

## The Acquisition and Developmet of the Concepts of English Modality Through Metaphors

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### Abstract

The current study attempted to investigate the effect of Systemic-Theoretical Instruction (STI) on English-language learners' acquisition of the concepts of modal verbs through exploiting metaphors. To this end, the effect of the main treatment of the study, i.e. Concept-Based Instruction (CBI) was investigated through conceptual metaphors, in two gender (male vs. female) and language proficiency (Elementary vs. Intermediate) groups. To inspect the acquisition of modality concepts, the participants were given a pretest and a posttest. The results were statistically analyzed through independent sample t-test and Pearson Correlation Coefficient. The results of the inspection in learning modality revealed that participants in the Experimental, Intermediate and Female groups outperformed their counterparts in the Control group in the modal test. Further, the investigation of cognitive awareness on the concepts of modality and its development revealed that the learners' definitions on the concepts of English modal verbs were theoretically functional before STI, while they were semantically based after STI.

**Keywords:** Systemic-Theoretical Instruction (STI); English Modality Learning; Vygotskian Concept Formation; Conceptual Metaphors, Cognitive Awareness

### 1. Introduction

The link between word and thought emerges in development process and is inextricably tied. Regarding the fact that in the Vygotskian stance, cognition and language are linked but not equated, learning an L2 is not only a linguistic activity but also a conceptual one (Neguereula, 2008). According to Vygotsky (1986), the point of departure to understand second language development, is speech mastery. In mastering external speech, children start from a part (a word) to the whole (a series of connected sentences). As far as the meaning is concerned, the first word a child utters is a whole sentence. Semantically

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speaking, the child proceeds from the whole, and only later does begin to master the meaning of the words (Lantolf & Thorne, 2006).

This view on language development can be utilized in second/foreign language learning, since this assumption offers a more comprehensive picture of what an adult learner goes through in learning another language. Negueruela (2003) argues that adult second/foreign language development can also be conceptualized as featuring two lines of development, which are dialectically united: an external line proceeding from the particular to the whole (i.e. learning the formation of linguistic forms), and an internal line from the whole to the particular (i.e. from a whole to a new concept formation).

Recently, in cognitive development, schooling is essential for abstract thinking processes and self-consciousness as unschooled individuals lack such intellectual capabilities. It does not mean that unschooled adults are less capable in everyday communications, rather it indicates that schooling paves the way for developing various concepts (Luria, 1976). It is worth noting that this kind of academic development of concepts is more effective only in certain kinds of activities including planning, intentional written memory, research, and schooling (Scribner, 1977; Scribner & Cole, 1981; Tulviste, 1989, 1992). Along with these research results, a concern is instructing the concepts of modal verbs and internalizing all the features of scientific concepts, i.e. general, abstract, independent, systematic, awareness, voluntary control.

Bardovi-Harlig (1995) maintains that modality is not only an integral part of foreign language curricula, but also an indicator of language learners' proficiency. With regard to the second or foreign language acquisition, modality has been considered as one of the most difficult grammatical categories for EFL learners to acquire, whether in terms of form or meaning (Bardovi-Harlig, 2000). An effective way to overcome the difficulties of learning and teaching English modal verbs is to employ conceptual metaphors to form and develop the concept of modality in learners' mind. In a study by Di Carlo (2014) on the discourse of TED talks (Technology, Entertainment, and Design), metaphors were not only employed as "an explanatory strategy" but also to simplify the intended ideas (p.1). A number of recent studies (Poehner & Lantolf, 2010; Negueruela & Lantolf, 2006; Van Compernelle, 2011) have concentrated on using learning tools developed based on the principles of Concept-Based Instruction (CBI). Piotr Gal'perin (1989, 1992) was one of the eminent researchers who proposed Systemic-Theoretical Instruction based upon Vygotsky's Socio-Cultural Theory (SCT) of consciousness. One of the most significant approaches to teaching, learning and development can be found in the works of Piotr Gal'perin, Vygotsky's close colleague, who went on to put forward his own theory of human development that continued and somewhat expanded Vygotsky's framework.

Many innovative ideas have been developed out of the Vygotskian approach with vast theoretical and pedagogical implications in education. In Vygotsky's Socio-Cultural Theory (CST) of mind, organized instruction of scientific concepts would be aided through mediational cognitive tools. One of the mediational tools with extensive theoretical and

pedagogical implications for education is conceptual metaphors that refer to the understating of an experience, an idea (i.e. a conceptual domain) integrated with another conceptual domain. A classic instance of a conceptual metaphorical expression is “it is not worth your time” in which the value of time is understood monetarily. While most conceptual metaphors involve physical orientations similar across languages (Lakoff & Johnson, 1980), the construction and understanding of a conceptual metaphor may vary to a great extent depending on the languages and cultures (Gibb, 2008; Kövecses, 2002, 2006).

Using conceptual metaphors in the context of teaching can provoke shared background knowledge and cultural awareness of the students with the same or similar background. Even in the case of multi-cultural and multi-lingual educational contexts, universal conceptual metaphors can evoke shared feeling, image, idea and perception. According to Davydov (1984), “empirical knowledge goes from concrete to abstract and theoretical knowledge goes from general to concrete”(p. 30). He further points out that a human being discerns concepts, based on abstraction, and in the process of ascending, he conceptually obtains and keeps the specific of those real relations of objects which define the origination and the totality of multiplex phenomena. To generalize, he establishes the real relations of this discerned specific relation with the individual particular phenomena originated on its basis. Only through the establishment of these connections can the general nature of some particular relation be revealed and raised to the level of universality. The substantial general is inseparable from the particular and the specific – they are manifested through each other. ( Frazier & Guillermina, 2013). So, students reading texts with global metaphors infer the message of the discourse similarly. In line with this idea, Zaire (2016) asserts that making inferences as a cognitive process, involves a range of activities from "connections between different parts of text and linking the text with background knowledge to look for cohesion and coherence within the text" (p. 179).

Following Lakoff and Johnson’s (1980) introduction of the conceptual metaphor theory, cognitive linguistics and psycholinguistic studies have been remarkably fruitful in terms of such aspects as the structure of conceptual metaphor, expressions in discourse, similar conceptual metaphors across languages and language-specific patterns (e.g. Barcelona, 2000; Kövecses, 2002, 2006; Lakoff & Johnson, 1999). Concerning L2 teaching and learning, the universality of conceptual formation serves as a standpoint from which cultural and linguistic variations can be elaborated and explained to L2 learners to facilitate the comprehension and acquisition of different conceptualizations. Littlemore and Low (2006) argue that figurative language enhances communicative competence and language skills. Some researchers have similar opinions that teaching L2 metaphors can contribute to a better understanding and the acquisition of the target language as well as its culture (Danesi, 1993; Holme, 2004; Lantolf, 1999).

Nevertheless, not many empirical studies on teaching L2 conceptual metaphors have been conducted. This lack of sufficient empirical studies in teaching L2 metaphorical expressions might be due to three causes.

First, selecting an appropriate conceptual metaphor as an L2 unit of instruction requires both theoretical linguistic knowledge and higher cultural awareness of the target language as well as learners’ first language. In other words, language researchers and instructors have to identify and analyze the similarity and distinction between languages and cultures, and then decide to what extent this knowledge of concept formation needs to be, and can be, taught. Second, traditional pedagogical approaches, which heavily rely on drills, inconsistent explanation of grammatical patterns, and rote memorization, cannot inform language learners of the complexity and sophistication of any conceptual metaphor category. Third, it is difficult to explain appropriate criteria to evaluate and assess learners’ competence, understanding, even conceptual metaphors and concept formation in L2 .

Proposed by Piotr Gal’perin (as cited in Haenen, 1996), the main principle of Concept-Based Instruction (CBI) within the pedagogical setting is that well-organized education can foster conceptual development if it provides learners with cognitive tools of high quality and step-by-step guidance. CBI promotes the idea that theoretical concepts should be introduced at the onset of the instruction and then, learners can be guided to develop their own understanding of the concept (Davvydov, 1988; Gal’perin, 1989, 1992a, 1992b). In CBI, explicit instruction of the relevant theoretical concepts is implemented not to merely enhance learners’ understanding of the concepts, but also to use this understanding as a framework for guiding performance. According to Gal’perin (1992a), “this is concretized through a series of clearly delineated procedures including introduction and explanation of the concept, materialization of the concept in the form of a visual schema that allows learners to comprehend the concept in a deeper way than is normally achievable through verbal definitions alone, as well as activities that push the learners to articulate their own understanding of the concept, and practice using the concept in communicative tasks, guided by the schema when necessary” (p.17). Gal’perin adds that the teachers’ guidance is more effective when it is accompanied by symbolic representations(for more details, see Figure 1).

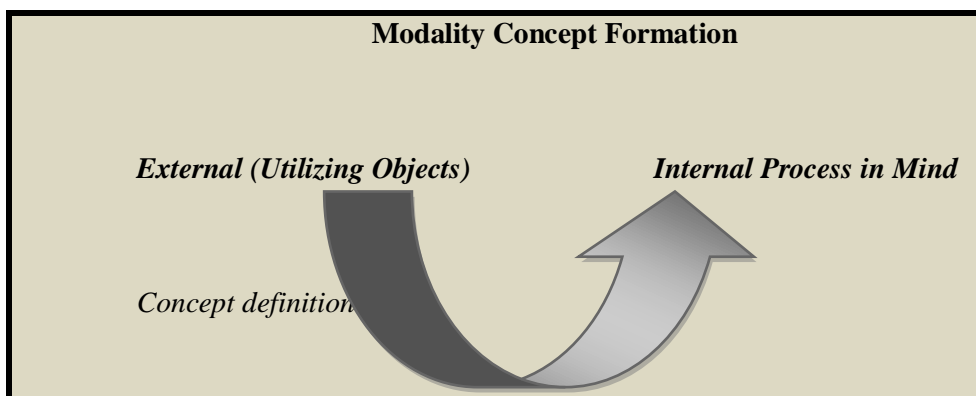


Figure 1: Modality Concept Formation

Long ago, Narziss Ach (1905, 1951) initiated employing systemic experimental investigations to study thought, awareness and volition through his studies on concept formation. He came up with an important factor for thinking process development: the

determining tendency. Ach coined the term determining tendency to explain that mental and cognitive processes are determined unconsciously or consciously by the specified ends rather than by associations. According to Ach's determining tendency, an essential factor in concept formation is posing a problem whose solution activates conscious thinking acts that help develop the concept. However, as Vygotsky (1994) explains the fact that there is a clear problem or goal does not regulate or explain the process of development. Vygotsky (1994) further states that:

The child's and the adult's experiences are full of numerous incidents where, at certain stages of development, the individual is faced with unanswered questions, unresolved or incompletely worked out problems, or unattained or unattainable goals, without, however, any guarantee of success merely as a result of their being there. (p. 206)

Goal oriented activity is critical to set the process in motion, but it is the mediating use of the sign which regulates the process of development. In fact, it is through the use of mediated tools, in goal oriented activity, that individuals mediate their mental processes and take over their own behavior and thinking (Vygotsky, 1987). As Vygotsky (1994) asserts, Ach's method could not clearly explain the process, and different stages that the child goes through in concept formation. Nonetheless, this method was the first research platform that comprehensively involved an objective material as well as a concept definition method by the use of words, as a sign.

Next was the functional method of dual stimulation, developed by Sahkarov (1930). Vygotsky and his colleagues used this method in order to conduct several experimental studies on concept formation in children, adolescents and adults. There was no prior instruction before experiments. During the studies, the task, representing the constant, remained the same, and the words (signs), as variables, given to the individual to solve a task were changed. This method, according to Vygotsky (1987), allowed the researchers to observe how the participants used the words in order to solve a problem, and during the studies, they observed the process and development of concept formation.

One of the main problems for English language learners is acquiring English modality. Since the concept of modality includes both figurative meaning and grammatical functions, it should be taught in a coherent and consistent way to reduce the possibility of misunderstanding. Learning English modals leads to a unified concept formation in EFL learners' minds. In fact, learners do not manage to utilize the modal verbs in daily interactions. Thus, there should be some attempts to find the most efficient methods (one of which can be CBI) to teach and stabilize modality concept formation for such EFL learners.

## 2. Review of the Related Literature

Vygotsky's (1978) cultural-historical theory has inspired and contributed to the creation of literacy programs based on sociocultural tenets at different levels and with a different focus not only in Russia (Gal'perin, 1969, 1992a; Markova, 1979; Talyzina, 1981, among others),

but also in other parts of the world (Hedegaard, 1995; Kozulin, Ageyev, Miller & Gindis, 2003). The Vygotskian research about foreign languages has been carried out by Lantolf, his students and colleagues (Ferreira, 2005; Frawley & Lantolf, 1985; Lantolf, 2000; Lantolf & Poehner, 2008; Lantolf & Thorn, 2006; Negueruela, 2003) at the college level.

One of the first researchers who adopted Vygotskian ideas in educational contexts was Negueruela's (2003) project in which Gelperin's step-wise procedure was also utilized in its six stages. Following CBI's three main tenets: finding a unit of instruction that provides a complete orientation for the subject matter; materializing of that unit of instruction through didactic aids, and using verbalizations for internalization purposes, Negueruela (2003) designed data analysis procedures, emerging from CBI tenets, to connect CBI to the Second/Foreign Language (L2) development. This, as he argues, bridges the gap between instructional processes and L2 research methodology.

In his analysis of discourse (written and oral) data entitled "systemic-theoretical instruction and L2 development: a socio-cultural approach to teaching-learning and researching L2 learning" Negueruela (2003) observed improvement among all of his students after CBI, especially in written performance. As he expected, and as Pavlenko (1999) asserted, even though students were able to provide the definition of a certain grammatical aspect, it did not mean they had control over its functionality. Subsequently, according to Negueruela's six essential features of defining a theoretical concept, namely generality, abstractness, systematicity, explicability, functionality and significance, the conceptual definition of aspect or mood in Negueruela's participants did not directly reflect their functional use of grammatical features.

To study the mental process of meaning making, concept formation and conceptualization, Negueruela et al. (2004) found that any language feature related to second language thinking for speaking was very resistant to any change, unless they were taught via appropriate mediation. Based on the findings of this study, it can be recapitulated that second language conceptualizations of the word would be hard to learn, especially when they are absent in the first language. In addition, according to the SCT view of L2 learning, not only the concepts absent in the first language require to be processed by L2 learners, but also L1 notions, which are invisible but are utilized in order to conceptualize the external world, need to be made visible.

In their study, Serrano-Lopez and Poehner (2008) focused on Gal'perin's stage of materialization, which entailed the construction of learning-didactic theoretical models. Following Talyzina (1981), they pointed out the difference between material and materialized objects. In the former, the object can be physically manipulated while in the latter, the object is materialized in the form of charts, graphs, etc. They then highlighted the student's materialization of theoretical knowledge in concrete form through 3-D clay models. The main learning goal of these models was conceptualizing Spanish locatives whose meaning did not correspond to the students' first language (L1). Results from their

pre-test, post-test and delayed effects revealed that CBI and 3-D clay models provided students with a deep understanding over the meaning of locatives.

Another study implementing CBI and modeling was by Ferreira and Lantolf (2008), who investigated theoretical thinking, meaning-making, and writing improvement through a genre-based approach in an ESL freshman composition class. The L1 languages spoken by the participants of the study were Spanish, Chinese, Vietnamese, Korean. In their study, the researchers combined a CBI approach to target cognitive processes by utilizing Davydov's (1999) steps, a contemporary of Gal'perin, and Systemic Functional Linguistics' (SFL) elements of field, tenor, and mode. As the authors state, Davydov's (1999) approach is known as the Movement from the Abstract to the Concrete (MAC) teaching approach. According to this approach, students learn through the systematic conceptual knowledge of a subject matter, and then are encouraged to process and internalize this knowledge in the concrete contexts.

Correlations between the two pre-course and after-course texts, and evaluations of these texts by independent readers showed improvement in theoretical thinking. Ferreira and Lantolf (2008) mentioned that their study did not have a rate level of positive results contrary to Karpov's study (2005) in which second to fourth grade elementary students who were taught through systemic theoretical instruction outperformed the group taught through traditional methods; they not only did better at problem-solving, but also found the optimal solution to solve certain problems.

In general, the word concept is understood as a meaning that is combined under one core general feature. In SCT, it is not possible to simplify the idea of academic or theoretical concepts to only one of the above features, as they are all interconnected. Therefore, a scientific concept is not only an abstract idea, but also a subject for re-contextualization. This concept has the following unified features: general (synthetic) and abstract (analytic); while it has developed from a concrete activity, it is context-independent (therefore it provides the opportunity for re-contextualization in externalization). It is also systematic (compared to other concepts in a comprehensible and consistent way); it can be clarified (conscious awareness); it can be applied at will (voluntary control), and it has a personal sense for the person-agent (implication). It is not just an explanation of a word and integrating a theme with one main feature, but is a meaning that one can go beyond the abstract internalized meaning, and from the related specific situation. It can also regulate the learners' cognition in the activity that they are participating in relation to their purposes (Tyler, 2012).

According to Smagorinski et al. (2002), the Vygotskian analysis of theoretical or scientific concepts is well-matched with an attitude based on a stable and a-priori definition of ideas that students should internalize the concepts from the teachers' definitions: "assume a concept with a more or less standard definition that one either assumes or only estimates in the form of a pseudo-concept to complex" (Smagorinski et al., 2002, p.33). The understanding of Vygotsky's ideas, not only refers unproductively back to first principles of

Vygotskian views on scientific concept development, but also misrepresents the entire theoretical model with embedded ideas. The view of Vygotskian theories of scientific concepts cannot be implicit as the internalization of the same word meanings by students. It is a theoretical incommensurability with the SCT paradigm, and it is mismatched with the critical meaning of internalization as a transformative process (Lantolf, & Thorne, 2006).

Although it is true that the Vygotskian view for education is the internalization of theoretical significances that are well-defined and presented by teachers in a particular way, students obtain a theoretical concept not because they have the same verbal meaning that the teacher has presented (i.e. this is not an education of identity but a dialectical education), but because they have adopted a word meaning that holds all features of scientific concepts defined above: general, abstract, independent, systematic, awareness, voluntary control, and more importantly because that meaning has learned a sense, i.e. a meaning for that person (Kozulin, 2003).

Obviously, according to Karpov and Haywood (1998), the final verbal definition may certainly take place after the one coming from the teacher, but it is not about verbalism (repeating the words), it is about adopting the meaning through conscious intelligent imitation. In this process, students internalize-transform an idea, although creating systematic relationships with other meanings they may have in an even more influential way than the one present in the original meaning. As communication is always facilitated by language, it is not possible to predict the exact outcome of instruction, whereas mutual understanding is possible (Hedegaard, 1990).

### 3. Statement of the Problem

The instruction utilized in the present study was designed based on the conceptualization of the modality structure. The rationale is that the current instructional curricula and pedagogical practices still rely on translation and prescriptive grammar rules. Even though the concept of modality exists in most languages, word-by-word translation and grammatical rules can neither efficiently inform the learners of the common ground nor highlight the distinction between the languages .

The aim of the study was to teach English modality in the CBI approach, through the medium of conceptual metaphor theory. The results of a pilot study by the researcher on the students' knowledge about the concepts of modal verbs, their performance on modal-verb tests and learners' level of appropriate use of modal verbs in communication showed that the students' misuse of modal verbs was duly affected by mis- or non-conceptualization of English modality. As mentioned earlier, one of the thorniest grammatical concepts for EFL language learners is modality. Whereas, in traditional methods, English modality is mostly taught as a unified concept, in CBI, there is a tendency to utilize the concept formation possibilities in educational settings. This can assist the learners to be able to find a complete orientation toward the concept of modality .

Thus, the current study considered the learning and teaching of English modality as a conceptual category to be internalized by students through organized tool-oriented concept-



based teaching. It was assumed that when the modality was presented to the Persian-Speaking English learners in a coherent and systematic manner through the lens of conceptual metaphor, it would result in enhanced and efficient learning. To achieve this goal, applicable conceptual metaphors were first carefully selected and thoroughly inspected from linguistic, communicative and pedagogical perspectives and then adapted to CBI principles, and then presented in an easily comprehensible and accessible form to EFL learners. The conceptual metaphors exploited as mediational tools in this study were mainly selected from Macmillan English Dictionary which introduces 'metaphor boxes' covering the most salient Lakoffian metaphors in English and Nourmohammadi and ZareBehtash's (2015) book about everyday metaphors.

#### 4. Research Questions and Hypotheses

To achieve the objectives of the study, the following research questions and hypotheses were formulated:

RQ1. Does instructing modality to students via concept-based instruction make any significant difference in learning modal verbs?

Sub-RQ1.1. Do male/female EFL learners equally benefit from concept-based instruction when learning modality in EFL ?

Sub-RQ1.2. Does the level of language proficiency influence Iranian learners' conceptualization of modality when taught via concept-based instruction?

RQ2. How does the implementation of concept-based instruction affect the cognitive development of the concepts of modality in EFL learners, reflected in their definition of modal verbs?

The hypotheses are as follows.

H01. Instructing modality to students via concept-based instruction makes no significant difference in learning modal verbs as compared to Communicative Language Teaching method.

H01.1. Male/female EFL learners do not equally benefit from concept-based instruction when learning modality in EFL .

H01.2. The level of language proficiency does not influence Iranian learners' conceptualization of modality when taught via the concept-based instruction.

H02. There is no significant evidence in the difference between EFL participants' definition of the concepts of modal verbs before and after concept-based instruction.

#### 5. Methodology

##### 5.1. Participants

An Oxford Placement Test (OPT) was administered to Iranian EFL language learners ranging between 22-26 years old studying in five language institutes in Isfahan, Iran. Attempts were made to select the participants from five English classes with nearly the

same language experience and background. Based on OPT results, the participants were divided into [pre]Intermediate (equal to post-A2 and B1 according to Common European Framework Reference, CEFR) and Elementary (A1, according to CEFR) groups. In the first stage of selecting participants, the total number of the control group and the experimental group participants came to 120, 60 in each .

Concerning the gender of the participants, the second stage of selecting participants was to divide the participants of each group into two sex categories. To do so, utilizing convenience-random sampling, 30female and 30 male participants were selected in each group.

### 5.2. Instrumentation

Three instruments were utilized in this study: an Oxford Placement Test (Appendix I.), an English modality pretest (Appendix II.), and posttest (Appendix III.). First, in order to check the participants' level of general language proficiency at the outset, an Oxford Placement Test (OPT, 2008) was utilized. The OPT had one section on grammar with 60 multiple-choice and fill-in-the-blank items. For the present study, EFL learners were only given the grammar part. The second test was the researcher-made pretest, contrived, especially to evaluate the EFL learners' modal knowledge, both in modal verbs' comprehension and production. This test contained three parts: The first part pertained to modal verbs comprehension consisting of 16 multiple-choice items, the second part was associated with modal verbs production consisting of 12 fill-in-the-blank items, and the last part as error recognition section consisting of 12 items. The reliability of the pretest was calculated through Spearman Brown Prophecy Formula. The estimated reliability for the pretest came out to be 0.75. The reliability of the pretest was calculated through the use of split-half method, with the assumption that all the items were parallel in the two halves to avoid administering the same test to the same group twice in order to eliminate the risk of practice effect; it was also meant to avoid developing two parallel tests and saving time and effort in developing, administering, and scoring processes. In addition, to ensure its validity, it was reviewed by three language experts and their comments were used.

The time allocated for the test consisting of multiple-choice, fill-in-the-blank, and error recognition items was 60 minutes, so that all participants could try all the items. The scoring procedure was an objective type, so that the rater's own judgment had no effect on the scores. It should be noted that the pretest was a discrete point test, an ideal form of test for diagnostic purposes.

Third, the posttest encompassed three components: i.e. modal verb's comprehension, production and appropriate use, respectively. The production part required the subjects to read some incomplete statements and fill in the blanks using suitable modal verbs to test their English knowledge in producing appropriate modal verbs. The final part was an error recognition task designed to assess the participants' knowledge about the recognition of errors in the appropriate use of modal verbs. The total reliability of the posttest was calculated using Spearman Brown Prophecy Formula. The estimated reliability for the

posttest was 0.78. The time allocated for the test consisting of multiple-choice, fill-in-the-blank, and error recognition items was 60 minutes, being the same for the pretest; so that all participants could try all the items. The scoring procedure was objective, that is, the rater's own judgment had no effect on the participants' scores. It should be remembered that the posttest was a discrete point test type which examined only one linguistic sub-skill.

Another data collection instrument given to the participants was a self-explanation open-ended questionnaire intended to elicit learners' understanding of pure modal verbs before and after CBI.

## 6. Data Collection

### 6.1. Data Collection Procedure

The current study was designed in two modes: experimental(quantitative) and developmental (qualitative). The experimental phase of the study was conducted at five language institutes in Isfahan, Iran. To ensure voluntary participation, the researcher gave an informed-consent form to each language learner. They were told that by signing the informed-consent form, they agreed to participate in the study. The main treatment, based on CBI principles, was done twice a week and lasted for twelve weeks. CBI was presented via teaching two English textbooks: Top Notch (1) and (2) in which CBI didactic models were implemented throughout the course. In the CBI classrooms, teaching does not focus on the form, but triggers from meaning. Thus, instead of starting from the syntax and morphology, it starts from semantics and then pragmatics. So, in the current study, the students of the experimental groups are exposed to the concepts and meanings of the modal verbs prior to their form. So as to say; for example, firstly the concept of request was explained through the metaphorical expression of lazy bones and then the modal verbs of could and would were provided in a context.

In other words, each concept can be simplified and packed in a flash of conceptual metaphors and expressions related to the students' linguistic and cultural background, illustrated in the following chart. It can also alleviate the problem of multiple uses of one modal for more than one concept. (Appendix IV. & Appendix V.)

Prior to the main part of the study, the researcher-made pretest on English modality was administered to all groups. The pretest was piloted on 30 language learners who shared the same characteristics with the main participants of the study. In addition, for the three experimental groups, the researcher selected three language teachers with nearly five years of language teaching experience. Then, the researcher held three briefing sessions with them before, during, and after the instruction. In the pre-treatment session, the researcher asked the students to define modal verbs, and the concept of modality to obtain an insight into students' understanding of the concepts of modal verbs, evaluate their probable prior knowledge of modal verbs and realize any pitfalls in their conceptualization and utilization of modal verbs. In the during- and after-treatment sessions, she gathered teachers' comments on the strengths and weaknesses of the treatment. She also scrutinized all of the sessions personally and gave any necessary recommendations to the teachers. At the end of

CBI treatment, a posttest on English modality with similar content as the pretest was given to the learners, and finally the results were compared and analyzed.

To execute the developmental phase of the study, an open-ended questionnaire was given to the participants to define the nine pure modals in English or their L1; i.e. Persian. They were asked to provide the grammatical conceptual meanings of modality before and after the CBI treatment.

### 6.2. Data Analysis

To ensure the normality of the data set distribution One-Sample Kolmogorov-Smirnov was run. Table 1. demonstrates the results of this test.

Table 1: One Sample Kolmogorov-Smirnov Test

		Control Groups	Experimental Groups
N		60	60
Normal Parameters <sup>a,b</sup>	Mean	19.08	21.65
	SD	4.27	6.72
Most Extreme Differences	Absolute	.367	.354
	Positive	.367	.284
	Negative	-.233	-.354
Kolmogorov-Smirnov Z		.367	.354
Asymp. Sig. (2-tailed)		.216	.374

- a. Test distribution is Normal.
- b. Calculated from data.

As shown in Table 1., p-value for both sets of scores was higher than 0.05. Hence, the scores were normally distributed. In addition, to explore the correlation between the pretest and posttest scores of the participants, Pearson Correlation Coefficient between pretest and posttest of the control and the experimental groups were calculated (See Table 2. for the results).

Table 2: Pearson Correlation between the Pretest and Posttest Scores of the CG

		Pretest	Posttest
Pretest	Pearson Correlation	1	.184
	Sig. (2-tailed)		.160
	N	60	60
Posttest	Pearson Correlation	.184	1
	Sig. (2-tailed)	.160	
	N	60	60

Just as shown in Table 2., the results indicate that there is no high correlation between pretest and posttest scores in the Control Group (CG) participants. That is, those who had higher scores in the posttest, were not necessarily scored high in the pretest.

Table 3: Pearson Correlation between the Pretest and Posttest Scores of the EG

		Pretest	Posttest
Pretest	Pearson Correlation	1	.148
	Sig. (2-tailed)		.259
	N	60	60
Posttest	Pearson Correlation	.148	1
	Sig. (2-tailed)	.259	
	N	60	60

The results displayed in Table 3. indicate that there is no high correlation between pretest and posttest scores in the Experimental Group (EG) participants. That is, those who had higher scores in the posttest, did not necessarily score high in the pretest. Due to the fact that the normality of the data set was ensured to answer the first research question, the performance of the experimental and the control groups was measured through the parametric test of independent sample t-test. Table 4 displays the results .

Table 4. Independent Sample T-test Results.

Groups	N	Mean	SD	Levene's Test for F	t-test for Equality of Means Equality of Variances			
					Sig.	t	df.	Sig. (2-tailed)
EG	60	21.65	6.72	12.758	0.001	2.494	118	0.014
CG	60	19.08						

As it can be seen in Table 4., the mean score of the experimental groups taught via CBI is 21.65, and that of the control groups is 19.08 with .001 level of significance..which is less than 0.05, and  $F(2, 118) = 12.758, p < .05$ ). Therefore, it is concluded that there is a significant difference between the two groups' performance score in the posttest, thereby the first null hypothesis is rejected. Furthermore, as the normality of the data set was ensured, to answer the second research question, first, the correlation coefficients of pretest and posttest scores of male and female participants were calculated and reported. Furthermore, as the normality of data set was ensured, to answer the second research question, , the correlation coefficients of pretest and posttest scores of male and female participants were initially calculated and reported.

Table 5: Pearson Correlation between the Pretest and Posttest of Male EFL Learners

		Pretest	Posttest
Pretest	Pearson Correlation	1	.248
	Sig. (2-tailed)		.056
	N	60	60
Posttest	Pearson Correlation	.248	1
	Sig. (2-tailed)	.056	
	N	60	60

As shown in Table 5, the results indicate that there is not any high correlation between pretest and posttest scores in male participants. That is, those who obtained higher scores in the pretest do not necessarily do so in the posttest .

Table 6: Pearson Correlation between the Pretest and Posttest of Female EFL Learners

		Pretest	Posttest
Pretest	Pearson Correlation	1	.115
	Sig. (2-tailed)		.381
	N	60	60
Posttest	Pearson Correlation	.115	1
	Sig. (2-tailed)	.381	
	N	60	60

As illustrated in Table 6, the results indicate that there is not any high correlation between pretest and posttest scores in female participants. That is, those who scored higher in the pretest did not necessarily score higher in the posttest. Then, the parametric test of independent sample t-test was run to investigate the performance of the male and female groups. The results are presented in Table 7.

Table 7: Independent Sample t-test Results.

Groups	N	Mean	SD	Levene's Test for t-test for Equality of Means				
				Equality of Variances				
				F	Sig.	t	df.	Sig. (2-tailed)
MG	60	22.48	5.48	14.62	0.000	3.077	118	0.011
FG	60	20.25						

According to Table 7, the mean score of the male groups is 22.48, and that of the female groups is 20.25 with .000 level of significance which is less than 0.05, and  $F(2, 118) = 14.62, p < .05$ , thus it is concluded that there is a significant difference between the two groups' performance in the posttest. Accordingly, the male groups outperformed their female counterparts. Therefore, the third null hypothesis was rejected .Furthermore, in order to answer the third research question, the Pearson Correlation Coefficient of the elementary and intermediate groups were calculated, the results are presented in Tables 8 and 9, respectively.

Table 8: Pearson Correlation Coefficient of the Elementary Group

		Pretest	Posttest
Pretest	Pearson Correlation	1	.092
	Sig. (2-tailed)		.485
	N	60	60
Posttest	Pearson Correlation	.092	1
	Sig. (2-tailed)	.485	
	N	60	60

\*. Correlation is significant at the 0.05 level (2-tailed).

As shown in Table 8., the correlation of 0.092 indicate that there is no high correlation between the pretest and the posttest scores of the elementary participants, though since it is higher than the significance level of 0.05, it is considered statistically significant. Therefore, it is concluded that those who obtained higher scores in the posttest did not necessarily score higher in the pretest. The correlation between the pretest and posttest scores of the intermediate participants was investigated and tabulated in Table 9.

Table 9: Pearson Correlation Coefficient of the Intermediate Group

		Pretest	Posttest
Pretest	Pearson Correlation	1	.0299*
	Sig. (2-tailed)		.020
	N	60	60
Posttest	Pearson Correlation	.099*	1
	Sig. (2-tailed)	.020	
	N	60	60

\*. Correlation is significant at the 0.05 level (2-tailed).

According to Table 9., the correlation of 0.299 reveals that there is no high correlation between the pretest and posttest scores of the intermediate participants, though since it is higher than the significance level of 0.05, it is statistically significant. Thus, the intermediate participants who were scored high in the posttest did not necessarily score high in their pretest. In order to compare the performance of these groups another independent sample t-test was run.

Table 10: Independent Sample T-test Results.

Groups	N	Mean	SD	Levene's Test for t-test for Equality of Means Equality of Variances				
				F	Sig.	t	df.	Sig. (2-tailed)
EG	60	18.96	7.22	14.901	0.001	3.006	118	0.227
IG	60	21.76						

As it can be seen in Table 10., the mean of the elementary groups (EG) is 18.96, while that of intermediate groups is 21.76 with .227 level of significance which is less than 0.05 and  $F(2, 118) = 14.901, p < .05$ , thus, it was concluded that there is a significant difference between two groups' performance in the posttest, and the intermediate groups outperformed their counterparts, thereby the second research question is answered and the third null hypothesis is rejected.

Finally, the third research question of the current study tried to see the cognitive development in concept-formation of the modal verbs. Accordingly, in order to observe and analyze conceptual development through definition data, based on Negueruela

(2003), the researcher implemented the following features: (a) generality (semantic, functional, or perceptual), (b) abstractness, (c) systematicity, (d) functionality, and (e) significance. One of the main pedagogical objectives in this study was to help students develop linguistic awareness and control over the meanings conveyed by language structures. The goal was to help students further develop the process that allows them to connect their rule of thumb knowledge and the concepts formed during the course with regard to modal verbs and their different functions. In the following tables presenting the six interrelated features of theoretical concepts, students' definition data have been analyzed.

## 7. Discussion

The aim of the first research question was to seek the effect of teaching the concept of modality to students via concept-based instruction (Systemic-Theoretical Instruction). The results of the independent sample t-test revealed that there was a statistically significant difference between the performance score of the experimental group and that of the control group in terms of learning English modality, confirming the idea that teaching through CBI significantly affects learning English modalities among Iranian EFL learners. Negueruela (2003) asserts that since CBI is an organized, systematic instruction, it would lead to development, and learners' theoretical concept learning would go from complex to concepts in their learning process.

Furthermore, as Vygotsky (1987) asserts, based on the Socio-Cultural Theory (SCT), the development of scientific concepts is different from everyday concepts. SCT is rooted in a philosophical grasp of the world, considering the dialectics principles as the basis for understanding all processes. Vygotsky believes that there are two major categories of concepts: everyday and academic (scientific) concepts. He points out that since everyday concepts are known by their spontaneous usage, and the learners' lack of conscious awareness of their meaning and the application of such concepts does not imply that the learners are aware of the meaning or use of such concepts.

There is a large number of studies on the three modes of investigating internalization, awareness and control of acquisition of concepts (Tulviste, 1989; Scribner, 1977; Scribner & Cole, 1981; Negueruela, 2003; Lapkin, Swain & Knouzi, 2008). Concerning the results of analyzing definition data obtained from participants, in Negueruela's (2003) study, most of his research participants' definitions were initially functional, while after administering CBI, all the learners' definitions were semantic-based. This showed that learners' definitions were not theoretically functional and thus did not provide a complete orientation for them and thereupon it confirms the effect of CBI on learning.

According to Schmidt (1995) there are two levels of awareness: noticing and understanding. Noticing indicates the "conscious registration of the occurrence of some event", whereas understanding refers to the learners' "recognition of a general principle, rule or pattern", which is the higher level of abstraction about meaning (Li et al, 2015,



p.29). This shift in the participants' definition toward the functionality of the concepts of modal verbs signifies both levels of awareness.

It seems relatively easy to teach English modalities as a holistic structural concept through STI and conceptual metaphors, compared to teaching them as discrete structural units through the rules specified in the textbook. In conventional teaching methods, the grammatical structures were taught via formulated constructs in contexts, and the original exercises offered in the textbooks must be accomplished. While in CBI teaching, the concepts of modality were demonstrated and explained as structural units. The results, thus, show that STI enhanced the learning process, in general. Holistic perception of concepts can also facilitate 'perceptual fluency' of words as emphasized in studies by Rezazadeh Yazdeli et al (2016). They explicate 'perceptual fluency' as "the ease with which information is processed. This sense of fluency exists in the listener's mind and corresponds to holistic rating scales." (p. 112)

The first research question was further studied, once its answer was positive by two sub-research questions. The first sub-research question investigated the difference between the groups under study across gender. The results of the independent sample t-test revealed that the male groups had a better performance and progressed more efficiently in using English modality compared to their counterparts in the female groups. According to Gal'perin (1989), the cognitive transformation occurs internally while the learners were engaged in material actions during their learning activities. He argues that the learners pass the complete learning process from beginning to the end. He believes that one of the main learners' tasks to accomplish is having the full awareness of the subject matter. This can be attributed to the fact that the male learners view the concepts holistically, as stated by Chaiklin (2003), whereas the females tend to learn and notice the details of new concepts in their minds. Furthermore, regarding conceptual-formation studies across gender, Vygotsky (1978) explains in his holistic theory of mind how conceptual learning proceeds in cognitively mediated goal-oriented activities in male and female learners. He argues that higher mental processes are utilized in the process of creating and contextualizing meaning in practical and meaningful activities in which, according to Chaiklin (2003), male learners are fully aware of the conceptual formation due to their higher mental processes compared to female learners.

Concerning the second sub-research question, the results obtained from the independent sample t-test indicates that the intermediate Iranian EFL learners had a better performance compared to the elementary learners on English modality tests, indicating that language proficiency has a significant effect on Iranian learners' conceptualization and utilization of modality when taught via Systemic-Theoretical Instruction (STI) and through the mediation of conceptual metaphors.

The findings of the current study also reveal that the intermediate group was more advantaged in their modality learning contrary to the elementary group. This could be due to the point that the intermediate group learned English modalities based on well-organized

linguistic analysis as to their ability to form concepts more vividly and profoundly. The intermediate group also had enough experience and a more mature cognitive ability to benefit from concept formation. Furthermore, because the intermediate group seemed to be more cognizant and conscious to notice the point of instructions in the experiment, they could reach the ability to develop the formation of various modal concepts more effectively than the elementary group. This can also lead to another convincing evidence of the efficacy of the experiment on the intermediate group, based on the comparison of the amount of time spent on teaching English modalities to Intermediate and Elementary groups. The fact that the less time span was spent on teaching the concepts of modal verbs via metaphorical expression in CBI approach in the Intermediate group than that of the elementary group reveals the effectiveness of STI in the intermediate group. However, further research studies can be designed to measure the exact time spent to execute the treatment in the experimental and control groups .

The second research question attempted to investigate one of the ways through which the students’ awareness and control of their learning and implementing modal verbs can be inspected. The findings implied that the learners’ definitions were not theoretically functional and; therefore, did not provide coherent and complete orientation for learners. Most of learners’ definitions were initially functional. While after CBI, the majority of learners’ definitions were semantic based (i.e., the learners formed their understanding based on conceptual metaphors and everyday concepts available in their surroundings). Table 11 shows the conceptual development report of one participant before and after CBI, based on her definition of English pure modal verbs.

Table 11: Conceptual Development in a Participant

Participant Student # 5	Before CBI	Time 2	After CBI
Generality a. semantic (meaning/idea) b. functional (how it is used) b. perceptual (describes specific properties)	Semantic	Functional	Perceptual, Semantic & functional
Abstractness (includes essential features in definition)	Yes	Yes	Yes
Systematicity (coherent and interrelated)	No	Yes	Yes
Explicability (awareness/ability to explain a concept)	-	Some	Yes
Functionality (its features can orient activity)	Yes	Yes	Yes
Significance (Based on intentionality)	No	Yes	Yes

## 8. Conclusion

Based on the findings of the current study, it was concluded that English modality learning is enhanced by recognition and practice. Utilizing their orienting tool in a top-down fashion, the learners could strengthen theoretical understanding practically, while still

access empirical knowledge, and generalize its implementation in new settings. By focusing learners' attention on conceptual categories, they could expand their understanding of critical interrelated concepts in English modality.

Pedagogically speaking, after teaching the concepts of modal verbs through CBI and exploiting metaphors, the learners were able to direct their learning relying on essential features expressed by conceptual categories in their cognition and demonstrated them in their performance, as well. The conceptual categories utilized for teaching provided a teaching-learning sequence and, consequently, promote theoretical and practical understanding of English modal verbs.

Furthermore, after CBI, most language learners' definitions were so semantic and functional that they had the potential to orient execution. Thus, their potential to orient execution was lower because it was not fully semantically centered. Moreover, comparing the definition data between male and female sample participants revealed that female EFL learners formed and developed cognitive awareness over the concepts of modality more effectively than their male counterparts. Then, in general, definition data provided insights on learners' evolution from functional to perceptual and semantic understanding on cognitive concepts of modality as a grammatical category.

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