Gist Education and Learning Research Journal. ISSN 1692-5777.
No. 30 (January - June, 2025). pp. 7-36.

EFL Learners' Receptive and Productive Knowledge of Factive Cognitive Verbs' Complementation Patterns

Comprensión y uso de los patrones de complementación de los verbos cognitivos factivos en estudiantes de inglés como lengua extranjera

Dr. Serap Atasever Belli[1]
Erzurum Technical University, Erzurum, Turkiye

Dr. İlknur Keçik[2]
Anadolu University, Eskişehir, Turkiye

Received: October 29, 2024 / Accepted: April 7, 2025
[1] serap.belli@erzurum.edu.tr
[2] ikecik@gmail.com

Abstract

The phenomenon of verb complementation has been a challenging research topic in the domain of first and second language acquisition in recent decades. This study aimed to determine the achievement levels of learners of English as a foreign language (EFL) in terms of their recognition and production of factive cognitive verb complementation patterns and their associated senses. Specifically, the factive verbs analyzed within the scope of the study were: *know, understand, regret, remember,* and *forget,* along with their complementation patterns and senses. Data were collected from 269 Turkish EFL learners through four types of tests developed by Atasever Belli (2019). Learners' receptive knowledge was measured through *the Grammaticality Judgment Test* and *Fill-in-the-Blank Test.* Their productive knowledge was assessed through the *Free-Production Test* and *Sentence Completion Test.* Data obtained from the participants' responses to tests were analyzed both quantitatively and qualitatively. This study demonstrated that word knowledge level has a significant impact on verb complementation performance both at receptive and productive levels. It also revealed that production test performance exceeded recognition test performance. The performance differences were analyzed by considering factors such as linguistic transfer, vocabulary knowledge, test types, verb properties, context, and input exposure. These results highlight learners' interlanguage development and offer profound pedagogical implications.

Keywords: English as a Foreign Language learners, Factive cognitive verbs, Productive knowledge, Receptive knowledge, Verb complementation

Resumen

El fenómeno de la complementación verbal ha representado un reto constante en las investigaciones sobre adquisición de la lengua materna y de una segunda lengua en las últimas décadas. Este estudio tuvo como objetivo determinar los niveles de logro de los estudiantes de inglés como lengua extranjera (EFL) en cuanto al reconocimiento y la producción de los patrones de complementación de verbos cognitivos factivos y sus significados asociados. En particular, los verbos factivos analizados en el estudio fueron: *know*, *understand*, *regret*, *remember* y *forget*, junto con sus respectivos patrones de complementación y sentidos. Los datos se recopilaron a partir de 269 estudiantes turcos de EFL mediante cuatro tipos de pruebas desarrolladas por Atasever Belli (2019). El conocimiento receptivo de los estudiantes se evaluó mediante una prueba de juicio de gramaticalidad y una prueba de llenar espacios en blanco; el conocimiento productivo se midió a través de una prueba de producción libre y una prueba de completación de oraciones. Los datos obtenidos de las respuestas de los participantes se analizaron tanto cuantitativa como cualitativamente. El estudio evidenció que el nivel de conocimiento léxico influye de manera significativa en el desempeño en complementación verbal, tanto en niveles receptivos como productivos. También se observó que el rendimiento en las pruebas de producción superó al de las pruebas de reconocimiento. Las diferencias de desempeño se analizaron considerando factores como la transferencia lingüística, el conocimiento del vocabulario, el tipo de prueba, las propiedades del verbo, el contexto y la exposición al input. Estos resultados aportan información relevante sobre el desarrollo de la interlengua de los aprendientes y ofrecen implicaciones pedagógicas significativas.

Palabras clave: estudiantes de inglés como lengua extranjera, verbos cognitivos factivos, conocimiento productivo, conocimiento receptivo, complementación verbal.

Resumo

O fenômeno da complementação verbal tem sido um tema desafiador nas pesquisas sobre aquisição de primeira e segunda língua nas últimas décadas. Este estudo teve como objetivo determinar os níveis de desempenho de estudantes de inglês como língua estrangeira (EFL) em relação ao reconhecimento e à produção de padrões de complementação de verbos cognitivos factivos e seus significados associados. Especificamente, os verbos factivos analisados foram: *know*, *understand*, *regret*, *remember* e *forget*, juntamente com seus respectivos padrões de complementação e sentidos. Os dados foram coletados junto a 269 estudantes turcos de EFL por meio de quatro tipos de testes desenvolvidos por Atasever Belli (2019). O conhecimento receptivo dos estudantes foi avaliado através de um teste de julgamento de gramaticalidade e de um teste de preenchimento de lacunas; já o conhecimento produtivo foi medido com um teste de produção livre e um teste de completamento de frases. As respostas dos participantes foram analisadas quantitativa e qualitativamente. O estudo demonstrou que o nível de conhecimento lexical tem um impacto significativo no desempenho em complementação verbal, tanto nos níveis receptivo quanto produtivo. Também revelou que o desempenho nas provas de produção superou o das provas de reconhecimento. As diferenças de desempenho foram analisadas levando em consideração fatores como transferência linguística, conhecimento de vocabulário, tipo de teste, propriedades dos verbos, contexto e exposição ao input. Os resultados oferecem contribuições relevantes sobre o desenvolvimento da interlíngua dos aprendentes e trazem importantes implicações pedagógicas.

Palavras-chave: estudantes de inglês como língua estrangeira, verbos cognitivos factivos, conhecimento produtivo, conhecimento receptivo, complementação verbal.

This study is part of a PhD thesis titled 'An Analysis of Factive Cognitive Verb Complementation Patterns Used by ELT Students,' written by Serap Atasever Belli and supervised by İlknur Keçik, and supported by TUBITAK-SOBAG.

Introduction

Verb complementation has recently gained popularity as a research topic in first and second language acquisition. It has been revealed to be a problematic issue for many language users, especially the ones using a language as a foreign/second language (e.g., Bourke, 2007; Vercellotti & Jong, 2013; Yoon, 2016; Atasever Belli, 2019; Söğüt & Keçik, 2023; Vasco, 2024; Zhao & Jiang, 2024). EFL learners with various L1 backgrounds, such as Chinese, French, German, Russian, Spanish, and Thai, have been identified as having difficulty differentiating the senses of verbal complements (Schwartz & Causarano, 2007; Vercellotti & Jong, 2013). They make grammatical and syntactical errors such as using incorrect verb complementation patterns with the incorrect verbs (e.g., a prepositional complement instead of a noun phrase), excluding obligatory complements, and failing to choose the appropriate tense, aspect, and case (Celce-Murcia & Larsen- Freeman, 1999, p.645; Roe, 2007, p.220). Furthermore, learners often struggle with using to-infinitives correctly, including errors in omission, inflection, and complementizer choice (e.g., Anderson, 1983, p. 24). They also encounter problems in distinguishing between gerundial and infinitival verb complementation patterns and inaccurately use the root verb form or both *the to*-infinitive and *ing* patterns after the verb, which requires either the former or the latter (Duffley & Tremblay, 1994; Schwartz & Causarano, 2007; Wang, 2014). These challenges unarguably underscore the need for further examination of the issue, as knowledge of verb complementation is extremely important for learners to understand meaning and pattern variations.

This study contributes to the emerging literature on the use of verb complementation by EFL learners, as their achievement levels in word knowledge have not been adequately addressed. To fully understand a word in the target language, both receptive and productive knowledge are essential (Gass & Selinker, 2008; p. 451). Receptive knowledge involves recognizing words in writing and speech (Milton, 2009), distinguishing between general and specific meanings, understanding the parts or components of words, and identifying negative and positive connotations (Gass & Selinker, 2008, pp. 451-452). Productive knowledge refers to the ability to recall and use words in speech or writing (Milton, 2009, p. 13), involving pronunciation, spelling, and contextual meanings (Gass & Selinker, 2008, pp. 451-452). This study highlights the importance of these two dimensions in language learning by evaluating learners' abilities in both understanding and using words.

This study is believed to bring unique insights into syntactic and semantic features of factive cognitive verbs in interlanguage of EFL learners, which is relatively new area and has not been globally addressed in the relevant literature yet. The following questions were addressed:

1. What are the achievement levels of EFL learners' factive cognitive verb (*i.e., know, regret, remember, forget,* and *understand*) complementation patterns in recognition tests?
2. What are the achievement levels of EFL learners' factive cognitive verb (*i.e., know, regret, remember, forget,* and *understand*) complementation patterns in production tests?
3. Is there a significant difference across the achievement levels of EFL learners at different vocabulary levels (2000, Academic Word List, 3000, 5000, and 10000-word levels) in four tests?

The following section explains the concept of verb complementation and a review of studies conducted earlier in this field of study.

Literature Review

The syntactic and semantic relationships between words within a sentence have been the subject of inquiry by many scholars. One of the terms used to describe the relationships between the required constituents within the environment in which the word appears is *valency*. The concept of "valency," initially proposed by Tesnière (Herbst, 2007), was primarily considered the property of a word or lexical unit that determines the occurrence of other elements in a clause (Herbst, 2007). However, later, the scope of this concept was extended from purely syntactic to semantic properties of words (Levin, 2015). Following Herbst and his colleagues (2004), valency determines not only the structural or syntactic properties of complements but also semantic and collocational features. This term encompasses the analysis of verbs, nouns, and adjectives in terms of complements (Herbst, 2004, p. xxv). Valency provides the theoretical foundation for analyzing verbs within the framework of this research, as it helps explain the verb complementation patterns of factive cognitive verbs and the verb senses. As Herbst and Götz-Votteler (2007) indicate, the term "complementation" was used in the study, referring specifically to the complements of cognitive verbs and considering both syntactic (i.e., phrases and clauses) and semantic (i.e., the meanings of verbs and complements) aspects. Among verbs, the class of cognitive verbs analyzed within the scope of this research is particularly significant for several reasons.

The verbs such as *know, understand, suppose, believe, think, understand,* and *so on* are labeled by various terms such as private verbs (Quirk et al., 1985; Biber, 1988; Palmer, 1988) and verbs of belief (Papafragou et al., 2007), and here the term 'cognitive verbs' (Bourke, 2007; Fetzer & Johansson, 2010) is adopted. They are defined as a class of verbs based on the semantics of their members, which concentrate on the verb's private domain of reference and may denote the psychological disposition of the speaker or

other discourse communities (Fetzer, 2008, p. 4; Fetzer & Johansson, 2010, p. 243). They include various verb senses related to cognition, feeling, knowledge, perception, and belief, and they are universal and found in every language (Givón, 1973, p.891). Being extremely complex lexical items (Cappelli, 2008, p. 538), they pose challenges for language users at cognitive, syntactic, and semantic levels (Nixon, 2005; Papafragou et al., 2007). At a cognitive level, they express varying levels of certainty about the proposition (i.e., *know* with a high degree of certainty and *think* with less certainty) in terms of factivity (factive vs. non-factive) (Moore et al., 1989, p.168; Wellman & Estes, 1987, p.152), which make them cognitively complex (Nixon, 2005, p.20). At a syntactic level, they can take many complements, including primarily sentential complements (that-CL, zero that-CL, and wh-CL complements), [NP], [PrepN], and [VP] (Nixon, 2005), but they may not appear in the same environment with the same type of pattern. At the semantic level, they are polysemous verbs with multiple meanings when they occur in different syntactic environments, resulting in ambiguity (Booth & Hall, 1995; Booth et al., 1997; Naigles, 2000; Stojičić, 2008, p. 27). For example, *"know"* takes [NP] as a complement, and it refers to *recognition* in "I know that song," whereas it refers to *belief* with zero-that-CL in "I know you like that book" (Naigles, 2000, p. 247). Some cognitive verbs can co-occur with both *to*-infinitive and *ing*- complements, but the choice of complement yields totally a change in meaning, which is called the 'Bolinger Principle' developed by American linguist Dwight Bolinger in 1968 (Celce-Murcia & Larsen-Freeman, 1999, p. 648):

He *forgot to buy* the books (the books were not bought)

He *forgot buying* the books (the act of buying has been fulfilled)

These examples provide evidence for the meaning difference between verbs taking V-ing and to-INF patterns in terms of potentiality versus actuality semantic aspect (Celce-Murcia & Larsen-Freeman, 1999; Quirk, Greenbaum, Leech, & Svartvik, 1985). Bolinger's Principle posits that any variation in syntactic form yields a corresponding difference in meaning (Bolinger, 1968, p. 127). However, this principle attempts to make predictions about the expected usages and the corresponding meanings of only two complementation patterns. Furthermore, the Bolinger Principle does not explain all instances of verbs allowing both types of patterns, such as the verb *"like"* (Celce-Murcia & Larsen-Freeman, 1999, p. 649). In addition, many verbs allow more than one pattern and may behave differently depending on the context where they are used on the syntactic level and the meaning they serve on the semantic level. In this respect, it is crucial for language learners to be aware of these complexities and to have knowledge of the different senses of cognitive verbs and complementation patterns. In this research, factive cognitive verbs were analyzed. They consist of verbs *"know, remember, forget, see, hear, guess, resent, suspect, understand, regret, learn, realize, discover, notice* and *find out"* (Givón, 2001; p. 893) and presuppose the truth of their complement sentences (Abbeduto & Rosenberg, 1985, p. 621; Givón, 1973, p. 2). Specifically, the

following five factive cognitive verbs were analyzed: *know, understand*, *remember, forget,* and *regret.* They are among high-frequency verbs as revealed in both child-speech in L1 acquisition studies (i.e., Bloom et al., 1989; Kidd et al., 2006; Kidd et al., 2010; Shatz et al., 1983) and frequency lists of corpora in English such as in Longman Spoken and Written English Corpus (LSWE) (Biber et al., 1999). As factive cognitive verbs belong to the high-frequency category, understanding high-frequency verbs and their functions across languages merits closer examination. They denote basic meanings, predominantly found in various semantic fields, and have high-frequency equivalents in many languages (Altenberg & Granger, 2001, p. 174). They exhibit a high degree of polysemy, resulting in two or more types of meaning extensions with varied patterns of complementation (Altenberg & Granger, 2001; Perek, 2015). They pose problems for language learners, and they exhibit language-specific differences despite semantic similarities among various languages (Altenberg & Granger, 2001, p. 174). They are not well represented in terms of number and type in EFL/ESL instructional courses or programs, and thus, even advanced-level learners may have incomplete knowledge of verbs (Altenberg & Granger, 2001, p. 190; Wang & Shaw, 2008). It is the verb that establishes the relationship between semantics (verb meaning) and syntax (verb complementation pattern) (Can, 2009, p. 2832). Therefore, language learners need to possess knowledge of verbs for adequate language comprehension and production.

Given their prominence in language use as high-frequency verbs and the aforementioned challenges, factive cognitive verbs are particularly worth exploring in syntactic and semantic terms. This study focused on the verbs used by Turkish EFL learners, with a particular emphasis on their syntactic and semantic behaviors, and aimed to determine the achievement levels of learners across different tests at both receptive and productive levels.

Methodology

Participants

The study population consisted of 360 university students enrolled in the English Language Teaching Program during their 1st, 2nd, 3rd, and 4th years of study at a state university in Turkiye. These students' L1 is Turkish, and their prior English language learning experience dates back to elementary schools, where English is taught three hours per week. In courses such as contextual grammar, linguistics, and grammar teaching, they received a list of verbs that occur with limited types of complementation patterns, such as V-ing and to-INF, along with a few example sentences. To group learners from various grades (i.e., 1st, 2nd, 3rd, and 4th) based on their word levels, participants were given the Vocabulary Levels Test (VLT) initially developed by Nation (1983) and revised by Schmitt et al. (2001) at the beginning of data collection

because learners' interlanguage development and proficiency may differ within/across grade/s. The word levels are ordered in the following way, from the lowest to the highest: 2000, Academic Word List (AWL), 3000, 5000, and 10000-word levels. The test took approximately 50 minutes. Learners were grouped into five-word levels, as depicted below.

At the beginning of the data collection procedure, the VLT test was administered to all populations. However, there was a decrease in the number of students participating in the following data collection phases. Therefore, 269 EFL learners, including 159 female and 110 male students, participated in all phases. Participants' ages ranged from 18 to 22.

Table 1
Distribution of participants across VLT levels (N=269)

Levels	**Number of participants**	**Percentage %**
2000-word	60	22.3
AWL	58	21.5
3000-word	74	27.5
5000-word	72	26.7
10000-word	5	1.8
Total	269	100

Ethics Committee approval was obtained from Anadolu University prior to the study (Protocol number 44818). Research standards and ethical principles were followed. According to these principles, participants were informed about the purpose, scope, procedure, potential risks, and confidentiality of the study at the beginning of the data collection procedure. Informed consent forms were obtained from all participants in written form, and voluntary participation was ensured. Confidentiality was ensured by using pseudonyms. Participants were also informed of their right to withdraw from the study at any time.

Data Collection

This section provides a detailed explanation of the data collection instruments and the data collection and analysis procedure.

Instruments

Four different types of tests developed by the researchers were used to collect data and to measure learners' state of knowledge and the use of verb complementation patterns and senses. These tests, developed by Atasever Belli (2019), consisted of two production tests, namely the Free Production Test (FPT) and the Sentence Completion Test (SCT), and two recognition tests, namely the Grammaticality Judgment Test (GJT) and the Fill-in-the-Blank Test (FBT). Through different test formats, we aimed to uncover learners' potential uses in syntactic and semantic terms in both context-bounded and context-free tests.

Regarding production tests, FPT asked participants to produce two sentences per factive cognitive verb and write the meaning of the verb in these sentences, as exemplified below.

Forget:

Sentence 1: _____ *(e.g., Forget your troubles, come on, be happy!)*

Verb meaning: _____ *(e.g., dismiss)*

In SCT, sentence fragments were provided within contexts for students to complete.

> Focus is really important in life. I would have to say my favorite aspect of yoga is the focusing aspect of yoga. I only focus on yoga when I am practicing. I just forget _____ *(about everything outside of yoga)* _____ , but when I practice yoga, I focus on all of the details of yoga during my practice. (COCA, 2018)

For the recognition test, participants were instructed to judge the acceptability of sentences in GJT to assess their knowledge of each item from various registers (i.e., fiction, spoken, newspaper, magazine, and academic texts) in COCA (2018).

He regrets of having told his story to his cousin and to his wife.

a. Correct b. Not sure c. Incorrect

Lastly, in FBT, sentence fragments, including those of the complement type without cognitive verbs, were provided to be filled in with appropriate verbs from a box.

Example item:

> Curry: So how will you spend yours? The average refund for the 2006 tax season will be just over $2,600.
>
> Christina: I spent my refund very quickly on vacation.
>
> Kate: Probably spend it on clothes, shopping, what I usually spend my refund on. I *do* _____ *(regret)* _____ how I spent my refund. I could have -- I could have probably saved the money instead of spending it.

No. 30 - ISSN 1692-5777

Table 2 presents the number of items and their corresponding scores in the tests.

Table 2
Overview of test types

Tests	Sub-tests	No. of items	Scoring Per item	Scoring Total
Productive	FPT	10	10	100
	SCT	20	5	100
Receptive	FBT	10	10	100
	GJT	20	5	100

The reliability and validity of tests were checked based on a pilot study conducted with 46 participants in the ELT program. Based on the Kuder-Richardson formula 20 (KR-20), SCT had a moderate degree of reliability (i.e., 0.78), and GJT (0.87) and FBT (0.80) had a high degree of reliability. Item analysis was also performed to measure the effectiveness of the items, and those with a correlation coefficient below 0.19 were eliminated. The latest versions were then prepared. In the main study, in which 269 participants responded to the tests, the reliability and validity of the tests were rechecked. GJT, SCT, and FBT were found to have moderate reliability coefficients. Regarding interrater reliability, as measured by Cohen's Kappa, there was almost perfect agreement between the two raters for all items in SCT and nine items in FPT, and substantial agreement for one item in FPT regarding the acceptability of patterns and senses (See Atasever Belli, 2019, for detailed information).

Based on the experts' recommendations, to minimize the potential risk of affecting learners' use of verb complements due to the implementation of receptive tests. First, tests were administered to the participants in an order that started with production tests.

Data Analysis

Data analysis was carried out in two phases. In the first phase, learners' responses were qualitatively analyzed to identify learners' syntactic and semantic choices in production tests. After putting all learners' answers into the Excel program, all the patterns and verb senses produced were manually annotated, checked, and identified based on the Valency Dictionary of English and VerbNet as well as the sources, including Collins Cobuild, Merriam Webster, and Oxford and labeled as *correct, incorrect* and *problematic* based on these native control data. The correct, incorrect, and problematic uses were highlighted in different colors. To illustrate, instances where the patterns used with a particular verb, according to the aforementioned sources, were chosen by

the learners, and the verb was used in the correct sense were identified as *correct* and colored in blue. The verb meanings produced by the learner but not denoted by the factive verb, according to the sources, were identified as *incorrect*.

Furthermore, the patterns that do not occur with the verb in question, according to the sources, but are produced by the participants, were labeled as *'incorrect.'* The instances, including mismatches between the patterns and the verb meanings, as well as the problematic use of the wh-clause complementation pattern, were labeled as *problematic*. In FPT, points were given for each accurate sentence, including the target verb, regardless of the variety of verb meanings. Interrater agreement was conducted with two different raters. The first interrater agreement was conducted between the researcher and a Turkish expert from the same institution, who independently analyzed 30% of the data. The second one was conducted between the researcher and an American native speaker working as an instructor at a state university in Turkiye, who analyzed 20 % of the data. The researcher compared her findings with the raters' findings at separate meetings, where the discrepancies were resolved.

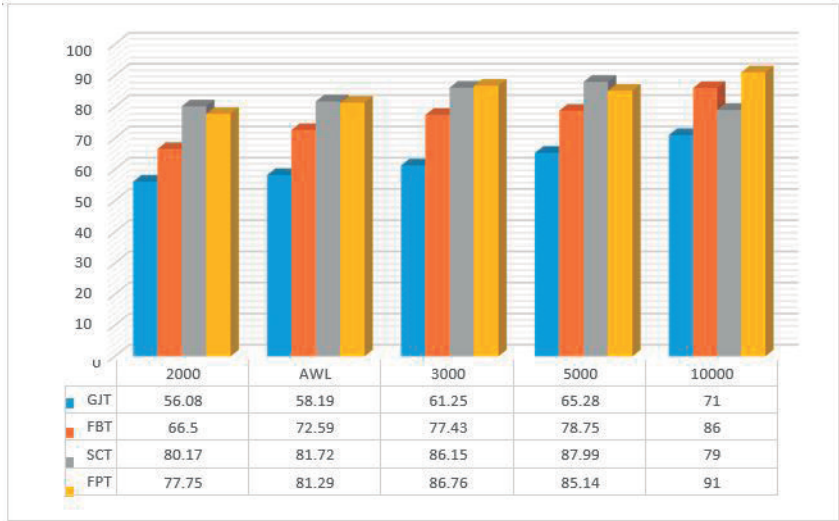
Next, all tests were quantitatively analyzed by calculating overall mean scores and raw scores based on the scoring system given in Table 2. To explore the statistical differences across VLT levels in each test, a Multivariate analysis of variance (MANOVA) was conducted. MANOVA was specifically used since there is one categorical independent variable (i.e., five groups of participants grouped based on their word levels according to VLT test scores) and more than one dependent variable (i.e., test scores obtained from GJT, FBT, SCT, and FPT). It controls for the risk of Type 1 error and determines the effects of independent variables on several dependent variables (Pallant, 2007, p. 275). A one-way ANOVA was also conducted to reveal the differences among the four groups individually. To determine which groups contributed to the overall multivariate significance, post hoc tests, i.e., Bonferroni Adjustment, were performed.

Given that this study is part of a larger study, i.e., a PhD thesis written by Atasever Belli (2019), only quantitative results were presented in the current study since the research questions addressed were mainly concerned with achievement levels of learners and the comparison among learners at different word levels based on their test scores.

Results

The mean scores of EFL learners across word levels are depicted in Figure 1 below.

Figure 1.
Mean scores of students across five VLT levels



	2000	AWL	3000	5000	10000
GJT	56.08	58.19	61.25	65.28	71
FBT	66.5	72.59	77.43	78.75	86
SCT	80.17	81.72	86.15	87.99	79
FPT	77.75	81.29	86.76	85.14	91

An examination of the figure above reveals the diverging performances of participants across different tests, highlighting varying levels of difficulty in the tests and the impact of test format on performance. As shown in Figure 1, based on the overall mean scores, participants scored higher on the production tests compared to recognition tests. Among the four types of tests, participants obtained the lowest mean scores from GJT ($\bar{x}$ = 60.67; SD = 1.54) and the highest mean scores from SCT ($\bar{x}$ = 84.22; SD = 13.47). A one-way repeated measures ANOVA was conducted to determine whether there was a significant difference in the mean scores across four different tests. Accordingly, there was a significant main effect of test type on verb complementation use ($F(3,804)=145.692$, $p=.000$, $\eta p2=.352$) (see Table 3).

Table 3
Differences across EFL learners' Performances on four test types

Tests	*N*	*x*	*SD*	p	*F*
GJT	269	60.67	15.463	.000*	
FBT	269	74.46	19.760	.000*	145.692
FPT	269	83.22	16.994	.000*	
SCT	269	84.22	13.471	.000*	

*Significant at the level of .05

To determine the source of the difference, a Bonferroni Adjustment was conducted as a post-hoc test. Based on the results, statistically significant differences were found between each test type, except between SCT and FPT.

Table 4
Post-hoc test results: Pairwise comparisons across four tests

				95% Confidence Interval for Difference		
(I) test_ effect	**(J) test_t effec**	**Mean Difference (I-J)**	**Std. Error**	**Sig.[b]**	**Lower Bound**	**Upper Bound**
GJT	FBT	-13.792*	1.248	.000	-17.108	-10.475
	SCT	-23.550*	1.120	.000	-26.528	-20.572
	FPT	-22.546*	1.284	.000	-25.960	-19.133
FBT	GJT	13.792*	1.248	.000	10.475	17.108
	SCT	-9.758*	1.318	.000	-13.263	-6.254
	FPT	-8.755*	1.496	.000	-12.731	-4.778
SCT	GJT	23.550*	1.120	.000	20.572	26.528
	FBT	9.758*	1.318	.000	6.254	13.263
	FPT	1.004*	1.162	.999	-2.085	4.092
FPT	GJT	22.546*	1.284	.000	19.133	25.960
	FBT	8.755*	1.496	.000	4.778	12.731
	SCT	-1.004	1.162	.999	-4.092	2.085

Based on estimated marginal means

*. The mean difference is significant at the .05 level.

b. Adjustment for multiple comparisons: Bonferroni.

The comparison among participants according to vocabulary levels showed that as the level increased, learners' performances increased in producing correct and appropriate verb complementation patterns and senses. In all tests except for SCT, the lower the word level was, the lower the overall mean score was. In SCT, 10000 word-level students got the lowest mean score. In this test, both 2000-word and 10,000-word level students performed similarly, with a slight difference, as the former group did slightly better than the latter group. (See Appendix A for the means and standard deviations of tests)

Table 5 demonstrates the results of comparison across the performances of learners at different word levels.

Table 5
MANOVA Result for VLT

Effect		Value	F	Hypothesis df	Error df	Sig.	Partial squared	Eta
VLT level	Pillai's Trace*	.155	2.655	16.000	1056.000	.000*	.039	

a. The statistic is an upper bound on F that yields a lower bound on the significance level.
*Computed using alpha = **.05**

In Table 5, the multivariate result was significant for the VLT level at the .05 significance level ($F(2, 655) = 0.155$, $p < .000$; *Pillai's Trace* = 0.000; $\eta p^2 = 0.039$), indicating that the differences in test scores of participants across word levels were statistically significant. Based on an overview of tests of between-subject-effects, participants differed on all dependent variables, as illustrated below.

Table 6
The comparison among EFL learners from five VLT levels in tests

Source	Dependent Variable	Type III Sum of Squares	df	Mean Square	F	Sig.	ηp2
VLT Level	GJT	3698.247	4	924.562	4.042	.003*	.058
	FBT	6650.109	4	1662.527	4.479	.002*	.064
	SCT	2779.789	4	694.947	4.001	.004*	.057
	FPT	3503.994	4	875.999	3.130	.015*	.045

Computed using alpha and significant = .05

The VLT level had a significant effect on learners' performances in each of the four tests, specifically the GJT (p = .003*), FBT (p = .002*), SCT (p = .004*), and

FPT (p = .015*) tests (Table 6). To determine which groups contributed to the overall multivariate significance and identify the location of the significant difference, post hoc tests were performed, as shown in the table below.

Table 7
Multiple comparisons across five VLT levels in production tests

VLT	SCT										FPT							
	2000		AWL		3000		5000		10000		2000		AWL		3000		5000		10000	
	MD	Sig.	MD	Sig.	MD	Sig	MD	Sig.	MD	Sig.	MD	Sig.	MD	Sig.	MD	Sig	MD	Sig.	MD	Sig.
2000	-	-	-1.56	1.000	-5.98	.095	-7.82	**.008***	1.17	1.000	-	-	-3.54	1.000	-9.01	**.022***	-7.39	.121	-13.25	.900
AWL	1.56	1.000	-	-	-4.42	.567	-6.26	.075	2.72	-14.67	3.54	1.000	-	-	-5.46	.637	-3.85	1.000	-9.71	1.000
3000	5.98	.095	4.42	.567	-	-	-1.84	1.000	7.15	1.000	9.01	**.022***	5.46	.637	-	-	1.62	1.000	-4.24	1.000
5000	7.82	**.008***	6.26	.075	1.84	1.000	-	-	8.99	1.000	7.39	.121	3.85	1.000	-1.62	1.000	-	-	-5.86	1.000
10000	-1.17	1.000	-2.72	1.000	-7.15	1.000	-8.99	1.000	-	-	13.25	.900	9.71	1.000	4.24	1.000	5.86	1.000	-	-

Table 8
Multiple comparisons across five VLT levels in recognition tests

VLT	GJT										FBT							
	2000		AWL		3000		5000		10000		2000		AWL		3000		5000		10000	
	MD	Sig.	MD	Sig.	MD	Sig	MD	Sig.	MD	Sig.	MD	Sig.	MD	Sig.	MD	Sig	MD	Sig.	MD	Sig.
2000	-	-	-2.11	1.000	-5.07	.549	-9.19	**.006***	-14.92	.350	-	-	-6.09	.874	-10.93	**.012***	-12.25	**.003***	-19.50	.306
AWL	2.11	1.000	-	-	-2.96	1.000	-7.09	.084	-12.81	.703	6.09	.874	-	-	-4.85	1.000	-6.16	.709	-13.41	1.000
3000	5.07	.549	2.96	1.000	-	-	-4.13	1.000	-9.85	1.000	10.93	**.012***	4.85	1.000	-	-	-1.32	1.000	-8.57	1.000
5000	9.19	**.006***	7.09	.084	4.13	1.000	-	-	-5.72	1.000	12.25	**.003***	6.16	.709	1.32	1.000	-	-	-7.25	1.000
10000	14.92	.350	12.81	.703	9.85	1.000	5.72	1.000	-	-	19.50	.306	13.41	1.000	8.57	1.000	7.25	1.000	-	-

According to multiple comparisons across word levels for production tests (Table 7) and recognition tests (Table 8), significant differences were observed between the achievement levels of 2000-word and 5000-word levels (p = .008) in SCT and between the 2000-word and 3000-word level*s* (p = .022) in FPT. In SCT, 5000-word level learners ($\bar{x}$ =87.99, SD=13.41) performed significantly better than 2000-word level learners ($\bar{x}$=80.17, SD=14.75). In FPT, 3000-word level learners ($\bar{x}$ =86.76, SD=14.86) performed significantly better than the 2000-word level group ($\bar{x}$ =77.75, SD=16.58).

Regarding the post hoc test results for GJT, a statistically significant difference was found between the achievement levels of the 2000-word and 5000-word levels (p = .006). Students at the 5000-word level performed significantly better than those at the 2000-word level in recognizing complementation patterns. Lastly, in FBT, there is a statistically significant difference between the scores of the 2000-word and 3000-word

levels (p = .012) and between the scores of the 2000-word and 5000-word levels (p = .003). Both 3000-word ($\bar{x}$ = 77.43, SD = 15.79) and 5000-word level learners ($\bar{x}$ = 78.75, SD = 19.56) performed significantly better than 2000-word level students ($\bar{x}$ = 66.50, SD = 21.69).

Discussion

The current study offers an important insight into the recognition and production of EFL learners' verb complementation use and achievement levels by examining their syntactic and semantic choices in factive cognitive verbs *(i.e., know, understand, regret, remember, and forget*) complementation patterns and verb senses. Four types of tests developed by the authors were used to decipher participants' state of knowledge and use of factive cognitive verb complementation.

One remarkable finding was that word level had a significant effect on learners' receptive and productive knowledge of factive cognitive verb complementation patterns and senses. Specifically, the higher the word level, the better the test performance was in using verb complementation patterns and related senses. Parallel to this finding, Söğüt (2019) and Söğüt and Keçik (2023) studies on non-factive verb complementation revealed that Turkish EFL learners with a high word level performed better in various types of receptive and productive tasks compared to those with a lower word level. This finding supports the claim that vocabulary has a crucial role in language use (Odlin, 1989, p. 160) and rich L2 lexical knowledge yields more accurate word-meaning comprehension and production (Ringbom, 1987, p. 36; Wesche & Paribakht, 2010, p. 165). Similar to the Turkish EFL learners, in the previous studies, as proficiency increased, EFL learners tended to prefer verb complementation patterns and senses that were similar to the preferences of native speakers of English (e.g., Ard & Gass, 1987; Römer & Berger, 2019; Schwartz & Causarano, 2007; Vercellotti & Packer, 2016). For instance, in the study by Ard and Gass (1987), the authors examined the interaction between lexicon and syntax. They found that students of lower and higher proficiency levels differed in their responses to four sentence types in GJT. The lower group focused on the surface level and the syntactic aspects of the sentences, whereas the higher-level group also focused on semantic and lexical aspects. Accordingly, as they become more proficient, learners undergo a significant amount of language learning experience, during which they restructure their L2 knowledge. It is plausible that high-level learners have had greater exposure to the target language in various contexts through the use of web-based technology, such as the internet, communicating with speakers from different countries, watching films or TV series in the target language, or engaging in extensive reading. In this regard, Zinteng et al. (2023) emphasize the importance of incorporating social and cognitive dimensions of language use into the instruction of verb complementation.

A noteworthy explanation for the better performance of high-word-level learners is that they may have been exposed to a much larger number of words in English and thus have had a high degree of productive and receptive knowledge in their mental lexicon. Our finding, in this respect, supports Zhao and Jiang (2020), who claim that as grade increases, the valency pattern increases. Aligning with this claim, Park and Sung (2022), who explored the verb-argument construction use in essays by Korean learners of English, found that the pattern variation increases, and the expansion of individual verb argument constructions grows along with the EFL proficiency profile. Similarly, comparing the different proficiency levels of Chinese EFL learners' interlanguage and the English target language, Zhao and Jiang (2024) found that as proficiency levels increased, the verb complementation use of EFL learners aligned more closely with the verb complementation use in the English native language, although some disparities persisted. Römer and Berger (2019) also provide evidence from German and Spanish learners of English. According to the authors, as proficiency level increases, the productivity of verb argument constructions and their types increases, and their repertoire expands, moving toward more native-like usage. Building on these similar findings, this correlation between higher proficiency and native-like verb complementation may be attributed to some underlying developmental factors. As learners progress, they develop a greater awareness of syntactic structures, semantic constraints, and collocational patterns, which are influenced by increased interaction with authentic language and enhanced cognitive abilities.

Another plausible explanation for the difference in achievements of learners from different word levels could be the higher groups' experience, exposure, or awareness about the linguistic transfer issues between L1 and L2. A deeper insight into the responses of learners in the tests revealed that learners, especially those with low word-level proficiency, mostly transferred syntactic properties of verbs from their L1 Turkish to their L2 English. To illustrate, in Turkish, the factive cognitive verb 'regret' (*pişman ol-* in Turkish) occurs with [from NP], [because of V-ing], and [for V-ing]. Here are several sentences from Turkish to illustrate the use of these patterns:

Zamanında bunu bana anlatmadığı *için pişman oldu.* (Verb [for V-ing])
Ders çalışmadığına *pişman olacak.* (Verb [to V-ing])
Yaptığı hataları *düşününce pişman oldu.* (Verb Zero Comp.)
Söylediklerim*den pişman oluyorum*. (Verb [from wh-CL/NP]),

In low-level learners' responses, such constructions as illustrated above that are acceptable in Turkish were observed in their English productions, i.e., the use of *regret* with these incorrect patterns including but not limited to [from NP], [for NP/V-ing] [about NP/V-ing/wh-CL] [for wh-CL] and [to V-ing] patterns. To give an example, they produced sentences like "I don't *regret from my decision* at all", "*I regret because of my words*", and "*I regret about being so rude*". These instances are the result of L1 Turkish cross-linguistic transfer in learners. Similarly, Römer and Yılmaz (2019)

found evidence for collocational transfer from Turkish learners' L1 to their English productions in the use of verb constructions, specifically the use of "with NP" and "for NP" with the verb *"struggle*."

Another notable finding was that learners' performances differed significantly across various test types. Better performances were observed in less-controlled production tests (SCT and FPT) compared to more controlled recognition tests (GJT and FBT). This finding stems from the fact that there was freedom in the choice of verb complementation patterns in FPT and in SCT, which is more context-dependent. This finding does not necessarily mean that they used diverse verb complementation patterns and verbs in various senses, resulting in higher scores. In productive tests, as long as EFL learners created a grammatically correct sentence using the target verb in the appropriate sense and with the correct pattern, they earned points. To illustrate, participants received points even if they preferred to use the verb *'understand*' with the same meaning, i.e., to *comprehend or consider logical*, and followed the same pattern, e.g., a *Noun Phrase* in two different sentences. Hence, this freedom of choice allowed them to produce similar sentences having the same verb sense and verb complementation pattern. That may be why they preferred the patterns they already knew, regardless of the variation in types, and performed better in these tests.

In contrast, in the receptive tests, they were more restricted in their choice of patterns due to the context, which required a verb used in a restricted sense, and in the fill-in-the-blank test, they were expected to select between a correct or incorrect choice in the judgment test. To illustrate, in the following SCT item, the learner is expected to complete the sentence with a *Noun Phrase*, not [that-CL] or [to-INF]. Moreover, the learner is expected to use the verb with the sense referring to *'feel remorse for, feel guilty about, entails responsibility for action/situation*' as given in *the Valency Dictionary of English.*

> Judith: What advice would you offer?
>
> Paul: I'd say, " If you really want to do it, go for it. It's your life, no one else's.
>
> Judith: Would you tell your younger self the same thing if you could?
>
> Paul: You can't relive the past, and *I don't regret (those experiences).* Opportunities like that don't come every day. I knew I was lucky. And I tried to use the experience to my benefit. Looking back, I made great friends. *(drawn and adapted from Corpus of Contemporary American English)*

This example illustrates that there were limitations on which complementation pattern to choose and which verb sense to use. Thus, learners did not get points when they failed to complete the verb with an appropriate pattern in a proper sense. In this respect, it can be concluded that EFL learners tended to stick to the patterns they knew best in the production tests, as these tests were more free and flexible compared to the receptive ones, and hence, they became more successful in the production tests.

Furthermore, the poor performance of learners, especially GJT, may result from their unfamiliarity with this test. Even native speakers find it difficult to judge the acceptability of a sentence in their native language correctly. Moreover, as Odlin (1994, p. 273-281) states, even native speaker intuition does not guarantee the accuracy in judgments of sentences as there exist inconsistencies in native speakers' judgments. If this is the case for native speakers, it is much more likely that learners whose native language is not English will struggle with judging the sentences. Supporting this idea, as revealed in the study by Bley-Vroman and Masterson (1989, p. 212), non-native learners are inconsistent in their judgments regarding the acceptability of sentences. Thus, most likely, non-native learners attempt to evaluate a simple sentence presented without any contextual clues primarily by relying on their prior beliefs. In the current study, in many items, EFL learners chose the option 'not sure' and got zero points rather than selecting the options 'correct' or 'incorrect.' This reveals their hesitation in their judgments and their reluctance to provide an accurate answer. In this respect, as pointed out by Odlin (1994, p. 284), "uncertainty is one of the key characteristics of learner intuitions ."

Furthermore, as noted by Ellis (1991), it is unclear what learners rely on when making their judgments. Accordingly, many factors influence their judgments, including intra-learner and inter-learner variations, processing factors, existing interlanguage, perceived target language norms, and grammatical knowledge. Unfamiliarity with the test design or difficulty in understanding specific test items might have affected learners' performances. Therefore, EFL learners' GJT performances alone may not accurately reflect all that they know and produce in production tests.

Conclusion and Implications

In an attempt to elucidate the syntactic and semantic choices of EFL learners and their achievement levels in recognition and productive dimensions of verb complementation use, this study highlights the importance of EFL learners' word knowledge in generating accurate and appropriate use of verb complementation. Based on the findings, learners' choices are determined by various factors, such as vocabulary knowledge, the nature of the tests, the syntactic and semantic properties of verbs, contextual information associated with the verb in question, and exposure to target language input. In this sense, several implications are provided for pedagogical purposes and to facilitate further inquiries.

Considering that this study has emphasized the role of word level on EFL learners' state of knowledge and language production regarding syntactic and semantic features of verbs, the first pedagogical implication is that vocabulary learning should be enhanced in and out of the classroom. Given the important role of the lexicon in comprehension, vocabulary instruction can be effectively integrated into classroom

teaching by focusing on word meanings and usage, as well as collocations, through context-rich practices that help deepen learners' lexical understanding. Foreign language curricula should be designed based on learners' vocabulary needs to maximize their word knowledge, as the complete mastery of a word necessitates both receptive and productive knowledge. Furthermore, to reinforce learners' receptive and productive knowledge, teachers can also help learners by raising their awareness of various vocabulary learning strategies. Alternatively, they can utilize techniques such as drawing, using objects, guessing, eliciting, or creating illustrations, with a focus on the forms and meanings of words. Teachers could explicitly introduce learners to the most frequent verbs in the target language and teach them the most frequent verb complementation patterns and verb senses in English. To achieve this, for instance, valency dictionaries could be utilized to familiarize learners with the syntactic and semantic properties of verbs and practice them. To provide another example, task-based awareness-raising activities that incorporate instances of verb complementation patterns within context can be highly effective and useful for learners. Tasks provide input for learners and enable them to notice patterns when they come across them. Therefore, teachers could design different types of spoken and written tasks for practice.

As a further implication, to support vocabulary learning among students, teachers could utilize corpora of the present-day English language and bring concordance lines reflecting different varieties of language, such as newspaper articles, academic texts, magazines, or spoken language, for practicing verb complementation patterns and senses that are frequent in the language. Using such concordance-based activities as teaching materials could be very beneficial for learners, as it provides access to authentic language and allows them to discover the syntactic and semantic properties of words autonomously. In this sense, a corpus-based approach could be beneficial in teaching verb complementation, as it promotes real language use and enables learners to discover patterns through a variety of contexts.

Since learners at all word levels performed poorly in the grammaticality judgment test in comparison to other test types in this research, another pedagogical implication is that acceptability judgment tasks could be developed as written tasks to help EFL learners familiarize themselves with this test type and practice verb complementation use. Such tasks could be designed based on authentic language by using pictures or short videos along with a sentence that describes these pictures or videos and includes a specifically related verb occurring with a complementation pattern. Through such activities, learners could practice judging sentences in the target language and discover the meanings and complementation patterns of verbs. For the instances they judge as incorrect, they could be asked to rewrite sentences correctly. Such practices help learners notice what they perceive to be the correct choice and what is correct in the target language.

Building on these pedagogical suggestions, further studies could expand the scope of this inquiry by including language learners from various academic disciplines,

different educational levels such as primary or secondary education, or varying cultural or linguistic backgrounds. Such studies help generalize the findings and provide greater insights into the verb complementation use of EFL learners.

Given that the scope of this study is limited to the analysis of five factive verbs, expanding this area of study to include additional factive cognitive verbs or other semantic verb classes would be highly beneficial. Such an extension could help identify potential similarities, differences, or variations in the performance and achievement levels of learners.

Furthermore, the data in the present study were collected through a written medium, i.e., four types of tests. However, the tests included extracts or sentences from both written and spoken language (i.e., a wide range of registers, such as academic texts, fiction, magazines, and news). Future inquiries would hence benefit from the collection of data through the spoken medium to gain a deeper insight into the use of verb complementation in spoken language. For example, spontaneous conversations, interviews, or role-plays, along with visuals (e.g., pictures, images, or videos), may provide further evidence.

Another implication is that think-aloud protocols could be carried out based on learners' judgments to understand better the possible reasons behind poor performance in judgment tasks. Such think-aloud protocols could enable researchers to delve into the participants' thought processes in their preferences of verb complementation patterns and senses.

Finally, longitudinal studies could be designed to focus on a specific group of EFL learners, providing insights into both their achievement levels and the learning processes of verb complementation during interlanguage development. Case studies could also be conducted by focusing on one language learner to shed light on the development of vocabulary knowledge, particularly the learning of verb lexicon, concerning verb complementation patterns and senses.

Funding Information: This study is a part of the research project funded by the Scientific and Technological Research Council of Turkey (TÜBİTAK), Social and Human Sciences Research Grant Group (SOBAG-1001) with grant no: 118K130.

Acknowledgment

This research is part of a PhD dissertation titled *An Analysis of Factive Cognitive Verb Complementation Patterns Used by ELT Students* supervised by Prof. Dr. İlknur Keçik and funded by the Scientific and Technological Research Council of Turkey (TÜBİTAK), Social and Human Sciences Research Grant Group (SOBAG-1001) with the grant no 118K130.

References

Abbeduto, L., & Rosenberg, S. (1985). Children's knowledge of the presuppositions of *know*ing and other Cognitive verbs. *Journal of Child Language, 12,* 621–641. https://doi.org/10.1017/S0305000900006693

Altenberg, B., & Granger, S. (2001). The grammatical and lexical patterning of make in native and non-native Student writing. *Applied Linguistics, 22*(2), 173-195. https://doi.org/10.1093/applin/22.2.173

Anderson, J. I. (1983). An accuracy order of English sentential complements for native speakers of Persian and Spanish. *Papers and Studies in Contrastive Linguistics, 16,* 17–33.

Ard, J., & Gass, S. M. (1987). Lexical constraints on syntactic acquisition. *Studies in Second Language Acquisition, 9*(2), 233-252. https://sci-hub.se/10.1017/S0272263100000498

Atasever Belli, S. (2019). *An analysis of factive cognitive verb complementation patterns used by ELT students* [Unpublished doctoral dissertation]. Anadolu University.

Biber, D. (Eds.). (1988). *Variation across speech and writing*. Cambridge, UK: Cambridge University Press.

Biber, D., Johansson, S., Leech, G., & Conrad, S. (1999). *Longman grammar of spoken and written English.* Pearson Education Limited.

Bley-Vroman, R., & Masterson, D. (1989). Reaction time as a supplement to grammaticality judgments in the Investigation of second language learners' competence. *University of Hawaii Working Papers in ESL*, *8*(2), 207–237. https://scholarspace.manoa.hawaii.edu/server/api/core/bitstreams/34a2cb57-bd44-4cd7-9123-5d62c71cca68/content

Bloom, L., Rispoli, M., Gartner, B., & Hafitz, J. (1989). Acquisition of complementation. *Journal of Child Language, 16*, 101–120. https://sci-hub.se/10.1017/S0305000900013465

Bolinger, D. (1968). *Aspects of language.* New York: Harcourt, Brace, & World. https://archive.org/details/aspectsoflanguag0000dwig/page/n5/mode/2up

Booth, J., & Hall, W. S. (1995). Development of understanding of the polysemous meanings of the mental state Verb know. *Cognitive development,* 10, 529-549. https://doi.org/10.1016/0885-2014(95)90025-X

Booth, J. R., Hall, W. S., Robison, G. C., & Kim, S. Y. (1997). Acquisition of the mental state verb *known* by 2-To 5-year-old children. *Journal of Psycholinguistic Research*, 26 (6), 581–603. https://doi.org/10.1023/A:1025093906884

Bourke, J. M. (2007). Verbal complementation. A pedagogical challenge. *Reflections on the English Language Teaching, 6*(1), 35-50. https://www.nus.edu.sg/celc/wp-content/uploads/2022/11/35-50bourke.pdf

Can, A. (2009). Acquisition of English ergative verbs by Turkish students: Yesterday and today. *Procedia Social and Behavioral Sciences, 1,* 2832-2837. https://doi.org/10.1016/j.sbspro.2009.01.504

Cappelli, G. (2008). Antonymy and verbs of cognitive attitude: When *'know'* is the opposite of *'think'* and *'believe.'* In M. Bertuccelli Papi, A. Bertacca and S. Bruti (Eds.), *Threads in the complex fabric of language* (pp. 529-546). Pisa: Felici Editore.

Celce-Murcia, M., & Larsen-Freeman, D. (1999). *The grammar book: An ESL/EFL Teacher's course.* Boston, MA: Heinle and Heinle.

COCA. (2018). Corpus of Contemporary American English. Retrieved from https://corpus.byu.edu/coca/

Duffley, P. J., & Tremblay, R. (1994). The infinitive and the *–ing* as complements of verbs of effort. *English Studies, 75(6)*, 566-575. https://sci-hub.se/10.1080/00138389408598945

Ellis, R. (1991). Grammatical judgments and second language acquisition. *Studies in Second Language Acquisition*, *13*(2), 161-186. https://sci-hub.se/10.1017/S0272263100009931

Fetzer, A. (2008). "And I think that is a very straightforward way of dealing with it ." The communicative function of cognitive verbs in political discourse. *Journal of Language and Social Psychology, XX*(X), 1–13. https://doi.org/10.1177/0261927X08322

Fetzer, A., & Johansson, M. (2010). Cognitive verbs in context: A contrastive analysis of English and French Argumentative discourse. *International Journal of Corpus Linguistics, 15*(2). https://doi.org/10.1075/ijcl.15.2.05fet

Gass, S. M., & Selinker, L. (2008). *Second language acquisition: An introductory course*. (Third Edition). New York: Routledge.

Givón, T. (1973). The time-axis phenomenon. *Language, 49*(4), 890–925. https://doi.org/10.2307/412067

Givón, T. (2001). *Syntax: An introduction*. Amsterdam: John Benjamins Publishing Company.

Herbst, T. (2004). Valency theory and the valency dictionary of English. A few remarks on the linguistic and lexicographical principles. In T. Herbst, D. Heath, I.F. Roe, and D. Götz. (Eds). *A Valency Dictionary of English*. Berlin/New York: Mouton de Gruyter.

Herbst, T., Heath, D., Roe, I.F., & Götz, D. (2004). *A Valency Dictionary of English*. Berlin/New York: Mouton de Gruyter.

Herbst, T. (2007). Valency complements or valency patterns? In T. Herbst and K. Götz-Votteler (Eds.), *Valency: Theoretical, descriptive, and cognitive issues* (pp. 15-36). Berlin: Mouton de Gruyter.

Herbst, T., & Götz-Votteler, K. (2007). *Valency: Theoretical, descriptive, and cognitive issues*, Berlin: Mouton De Gruyter.

Kidd, E., Lieven, E., & Tomasello, M. (2006). Examining the role of lexical frequency in the acquisition and Processing of sentential complements. *Cognitive Development, 21*(2), 93- 107. https://sci-hub.se/10.1016/j.cogdev.2006.01.006

Kidd, E., Lieven, E. V. M., & Tomasello, M. (2010). Lexical frequency and exemplar-based learning effects in Language Acquisition: Evidence from Sentential Complements. *Language Sciences, 32*(1), 132-142. https://pure.mpg.de/rest/items/item_2502706/component/file_2502705/content

Levin, B. (2015). Semantics and pragmatics of argument alternations. *Annual Review of Linguistics, 1*, 63–83. https://doi.org/10.1146/annurev-linguist-030514-125141

Milton, J. (2009). *Measuring second language vocabulary acquisition*. Great Britain. Short Run Press.

Moore, C., Bryant, D., & Furrow, D. (1989). Mental terms and the development of certainty. *Child Development*, *60*(1), 167–171. https://www.jstor.org/stable/pdf/1131082.pdf?refreqid=fastly-default%3A5a45e12e6afe161f7bdbd596a7184f09&ab_segments=&initiator=&acceptTC=1

Nation, P. (1983). Testing and teaching vocabulary. *Guidelines, 5*(1), 12-25. https://www.wgtn.ac.nz/lals/resources/paul-nations-resources/paul-nations-publications/publications/documents/1983-Testing-and-teaching.pdf

Naigles, L. R. (2000). Manipulating the input: Studies in mental verb acquisition. In B. Landau, J. Sabini, J. Jonides and E. Newport (Eds.), *Perception, cognition, and language: Essays in honor of Henry and Lila Gleitman* (pp. 245–274). Cambridge, MA: MIT Press.

Nixon, S. M. (2005). Mental state verb production and sentential complements in four-year-old children. *First Language, 25*(1), 19-37. https://sci-hub.se/10.1177/0142723705046898

Odlin, T. (1989). *Language transfer. Cross-linguistic influence in language learning*. Cambridge: CUP.

Odlin, T. (1994). *Perspectives on pedagogical grammar*. Cambridge: Cambridge University Press.

Pallant, J. (2007). *SPSS survival manual. A step by step guide to data analysis using SPSS for Windows*. England: Open University Press.

Palmer, F. R. (1988). *The English verb*. London: Longman Linguistics Library.

Papafragou, A., Cassidy, K., & Gleitman, L. (2007). When we think about thinking: The acquisition of belief Verbs. *Cognition, 105,* 125-165. https://doi.org/10.1016/j.cognition.2006.09.008

Park, J. H., & Sung, M. C. (2022). Expansion of verb-argument construction repertoires in L2 English Writing. *International Review of Applied Linguistics in Language Teaching*, (0), 1-23. file:///C:/Users/DELL/Downloads/10.1515_iral-2022-0145%20(3).pdf

Perek, F. (2015). *Argument structure in usage-based construction grammar*. Amsterdam: John Benjamins Publishing Company.

Quirk, R., Greenbaum, S., Leech, G., & Svartvik, J. (1985). *A comprehensive grammar of the English Language.* London: Longman.

Ringbom, H. (1987). *The role of L1 in foreign language learning.* Clevedon: Multilingual Matters.

Römer, U., & Berger, C. M. (2019). Observing the emergence of constructional knowledge: Verb patterns in

German and Spanish learners of English at different proficiency levels. *Studies in Second Language Acquisition, 41*(5), 1089-1110. https://doi.org/10.1017/S0272263119000202

Römer, U., & Yılmaz, S. (2019). Effects of L2 usage and L1 transfer on Turkish learners' production of English Verb-argument constructions. *VIAL-VIGO International Journal of Applied Linguistics*, *16*, 107-133. 10.35869/vial.v0i16.95

Roe, I. (2007). Valency and the errors of learners of English and German. In Herbst, T., & Götz-Votteler, K. (Eds). *Valency: Theoretical, descriptive, and cognitive issues.* (pp. 217-229). Berlin: Mouton de Gruyter.

Schmitt, N., Schmitt, D., & Clapham, C. (2001). Developing and exploring the behavior of two new versions Of the Vocabulary Levels Test. *Language testing*, *18*(1), 55-88 https://www.lextutor.ca/tests/schmitts_clapham_2001.pdf.

Schwartz, M., & Causarano, P. L. (2007). The role of frequency in SLA: An analysis of gerunds and infinitives In ESL written discourse. *Arizona Working Papers in SLA and Teaching, 14,* 43-57. http://w3.coh.arizona.edu/awp/

Shatz, M., Wellman, H. M., & Silber, S. (1983). The acquisition of mental verbs: A systematic investigation of The first reference to mental state. *Cognition, 14*, 301-321. https://sci-hub.se/10.1016/0010-0277(83)90008-2

Söğüt, S. (2019). *EFL learners' use of non-factive cognitive verb complementation: A cross-sectional investigation*. [Unpublished doctoral dissertation]. Anadolu University.

Söğüt, S., & Keçik, İ. (2023). EFL Learners' production of verb complementation patterns and verb senses: An Investigation on high-frequency cognitive verbs. *The Reading Matrix: An International Online Journal, 23*(1).

Stojičić, V. (2008). Functional labeling with polysemy verbs. *Linguistics and Literature, 6*(1), 27-34.

Vasco, I. B. (2024). *The power of video games: Teaching verbal complementation patterns to l1 Spanish EFL students in the 1st year of non-compulsory secondary education*. [Unpublished master's thesis]. Universidad de Jaén.

Vercellotti, M. L., & de Jong, N. (2013). Use and accuracy of verb complements in English L2 speech. *Dutch Journal of Applied Linguistics, 2*(2), 243-250. https://doi.org/10.1075/dujal.2.2.05lou

Vercellotti, M. L., & Packer, J. (2016). Shifting structural complexity: The production of clause types in Speeches given by English for academic purposes students. *Journal of English for Academic Purposes, 22,* 179-190. https://doi.org/10.1016/j.jeap.2016.04.004

Wang, D. (2014). Verbs taking "to+v" or "v+ing" as their complements: A cognitive grammar account. *International Journal of Linguistics, 6*(5), 143-153. https://doi.org/10.5296/ijl.v6i5.6492

Wang, Y., & Shaw, P. (2008). Transfer and universality: Collocation use in advanced Chinese and Swedish Learner English. *ICAME journal*, *32*, 201–232.

Wellman, H. M., & Estes, D. (1987). Children's early use of mental verbs and what they mean. *Discourse Processes*, *10*(2), 141–156. https://sci-hub.se/https://sci-hub.se/10.1080/01638538709544666

Wesche, M. B., & Paribakht, T. S. (2010). *Lexical inferencing in a first and second language. Cross-linguistic Dimensions*. Short Run Press: Great Britain.

Yoon, C. (2016). Korean EFL learners' use of to-infinitival and gerundial verb complementation: A constructionist approach. *Journal of Language Sciences, 23*(2), 193–217. https://doi.org/10.14384/kals.2016.23.2.193

Zinteng, J., Gyau, A., & Fuseini, M. (2023). Teaching college students comprehensive approach to verb Complementation. *African Journal of Emerging Issues, 5*(5), 84-95. https://ajoeijournals.org/sys/index.php/ajoei/article/view/409/487

Zhao, Q., & Jiang, J. (2020). Verb valency in interlanguage: An extension to valency theory and new perspective on L2 learning. *Poznan Studies in Contemporary Linguistics, 56*(2), 339- 363. https://doi.org/10.1515/psicl-2020-0010

Zhao, Q., & Jiang, J. (2024). Syntactic functions of words grammatically related to verbs in interlanguage: A Valency perspective. *Lingua, 300,* 103675. https://doi.org/10.1016/j.lingua.2024.103675

Appendix A. Descriptive Statistics of Tests

Test Type	VLT	$\bar{x}$	SD
GJT*	2000	56.08	13.934
	AWL	58.19	14.829
	3000	61.15	15.160
	5000	65.28	16.205
	10000	71.00	15.572
	Total	60.67	15.463
FBT*	2000	66.50	21.693
	AWL	72.59	20.567
	3000	77.43	15.795
	5000	78.75	19.568
	10000	86.00	13.416
	Total	74.46	19.760
SCT*	2000	80.17	14.757
	AWL	81.72	13.590
	3000	86.15	10.648
	5000	87.99	13.418
	10000	79.00	18.841
	Total	84.22	13.471
FPT*	2000	77.75	16.581
	AWL	81.29	18.861
	3000	86.76	14.861
	5000	85.14	17.177
	10000	91.00	8.944
	Total	83.22	16.994

* Maximum score is 100.

Authors

Assist. Prof. **Dr. Serap Atasever-Belli** (Corresponding Author) Erzurum Technical University, Erzurum, Turkiye. Author Bio: Serap Atasever Belli is currently working as an Assistant Professor at the Department of English Language and Literature at Erzurum Technical University. She completed a Ph.D. in foreign language education program at Anadolu University with a dissertation on the analysis of factive cognitive verb complementation patterns used by students in English Language Teaching Program, which is funded by The Scientific and Technological Research Council of Turkey (TÜBİTAK) Social and Human Sciences Research Grant Group (SOBAG-1001) with the Project No. 118K130. She has research interests in pre-service teacher training, second language writing, discourse analysis, corpus linguistics, and digitalization in language education.

ORCID: https://orcid.org/0000-0003-3605-4943

Dr. İlknur KEÇİK (Co-author) Her research interests include discourse analysis, applied linguistics, English language teaching methodology, pre-service and in-service teacher training, and reflective practices in teaching. She has participated as a project director and researcher in various research projects funded by the Scientific and Technological Research Council of Turkey and Scientific Research Projects in Higher Education Institutions. She has recently retired but continues to teach graduate and undergraduate courses at the university and supervise PhD students.

ORCID: https://orcid.org/0000-0001-9764-4432

How to reference this article: Atasever Belli, S., & Kecik, İlknur. (2025). EFL Learners' Receptive and Productive Knowledge of Factive Cognitive Verbs' Complementation Patterns. *GIST – Education and Learning Research Journal, 30*(30). https://doi.org/10.26817/16925777.1906