$ (a large effect). Students reported higher self-efficacy for dictionary use in reading ($M = 4.03$, $SD = .86$) than listening ($M = 3.16$, $SD = 1.05$) modality. No main effects was observed for purpose, $F(1,110) = .001$, $p = .982$. No two-way interactions were observed for purpose ◊ language, $F(1,110) = 7.00$, $p = .010$, and purpose ◊ input modality, $F(1,110) = 7.04$, $p = .010$. For the purpose ◊ input modality interaction, follow-up simple effects analyses indicate that, in reading modality, students reported higher self-efficacy for dictionary use for leisure purpose ($M = 4.14$, $SD = .94$) than academic purpose ($M = 3.91$, $SD = 1.02$), $t(112) = 2.67$, $p = .009$. In listening modality, students reported higher self-efficacy for dictionary use for academic purpose ($M = 3.25$, $SD = 1.16$) than leisure purpose ($M = 3.09$, $SD = 1.15$), $t(112) = 1.77$, $p = .008$. There was no two-way interaction between input modality ◊ language or three-way interaction among input modality ◊ language ◊ purpose. The between-subject effect was not found for language between native speakers and ELs, $F(1,110) = .29$, $p = .594$. Descriptive statistics are presented in Table 2.

Self-efficacy for help-seeking. A significant main effect was found for purpose, $F(1,110) = 10.70$, $p = .001$, partial $\eta 2 = .09$ (a medium effect). Students reported higher self-efficacy for help-seeking for academic ($M = 3.64$, $SD = .83$) than leisure purpose ($M = 3.47$, $SD = .86$). There was a significant between-subject effect for language, $F(1,110) = 6.59$, $p = .012$, partial $\eta 2 = .06$ (a medium effect). For the main effect for language, higher self-efficacy for help-seeking was reported in reading for leisure purpose for native speakers ($M = 3.72$, $SD = .94$) compared with ELs ($M = 3.16$, $SD = 1.08$), higher in reading for academic purpose for native speakers ($M = 3.93$, $SD = .85$) compared with ELs ($M = 3.48$, $SD = .93$), and higher in listening for leisure purpose for native speakers ($M = 3.62$, $SD = .99$) compared with ELs ($M = 3.18$, $SD = .87$). Descriptive statistics are presented in Table 2. No additional significant main effects or two-way or three-way interactions were found.

Attitudes for Vocabulary Strategies

For general attitude, there was no main effect for purpose, $F(1,110) = 2.05$, $p = .155$, and no two-way interaction between purpose and language, $F(1,110) = 2.71$, $p = .103$. Similarly, for attitude for morphological analysis, results suggest no main effect for purpose $F(1,110) = 1.29$, $p = .258$, and no purpose ◊ language interaction, $F(1,110) = .69$, $p = .407$. For attitude for dictionary use, there was no main effect for purpose, $F(1,110) = 1.19$, $p = .277$, and no purpose ◊ language interaction, $F(1,110) = .02$, $p = .889$. Overall, no difference was observed in attitudes as a function of purpose or students' language background. Descriptive statistics are presented in Table 2.

Self-Efficacy, Attitudes, and Academic Achievement

To examine the relationship among students' self-efficacy and attitudes for vocabulary strategies and their academic achievement, three linear regression analyses were conducted: for all participating students, for ELs, and for native speakers. No multicollinearity was observed, with acceptable Variance Inflation Factor values for all

analyses ranging from 1.00 to 186, which were below the maximum level of 4 (Hair, Black, Babin, Anderson, & Tatham, 2006). The assumption of homoscedasticity was met where no obvious signs of funneling were observed in the plots of standardized predicted values and standardized residuals. For all participants, linear regression revealed that student attitudes explained 6% (R2 = .06) of the variance in academic achievement, $F(1,107) = 6.96$, $\beta = .25$, $p = .010$. Adding students' self-efficacy did not significantly increase the variance explained, $F(1,106) = .3.68$, $\beta = -.08$, $p = .509$. For ELs, their self-efficacy for vocabulary strategies did not significantly predict their academic achievement, $F(1,39) = .05$, $\beta = –.055$, $p = .808$; a similar relationship was revealed between ELs' attitudes and academic achievement, $F(1,39) = .50$, $\beta = –.097$, $p = .553$. For native speakers, results show that their self-efficacy for vocabulary strategies did not significantly predict their academic achievement, $F(1,67) = 11.62$, $\beta = –.09$, $p = .568$; students' attitudes explained 15% (R2 =.15) of the variance in academic achievement, $F(1,67) = 6.42$, $\beta = .387$, $p = .001$.

Discussion

This study explored university students' self-efficacy and attitudes for using vocabulary strategies in four hypothetical learning contexts typical in postsecondary settings. It is important to examine the dynamics of postsecondary students' self-efficacy and attitudes, which affect students' learning behaviors and academic achievement. Overall, students' self-efficacy and attitudes toward vocabulary strategies were positive. Our data reveal noticeable patterns of students' self-efficacy and attitudes toward vocabulary strategies in distinct learning contexts. We also found that students' English proficiency plays a role in their self-efficacy for vocabulary strategies. Finally, native speakers' attitudes positively predicted their academic achievement, but ELs' attitudes did not predict their academic achievement.

Self-Efficacy

The first research question focused on how students' self-efficacy for vocabulary strategies varied as a function of input modality (reading vs. listening) and purpose (academic vs. leisure). Data analyses revealed a distinct impact of both input modality and purpose on students' self-efficacy for vocabulary strategies. Specifically, students reported higher self-efficacy for seeking help as they engage in academic than leisure purpose, but no difference due to purpose for morphological analysis, contextual analysis, and dictionary use. It is promising to find that, regardless of the purpose, students reported the same relatively high self-efficacy to use effective strategies. Use of strategies is critical for postsecondary students to enhance their vocabulary knowledge and comprehend discipline texts, especially where little formal instruction on technical terms or vocabulary is provided for either academic or leisure learning (Francis & Simpson, 2009; Perin, 2013). Interestingly, students were more likely to seek help for academic purpose in which they study to meet external requirements. It is possible that they perceive help-seeking as more legitimate and they are more effortful using this strategy when their academic performance (e.g., learning progress, grades) is likely to be judged by others such as teachers and peers. This finding confirms previous findings that students studying for academic purposes tend to have higher motivation (De Naeghel et al., 2012).

It is well accepted that both reading and listening modalities provide students with rich opportunities to learn vocabulary incidentally (Schmitt, 2010); less is known about how the features of different modalities impact students' vocabulary acquisition. In this study, students reported higher self-efficacy in reading than listening modality for using morphological analysis and dictionaries, but no difference in using contextual analysis

and help-seeking. Our findings confirm previous research that showed morphologically predictable words are more facilitative for vocabulary learning in reading than during listening (Vidal, 2011). The use of a dictionary often requires access to word spellings, which are available in reading but not typically available while listening. The strategies of morphological analysis and dictionary use while listening increase cognitive load as these strategies require the learners to stop and focus on the words' orthographic representations. Such cognitive load is counterproductive during listening as the input is not likely to stop (e.g., lecturer continues speaking). Students' mastery experience with vocabulary learning strategies while reading can help build their perception of their capabilities to use these strategies. In the listening modality, students are less likely to have access to the spellings of unfamiliar words and, accordingly, might judge themselves with low capabilities to apply the strategy of dictionary use to learn word meanings (Rosenthal & Ehri, 2008). In morphological analysis, it is relatively more effective in the reading context than listening context, because morphological analysis requires learners to break words into smaller meaningful parts, but the pronunciations of the words in the listening context do not necessarily inform the listeners about the spellings (Carlisle, 2010).

Students reported no difference in their self-efficacy to use contextual analysis and help-seeking in reading and listening modalities. Considering both reading and listening modalities provide students with rich and diverse contexts to use contextual analysis to learn vocabulary incidentally, it is encouraging to find that students have high self-appraisal of their capability to use contextual clues in both reading and listening modalities. Contextual clues are critical for students to learn new vocabulary and comprehend discipline concepts as students are typically exposed to a considerable amount of written and oral content as commonly happen in university settings (Francis & Simpson, 2009). Similarly, students reported high self-efficacy to ask for help in both reading and listening modalities, as seeking help from others is a critical self-regulation related to university student learning and achievement (Karabenick & Knapp, 1991; Karabenick & Newman, 2013).

Attitudes

The second research question asked whether students' attitudes about vocabulary learning strategies in reading varied depending on the purpose. Results indicate no difference in students' attitudes as a function of purpose (academic vs. leisure). University students' attitudes toward vocabulary strategies were positive regardless of purpose. The results are important because previous research showed that students' positive attitudes during reading texts are positively related to the use of cognitive and metacognitive learning strategies and perceived task value (e.g., Pekrun et al., 2016). University students' positive attitudes positively predict learning motivation and academic achievement, whereas negative attitudes negatively predict motivation and academic achievement (Daniels et al., 2009; Mega et al., 2014).

ELs and Native Speakers

The third research question focused on the potential moderating role of students' language background on their self-efficacy and attitudes. Results suggest that, overall, ELs reported lower self-efficacy than native speakers toward morphological analysis, contextual analysis, and help-seeking. ELs can be apprehensive when they are more aware of the enormous number of words to learn in college (Laufer & Hulstijn, 2001), which becomes more obvious as they are exposed to the university academic learning community (Schmitt, 2008). The findings might also be explained by the fact that native speakers have far more exposure to both written and oral English before they attend college. The

accumulated experience with English is likely to help build native speakers' overall sense of confidence, which is influenced by students' mastery experiences, vicarious experiences, verbal persuasions, and affective indicators (Bandura, 1986). However, ELs' lower self-efficacy toward vocabulary strategies is a concern as they face bigger challenges in independent vocabulary learning than native speakers. Language learners' self-efficacy is positively related to their use of strategies as well as language learning outcomes (e.g., Graham & Macaro, 2008). Language learners with high self-efficacy for metacognitive strategies were more likely to be academically successful in foreign language learning (Mills, Pajares, & Herron, 2007). An implication from the findings is that university ELs might need more explicit instruction on critical vocabulary strategies (e.g., contextual analysis, morphological analysis) from academic support programs, in line with the recommendations from other vocabulary scholars (Francis & Simpson, 2009; Perin, 2004). The explicit instructions will help develop ELs' skills to use strategies to tackle vocabulary critical for discipline comprehension and likely develop their self-efficacy for vocabulary strategies. Language acquisition researchers have examined the influence of practices on self-efficacy development. For instance, one study found a project-based learning curriculum to be effective in developing French learners' self-efficacy in language knowledge (Mills, 2009).

University students who place a higher value on help-seeking tend to have better academic performance (Karabenick & Knapp, 1991). The finding that native speakers reported higher self-efficacy for help-seeking suggests that another aspect of academic support programs should be to work with ELs to identify available academic resources and encourage them in seeking academic help. For instance, writing centers are great resources for ELs that provide one-on-one help in vocabulary and grammatical and editorial services (Karabenick & Newman, 2013).

Interestingly, ELs' self-efficacy for dictionary use was not different from native speakers'. It is probably because ELs rely heavily on dictionary use, either English-only or bilingual, as they encounter new words (Nation, 2001; Ranalli, 2009). Indeed, dictionary use is one of the most commonly used strategies among ELs (Nesi, 2013). ELs' rich experiences of using dictionaries to learn new words can help build their efficacy in using the strategy. Caution should be taken as previous studies reported ELs' overuse of dictionaries that hinder the development of language skills and reading comprehension (Bromley, 2007).

The three-way interaction effects for self-efficacy for morphological analysis suggested that, in reading, native speakers had higher self-efficacy for morphological analysis for leisure purposes, whereas ELs had higher self-efficacy for academic purposes. ELs' higher self-efficacy for academic purposes might be due to the fact that they were better prepared in English for academic purposes than for leisure purposes before attending university, usually through attending an intensive English program (Hagedorn & Li, 2017). Native English speakers have far more exposure to written and oral English before they go to college (Laufer & Hulstijn, 2001; Nation, 2001), which allows them to gain rich experiences in vocabulary learning that happens in learning for leisure purpose. Overall, these results are in line with Bandura's (1986) notion that people's judgment of their competence is developed and revised as they interpret information from their prior experiences. Students' prior experiences within the English language are important sources for their self-appraisal of efficacy and these experiences contribute to their perception of the capabilities in learning vocabulary. When students complete an academic task successfully, their confidence of finishing a similar task is raised; conversely, if they

had no or little successful experience completing the task, they tend to judge themselves unable to succeed (Bandura, 1986). Students' actual mastery or unsuccessful performance of learning vocabulary with strategies is probably the most reliable information because they are usually perceived as tangible indicators of one's capabilities (Schunk & Pajares, 2002). Other sources of self-efficacy, including vicarious experiences, social persuasion, and physiological indexes, might also contribute to the group difference. For instance, ELs might have fewer occasions to observe their peers learning vocabulary with strategies than native speakers. Foreign/second language anxiety can be another construct that affects self-efficacy of ELs. Although the current study did not measure students' anxiety related to vocabulary learning, previous work indicated language anxiety is negatively related to self-efficacy (Mills et al., 2007).

Self-Efficacy, Attitudes, and Academic Achievement

The last research question investigated the relationship between students' self-efficacy and attitudes for vocabulary strategies and their academic achievement. Findings show the only significant relationship was between attitudes and academic achievement for native speakers. This result emphasizes the importance of positive attitudes for vocabulary strategies on native speakers' academic achievement.

Limitations and Implications

This study has three main limitations. First, it included only traditional undergraduate students from a 4-year research university. It is unknown whether the findings are generalizable to other populations. To generalize the dynamics of self-efficacy for vocabulary strategies to a larger population, future research should include samples from more varied institutions. Second, this study used self-reported GPA instead of actual academic performance to measure students' academic achievement. Although self-reported grades are very good estimations of actual grades for university students with relatively higher grades, we cannot claim these self-reported grades to be actual academic performance. Future research is needed to further establish the predictive role of self-efficacy for vocabulary strategies. For example, the utility of the merit of self-efficacy for vocabulary strategies may be better judged by its ability to predict vocabulary learning rate, vocabulary learning strategy use, vocabulary knowledge, and/or academic performances (e.g., verbal ability, reading comprehension, metalinguistic skills). Third, the current study only informed us of university students' self-efficacy and attitudes for vocabulary strategies and their relationship to academic achievement; no causal relationship between these factors can be claimed. Despite these limitations, findings from this study have some implications for working with university ELs.

The present study has a few important implications for educational practice. The findings suggest that attitudes for vocabulary strategies of native speakers significantly accounted for the variance in their academic achievement. This is meaningful for teachers and researchers as they attempt to monitor and help students enhance their vocabulary breadth and depth (Schmitt, 2010). Second, determining how self-efficacy for vocabulary strategies varies as a function of input modality (reading vs. listening) and learning goal (academic vs. leisure) can inform the preparation of instructional programs or the inclusion of more salient instruction in existing classes (Dörnyei et al., 2016; Nation, 2001). Both native speakers and ELs who find themselves less prepared for postsecondary education are encouraged to join university-level summer classes or special programs to learn and practice strategies (Francis & Simpson, 2009; Perin, 2013). Third, ELs reported lower self-efficacy than native speakers. ELs also reported different self-efficacy as a function of input

modality and learning goal. ELs' self-efficacy and attitudes toward vocabulary strategies did not predict their academic achievement. These findings indicate a need for more research on the processes and sources of ELs' attitudes and self-efficacy for vocabulary strategies, and how their self-efficacy and attitudes contribute to their vocabulary learning processes and language achievement as well as academic achievement. For example, teaching vocabulary learning skills can motivate students to learn words; mastery experiences of vocabulary learning enhance their perception of their capability to learn vocabulary. In all, this study serves us in our preliminary quest to fill the gap in vocabulary research about the role of self-efficacy and attitudes and to inform the vocabulary learning process of both native and nonnative university students.

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Appendix

Scenario 1

Think about the most interesting books or articles you have ever read or you are still reading for fun. Now KEEPING THAT READING IN MIND, and answer the following questions:

Scenario 2

Sometimes you must read textbooks or papers for school assignments. These reading assignments might be from your instructors or professors. Think about the last time you read a book or a paper, KEEP THAT READING IN MIND, and answer the following questions:

Scenario 3

We all listen at school. Sometimes you listen to teachers or professors in class; sometimes you listen to multimedia materials in class. KEEP THAT LISTENING IN MIND and answer the following questions:

Scenario 4

Think about a time when you listen to something after school. It can be anything, for example, a song, an interesting story, a TV show, or a piece of news. Now KEEP THAT LISTENING IN MIND and answer the following questions: