**ORIGINAL ARTICLE**

# Applying Cognitive Linguistics to Enhance Vietnamese English-Major Undergraduates' Learning of English Modal Verbs

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**ABSTRACT**

English modal verbs (EMV) have long been regarded as a challenge for English as a Foreign Language (EFL) learners, partly due to the widely used conventional speech act teaching method. The Cognitive Linguistics approach, which is believed to offer a more systematic explanation of English modals, has been introduced and applied to the teaching of English modal verbs in various international contexts. In this study, the researchers aim to investigate the perceptions and attitudes of Vietnamese EFL learners toward the application of Cognitive Linguistics at the tertiary education level, and whether this approach can improve their performance in using modal verbs through a Cognitive Linguistics intervention. To achieve the research objectives, two tests (pretest and post-test), questionnaires, and semi-structured interviews were conducted with 18 Vietnamese English-major undergraduates. Analyzed using SPSS 26, the research findings revealed a significant improvement in the students' performance in using English modals following the intervention. Additionally, the participants reported that the systematic explanation of modal verbs enhanced their ability to distinguish between social and logical functions of EMV more effectively than traditional methods. Ultimately, this study provides valuable insights into the perception of modal verbs among Vietnamese EFL learners, with implications for English language teaching and curriculum design.

## 1. INTRODUCTION

English modal verbs (EMV) are crucial for expressing intentions, commitments, probabilities, and social nuances (Sweetser, 1990; Biber et al., 1999; Nguyen, 2015); thus, their significance in communication cannot be overstated (Novotná, 2015). Despite their widespread usage in second language acquisition, modal verbs have garnered relatively little attention (Davies, 2003, Nguyen, 2015) from researchers who have primarily focused on other elements of English grammar (Liu & Qin, 2024; Jacobsen, 2018; Schmidt, 1990). It was not until the past few decades that researchers began to investigate the role of modal verbs in the language-learning process (Ellis, 1994; Liu & Qin, 2024). Nonetheless, non-native speakers' difficulties in using EMVs have been extensively discussed in the ELT literature.

According to Hinkel (1995; 2009), Milton and Hyland (1999), Ma and Lu (2007), Liang (2008), Hykes (2000), and Aijmer (2002), Liu & Qin, 2024, Nguyen, 2024; Fatehi Rad, 2022), it is commonly found that students from Asian-languages-speaking backgrounds tend to use modals in the context that would not be considered appropriate

by native speakers of English. Furthermore, modal verbs are claimed to be among the most problematic linguistic forms to perceive due to their functional complexity, i.e. one form may mark more than one semantic meaning (Tyler et al., 2010; Biber et al., 1999; Palmer, 1990; Collins, 2009; Greenbaum & Quirk, 1990; Papafragou, 1998). Moreover, modal meanings are often ambiguous, not straightforward or obvious, as "the meanings of modals cannot be described in terms of wholly discrete categories" (Palmer, 1990, p. 21). Recent studies on Vietnamese EFL learners corroborate the ubiquitous yet challenging task of comprehending and utilising EMV due to their context-laden polysemy and potential ambiguity, including Nguyen (2024), Nguyen et al. (2023) and Nguyen (2015). Noticeably, it is believed that a major justification for learners' difficulty is the traditional teaching approach which primarily focuses on grammatical forms of EMVs and rote-learning of their function-based meaning (Nguyen et al., 2024).

Instead of interpreting modal verbs through their several discrete functions, Cognitive Linguistics (CL) presents a compelling alternative that not only provides L2 learners with a principled and systematic understanding of modal verbs but also enhances the accuracy and completeness of such an understanding. By employing the methodology of CL, Talmy (1988) articulates modal verbs in terms of real-world experiences, thereby facilitating learners' comprehension of the nuanced meanings of modals and enabling their application with increased flexibility and precision. CL analyses furnish both a systematic and motivated representation of the interplay between social and logical meanings, as well as a precise delineation of the semantics associated with each modal (Langacker, 1991; Nuyts, 2001; Sweetser, 1990; Talmy, 1988; Tyler, 2012).

The benefits and challenges related to the instruction of EMV through CL approaches have been extensively documented, particularly within non-Western educational settings (Liu & Qin, 2024; Seifi, 2023; Ying, 2019). In Vietnam, the CL-based instructions have proved effective with Vietnamese EFL learners in facilitating their understanding and use of English prepositions (Hung et al., 2018), the long-term retention of English idioms (Hung, 2019), and English vocabulary learning in general (Nguyen, 2023). However, to the knowledge of the researchers, there has been an absence of empirical research on the impact of CL on learning EMV in the local context. Consequently, this research seeks to bridge this research gap by looking into the perceptions of Vietnamese learners of English as a Foreign Language (EFL) toward CL instruction in the teaching of EMV, as well as assessing the extent to which this pedagogical method enhances their ability to acquire and use EMV.

Specifically, the study aims to answer two research questions: (1) What are Vietnamese English-major undergraduates' perceptions and attitudes towards the application of the CL approach in learning English modal verbs?; (2) Can the CL teaching approach improve Vietnamese English-major undergraduates' ability to understand and use English modal verbs? Accordingly, the following hypotheses are tested: H0: There is no significant difference between the pretest and posttest mean scores; H1: The post-test mean score is significantly higher than the pretest mean score.

## 2. LITERATURE REVIEW

### 2.1. The Cognitive Linguistics Account of English Modal Verbs

Cognitive Linguistics (CL) establishes a distinct paradigm within the field of linguistics, emphasising the notion that language operates not as a self-contained system governed predominantly by syntactic or semantic rules, but rather as a reflection of overarching cognitive processes and a spectrum of human experiences (Sweetser, 1990; Talmy, 1998; Tyler, 2010). This theoretical framework posits that the construction of linguistic meaning is inherently grounded in the physical, social, and psychological contexts experienced by speakers (Langacker, 1991; Hung, 2019). From a CL perspective, a comprehensive understanding of language necessitates engagement with the mental and experiential foundations that underlie linguistic phenomena, rather than the mere acquisition of isolated linguistic functions (Lakoff & Johnson, 1980).

In the domain of CL, the concept of force dynamics serves as a pivotal framework for understanding modal verbs - a notion initially articulated by Talmy (1988) and subsequently scrutinized by Sweetser (1990). Specifically, force dynamics is interpreted as an illustration of linguistic expressions that reflect the physical forces and relational dynamics experienced by speakers. For example, the modal verb "*must*" indicates a force that engenders action, frequently operating beyond the subject's volitional control. Drawing on this analytical perspective, learners are entitled to relate their comprehension of modal verbs to concrete, real-world experiences.

A prevailing consensus among linguists, including those operating within the CL paradigm, is that nearly every modal verb encompasses two principal meanings: epistemic modality and deontic modality (Tyler, 2010; Jespersen, 1949). From the perspective of CL, epistemic and deontic modalities can be elucidated through the lens of force dynamics (Talmy, 1988; Sweetser, 1990; Langacker, 1991, 2003). Researchers argue that the modal deontic sense is intrinsically linked to physical forces, forward motion, barriers, and directional orientation. For instance, the modal verb "*must*" encapsulates a robust external compulsion, exemplified in the statement, "*You must pay the rent by tomorrow*." where the force emanates from an authoritative figure or an established regulation, thereby creating a binding obligation. In the domain of epistemic modality, this facet of modal verbs is concerned with knowledge acquisition, inference processes, and the speaker's degree of certainty. Within CL, the epistemic interpretations of modal verbs originate from metaphorical extensions of their deontic connotations. Sweetser (1990) explicates the epistemic import of "*must*" as denoting a heightened degree of logical certainty, substantiated by available evidence. For instance, the statement, "*John must be at the office*" serves to illustrate the epistemic application of "*must*" where in it reflects the speaker's logical reasoning rather than an external mandate. This semantic shift is attributable to metaphorical mappings that bridge the external social context and the internal domain of cognitive reasoning. Thus, deontic modality is generally linked to social meanings, encompassing obligations and external constraints, whereas epistemic modality pertains to logical meaning - namely, the processes of reasoning and evidence evaluation.

## 2.2. The traditional approach of teaching English modal verbs

In the discourse surrounding the pedagogy of English modal verbs (EMV), the prevalent method exemplified in English Language Teaching (ELT) textbooks emerges as a substantial challenge for second language (L2) learners (Palmer, 1986; Tyler, 2008). This conventional pedagogical approach tends to categorize modal verbs as discrete entities associated with specific pragmatic functions, lacking an adequate contextual framework. Consequently, this categorization may lead both educators and learners to perceive modal verbs as disjointed entities that necessitate rote memorization, ultimately fostering a fragmented cognitive grasp (Tyler, 2010).

In the context of ELT across various Asian settings, including Vietnam, learners are found to face distinct cultural and linguistic barriers in learning English modal verbs (Back & Eunsuk, 2017; Whitty et al., 2022; Nguyen et al., 2024; Seifi, 2023; Nguyen et al., 2023; Nguyen, 2015; Vu, 2020). Three predominant issues are identified, including: (1) the inappropriate substitution of "*can*" for "*could*" in contexts where the latter is lexically more appropriate; (2) the erroneous selection of modal verbs when their usage is warranted; and (3) the application of "*can*" in instances devoid of the necessity for a modal verb. It is posited that these difficulties arise from the reliance on function-based pedagogical approaches and conventional curricular resources, which fail to equip learners with a comprehensive and systematic framework for understanding modal verbs (Nguyen et al., 2024). Thus, there is a need for a more effective teaching approach to facilitate Vietnamese EFL learners' EMV understanding and utilisation.

## 2.3. Teaching English Modal Verbs with The Cognitive Linguistic Approach

In addressing the limitations in traditional pedagogical methods, in the past 20 years, the CL framework has been strategically employed across diverse domains within second language (L2) education (Liu & Qin, 2024), yielding significant advancements in areas such as vocabulary acquisition (Nguyen, 2023), metaphorical understanding (Hung, 2019; Ying, 2019), prepositions (Pan & Hu, 2022; Hung et al., 2018), instruction in grammatical structures (Jacobsen, 2018; Boers & Lindstromberg, 2008; Tyler & Evans, 2003), and particularly, modal verbs (Seifi, 2023; Nikolova, 2015; Tyler et al., 2010, Abbuhl, 2005; Hama, 2005). Collectively, the studies emphasize CL's potential to furnish a systematic and explanatory discourse on modal semantics, thereby offering a holistic pedagogical framework for the instruction of these intricate constructs within English grammar (Sweetser, 1990; Talmy, 1998; Tyler, 2010). Overall, these studies provide strong evidence that the CL approach improves learners' comprehension and application of English modal verbs.

Hama (2005) investigated the impact of the CL approach on EMV usage in writing among six advanced English learners who had previously struggled to appropriately produce modals. 30 written texts were analyzed to evaluate changes in modal usage following a CL-based explanation. The findings reveal that this instructional approach significantly improved the learners' understanding and application of modal meanings in written discourse. During a later class discussion, several participants asserted that the intervention gave them a clearer grasp of the distinctions between specific modals, particularly *should, would*, and *could* in predictive contexts. These findings are significant as enhancements in modal use were noted in students' naturally occurring written production, rather than in

controlled exercises. Additionally, these changes took place after a single, brief instructional intervention, highlighting the potential effectiveness of CL-based instruction in improving modal verb usage among highly proficient L2 learners. However, the small sample size and limited duration of the treatment can undermine the reliability of the results.

In a larger-scale study, Tyler et al. (2010) investigated the impact of force dynamics-based instruction on modal verb usage on 64 proficient EFL learners with a diverse range of first languages (L1s), including Chinese, Arabic, Turkish, Farsi, Korean, Spanish, Portuguese, Russian, Kazakh, and French. The study categorized the participants into three separate groups based on the instructional approach they received: a CL-based intervention, the traditional treatment group, receiving instruction following conventional teaching methods, and the control group, which did not undergo any instruction on modal verbs. The study revealed that learners in the CL group, who received instruction centered on force dynamics, outperformed the other groups in both their correct use of modal verbs and overall comprehension of modal semantics. The post-course feedback indicated that participants found the CL approach to be more engaging and effective in clarifying modal meanings. The intervention framework of this study has been widely adopted in subsequent research to measure the impact of CL instruction on various aspects of English learning, ranging from preposition (Hung et al., 2018), the long-term retention of English idioms (Hung, 2019), to EMV in other contexts (Seifi, 2023; Fatehi Rad et al., 2022). However, the research results are limited due to the small number of EMV involved in the instructional intervention (only four modals) and the short duration of the treatment (130 minutes altogether).

In a more recent quasi-experimental study by Seifi (2023), the effectiveness of the CL approach in teaching EMV for Iranian EFL learners is evaluated. The researcher also designed their CL-based instruction with reference to that of Tyler et al. (2010) on the participants where illustrative images are utilised to explain the meaning and functions of EMVs. It is found out that CL-based instructions, both conceptual (based mainly on illustrative images) and verbal (based on oral explanations only) are superior to the traditional grammar-translation teaching approach in helping learners perceive and interpret EMV. In particular, the findings highlight the use of explanatory pictures in instructing Iranian EFL learners of EMVs.

### 2.4. EMV Teaching and the Cognitive Linguistics Approach in Vietnamese context

In Vietnamese educational settings, the CL approach has been introduced and investigated as a potential alternative teaching approach in a number of research studies. This pedagogical framework is empirically confirmed to be effective in facilitating learners to comprehend and use English prepositions (Hung et al., 2018), English vocabulary (Nguyen, 2023), or more specifically, English idioms (Hung, 2019). Noticeably, in their quasi-experimental research, Hung et al. (2018) conducted an instructional treatment of 6 teaching hours to teach English prepositions with Cl-based activities, adapting Tyler et al.'s (2010) interventional framework. 50 EFL university students were divided into two groups: an experimental group (taught with CL) and a control group (traditional teaching methods applied). By comparing the pretest and post-test results of the two groups, the study concluded that CL-based instructions are more effective than conventional teaching methods in improving learners' understanding of English prepositions.

However, existing literature on EMV in Vietnamese contexts is generally restricted to exploratory research where learners' perceptions and practice of EMV use are the focal point (Nguyen et al., 2024; Nguyen et al., 2023, Nguyen, 2015). In particular, Nguyen (2015) made an attempt to analyse and compare the use of MV in the languages of English and Vietnamese from a Cognitive Linguistic perspective, with force dynamics as a key to the theoretical framework. The findings reveal that MV are widely used in both languages as a means of expressing modality. However, in this comparative study, the researcher limits her study to exploring current practice of MV use and comparing between the two corpus rather than testing the impact of applying CL in teaching MVs, as claimed in the paper, so as "to contribute to the application of the CL as a theoretical background to compare and contrast the two languages". Thus, it can be stated that the application of the CL-based teaching approach to EMV teaching in Vietnam constitutes a relatively under-researched domain.

The current study draws on insights from these studies to advance the application of force dynamics within the Vietnamese context. It adopts Tyler et al. 's (2010) pedagogical materials for the instructional intervention to assess the effectiveness of the CL approach in Vietnamese tertiary education setting.

## 3. MATERIALS AND METHODS

### 3.1. Research Design

As an exploratory attempt to measure the impact of applying CL-based instruction on EMV learning of Vietnamese EFL learners, this study adopts the pre-experimental one-group pretest-posttest design, focusing on a single group of participants experiencing a CL-informed instructional intervention without involving a comparison group (Creswell, 2009). This research design fits the research objective to identify and measure any differences in student performance in perceiving and using EMV after learning with an alternative instructional approach (in this case, CL-based instructions) over a limited period of time (Patmanthara et al., 2019). Moreover, the intervention materials such as Tyler's diagrams or Sweetser's force maps are not widely used in ELT classrooms or Vietnamese curricula, which minimizes the likelihood of history biases and mutation effects of one-group pretest-posttest design. In addition, the pretest, and posttest were designed following the same format and knowledge focus to ensure test result reliability and validity. Yet, to assert that the test results reflect genuine learning rather than mere test familiarity, they involve distinct contexts, dialogues, and target sentences; and no feedback or correct answers after the pretest to most possibly reflect.

Additionally, this study employs a mixed-methods approach to address the two research questions with sufficient data convergence (Cohen et al., 2018). Specifically, quantitative data was collected from the pretest and posttest, together with the questionnaire responses while the qualitative data derive from the student interview conducted following the treatment.

### 3.2. Participants and Sampling

The study involved 18 Vietnamese undergraduates, majoring in English at a state university of education in Vietnam. The participants were between 20 and 23 years old and predominantly had C1-level English proficiency. Although these individuals had advanced proficiency in English, their prior exposure to concepts related to Content Language Integrated Learning (CLIL) was minimal, making them suitable candidates for evaluating the accessibility and effectiveness of CLIL-based modal instruction. This choice of participant is justified by the fact that this instructional approach has historically been perceived as challenging due to its intricate terminology and conceptual frameworks. The purposive sampling method employed yielded targeted insights regarding the experiences of advanced learners encountering the CL methodology for the first time.

### 3.3. The Treatment

Adopting the treatment design developed by Tyler et al. (2010a), the researchers conducted pre-tests and post-tests at the beginning and end of the experimental course respectively. The experimental teaching program spanned three sessions of online instruction, each lasting 120 minutes. Regarding the training materials, the participants were exposed to the instructional content adapted from Tyler (2008). Beginning with a diagnostic activity that highlighted the limitations of traditional methods and set the stage for the introduction of the CL approach, the instructors provided an overview of modal verbs, focusing on their root and epistemic meanings. This overview also outlined the shortcomings of traditional instruction, which often relies on fragmented, function-based explanations. The CL approach was introduced as a comprehensive alternative, emphasizing its ability to systematically connect the social and logical functions of modals. The participants were introduced to three foundational elements critical to understanding modal semantics within the CL framework:

**Source of force:** Identifying the origin of obligation, permission, or necessity.

**Strength of force:** Evaluating the intensity of the modal's meaning.

**Direction of force:** Understanding the trajectory of the action or likelihood.

Throughout the program, they participated in dynamic activities that promoted both theoretical understanding and practical application. Diagrams visually represented modal meanings, bridging the gap between abstract concepts and real-world usage. For example, consider "*would*" and "*will*" (i.e., Figure 1). The diagram for "*will*" illustrates a strong, present-oriented force with solid lines and a forward-pointing arrow, indicating an internal source of force within the actor, propelling them with unwavering direction and momentum toward the intended action. In contrast, "*would*" is depicted with dotted lines and a dotted arrow, suggesting a weaker force originating internally but influenced by external or conditional barriers. The direction of force for both remains forward, but in "*would*," the dotted elements imply reduced certainty, hypothetical scenarios, or politeness. These elements - source, strength, and

direction of force - reflect the critical distinctions between "*will*" and "*would*" in their force dynamics. Also, the clips from selected sitcoms provided authentic contexts, allowing learners to analyze how modal verbs function in everyday interactions. The learners were also encouraged to ask questions and share insights in a private social media group set up by the researchers to ensure ongoing engagement. This platform served as a collaborative space for addressing challenges and reinforcing learning beyond the classroom.
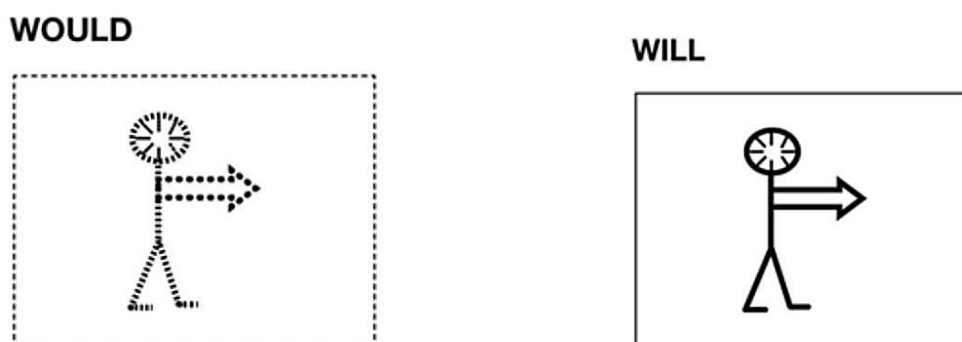


*Figure 1. Diagram of WOULD and WILL*

### 3.4. Data collection instruments

This study employs pre-tests and post-tests, questionnaires, and semi-structured interviews to collect data.

*Pre-test and post-test*

Initially, the participants were administered a pre-test designed to evaluate their foundational understanding of English modal verbs prior to the experimental CL-based teaching program. Following the intervention, a post-test was executed to measure differences in the participants' performance. The pre-tests and post-tests, adapted from Tyler et al. (2010), featured dialogues and scenarios with multiple-choice items that necessitated participants' selection of the appropriate modal verb based on contextual interpretation equally involving deontic (social) and epistemic (logical) uses of EMV. To optimize the reliability and validity, the tests were consulted with an expert for approval. Moreover, they were piloted with a group of college students who were blind to the purpose of the test. The researcher planned to evaluate the learners' development in understanding of the social function, logical function and the metaphorical extension of the two senses, therefore in each test ten items targeted social meaning and ten targeted epistemic meanings.

*Survey questionnaire*

In this study, a survey questionnaire was used to gain deeper insights into participants' perceptions and attitudes following the instructional intervention on EMV through the lens of force dynamics. The researcher drew on the questionnaire's structures provided by VanHorn-Grassmeyer (1998). The questionnaire was designed on Google Forms platform using a 5-point Likert scale ranging from Strongly disagree, Disagree, Undecided, Agree, to Strongly Agree for greater convenience in distribution and response collection. The 15 items of questionnaires were categorised into two groups: (1) Students' positive experience with the application of CL in acquiring EMV (consisting of 10 statements); (2) Students' negative experience with the application of CL in acquiring EMV (consisting of 5 statements).

The items are designed with two main purposes: (1) items related to the perception and attitudes to the effectiveness of the instruction and (2) items related to the feelings and attitudes during the learning process. The first kind of items were adapted from the functions and the effectiveness reported in the studies by Talmy (1988); Sweetser (1990); Tyler (2008); and Tyler et al. (2010). In contrast, the second set included statements that elicit learners' emotional responses and attitudes, adapted from Selamat (2014). To ensure the clarity and validity of the questionnaire items, a pilot study was conducted.

*Post-intervention Interviews*

According to Saldaña et al. (2011), interviews are one prominent data collection method, enabling researchers to elicit and construct the opinions, attitudes, perspectives and experiences of individuals. The interview questions in

this research were designed to elicit the participants' perceptions, as well as their beliefs and attitudes towards the application of the cognitive approach to comprehending the modal verbs. The questions were provided to three participants, who had agreed to participate in the follow-up interviews, one day before the interview to give them the opportunity and time to reflect on their personal experiences and formulate their responses. All of the interviews were conducted individually in a small meeting room and were recorded using an audio recorder with participants' permission. The interviews lasted between 6 and 10 minutes, starting off with a short briefing stage where the researcher stated the purpose of the study. During the interviews, the researcher asked for further clarification and elaboration when new directions arose, only if they are related to the main themes of the interview.

### 3.5. Data Analysis

First, the quantitative data from the pretest and post-tests were analyzed using SPSS software to determine the interventional program's impact. A paired t-test was conducted, comparing the pre-test and post-test mean scores. In addition to performance-based data, the study gathered further insights through a questionnaire designed to capture the participants' attitudes toward the CL approach. Their responses were coded and analyzed using SPSS based on the percentages of agreement and disagreement with various statements about the CL approach together with the mean and standard deviation values to obtain a comprehensive view of the participants' perceptions.

In addition to the quantitative analysis, the study employed qualitative methods that involved collecting feedback through a questionnaire and conducting semi-structured interviews with a subset of participants to capture nuanced perspectives on the CL-based teaching intervention. The research used thematic analysis techniques to uncover the learners' experiences and gather data for future research. The researcher applied qualitative coding, using both deductive and inductive approaches, to analyze the audio transcripts collected (Linneberg & Korsgaard, 2019). Inductive coding was a bottom-up approach where the researcher examined the data and derived codes from it. Deductive coding was a top-down approach in which a set of codes was developed based on the research questions. The procedure included two stages for coding qualitative data: (1) initial coding and (2) line-by-line coding. In stage 1, the researchers implemented descriptive coding to identify codes. Descriptive coding was utilized to capture the general idea of the data, often in the form of nouns. In stage 2, the researchers transitioned from coding to analysis, followed by code categorization and theme identification.

#### Ethical Considerations

To address ethical concerns, in this study, the participants were clearly informed about the purpose of the research and what it involved. They were given enough time to understand the information and were free to choose whether or not they wanted to take part. They also signed a consent form before taking part, showing they agreed to be included in the study (Marshall & Rossman, 2016). Also, the participants were told clearly that they could stop or leave the study at any time if they wanted to. Each interview was done individually in a private online meeting room. The interview setting was handled carefully to make sure it was private and comfortable. Only the researchers had access to the data collected from the participants.

## 4. RESULTS AND DISCUSSION

### 4.1. Vietnamese English-major undergraduates' perceptions and attitudes towards the application of the Cognitive Linguistics approach

The first research question concerns learners' perceptions and attitudes toward the application of the CL approach in learning EMV. This question was addressed using quantitative data from the questionnaire responses and qualitative data from the interviews. Analysis of the questionnaire responses revealed that the majority of the participants held a positive attitude toward the CL-based teaching approach. Table 2 displays their favorable perceptions and attitudes, showing near-universal approval of CL-based instruction following the intervention.

*Table 1. The learners' positive perceptions and attitude towards CL-based instruction in teaching EMV*

| Statement | Percentage of approval |
|---|---|
| 1. The application of Cognitive Linguistics into teaching and learning English modal verbs helps me enjoy learning this unit of grammar. | 94.5% |

| | |
|---|---|
| 2. The application of Cognitive Linguistics into teaching and learning English modal verbs improves my comprehension of English modal verbs. | 100% |
| 3. The application of CL into teaching and learning English modal verbs increases my confidence and motivation in using English modal verbs. | 88.9% |
| 4. The application of CL into teaching and learning English modal verbs enables me to have a systematic understanding of modal verbs. | 100% |
| 5. The application of CL into teaching and learning English modal verbs enables me to understand the difference between the social function and logical function of English modal verbs. | 88.9% |
| 6. The application of CL into teaching and learning English modal verbs enables me to understand the differences in meaning among English modal verbs. | 88.9% |
| 7. The application of CL into teaching and learning English modal verbs enables me to understand the metaphoric extension of the root use into the epistemic use. | 83.4% |
| 8. I prefer the application of CL into teaching and learning English modal verbs to be used more in the class. | 72.2% |
| 9. I find it less difficult to apply CL into comprehending English modal verbs. | 72.2% |
| 10. The application of CL into teaching and learning English modal verbs is a learner-friendly and accessible approach. | 83.3% |

Moreover, there were only slight differences in the participants' positive opinions. Table 3 indicates that the mean values for all ten questions were greater than 3. In other words, the participants generally had positive experiences when applying Cognitive Linguistics in learning EMV. Additionally, the low standard deviation suggested minimal variation in participants' opinions.

*Table 2. Descriptive statistics of the learners' positive experience questionnaire*

| | N | Mean | Std. Deviation |
|---|---|---|---|
| S1 | 18 | 4.3333 | 0.59409 |
| S2 | 18 | 4.5556 | 0.51131 |
| S3 | 18 | 4.2222 | 0.80845 |
| S4 | 18 | 4.7222 | 0.46089 |
| S5 | 18 | 4.5000 | 0.70711 |
| S6 | 18 | 4.5556 | 0.61570 |
| S7 | 18 | 4.1111 | 0.67640 |
| S8 | 18 | 4.0556 | 0.80237 |
| S9 | 18 | 4.0556 | 0.80237 |
| S10 | 18 | 4.0556 | 0.99836 |

Regarding the negative perceptions and attitudes as presented in Table 4, only a small percentage of the participants claimed that using modal verbs was a negative experience. Specifically, the highest percentage of respondents (38.9%) felt that the CL approach was unnecessary for achieving optimal performance in using English modal verbs. Meanwhile, only a modest proportion of respondents (11.1%) preferred to rely solely on the traditional approach, and the same numbers of participants thought that applying CL was too difficult.

*Table 3. The learners' negative perceptions and attitude*

| Statement | Percentage of approval |
|---|---|
| 11. I dislike the application of CL to comprehending English modal verbs. | 22.3% |
| 12. I prefer to use only the traditional approach to acquire English modal verbs. | 11.1% |
| 13. I believe I still can have the best performance in using English modal verbs without the application of CL. | 38.9% |
| 14. I don't feel much change after learning English modal verbs from the perspective of CL. | 27.7% |
| 15. The CL approach is too challenging for me to acquire. | 11.1% |

Additionally, most participants disagreed with the perspective that the application of CL in teaching and learning English modal verbs was a negative experience, as shown in Table 5.

*Table 4. Descriptive statistics of the learners' adverse experience response*

|  | N | Mean | Std. Deviation |
|---|---|---|---|
| **QS11** | 18 | 1.8889 | 0.75840 |
| **QS12** | 18 | 2.2222 | 0.64676 |
| **QS13** | 18 | 2.3889 | 0.84984 |
| **QS14** | 18 | 2.1111 | 0.67640 |
| **QS15** | 18 | 2.0000 | 0.48507 |

The data gathered from semi-structured interviews further corroborate to the response to research question 1. The participants' responses suggest significant perceived improvements in their understanding of modal verbs, increased clarity through systematic instruction, and high levels of engagement. These findings emphasize the CL approach's potential as an effective and practical tool for teaching modal verbs. The key term "*improvement*" appeared 10 times in the participants' responses, highlighting the effectiveness of the CL approach in enhancing their comprehension of modal verbs. Participant A shared after receiving CL-based instruction that the cognitive method was "*easier to understand*" compared to traditional methods. Participant B echoed this sentiment, noting that she had previously struggled but now "*improved her understanding of the modal verbs*". Similarly, Participant C stated that she "*understood better and knew how to use modal verbs correctly*". These responses collectively indicate that the program successfully addressed prior challenges and facilitated noticeable progress in learners' mastery of modal verbs.

The phrase "*understandable*" was identified 14 times, reflecting participants' appreciation for the clarity offered by the CL approach. Despite ongoing challenges in applying the method during production, Participant A noted that she "*still understood*" the modal verbs better than before. Participant B provided a more detailed perspective, explaining that the CL approach "*helped me understand when to use which modal verbs, and why, in a detailed and systematic way*." These findings highlight the CL approach's ability to present modal verbs in an organized fashion, making their functions and contexts easier to comprehend.

The second theme emphasized the participants' high level of engagement and positive attitudes toward the CL approach. The key word "*engaged*" was mentioned 10 times, showcasing learners' active involvement and interest. Participant B described the CL method as "*realistic and useful*" particularly appreciating the discussions about native speakers' use of modal verbs. She remarked, "*My favorite part was discussing why native speakers used modal verbs and how modal verbs expressed the speaker's purpose.*" This practical, real-world focus allowed participants to connect theoretical concepts with authentic language use, further enhancing their motivation and understanding.

The findings from the survey and interviews collectively highlights a predominantly positive experience and attitude towards using CL in learning EMV among the Vietnamese ELF undergraduates. Specifically, it is revealed

that most learners expressed preferences for CL over the conventional ways of learning EMV. Additionally, 72.2% of participants expressed interest in using more CL methods in future classes, citing the approach's effectiveness and engaging nature. This suggests that the cognitive framework of the CL-based method, although challenging, ultimately enhances learner satisfaction by providing a meaningful, interactive approach.

There are several empirical studies on CL-inspired pedagogical approaches resonating with this finding, ranging across different aspects of English language learning from conditionals (Jacobsen, 2018); prepositions (Pan & Hu, 2022); and, particularly, modal verbs. As stated by Jacobsen (2018), the CL-based learning tasks were 'explicitly favoured' by the participants in her study due to the 'richer contextual knowledge, and the involvement of cognitive efforts, collaboration and production'. Similarly, the participants in this study echoed with these viewpoints when depicting the CL approach as "realistic and useful". Meanwhile, the comparative research on EMV goes back quite a long way to Tyler et al. (2010) and Hama (2005), which also boasts participants' post-treatment positive reflection on CL-instructions. It can be justified with the fact that more recent studies on the impact of CL instructions on modal verbs learning generally employ a quantitative design with pretest posttest to measure the empirical results of the target pedagogy while leaving out qualitative methods aiming at exploring learners' experience. This is also a noteworthy contribution of the current study to the existing literature.

Compared to studies by Tyler et al. (2010), and Hama (2005), which primarily relied on test results, this study incorporated questionnaires and semi-structured interviews to gain more elaborated insights supporting the effectiveness of CL. The interview data illuminates a more systematic understanding of modal functions among the participants of this study.. For instance, Participant B recalled her challenges with the traditional approach, where she often "*had to memorize cases*" and struggled to understand why "*certain modals were used in one context but not another.*" Following the CL intervention, she reported a clearer, "*more systematic"* understanding. Similarly, Participant A noted that the CL approach provided a structured framework, making it "easier to understand" modal functions and distinctions. These findings echo with multiple studies where the CL approach has been hailed as a meaning-based, context-laden and effective pedagogical framework for EFL learners (Hung et al, 2018; Nguyen, 2023; Ying, 2019; Nikolova, 2015).

Furthermore, this study finds that the participants felt more confident using modals after receiving CL instruction, aligning with Tyler et al.'s (2010) concluding notes that CL frameworks enhance both comprehension and competence. A large majority reported greater precision in selecting appropriate modals based on context, reflecting CL's effectiveness in developing not only theoretical knowledge but also practical accuracy in language use. This finding reinforces the view that CL, with its structured analysis of force dynamics, provides learners with tools to confidently navigate complex linguistic structures.

### 4.2. Improvements in Vietnamese English-major undergraduates' ability to understand and use EMV after learning with the Cognitive Linguistic approach

As stated in the second research question, the study aims to determine whether the cognitive linguistic (CL) teaching approach can improve Vietnamese English-major undergraduates' ability to understand and use EMV based on the data collected from the pre-test and post-test scores, which provide quantitative evidence to answer this research question.

The study aims to test the stated hypotheses:

H0: There is no significant difference between the pretest and posttest mean scores.

H1: The posttest mean score is significantly higher than the pretest mean score.

The results of the paired sample t-test, in which the mean score of students' pre-test is compared with that of the post-test, revealed a statistically significant improvement in the participants' performance of interpreting and using EMV following the CL-based instructional program. According to Table 5, the mean score rose from 12.61 in the pre-test to 16.05 in the post-test, reflecting an average improvement of 3.44 points. Furthermore, Table 6 illustrates that the paired-sample t-test confirmed this improvement was statistically significant ($t = -5.786$, $p = 0.00$), providing strong evidence that the observed changes were unlikely due to chance. These results allow us to reject the null hypothesis and support the alternative hypothesis, indicating that the CL-based instructional intervention significantly improved students' scores.

*Table 5. The difference in mean values between pretest and posttest results*

| | Paired Samples Statistics | | | | |
|---|---|---|---|---|---|
| | | Mean | N | Std. Deviation | Std. Error Mean |
| Pair 1 | Pre-test score | 12.6111 | 18 | -2.27877 | 0.53711 |
| | Post test score | 16.0556 | 18 | 2.04284 | 0.48150 |

*Table 6. Statistically significant difference between pre-test and post test results*

| | Paired Differences | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | | 95% Confident Interval of the Difference | | | | |
| | **Mean** | **Std. Deviation** | **Std. Error Mean** | **Lower** | **Upper** | **t** | **df** | **Sig.(2-tailed)** |
| Pre-test score - Post test score | -3.44 | 2.52 | .595 | -4.70 | -2.188 | -5.78 | 17 | 0.000 |

The pre-test and post-test results were further analyzed to examine specific improvements in the social and logical functions of modal verbs. The scores shown in Table 8 reflect students' understanding of modal verbs used to express permission, obligation, or prohibition. In the pre-test, the mean score for social functions was 7.33, which increased to 8.17 in the post-test. Although this increase was moderate, it demonstrated a measurable gain in students' ability to interpret and apply modals in social contexts after the CL instruction. Moreover, Table 9 indicates that the p-value of the tests was less than 0.05 (0.031), showing a statistically significant difference between the social meaning scores of the pre-test and post-test.

*Table 7. Mean of social function in pre-test and post-test*

| | Paired Sample Statistics | | | |
|---|---|---|---|---|
| | Mean | N | Std. Deviation | Std. Error Mean |
| Social function in Pre test | 7.33 | 18 | 1.571 | 0.37048 |
| Social function in post-test | 8.167 | 18 | 1.150 | 0.27116 |

*Table 8. Statistical differences between social function in pre-test and post-test*

| | Paired Differences | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | | 95% Confident Interval of the Difference | | | | |
| | **Mean** | **Std. Deviation** | **Std. Error Mean** | **Lower** | **Upper** | **t** | **df** | **Sig.(2-tailed)** |
| Social function in Pre-test - Social function in post-test | -0.833 | 1.504 | .354 | -1.581 | -0.085 | -2.349 | 17 | 0.031 |

Regarding the logical function of modal verbs, as shown in Table 10, the mean score for logical functions increased notably, from 5.28 in the pre-test to 7.89 in the post-test. This improvement indicates that the CL approach effectively addresses the complexities of epistemic modality, aiding students in better understanding how modals operate in logical reasoning and inference. Additionally, in Table 11, the p-value of the tests is below 0.05 (0.000), indicating a statistically significant difference between the social meaning scores in the pre-test and post-test.

*Table 9. Mean differences between logical function in pre-test and post-test*

| Paired Sample Statistics | | | | |
|---|---|---|---|---|
| | **Mean** | **N** | **Std. Deviation** | **Std. Error Mean** |
| Logical function in Pre-test | 5.2778 | 18 | 1.44733 | 0.34114 |
| Logical function in post-test | 7.8889 | 18 | 1.23140 | 0.29024 |

*Table 10. Statistical differences between logical function in pre-test and post-tes*

| | Paired Differences | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | | 95% Confident Interval of the Difference | | | | |
| | **Mean** | **Std. Deviation** | **Std. Error Mean** | **Lower** | **Upper** | **t** | **df** | **Sig.(2-tailed)** |
| Logical function in Pre-test - Logical function in post-test | -2.611 | 1.613 | 0.3803 | -3.413 | -1.808 | -6.864 | 17 | 0.000 |

It can be seen that the present study observed a statistically significant improvement in post-test scores after CL instruction. This finding corroborates that of Liu and Qin (2024) that 93,5% of CL-inspired language pedagogical studies on various target knowledge aspects confirms the effectiveness of CL-informed instruction on participants' learning achievement. Specifically, the result of the current study is a strong match with Seifi (2023), and further back, with Tyler et al. (2010) and Abbuhl (2005). In comparison with Tyler et al. (2010), which inspired the intervention program of this study, both show that force-dynamics-based instruction helps learners better understand the nuanced meanings and applications of EMV. This consistent pattern across studies indicates that the CL approach can reliably support comprehension gains in EFL learners by providing a structured framework for interpreting modality.

Importantly, the logical and social functions of EMV are examined in this empirical study for a more thorough insight into the impact of CL-based instructions, which has been barely attempted in the relevant literature on teaching EMV with the CL approach, to the best of the researchers' knowledge. As shown in Tables 8 and 10, there exists a more significant increase in logical function scores compared to social function scores, underscoring the effectiveness of the CL approach in addressing the nuanced, abstract aspects of modal verbs. Epistemic functions often require learners to grasp metaphorical extensions and cognitive inferences that go beyond straightforward rules. The substantial improvement in these scores suggests that force dynamics and cognitive frameworks help students conceptualize these abstract functions more effectively. By integrating force dynamics, students can better visualize modals as expressions of internal and external forces, which may have contributed to their improved performance, especially in complex logical functions.

The materials developed by Tyler (2008), which were adopted for the experimental teaching program in this study, likely contributed to this improvement. Tyler's diagrams represent modal verbs with minimal jargon, organizing each modal into two separate columns for social and logical meanings, and a third column explaining metaphorical extensions. These visual aids allowed participants to conceptualize the connection between social (deontic) and logical (epistemic) functions in a simplified manner, which likely facilitated better performance across both categories. However, in this study, it's worth mentioning that compared to Tyler et al.'s (2010) intervention program, the number of EMV was increased to 8 from 4, to allow more systematic juxtaposition across EMV, and the duration of the intervention also lengthened. This is an attempt to enhance the scope of research, the generalisability and reliability of the results.

## 5. CONCLUSION

In short, the combination of improved test scores, positive feedback from questionnaires, and supportive interview comments highlights the CL approach's effectiveness in learning English modal verbs among Vietnamese English major undergraduates. The learners not only showed significant progress in their comprehension of social and logical modal functions but also indicated a strong preference for the CL approach over traditional methods. These findings underscore the potential of CL in ELT, advocating for broader adoption of force dynamics-based CL frameworks to enhance grammar instruction. The study's results suggest that CL offers a valuable and effective alternative to conventional modal verb instruction, providing learners with a more comprehensive, structured, and engaging approach to mastering English modal verbs, and likely other complex grammatical concepts.

Concerning the research shortfalls and future research directions, the study's limited sample size, comprising only English majors from a single Vietnamese university, undermines its applicability to the broader population of Vietnamese English learners. Additionally, the conceptual basis of the CL approach may present challenges for learners with lower English proficiency levels, as it requires abstract thinking and adaptability. Therefore, future studies should investigate the effectiveness of CL for learners at intermediate or beginner levels to assess its wider applicability. Moreover, the short duration of the intervention program, which spanned only three instructional sessions, restricts insights into long-term retention and application. Future research with extended programs could explore whether the initial gains observed in this study are maintained over time.

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