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EFL Learners' Production of Verb Complementation Patterns and Verb Senses: An Investigation on High-Frequency Cognitive Verbs[1]

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ABSTRACT

This study investigates the use of high-frequency cognitive verbs - think and believe - in Turkish L2 learners' interlanguage, both in terms of their verb senses and complementation patterns. In line with this purpose, a Sentence Production Task consisting of context-independent items and a Sentence Completion Task consisting of context-dependent items were developed by using the Corpus of Contemporary American English (COCA). These tasks were applied to 182 students at four different vocabulary levels. The findings indicated that the learners showed a strong tendency to use verb think in the verb sense of expressing a personal opinion and in the complementation pattern of [zero that-CL]. Along with these results, the acceptability levels of learners' productions with the verbs think and believe showed differences. The learners had problems with the use of believe more than they had with the verb think. The findings have pedagogical implications by shedding light on the learner preferences for verb complementation patterns and senses. The findings also provide an insight into the learners' performance on the syntactic and semantic properties of the cognitive verbs through context-dependent and independent tasks.

INTRODUCTION

A verb is the central component of a sentence (Mckay, 1980), the main determinant of sentence meaning (Healy & Miller, 1971), the nucleus of sentences (Hubbard & Hix, 1988) and it unites the sentence syntactically and semantically (Nilsen & Nilsen, 1975). Semantic and syntactic properties of verbs, one of them being the complements they take, are complex patterns and difficult to define. All clausal complements are determined by the verb and many verbs admit more than one type of complementation (Downing & Locke, 2006). Due to the complexity of verbal complements, many grammarians have a hard time explaining verbal complementation, so it was ignored by pedagogical grammar and considered to be 'unteachable, or at least very complex and messy'. It is seen as one of those areas of English grammar that is best acquired without overt instruction (Bourke, 2007). However, the nature of complementation is itself a potential challenge

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for language learners as the English language offers a great variety of semantically similar complement patterns (Martinez-Garcia, 2010). That is, verb characteristics such as irregularity and complexity of patterns, their polysemy, permission for more than one complementation pattern, and verb alternations are possible factors causing problems for learners (Cuyckens & D'hoedt, 2015). Because of their polysemous nature, the choice of one complement type rather than another goes with sometimes very subtle semantic differences in the resulting sentences (Taylor, 2008). These varieties represent a major hurdle for learners, who have difficulty coping with them not so much receptively but rather productively in spoken and written English (Lennon, 1996; Ringbom, 1998) even at more advanced levels of proficiency.

Apart from the studies on the nature of verb complementation, studies conducted with L2 learners have also revealed that learners' use of verb complementation is influenced by verb frequencies, their proficiency levels, and their first language (Römer, O'Donnell & Ellis, 2014; Römer, Skalicky & Ellis, 2017; Römer & Berger, 2019; Römer &Yılmaz, 2019; Zhao & Jiang, 2020). Studies on comparisons between native and non-native usage data by speakers of German and Spanish and comparisons across beginner to advanced levels revealed that learners' verb complementation use becomes more varied and schematic at higher proficiency levels and moves closer to a native usage norm (Römer & Berger, 2019). Similarly, Zhao & Jiang (2020) indicated a developmental tendency. They found that as the students are exposed to more language input, they are likely to make use of more diversified complementation patterns of a high-frequency verb in their writing, which is an indicator of progress in students' language ability, though the diversity of the frequently used verbs by L2 learners was still relatively low compared to the native speakers (Zhao & Jiang, 2020). However, not all high-frequency verbs were found to be used appropriately by the learners. For example, previous studies revealed that the learners tend to mainly overuse some high-frequency verbs (i.e. *make*) (Altenberg & Granger, 2001) and they misuse them to a great extent compared to the native speakers (Nesselhauf, 2004). While the core meanings of the verbs usually seem to be mastered, their delexicalised uses, occurring mainly in phraseological patterns, have been shown to remain a stumbling block to native-like proficiency (Gouverneur, 2008). Therefore, this study aims at figuring out the learners' use of verb complements and their related verb senses of the high-frequency non-factive cognitive verbs.

In line with these issues, the studies focusing on the complement use in the language of learners with different L1s are carried out either using a learner corpus or considering the use of specific verbs in different tasks. One of these studies focused on complement clauses in Longman Learners' Corpus and they compared learners whose native languages are French, Spanish, Chinese and Japanese with the native corpus (Biber & Xepen, 1998) They found out that *that* clauses and *to*-clauses are much more frequently used by all learner groups compared to the native register. Another study examining valency errors of learners of English and German in sets of translations outlined the most common problem areas such as the choice of prepositional complement, the choice of clause complement, the choice between a noun phrase and prepositional complement (Roe, 2007). Römer and Yılmaz (2019) focused on Turkish, German and Spanish L1 learners' data from the International Corpus of Learner English (ICLE) to find out the frequently preferred verb-argument constructions (VAC). The results of the study indicated that Turkish learners use 'V *for* n' and 'V *with* n' with a comparatively wider range of verbs than their use of 'V *about* n' or 'V *in* n'. Additionally, 'V *in* n' is the most frequent verb-argument constructions (VAC) in terms of tokens and it is more frequent in ICLE Turkish than in ICLE German and ICLE Spanish.

Apart from Römer and Yılmaz's study, most of the studies were conducted with students with different L1 backgrounds other than Turkish, which is a verb-framed and agglutinating language. One of the rare studies carried out with Turkish students which examined verb subcategorization probabilities using sentence completion tasks (i.e., off-line productions), both in the presence and absence of context is Uçkun (2012). The aim was to figure out the learners' awareness of subcategorization probabilities for polysemous verbs. As a result of the study, it was found that sentential complement arguments were dominant whereas direct object arguments in L2 learners' productions were underused (Uçkun, 2012).

In this study, aiming to fill a gap in the literature, non-factive verbs-*think* and *believe*- are chosen because non-factive verbs are considered not to denote presupposition (Givon, 2001), the speaker cannot commit themselves to the truth of the complement sentence following the non-factive verbs (Karttunen, 1971). Additionally, these verbs are frequently used in English, and yet, their acquisition is found to be difficult. (Bourke, 2007; Herbst, Heath, Roe & Götz, 2004; Vercellotti & Jong, 2013). So, they may be more problematic for the learners of English (Carrel, 1984). Thus, the present study goes beyond previous work on Turkish L1 learners' use of high-frequency cognitive verb patterns in L2. This study specifically addresses both context-bounded and context-independent behaviours of verb uses in terms of their complementation patterns in learner language by discussing the results in the light of the learners' vocabulary levels. In light of the aforementioned discussions, this study aims at having an insight into the verb complementation preferences, semantic and syntactic choices of the learners in their interlanguage (Gass & Selinker, 2008), and the following research questions are addressed:

1) Is there a significant difference among the task achievement levels of non-factive cognitive verbs (think, believe) by the Turkish EFL learners at different vocabulary levels?
2) What are the preferences of the Turkish EFL learners regarding verb complementation patterns and their related verb senses of non-factive cognitive verbs?

METHODOLOGY

Participants

The participants of the study consist of a total of 182 L2 learners majoring at English Language Teaching Department in their first and fourth year at a state university in Turkey. Eighty-four students were from first year and ninety-eight from fourth year. The students were found to have non-homogeneous characteristics (there seemed to be first-year students with better language skills than fourth year students). Thus, they were re-grouped according to their vocabulary levels using the Vocabulary Levels Test (VLT) revised by Schmitt, Schmitt and Clapham (2001). This test enabled to have a comprehensive picture of their use of complementation patterns through a developmental and cross-sectional perspective. The result of the VLT revealed four groups of participants: thirty-four participants were at the 2000-word level, thirty-six participants at Academic word level (ACAD), seventy-four participants at the 3000-word level, and thirty-eight participants at the 5000-word level.

Data Gathering Instruments

The data were gathered from the responses of learners to the context-independent Sentence Production and context-dependent Sentence Completion Tasks. Since the exposure of language input, avoidance of certain patterns, variability of input robustness, and the role of contextual information in learners' interlanguage may be revealed through the combination of both tasks, the learners' production of verb complementation patterns and their related verb senses were investigated by using multiple data collection sources. These tasks are explained below:

Sentence Production Task

The Sentence Production Task (SPT) aims to identify the learners' performance in the use of verb senses and verb complementation patterns and their productions of the verbs through the use of context-independent items. By context-independence, we mean that the task just provided verbs as prompts rather than context with prompts for the learners' production. The learners were asked to produce two sentences for each of the verbs *think* and *believe* and write down the meaning of the verb in each sentence they formed. They were free to choose the complementation patterns and their related verb senses. An example of an item is as follows:

Example Item (1)
think
Sentence I: _____.
Verb meaning: _____.

Sentence Completion Task

The Sentence Completion Task (SCT) is a context-dependent task containing the introductory part of an extract with its concluding sentence left out and prompts given for the students to write the missing sentence. In the task, the learners notice the contextual constraints and are expected to retrieve the verb from their lexicon by making the use of the contextual clues and completing the extract. These extracts including the frequent verb complementation patterns used with *think* and *believe* and their related verb senses, detected in the Valency Dictionary of English, were taken from COCA. A total of 13 items, 7 for the verb *think* and 6 for the verb *believe* were prepared. Thus, the present study attempts to provide some understanding of how contextual processes and constraints operate in language processing. An example item is as follows:

Example Item (2)
'Even at the kindergarten level, parents, especially mothers, encourage their sons and daughters to excel in different areas. Males are encouraged and expected to achieve in subjects such as math, and females are encouraged to be cooperative' (Baker & Entwisle, 1986). /Children-believe/ _____.

As exemplified above, the prompts including the verb were given at the beginning of the blank and the learners were expected to complete the extract with an appropriate sentence using the prompt and the verb (*what their parents tell them and try to adjust to parental expectations: missing part in* the COCA context).

For the content validity of the items in SCT, face-to-face and online consultations with two English native speakers and one non-native English language instructor were carried out. In this process, the guideline proposed by Brown (1996, pp. 50-51) was used to "make well-informed and relatively objective judgments about how well items are formatted". Besides, the complexity of the items in the task is controlled through the feedback received at the end of a pilot study. This pilot study is conducted to observe the types of responses elicited from the learners, to have an

insight into the reliability of the task, to predict the time allocated to the tasks, to gain an understanding of the poorly performing items and to revise the items to improve consistency (Carr, 2011). Based on the results of the pilot study, we carried out item facility and item discrimination analyses and calculated Kuder and Richardson Formula 20 (KR20) for internal consistency and reliability of the data collection tool. The test items with item discrimination indices less than .20 were omitted. New items were added and some complex test items were revised and simplified.

Data Analysis

The learners' responses to STC and SPT were examined semantically, that is identifying verb senses and syntactically, analyzing verb complementation patterns used by the learners. In the initial stage, learner responses were written on an Excel worksheet and categorized semantically and syntactically by referring to the Valency Dictionary of English, Verbnet (Schuler, 2005), and further by referring to a native speaker and by consulting another rater. In this respect, inter-rater reliability and agreement values were calculated.

The first phase of the data analysis was semantic analysis. Each sentence written by the learners was tagged by using labels of 'unacceptable pattern and meaning' (e.g., ill-formed pattern/meaning, incomplete sentences, out of context sentences in SCT), 'pattern-meaning mismatch', 'unacceptable pattern', 'possible literal translation from Turkish', 'undecided items', 'minor errors' (e.g., mistake in forming indirect questions, the use of comma after the verb or the complementation pattern). Both tasks were analyzed using these labels. Each token was analyzed in its context and highlighted with different colors to indicate different labels.

The second phase of the data analysis was syntactic analysis. The learner responses with verb complementation patterns (e.g., [that-CL], [zero that-CL], [wh-CL]) were tagged based on the formal categories described in the *Valency Dictionary of English* (Herbst et al., 2004) and the phrases and clauses were categorized accordingly (see Appendix part for verb senses, patterns and examples). This categorization helped us to describe the verbs concerning their formal realizations. Within the scope of this study, after giving the overall results, the acceptable responses of the learners were analyzed both quantitatively and qualitatively in detail.

RESULTS

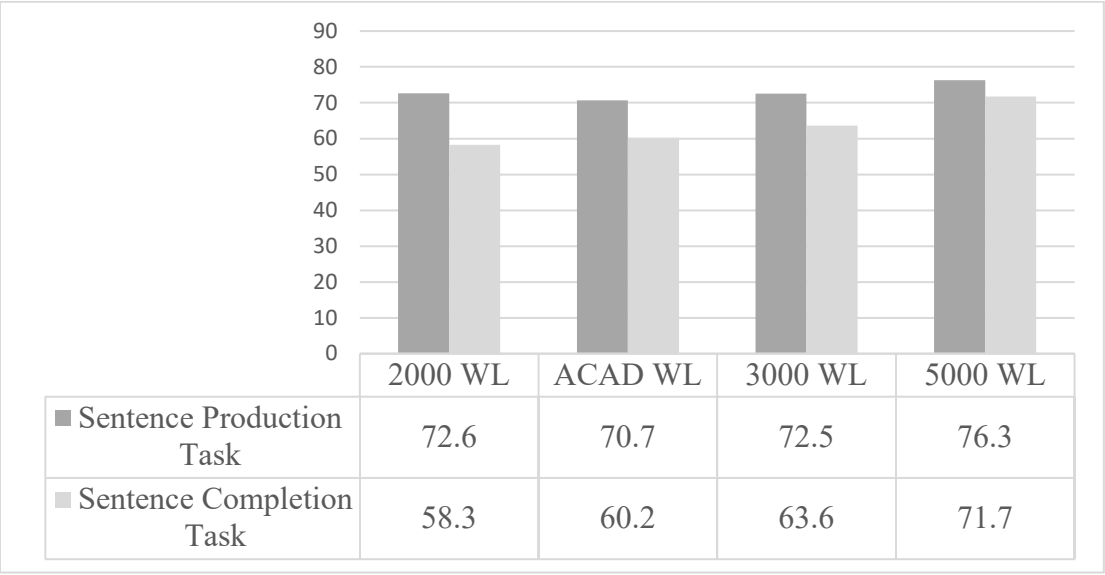
Using the labels given in the data analysis, in SCT a total of 2366 responses (182x13) and in SPT, a total of 728 responses, two sentences with two different meanings for each verb, (182x4) were analyzed. The learner responses for each task were evaluated on a basis of 100 points. Further, for SPT findings, the frequencies and percentages were calculated to each label.

Since the data were analyzed by two raters, inter-rater reliability was calculated. The measured Cohen's Kappa for Sentence Production Task is between 1.0 and .64 indicating an acceptable (i.e., substantial and almost perfect) agreement (Landis & Koch, 1977) and for Sentence Completion Task Kappa value was found between 1.0 and .80 indicating almost perfect agreement between the raters. In addition, a native speaker analyzed 20 % (a total of 36 learner papers for each task) of SPT and SCT. The findings are detailed in the following sections.

Task Achievement Levels of the Learners at Different Vocabulary Levels

The achievement levels of learners, at different word levels, were calculated and the mean scores are given in Figure 1. The results indicated that the range between the scores of two tests diminished as the level increased. This means that the learners from 5000-word level performed better in both Sentence Production and Sentence Completion Tasks.

Figure 1. Distribution of Mean Scores Across Vocabulary Levels



	2000 WL	ACAD WL	3000 WL	5000 WL
Sentence Production Task	72.6	70.7	72.5	76.3
Sentence Completion Task	58.3	60.2	63.6	71.7

MANOVA was conducted to see whether there is a difference across participants from different word levels in terms of their scores in both tasks. The result indicated a statistically significant difference between different vocabulary levels on the combined dependent variables (Söğüt, 2019 for more detailed statistical information).

Table 1. The Difference Across the Learners from Different Vocabulary Levels in the SPT and SCT.

Source	Tasks	N	Type III Sum of Squares	df	Mean Square	F	p	η^2
VLT	SPT[1]	182	600.322	3	200.107	.704	.551	.012
	SCT[2]	182	6186.106	3	2062.035	4.472	.005*	.070

Computed using alpha and significance= .05

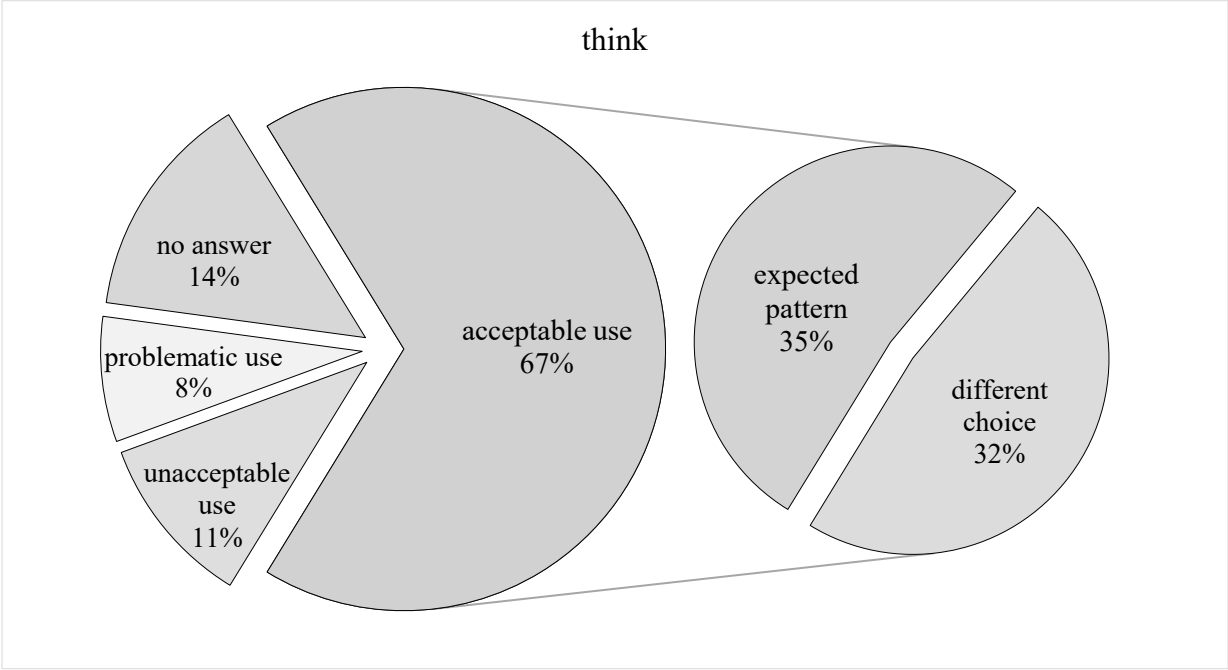
1 Sentence Production Task, 2 Sentence Completion Task

A Bonferroni test, used to determine whether the groups were significantly different from each other, indicated that the learners at 5000-word level had higher scores in Sentence Production Task ($\overline{x}$=76.31, *SD*=16.06), than they had in the Sentence Completion Task ($\overline{x}$=71.71, *SD*=19.83). In other words, the learners with 5000-word level were found to perform better in producing verb complementation patterns and their related verb senses in SPT.

Learners' Choice of Verb Senses and Verb Complementation Patterns in the Sentence Completion Task

The findings with respect to the use of *think* indicated that acceptable use was 67% as can be seen in Figure 2. In order to get a further in-depth picture and to reveal the patterns preferred over the others, an examination of item-based syntactic analysis of the acceptable learner responses was conducted.

Figure 2. Learners' Use of *think* in the SCT



The learners at all levels were found to have a tendency to choose [that-CL] and [zero-that CL] as the complementation pattern of *think* rather than choosing [to INF] and other variations in order to denote the same verb meaning. Example responses from the analysis are presented below:

> (3) I try to see this moment through his eyes: There's something very bright beneath the water, probably on the bottom but seemingly close enough to touch. He becomes mesmerized by this light, too large and bright to be a piece of jewelry, a diamond bracelet slipped off a woman's wrist, a ruby necklace: No, this light is so bright he can't quite connect it to anything his twelve-year-old brain knows the name of. He thinks ……. (Item 3- SCT)

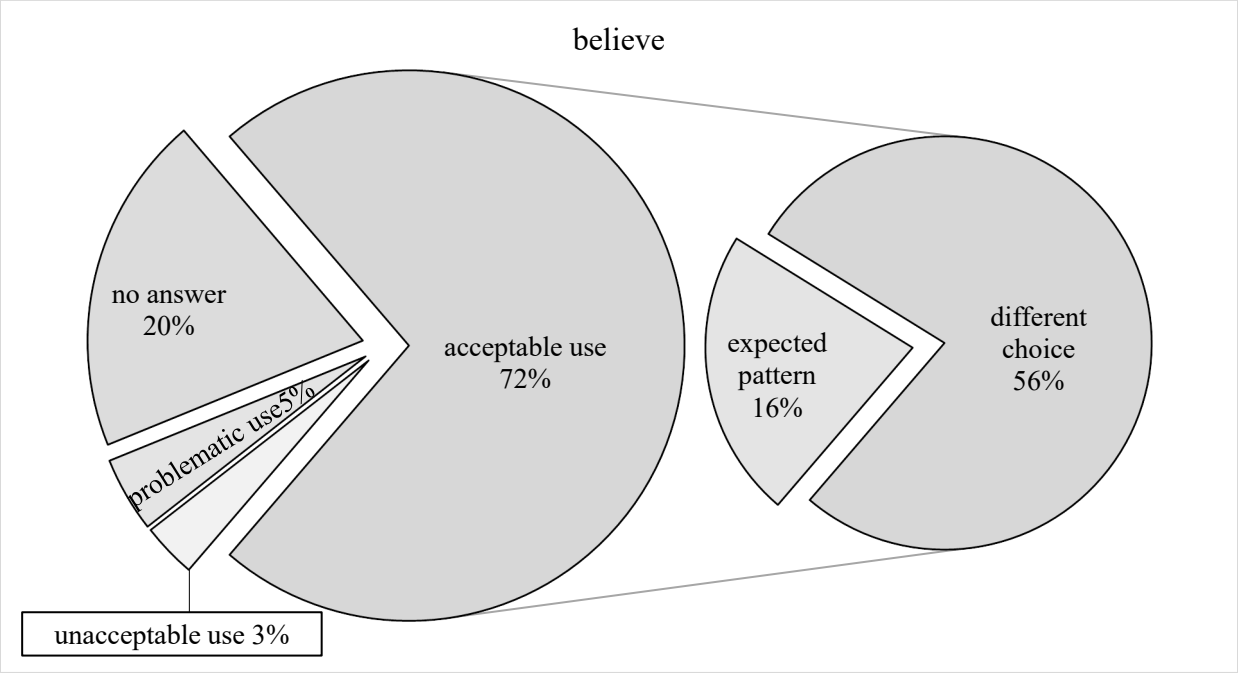
In example 3, the learners were expected to complete the rest of the sentence with "*to ask his mother if she sees it, if she knows what it is*". Rather than providing the expected pattern, the learners provided other acceptable responses such as "*He thinks that it is a magical gift from a superhero* (4.6.10: 3000 level)", and "*He thinks this is something that he has ever seen* (1.1.18: 3000 level). In other words, they showed a tendency to choose [that CL] or [zero-that CL] instead of choosing [to INF] as the complementation pattern.

(4) Before this assignment, I had never used Twitter; and, truthfully, I never gave it much thought as a medium. I really did not think_____. My impression was that Twitter was for celebrities, people who had an arrogant sense of self-importance, or others who think anything they do during the day is interesting. (Item 10-SCT).

In example 4, the learners were expected to use: *"I really did not think that I had a need for it*". This extract was in academic register and the expected complementation pattern was [that-CL]. Different from the patterns provided in the aforementioned example, the learners were found to omit [that CL] and prefer [zero-that CL] and wrote responses such as "*it is important in social life*", "*it is a necessary to use Twitter*".

The findings with respect to the use of *believe* showed that acceptable use is 72% as seen in Figure 3. Different from the verb *think*, the learners showed a tendency to choose different patterns rather than the expected patterns. A further item-based syntactic analysis showed that the learners preferred using [zero that-CL] rather than [that-CL], [NP], [wh-CL] whereas they preferred using [that-CL] rather than using [wh-CL]. In other words, preferences in their responses were mostly either [that-CL] or [zero that-CL] and they also showed variation in their choices and they preferred using [Prep N] and [NP] as the complementation pattern of the verb *believe* in SCT.

Figure 3. Learners' Use of *believe* in the SCT



(5) He snatched his trousers off the back of a chair. He zipped up, fingers fumbling as he fastened his belt, afraid she might leave. He checked the window again before unlocking the door. Nothing had changed. She still stood there alone. He could scarcely believe_____(Item 17- SCT).

As exemplified above (e.g. 5), the expected pattern was: "*his good fortune*" and the learners were expected to complete the sentence by using [NP] as the complementation pattern. However, rather than choosing [NP], the learners preferred using different choices (10.9 %) such as [that-CL] and

[zero that-CL] and provided responses such as "*that he would face to dangerous condition*" (1.1.23: ACAD level), "*someone was really waiting for him*" (1.8.6: 3000 level).

Another example in terms of the learners' preference of [that-CL] and [zero that-CL] over [wh-CL] is given below:

> (6) Even at the kindergarten level, parents, especially mothers, encourage their sons and daughters to excel in different areas. Males are encouraged and expected to achieve in subjects such as math, and females are encouraged to be cooperative (Baker &; Entwisle,1986). Children believe…..…(Item 18- SCT).

In example 6, the expected use was: "*what their parents tell them and try to adjust to parental expectations*". Rather than using this expected pattern [wh-CL], the majority of the learners provided different choices such as "*that they have different roles in society*" (4.8.9: ACAD level), "*there are roles for every gender*" (4.5.9: 5000 level).

In general, the learners were found to use a variety of acceptable complementation patterns in SCT rather than the expected patterns.

Learners' Choice of Verb Senses and Verb Complementation Patterns in the Sentence Production Task

In the Sentence Production Task, the learners were found to have a tendency to choose a limited variety of patterns which may indicate the salient ones for themselves since they were free to choose the verb patterns and senses. The overall results with respect to the use of *think* and *believe* in this context-independent task showed that for verb *think* the acceptable and unacceptable use was higher than verb *believe*. Another remarkable finding was that the problematic use and no answer categories were higher in the sentences formed with *believe* compared to the ones formed with *think* as can be seen in Table 2.

Table 2. Frequencies and Percentages of *think* and *believe* in the SPT

	Acceptable use		Unacceptable use		Problematic Use		No Answer		Total	
	N	%	N	%	N	%	N	%	N	%
think	*289*	*39.6*	*29*	*3.98*	40	5.49	6	0.82	364	50
believe	263	36.1	17	2.33	*53*	*7.28*	*31*	*4.25*	364	50
Total	552	*75.8*	46	6.31	93	12.7	37	5.08	728	100

To get a further in-depth picture and to reveal the patterns preferred by the learners, item-based syntactic analysis results of the acceptable learner responses is explained. In SPT, the learners had a strong preference for using *think* to *express personal opinion* as a verb sense and had a tendency to use [zero that-CL] or [that-CL] as a complementation pattern. As for the phrase category, they tended to use [about NP] to denote *thought/mental engagement* as shown in Table 3.

Table 3. Syntactic and Semantic Analysis of *think* in the SPT

think	thought (mental	consider (remember, plan/intend)	express opinion (have an opinion, believe sth), predict, suppose	Total

		engagement)							
		N	%	N	%	N	%	N	%
Clause	that-CL	-		-		31	11	*31*	*11*
	zero that-CL	-		-		145	51.6	*145*	*51.6*
	wh-CL	3	1.06	1	0.35	-	-	4	1.42
	to-INF	-		7	2.49	1	0.35	8	2.84
	so/twice/like this	-		1	0.35	4	1.42	5	1.77
	null	4	1.42	-		-		4	1.42
Total		7	2.49	9	3.2	181	64.4	197	70.1
Phrase	Prep N (about NP)	23	8.18	30	10.6	2	0.71	*55*	*19.5*
	Prep N (about V-ing)	-	-	8	2.84	-	-	8	2.84
	(Prep N) of NP	1	0.35	10	3.55	2	0.71	12	4.27
	Prep N (of V-ing)	-	-	8	2.84	-	-	8	2.84
Total		24	8.54	56	19.9	4	1.42	84	29.8
TOTAL	281								100

The examples below indicated a preference for using *think* to *express personal opinion* as a verb sense and a tendency to use [zero that-CL] or [that-CL] as a complementation pattern.

(7) I think the breakfast was delicious (3000 WL-express personal opinion).
(8) I think that there is a misunderstanding between them (2000 WL- express personal opinion).
(9) I think English is a difficult language (4.3.17: ACAD level-express personal opinion).
(10) I think the weather will be rainy tomorrow (1.4.5: 3000 level- predict/estimate).

Considering [NP] complementation pattern with *think*, there was a preference for using [Prep N-about NP] (19.5 %) as a complementation pattern, and the learners used this pattern to express the verb sense *thought/mental engagement* (8.18%) as shown in the following examples:

(11) I am thinking about my future plans (4.3.22: ACAD level-thought/mental engagement).
(12) I am thinking about my last exam grade (4.3.10: 3000 level- thought/mental engagement).

Other salient verb senses used for this verb by the learners were *consider, remember, plan/intend* used predominantly with [Prep N-about NP]. The percentages of all other types in verb patterns and senses were comparatively small and lied between 1.42 % [wh-CL] and 2.84 % for [to INF], [Prep N-about V-ing], and [Prep N -of V-ing]. A number of sentences produced by the learners are presented below in order to exemplify the use of aforementioned verb senses:

(13) I've been thinking about moving to America (1.1.18: 3000 level- consider/plan, intend).
(14) I'm thinking about you every second of a day (4.1.23: 2000 level-consider/remember).

(15) I'm thinking of you all the time (1.8.5: 3000 level-consider/remember).
(16) I'm thinking of going to the dentist tomorrow (1.4.23: 3000 level-consider/plan, intend).
(17) She's thinking of going to the concert (4.8.6: 5000 level- consider/plan, intend).
(18) I am thinking to join local team this year (4.1.22: 2000 level- consider/plan, intend).
(19) I am thinking to buy a new car (1.6.22: ACAD level- consider/plan, intend).

Another noteworthy finding was that the learners mostly used first person singular pronoun in forming sentences using the verb *think.*

In terms of the use of *believe* in SPT, the learners preferred using [Prep N-in NP] to denote senses such as *religion and to believe another person, trust, have confidence*. Apart from this pattern, the learners were found to have a stronger tendency to use [zero that-CL] and [that-CL] as the complementation patterns to express the verb meaning "*think or be sure that something is true, correct, useful*" (Table 4). It is worth explaining that as some of the learners wrote down the sentence and did not explain the sense of the verb, 5 sentences (NP: 3, zero that-CL: 2) were included in the syntactic analysis, but they were omitted in the semantic analysis.

Table 4. Syntactic and Semantic Analysis of *believe* in the SPT

Believe		General-think or be sure that something is true, correct, useful											
		believe the existence of sth		think this is the case (think sth is true)/hold as an opinion/accept sth as true or probable		believe another person (trust, have confidence)		else (support/ value, express surprise)		religion		Total	
		N	%	N	%	N	%	N	%	N	%	N	%
Clause	that-CL	-	-	55	20.9	-	-	-	-	-		*55*	*20.9*
	zero that-CL	1	0.38	69	26.2	-	-	-	-	-		70	26.6
	wh-CL	-	-	4	1.52	-	-	1	0.38	-	-	5	1.9
	so	-	-	1	0.38	-	-	-	-	-	-	1	0.38
Total		1	0.38	129	49			1	0.38			*131*	*49.8*
Phrase	NP	3	1.14	1	0.38	38	14.4	1	0.38	-	-	43	16.3
	Prep N (in NP)	11	4.18	-	-	45	17.1	1	0.38	32	12.1	*89*	*33.8*
Total		14	5.32	1	0.38	83	31.5	2	0.76	32	12.1	133	50.5
TOTAL												263	100

An in-depth analysis of the learner responses to SPT showed that [zero that-CL] and [that-CL] were salient in clause category and the prominent verb sense is "*think this is the case, hold as an*

opinion". The sentences produced by the learners are presented below in order to exemplify patterns and related verb meanings:

(20) I believe that he will pass the test (verb sense: accept something as true or probable) (4.8.6: 5000 level).

(21) I believe that you can do this (verb sense: accept something as true or probable) (4.6.21: 2000 level).

(22) I believe that you are perfect (verb sense: general-think this is the case) (4.5.10: 2000 level).

As seen in the examples learners used [that-CL] to denote the verb sense *think or be sure that something is true, correct, useful*.

In addition to the aforementioned examples, the learners used [zero that-CL] to denote the verb senses such as *think this is the case (think sth is true)/hold as an opinion/accept sth as true or probable* as shown in the examples below:

(23) I believe you will be a successful teacher. (verb sense: accept sth as true, probable) (4.5.6:2000 level).

(24) I believe I can pass the exam. (verb sense: accept sth as true, probable) (4.6.11:3000 level).

(25) I believe she tells the truth (verb sense: general-think this is the case) (1.6.2: 5000 level).

It was also revealed that *believe* is distinctive for [Prep N-in NP] (33.8 %) in the phrase category to denote senses such as *religion*, and to *believe another person, trust, have confidence*. The most striking finding was that there was not a clear tendency in the use of [that-CL] and [zero that-CL] as it is the case in the use of *think*, the learners showed variation and they also preferred using [Prep N] and [NP] as the complementation pattern of the verb *believe* as exemplified below:

(26) I don't believe in superstitions. (verb sense: general- believe the existence of sth) (4.3.7:3000 level)

(27) She believes in God. (verb sense: religion) (1.1.10: 3000 level).

(28) He believes in Hinduism. (verb sense: religion) (1.4.16:5000 level)

As exemplified above, in the phrase category, the learners mostly used [Prep N] to denote the verb meanings *believe in another person (trust, have confidence) and in religion* whereas they used NP to convey the verb senses *believe another person (trust, have confidence) and believe the existence of something.*

DISCUSSION

The results presented in this study have enabled us to better understand the tendencies of Turkish EFL learners in their production of verb complementation patterns and their related verb senses in relation to two non-factive cognitive verbs. This study also provided an insight on the learners' performance on the semantic and syntactic properties of the cognitive verbs.

With respect to the first research question, the present study found that the learners having high vocabulary levels performed better in production of verb complementation patterns in both tasks compared to the ones with basic vocabulary levels. These results are parallel with the

previous results of learners with different L1 backgrounds, indicating that learners' verb complementation use becomes more varied and schematic at higher proficiency levels and moves closer to a native usage norm (Römer & Berger, 2019) and shows a developmental tendency (Zhao & Jiang, 2020). The learners started off by learning words as bare items resulting in syntactic generalizations and accurate use of verb semantics (Ard & Gass, 1987).

Another notable finding in response to the first research question was the difference in the learners' achievement levels in SCT and SPT. The learners at all vocabulary levels were found to perform better in SPT which was a context-free task. The learners created their own context and they were free to use any pattern they chose, which means that they preferred the patterns they were familiar with and as their vocabulary level increased they performed better. The learners at 5000-word level performed better in producing verb complementation patterns and their related verb senses in the context-independent task compared to the learners at lower levels. This result is in line with the findings indicating that the learners at higher grades tended to use high-frequency words in more diverse valency constructions in their free productions (Zhao & Jiang, 2020). Yet, in the current study, the learners had challenges in explaining verb senses of the sentences they formed in the free productions so though they used a variety of patterns, the ones they acquired with their verb senses were limited. This may be because of the challenges language learners experience as English language offers a great variety of semantically similar complement patterns (Martinez-Garcia & Wulff, 2012). They receive input from different sources, but they do not seem to internalize the senses though they internalize the form, and they have not yet completed the form-meaning relationship. The learners need to internalize syntactic rules, verbal and nominal paradigms, and other descriptions of linguistic features of language (VanPatten, 1996). Whereas in the SCT, the learners preferred different complementation patterns rather than the expected ones. This result supports the previous finding. This may indicate that they have acquired a certain amount of varieties for complementation but still they are not aware of some varieties or have not internalized them as it is indicated in studies that challenges are experienced in providing varieties in the choice of verb pattern (Granger & Paquot, 2009). The learners experience such difficulties because of understanding the construction, construction's relative rarity, late introduction of the construction in the syllabus (Hubbard & Hix, 1988). These studies also deciphered that semantically similar complement patterns pose a challenge for the learners in terms of their distinctions and their employment in speech and writing (Biber, Johansson, Leech, Conrad & Finegan, 1999).

Moving on to second research question, this study found that the learners tended to use *think* in the verb sense of *expressing personal opinion* with complementation pattern of [zero that-CL]. The learners preferred to use *believe* in the salient verb sense (i.e. *think or be sure that something is true, correct, useful*) with [that-CL] and [zero that-CL] complementation patterns. The acceptability levels of learners' productions in the use of the verbs *think* and *believe* also showed differences in different tasks.

A particularly interesting observation that resulted from the analyses was that the learners at all levels were found to have certain tendencies in both verbs. More specifically, the learners used either [that-CL] or [zero that-CL] for both verbs and they also showed variation in their choices of senses and patterns and they preferred using [Prep N] and [NP] as the complementation pattern of the verb *believe.* They also tended to choose [that CL] or [zero-that CL] instead of [to INF] for the verb *think* to denote the same meaning. The choice of certain patterns over the others may be attributed to a number of possible reasons such as the inherent properties and the nature of the verb. For example, the learners' tendency to choose [that CL] over [to INF] may be attributed

to the fact that *think* chooses [that CL] as part of its inherent properties. According to Valency Dictionary of English, more than 30% (shown as '>30%' in the dictionary) of the verb *think* chooses [that CL] as the complementation pattern. If the verb is inherently mental-utterance, for example, verbs such as *believe, know, imagine, realize* and *find*, even though the verb allows both the [that-CL] and the infinitival complement, there would still be a preference for the that-clause over the infinitival clause (Choi Lai-Kun, 1996). In line with the aforementioned view, verb bias may be another factor affecting the learners' choice because of the fact that even though the verbs have various complementation patterns, they exhibit a bias and tend to co-occur with certain types much more than the others (Hare, McRae & Elman, 2003; Lee & Choe, 2013). In conversation, the complementizer *that* is usually omitted while in academic prose *that* is almost never omitted (Biber & Xeppen, 1998, p. 155). The learners' tendency to use [zero that-CL] with the verbs *think* and *believe* may be explained through their exposure to informal conversational English through different mediums. Consequently, the learners' exposure to literary genres, which includes examples of spoken language, their use of the internet as a spoken medium, their exposure to English films and popular serials may have an effect on their choice of verb complementation patterns along with its related verb senses.

Another possible explanation for the learners' tendencies to choose certain patterns over the others may be their L1. As it is suggested in the literature, their knowledge of constructions in their first language is likely to have an impact on their emerging constructional knowledge in the L2 (Römer, Skalicky & Ellis, 2017). In their study, Römer and Yılmaz (2019) examined what Turkish learners of English know about a set of frequent verb-argument constructions and they revealed that *talk* and *think* are the two verbs that most frequently appear with 'V about N'. Different from this finding, Turkish learners in our study had a tendency to use [zero that-CL] and [that-CL] with the verb *think* though lesser in number the use of [V about NP] with '*think'* as in Römer and Yılmaz (2019) were also found. Similarly, for the verb *believe,* our results indicated higher use of [zero that-CL]. Prior studies have also noted that learners with different L1 backgrounds have a tendency to choose [to INF] rather than that-clauses, ING-clauses, and WH-clauses (Biber & Xeppen, 1998). French, Spanish, Chinese, and Japanese learners were found to use to-clauses and that-clauses in their essays compared to any of the native registers. The Turkish learners in this study were found to prefer that-clauses but not [to INF] in their responses to the SCT and SPT. A parallel finding was documented by Uçkun (2012) by revealing that sentential complement arguments were dominant whereas direct object arguments in L2 learners' productions were underused. Turkish EFL learners' preference of [zero that-CL] and [that-CL] may be explained through their higher exposure to certain patterns over the others in grammar courses. Learners with different L1 backgrounds may share the same tendencies. For example, empirical studies have shown that clausal complements were the easiest complement type for Persian speakers (Anderson, 1983). Another plausible explanation in their choice of certain complementation patterns (e.g. zero-that CL) over the others may be the issue of optionality where a speaker may have a choice between two options to express the same meaning, but actually may have strong preference for one over the other (Sorace, 2003, p. 20).

CONCLUSION

This study focused on the appearance of verb complementation patterns and verb senses of non-factive cognitive verbs in the learners' interlanguage at production levels. The study provides

an overall picture of their achievement level at productive tasks and their preferences regarding verb complementation patterns and their related verb senses.

Two major findings were reported. First, it was revealed that the learners with high vocabulary levels were found to perform better in both tasks compared to the ones with basic vocabulary levels. The range between scores of two tasks diminished as the vocabulary level of the learners increased. The learners at all vocabulary levels preferred salient patterns and senses in their free productions while they tended to use a variety of patterns than the expected patterns in the controlled task. Second, the learners preferred to choose certain patterns over others. More specifically, they tended to use [that-CL] and [zero-that CL] as the complementation pattern of *think* rather than other variations in the context-dependent task. A further item-based syntactic analysis showed that the learners preferred using [zero that-CL] rather than [that-CL], [NP], [wh-CL] whereas they preferred using [that-CL] rather than using [wh-CL]. The analysis of the learner responses to the context-independent task revealed that the learners had a strong preference for using *think* to *express personal opinion* as a verb sense. In terms of the use of *believe*, the findings showed that the learners' preferences in their responses were mostly either [that-CL] or [zero that-CL] and they also showed variation in their choices and they preferred using [Prep N] and [NP] in the context-dependent task. In the context-independent task, the learners were found to have a stronger tendency to use [zero that-CL] as the complementation pattern to express the verb meaning "*think or be sure that something is true, correct, useful*" and to use [that-CL] to express the same meaning. The learners tended to choose clausal complements with *think* in SPT while they used both clausal and phrasal complements with *believe* in the same task. Another major finding was that the learners used a variety of complementation patterns rather than the expected patterns in SCT, which may indicate that they were getting more aware of different verb complements.

The findings of the study support the assertion that helping learners establish interrelation between the meaning of verbs and their complementation patterns is needed. In this line, the presentation of verb by highlighting context-specific uses of complements will promote the discovery of meanings of cognitive verbs especially those polysemous ones which have different senses with their associated complements (Papafragou, Cassidy & Gleitman, 2007). Adopting such an approach will probably enable the learners notice variation in the use of verb complementation patterns and verb senses as verbs which have similar syntactic frames are also the verbs that behave alike semantically (Gleitman, 1990). Comprehensive reference grammars presenting the structural and semantic properties of the verb complementation patterns may be used to enrich and expand the learners' lexical knowledge. In this respect, rather than an item-based presentation and exhaustive lists, a pattern-based approach that unites verb complementation patterns and their related verb senses would be helpful to the learners. As a pedagogical implication, verb complementation patterns and their related verb senses should be presented to the learners by highlighting contextual information leading to the appropriate choice. Considering that different complementation patterns may be used to encode the same verb meaning, introducing subtle differences among these properties contributes to raising their awareness about word grammar. Rather than a pure syntactic treatment of the verb properties, meaning-pattern connections may enhance their lexicon in English. As conclusion, presenting the structural properties of the verbs along with their semantic features within a context is crucial especially in an EFL context to help learners acquire the meaning of the verbs more effectively.

In spite of the fact that the data were collected through the use of various language examples in different genres such as fiction, spoken, academic, etc. in COCA corpus, the data were

collected through a written medium. As the non-factive verbs were analyzed within the scope of this study, factive verbs may also be investigated to identify the tendencies at production and recognition levels. The use of verb complementation patterns and their related verb senses may also be examined in the ICLE and the effects of different native languages on the choice of these patterns may be investigated by focusing on the variations in the Louvain Corpus of Native English Essays. Examining these expressions in the spoken language of the learners may also contribute to a comprehensive understanding of the appearances of these patterns in the learners' interlanguage.

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