65. A Typological Look at the Acquisition of Adjective Clauses within the Framework of Cognitive Linguistics Theory[1]

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Abstract

The acquisition of complex syntactic structures, such as adjective clauses, is a critical aspect of second language learning that has garnered significant interest within the field of linguistics. This study takes a typological approach to explore how learners of different language pairs acquire and comprehend adjective clauses, with a particular focus on the cognitive linguistics framework of the figure-ground relationship. The research involved 80 participants, including 20 Germans learning Turkish, 20 Germans learning English, 20 Turkish adults learning English, and 20 Turkish adults learning German. The participants' proficiency levels ranged from B2 to C1, and they were selected using convenience sampling from language teaching and related departments. A mixed-methods research paradigm was employed, combining both qualitative and quantitative data collection methods. The study utilized a series of tasks designed to assess participants' comprehension and production of adjective clauses, including picture selection, sentence connection, translation, sentence correction, and relative clause repetition tasks. The results were analyzed using the Chi-square test to identify patterns and differences in performance across the participant groups. The findings revealed no significant differences in performance across the tasks among the different participant groups, suggesting that the cognitive mechanisms underlying the comprehension and construction of complex sentences may be similar across diverse language pairs and learner backgrounds. This supports the notion that the figure-ground relationship, a fundamental aspect of cognitive processing in language, plays a crucial role in how learners acquire complex syntactic structures. The study's implications extend to language teaching and curriculum design, emphasizing the importance of incorporating cognitive linguistics principles into instructional materials and teaching strategies. By

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understanding the cognitive processes involved in language acquisition, educators can develop more effective approaches to teaching complex sentence structures. Additionally, the research contributes to the broader linguistic literature by providing insights into the typological aspects of language acquisition and the role of cognitive frameworks in understanding syntactic complexity.

Keywords : Second language acquisition, cognitive linguistics, figure-ground, relative clauses

Sıfat tümcelerinin edinimine bilişsel dilbilim kuramı çerçevesinde tipolojik Bir bakış[4]

Öz

Sıfat tümceleri gibi karmaşık sözdizimsel yapıların edinimi, dilbilim alanında özellikle ikinci dil öğreniminde kritik bir öneme sahiptir. Bu çalışma, farklı dil çiftlerini öğrenenlerin sıfat tümcelerini nasıl edindiklerini ve anladıklarını araştırmak için tipolojik bir yaklaşım benimsemekte ve özellikle şekil-zemin ilişkisinin bilişsel dilbilim çerçevesine odaklanmaktadır. Araştırma, Türkçe öğrenen 20 Alman, İngilizce öğrenen 20 Alman, İngilizce öğrenen 20 Türk yetişkin ve Almanca öğrenen 20 Türk yetişkin olmak üzere 80 katılımcıyı içermektedir. Katılımcıların yeterlilik seviyeleri B2 ile C1 arasında değişmektedir ve katılımcılar dil öğretimi ve ilgili bölümlerden kolayda örnekleme yoluyla seçilmiştir. Nitel ve nicel veri toplama yöntemlerini birleştiren karma yöntemli bir araştırma deseni kullanılmıştır. Çalışmada, katılımcıların sıfat tümcelerini anlama ve üretme becerilerini değerlendirmek üzere tasarlanmış, resim seçme, tümce bağlama, çeviri, tümce düzeltme ve sıfat tümce tekrarı görevlerini içeren bir dizi görev kullanılmıştır. Sonuçlar, katılımcı grupları arasındaki performans örüntülerini ve farklılıklarını belirlemek için Ki-kare testi kullanılarak analiz edilmiştir. Bulgular, farklı katılımcı grupları arasında görevler arasındaki performansta önemli bir farklılık olmadığını ortaya koymuştur; bu da karmaşık cümlelerin anlaşılması ve oluşturulmasının altında yatan bilişsel mekanizmaların farklı dil çiftleri ve öğrenici geçmişleri arasında benzer olabileceğini düşündürmektedir. Bu durum, dilde bilişsel işlemenin temel bir yönü olan şekil-zemin ilişkisinin, öğrencilerin karmaşık sözdizimsel yapıları nasıl edindiklerinde önemli bir rol oynadığı fikrini desteklemektedir. Çalışmanın sonuçları, bilişsel dilbilim ilkelerinin öğretim materyallerine ve öğretim stratejilerine dâhil edilmesinin önemini vurgulayarak dil öğretimi ve müfredat tasarımına kadar uzanmaktadır. Eğitimciler, dil ediniminde yer alan bilişsel süreçleri anlayarak karmaşık cümle yapılarının öğretiminde daha etkili yaklaşımlar geliştirebilirler. Ayrıca araştırma, dil ediniminin tipolojik yönleri ve bilişsel çerçevelerin sözdizimsel karmaşıklığı anlamadaki rolü hakkında görüşler sağlayarak daha geniş dilbilim alan yazınına katkıda bulunmaktadır.

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Introduction

The study of language acquisition, especially the comprehension and construction of complex sentences, remains a cornerstone of linguistic research. Adjective clauses are among the complex sentences that most interest linguistic theories. It can be said that studies on the acquisition of studies with adjective clauses started to increase after the 1960s (Chomsky, 1965; Diessel, 2004; Diessel & Tomasello, 2005; Guasti, Vernice, & Frank, 2018; Haig, 1997; Hamilton, 1995; Kornfilt, 1997, 2000; Ross, 1967;Smith, 1964; Wiechmann, 2015; Wilson, 1963; Young, 2018). The acquisition of adjective clauses, which were initially studied theoretically and typologically and later validated in both first and second language domains, remains relevant (Chomsky, 1965; Comrie, 1989; Frank & Ernst, 2018; Gibson, 1998; Hamilton, 1995; Kayne, 1994; Keenan & Comrie,1977; O'Grady, 2011; Thornton, 2016; Wu, Kaiser & Vasishth, 2018). From a typological point of view, adjective clauses are coded as prenominal, postnominal, circumnominal, correlative and participle in front of the noun (De Vries, 2002). According to the results of typological and psycholinguistic research, 7 hypotheses have been developed with adjective clauses. These are the noun phrase acquisition hierarchy (Keenan & Comrie, 1977), the process of subject acquisition in adjective clauses (Keenan, 1975), the perceptual difficulty moderation hypothesis (1975), the subject-object hierarchy hypothesis for adjective clauses (Hamilton, 1994), the parallel function hypothesis (Sheldon, 1974), the perspective change hypothesis (Mac-Whinney & Pleh, 1975), and the hypothesis of the acquisition of adjective clauses without interruption/intervention (1973). In addition to these hypotheses, there are also studies that evaluate adjective clauses according to corpus linguistics results (Wiechman, 2015). Corpus linguistics tests the validity of sentences used in hypotheses and sentences used in everyday life. Thus, corpus linguistics discusses the findings and sampling of hypotheses by giving more authentic examples in this sense (Wiechmann, 2015). Despite emerging as a reaction to generative transformational grammar theory, cognitive linguistics and usage-based grammar studies have not developed a very detailed theory of adjective clauses (Wiechman, 2015).

Due to the preference of the researchers or the limited number of data collection tools, most of the studies on adjective clauses focus on understanding these clauses. In recent years, studies on adjective clauses have started to increase in Turkey (Boran, 2018; Ekmekçi, 1990; Ördem, 2017; Ördem, Özezen, Darancık, Mavaşoğlu, & Hadutoğlu, 2018; Özçelik, 2006; Paluluoğlu, 2017; Turan, 2012, 2018; Yas, 2016). It is seen that there are fewer studies on the production of adjective clauses. Despite all these studies, it is not known how adjective clauses are acquired and how they are algorithmically formed psycholinguistically. The data on adjective clauses are still largely interpreted within the paradigm of generative transformational grammar. Talmy (1975) proposed the figure-ground relation in linguistics for the understanding of complex sentences. While figure is defined as a limited and small moving figure, ground is defined as a larger, wider, fixed and reference point. For Talmy, the relationship between two sentences can also be based on the figure-ground relationship. In the sentence 'The pen is on the table', the pen is the figure and the table is the ground. The main thesis of cognitive linguistics is that the basic organization of simple or complex sentences is based on the figure-ground relation (Grundy, 2004; Langacker, 2000; Thiering, 2011). Although there are studies on this subject at the lexical and simple sentence level, there is a need for studies in the learning of complex sentences, especially in the learning of adjective clauses (Diessel, Dabrowska, Divjak, 2019).

The originality of this study stems from the possibility of revealing similarities and differences while learning adjective clauses on the basis of figure-ground. Previous studies have been largely based on

syntax, and the form-ground relationship needs to be adequately addressed on the basis of Gestalt theory. Considering that cognitive linguistics basically benefits from fields such as cognitive neuroscience, psychology, body, affective-motor, it can be seen as a normal field of study to emphasize the shape-ground relationship from the field of psychology (Barsalou, 2010; Evans, 2012; Gallese & Lakoff, 2005). In order to overcome this deficiency in the field, this study designed a production-based research method and analyzed adjective clauses with a Cognitive Linguistics approach within the framework of the figure-ground relationship based on the Gestalt theory (Croft & Cruse, 2004; Evans, 2012; Ungerer & Schmidt, 2013). In contrast to classical models, Cognitive Linguistics, also known as Cognitive Grammar, analyzes complex sentences such as adjective clauses within the framework of concepts such as analogy, figure, ground, category ambiguity, attention, and perceptual selectivity. According to this approach, the reason why there are adjective clauses in the position of subject qualifying the subject, adjective clauses in the position of object qualifying the subject, adjective clauses in the position of object qualifying the object, and adjective clauses in the position of subject qualifying the object in order of difficulty lies in the relationship between cognitive structure and the partial overlap of the reality of objects in the world (Croft, 2001; Goldberg, 2006). The position of objects in the world and the perception of these objects in terms of the four principles of Gestalt occur according to the principles of proximity, similarity, boundary and continuity (Ungerer & Schmidt, 2013).

This paper introduces the field by examining the acquisition of adjectival clauses through the conceptual lens of the figure-ground relation in cognitive linguistics. First proposed by Talmy (1975) in the context of motion descriptions, this theory has since evolved to influence how complex sentence structures are perceived and understood. The novelty of the study lies in its focus on the figure-ground relation as a basic cognitive framework for understanding the acquisition of complex syntactic structures, especially adjectival clauses, an under-researched area. The figure-ground relation, as conceptualized by Talmy (1975), presents a dichotomy in which the figure is a distinct, often dynamic entity perceived against a more comprehensive, static background, the ground. This duality is crucial in understanding how language users understand and construct sentences. Talmy (1975) explores the cognitive-semantic categories of figure and ground, which are particularly important in the context of movement or location events. A figure is defined as a moving or movable object whose path or location is the focal point, while the ground is a reference point that provides a fixed environment in which the path or location of the figure is characterized.

Talmy (1975) explains these concepts with examples such as "the pencil was on the table" and "the pencil fell off the table", where the pencil functions as the figure and the table as the ground. He argues that these categories are not only restatements of movement and position, but also independent concepts that can be demonstrated in positional events where both objects are static, as in the sentences "the bicycle is next to the house" and "the house is next to the bicycle", and that they are not synonymous because of the difference in the way they specify the semantic functions of figure and ground. The study also explores the application of the categories of shape and ground in locative and locative-like situations, showing that the subject of a locative question must be shape, as seen in examples such as "Where is the lamp?" and "The lamp (Shape) is next to the chair (Ground)". Talmy also extends these categories to temporal structures in complex sentences, where the temporal location of the shape event is considered as a variable characterizing a certain value with respect to a ground event that is taken as a reference point in a temporal frame of reference. Overall, Talmy's analysis of shape and ground in complex sentences provides valuable insights into the semantic structure of language and the cognitive processes underlying the interpretation of spatial and temporal relations. Cognitive linguists such as Langacker (2000) and Grundy (2004) argue that this relationship is not just a perceptual phenomenon

but a fundamental aspect of cognitive processing in language. They argue that the cognitive mechanisms that guide our perception and attention in the physical world also shape our linguistic structures. This perspective suggests that understanding complex sentences, such as adjective phrases, requires an appreciation of how language users cognitively distinguish and associate shapes and grounds in their mental conceptualizations.

The acquisition of complex sentence structures, especially adjectival clauses, is an area that remains to be explored. Diessel, Dabrowska, and Divjak (2019) observe a gap in research at this intersection and note the potential for important findings. Adjective clauses that provide descriptive details and qualifications often involve a more complex figure-ground interaction. Understanding how learners acquire the ability to parse and produce such structures may offer insights into the cognitive processes underlying complex sentence structure. Integrating Gestalt theory into linguistic studies, especially in the context of shape-ground relations, opens new avenues for understanding language acquisition. Emphasizing how the human mind perceives patterns and wholes, this theory can provide a valuable framework for studying how language users perceive and organize linguistic information. This approach can enrich traditional syntax-focused analyses in linguistics, offering a more holistic understanding of how language is processed and learned. The examples in this study will be given without explicitly declaring the figure-ground relationship to the participants. The following example of a figure-ground relationship can be given.

a. The dog running in the meadow is very beautiful. (Figure -- Ground)

b. The meadow where the dog runs is very beautiful. (Background - Figure)

c. The lamp on the table is in the small room (Figure -- Floor)

d. The table under the lamp is in the small room (Floor- Figure)

In particular, this study draws on interdisciplinary insights from cognitive neuroscience, psychology, and affective-motor studies. As scholars such as Barsalou (2010), Evans (2012) and Gallese & Lakoff (2005) have emphasized, these fields offer invaluable perspectives on how cognitive processes influence language comprehension and production. This interdisciplinary approach is in line with the principles of cognitive linguistics, which suggests that language is deeply connected to the broader cognitive abilities of the human mind. In order to address this gap in the field, this study designed a research methodology based on one comprehension-based activity and four production-based activities and analyzed adjective clauses with a Cognitive Linguistics approach in terms of figure-ground relations based on Gestalt theory (Croft & Cruse, 2004; Evans, 2012; Ungerer & Schmidt, 2013). In contrast to classical models, Cognitive Linguistics, also known as Cognitive Grammar, analyzes complex sentences such as adjective clauses within the framework of concepts such as analogy, figure, ground, category ambiguity, attention, and perceptual selectivity. According to this approach, the reason why there are adjective clauses in the position of subject qualifying the subject, adjective clauses in the position of object qualifying the subject, adjective clauses in the position of object qualifying the object, and adjective clauses in the position of subject qualifying the object in order of difficulty lies in the relationship between cognitive structure and the partial overlap of the reality of objects in the world (Croft, 2001; Goldberg, 2006). The location of objects in the world and the perception of these objects in terms of the four principles of Gestalt occur according to the principles of proximity, similarity, boundary and continuity (Ungerer & Schmidt, 2013). The analysis of adjective clauses typologically

requires studies within the framework of this theory. Therefore, the study is expected to contribute to the field of typology as students from different languages will participate in the study.

Research Questions

1. In which ways do German adults learning Turkish understand and produce adjective clauses in subject and object position according to the relation between form and ground?

2. In which ways do German adults learning English understand and produce adjective clauses with subject and object positions according to the relation between figure and ground?

3. In which ways do Turkish EFL learners understand and produce adjective clauses in subject and object position according to the relation between figure and ground?

4. In which ways do Turkish adults learning German understand and produce adjective clauses in subject and object position according to the relation between form and ground?

Method and Research Design

This study adopts a mixed-method research paradigm to investigate the acquisition and comprehension of language structures in different groups of learners. By integrating both qualitative and quantitative approaches, the study aims to examine the subject and object acquisition of adjective clauses in a figure-ground framework based on comprehension and production-based data.

Participants

The study involved four different groups of participants, ranging in age from 21 to 30 years old and with language levels of B2 plus and C1. The German participants learned Turkish and English at school. All of them studied language teaching or language-related subjects. Similarly, the Turkish participants were trained in language teaching. Since the researcher's perspective on gender is not based on binary relations, the gender variable was excluded from the study. Convenient/accessible sampling method was used in the study. The participants consisted of 20 German adults learning Turkish, 20 German adults learning English, 20 Turkish adults learning English, and 20 Turkish adults learning German, for a total of 80 participants. These participants were selected to represent a cross-section of language learners engaged in understanding and applying grammatical structures across different language pairs. This diverse pool of participants allows for a comparative analysis of language acquisition processes influenced by different linguistic backgrounds.

Data Collection Tools and Procedure

In this study, four different data collection tools were used to ensure the collection of data appropriate to the research questions. All data collection tools were administered in accordance with ethical rules, and confidentiality and anonymity of the participants were ensured. Data were collected through two pre-study activities and five main activities. The activities addressed both production and comprehension elements. A primary criterion was that all adjective clauses used in the activities had a form-ground relationship in the qualifier-qualified relationship. Another criterion was that the sentence lengths should not exceed seven words. Sentences are generally given in the range of 5-7 words. This criterion is based on findings from memory studies (Baddeley, 2020; Tulving & Craik, 2000). In

addition, the words were mostly given at the basic level because the cognitive domain was not given an additional load since the goal of the study was a syntactic measure. Another criterion is that in the adjective clauses, various nouns such as human, animate, place, inanimate, animal are qualified in the qualifier-qualified relationship. Thus, the qualifiers are not only human and living things.

Since the study aimed to measure German and Turkish participants' prior knowledge about adjective clauses, two activities were used to measure participants' prior understanding. These activities consisted of measuring the participants' existing knowledge of nouns, verbs and inflectional suffixes as well as their ability to use adjectival pronouns to form adjective clauses.

Pre-Comprehension Activities

Understanding Nouns and Verbs: In the first activity, participants were asked to recognize the meaning of certain nouns and verbs that would be used throughout the study. The aim was to ensure a common understanding of these words among all participants. Participants were given a list of verbs and nouns and asked to write down their equivalents in the target languages. If they did not know them, the procedure was repeated until the researchers gave the meanings of the words and made sure that the participants knew them. Since the aim of the study was to measure a grammatical feature and the meanings of the words were not cognitively loaded, the vocabulary level was kept at a basic level. For example, German participants were asked to explain the meaning of the Turkish verb "chase", while Turkish participants were asked to define the German verb "laufen" (to run). For both groups of English learners, this word was 'chase'.

Inflectional Suffixes and Adjectival Pronouns: The second activity was divided into two parts adapted to the linguistic background of the participants: German participants learning Turkish were presented with a paragraph showing the use of inflectional suffixes in adjective phrases in Turkish. They were given sentences with blanks for certain verbs and asked to fill in the blanks with the appropriate verb forms. For example, they were given a sentence like "The dog chased the cat _____ very fast" and asked to fill in the blank with the correct form of the verb "chase". Turkish participants learning German and both German and Turkish participants learning English were given a paragraph focusing on adjectival pronouns. They were asked to use only the adjectival pronoun that would form the correct adjectival phrase in the given context. For example, they were asked to complete a sentence like ""The cat _____ is sitting on the mat is mine"" with the appropriate adjectival pronoun "that/which". Thus, it was ensured that the participants knew the adjective phrase pronoun.

Comprehension Based Activity

Picture Selection Activity: Participants were presented with 20 pictures along with the sentences and were asked to choose the pictures that best fit the scenarios described to assess their comprehension of the adjective clauses heard. The participants were read the sentences in a randomized order and asked to select the relevant picture. Sample sentences involving the figure-ground relationship are as follows. In the first picture, the dog is emphasized as a shape, while the ground is emphasized in accordance with the second sentence

1a. The dog running in the meadow is very beautiful. (Figure -- Ground)

1b. The meadow where the dog runs is very beautiful (Ground - Figure)

Production Based Activities

Sentence Linking Activity: In this activity, participants were given independent sentences and asked to use adjective clauses in these sentences. Thus, the participants' ability to produce coherent and grammatically correct structures was tested.

2a. The baby is sleeping in the bed. The bed looks comfortable.

2b. The baby is asleep in bed. The baby looks happy.

Translation Activity: Participants translated sentences between their mother tongue and the language they were learning. This activity assessed their ability to apply grammar rules across languages. Sample sentences involving the figure-ground relationship are given below.

3a. Birds with nests in trees may be in danger.

3b. The student's classroom faces the sea.

4a. Books on the table are important for students.

4b. The container pulled by the cart contained many products.

Sentence Correction Activity: Sentences were presented for the participants to evaluate their accuracy. Sentences that were thought to be incorrect were corrected by the participants, thus demonstrating their comprehension and production skills. While creating the wrong adjective clause, different suffixes were given to the adjective clause in Turkish, and in English and German sentences, the adjective clause pronoun was removed or the adjective clause pronoun was preserved in the sentence and the verb conjugation was not given correctly. Sample sentences containing the figure-ground relationship are given below.

5a. Watermelon grown in the field requires a lot of water.

5b. The lemons she picked in the garden are sour.

6a. A child laughs as he sits on the grass.

6b. The park where children play is big.

Adjective Phrase Repetition Activity: Participants listened to 20 adjective clauses and repeated them to test their auditory comprehension and grammatical structure retention. Each sentence contained 5-7 words based on memory exercises. In accordance with this explanation, examples involving the figure-ground relation are given below.

7a. The woman who swam in the pool for a long time got tired.

7b. The forest the students drove away from was large.

8a. The woman who lived alone on the island managed to survive.

8b. The barn where the animals escaped the fire was damaged.

Data Analysis

Quantitative data, such as scores from the Picture selection, Sentence Linking and translation activities, were statistically analyzed to identify patterns, differences and similarities across participant groups. Qualitative data, including responses from pre-perceptual assessment activities and sentence correction activities, were subjected to thematic analysis to reveal underlying cognitive processes and learning models. The analysis focused on comparing participants' performance and learning strategies across different language pairs, with particular attention to how adjectival clauses are understood and produced.

The primary aim of this research was to investigate the acquisition and production of adjective clauses by adult learners of different language pairs (German learners of Turkish and English, and Turkish learners of German and English). To measure proficiency and identify patterns, various activities were employed to test comprehension and production skills. The chi-square test was chosen for its suitability in analyzing categorical data (e.g., correct vs. incorrect responses) from these activities. It facilitated the comparison of performance across different participant groups, helping to determine significant differences and relationships between group backgrounds and activity performance. Additionally, being a non-parametric test, it was appropriate for the categorical nature of the data, which did not require the assumptions of normality. The chi-square test was specifically applied to assess performance in picture selection, sentence linking, translation, sentence correction, and sentence repetition activities. This provided insights into whether proficiency in comprehending and producing adjective clauses varied significantly among the groups, addressing the research questions effectively. In addition, One of the key objectives was to compare the performance across different groups of participants. The chi-square test allows for the comparison of observed frequencies (actual responses) with expected frequencies (based on theoretical distributions) to determine if there are significant differences between groups. This was essential to address the research questions related to the similarities and differences in the acquisition and production of adjective clauses among the participant groups. Thus, the chi-square test was essential in analyzing categorical data, comparing group performances, and forming a robust statistical foundation for the conclusions.

Based on a mixed methods research paradigm, this methodology and method design is adapted to

explore the nuances of language learning in different linguistic and cultural backgrounds. Using a range of data collection tools, the study aims to provide a comprehensive understanding of how learners of German and Turkish acquire, process and use grammatical structures and to go beyond mere linguistic competence to a deeper cognitive understanding.

Findings

The findings section presents the findings of the study, which aimed to address the research questions outlined in the methodology. The activities were delivered to four groups: German participants learning Turkish, German participants learning English, Turkish participants learning German and Turkish participants learning English. The findings for each research question are presented below.

Research Question 1 and Findings: In which ways do German adults learning Turkish understand and produce adjective clauses in subject and object position according to the relation between figure and ground?

Table 1. Descriptive Results of German Adult Turkish Language Learners' Comprehension and Production of Adjective Clauses Depending on the Activities

Events	**Correct (f, %)**	**Incorrect (f, %)**	**Total (f, %)**
Image Selection	14 (70%)	6 (30%)	20 (100%)
Linking Sentences	12 (60%)	8 (40%)	20 (100%)
Translation	15 (75%)	5 (25%)	20 (100%)
Sentence Correction	17 (85%)	3 (15%)	20 (100%)
Repetition of Sentences Containing Adjective Clauses	12 (60%)	8 (40%)	20 (100%)

Table 1 presents the performance of German-speaking adults in five different activities while learning Turkish. Most of the participants showed proficiency in Sentence Correction (85% correct) and Translation (75% correct). Performance was also above average in the Picture Selection activity and Repetition of Sentences with Adjective Clauses, with 70% and 60% correct answers, respectively. The Connecting Sentences activity was more challenging and only 60% of the participants gave correct answers.

Research Question 2 and Findings: In what ways do German adult learners of English understand and produce adjective clauses with subject and object positions according to the relation between figure and ground?

Descriptive Results of German Adult EFL Learners' Comprehension and Production of Adjective Clauses Depending on Activities

Events	**Correct (f, %)**	**Incorrect (f, %)**	**Total (f, %)**
Image Selection	18 (90%)	2 (10%)	20 (100%)
Linking Sentences	19 (95%)	1 (5%)	20 (100%)
Translation	19 (95%)	1 (5%)	20 (100%)

Events	Correct (f, %)	Incorrect (f, %)	Total (f, %)
Sentence Correction	18 (90%)	2 (10%)	20 (100%)
Repetition of Sentences with Adjective Clauses	16 (80%)	4 (20%)	20 (100%)

Table 2 shows the performance of German-speaking adults learning English on the same activities. Participants were successful in the Sentence Linking and Translation activities with 95% accuracy. They also performed strongly in Sentence Correction and Picture Selection, with 90% and 80% correct responses respectively. A slightly lower success rate was observed in the Repetition of Sentences with Adjective Clauses activity, with 80% of the participants giving correct answers.

Research Question 3 and Findings: In which ways do Turkish EFL learners understand and produce adjective clauses in subject and object position according to the relation between figure and ground?

Table 3. Descriptive Results of Turkish Adult EFL Learners' Comprehension and Production of Adjective Clauses Based on Activities

Events	Correct (f, %)	Incorrect (f, %)	Total (f, %)
Image Selection	12 (60%)	8 (40%)	20 (100%)
Linking Sentences	14 (70%)	6 (30%)	20 (100%)
Translation	13 (65%)	7 (35%)	20 (100%)
Sentence Correction	16 (80%)	4 (20%)	20 (100%)
Repetition of Sentences with Adjective Clauses	11 (55%)	9 (45%)	20 (100%)

Table 3 shows the results of Turkish adults learning German. The Sentence Correction activity showed the highest success rate, with 80% of the participants giving correct answers. The Connecting Sentences activity also showed a relatively high success rate, with 70% correct answers. Performance was slightly lower in the Picture Selection and Translation activities, with 60% and 65% correct responses, respectively. The Repetition of Sentences Containing Adjective Clauses activity proved to be the most challenging, with only 55% of the participants giving correct answers.

Research Question 4 and Findings: In which ways do Turkish adults learning German understand and produce adjective clauses in subject and object position according to the relation between figure and ground?

Table 4. Descriptive Results of Turkish Adult Learners of German on Understanding and Producing Adjective Clauses Depending on the Activities

Events	Correct (f, %)	Incorrect (f, %)	Total (f, %)
Image Selection	16 (80%)	4 (20%)	20 (100%)
Linking Sentences	16 (80%)	4 (20%)	20 (100%)
Translation	18 (90%)	2 (10%)	20 (100%)
Sentence Correction	18 (90%)	2 (10%)	20 (100%)

Events	Correct (f, %)	Incorrect (f, %)	Total (f, %)
Repetition of Sentences with Adjective Clauses	16 (80%)	4 (20%)	20 (100%)

Table 4 shows the performance of Turkish adults in learning English. Participants performed well in all activities, with the highest success rates observed in Translation and Sentence Correction (90% correct in each). High success rates were also observed in Picture Selection, Sentence Linking and Sentence Repetition with Adjective Clauses, with 80% of the participants giving correct answers in each.

Each table provides a detailed overview of each group's performance in understanding and producing adjective clauses in subject and object positions in different activities. The results highlight the various levels of proficiency between the groups and the relative difficulty of each activity.

Results of Comparison Between Groups and Chi-Square Test

This section presents the results of data designed to measure various language skills among the four different groups of participants mentioned above: The performance of each group was analyzed using a Chi-square test of independence to determine whether there were significant differences in their ability to complete these activities. The results of these analyses are presented in the tables below.

Table 5. Intergroup Chi-Square Test Results for Picture Selection Activity

Group	Correct (Observed)	False (Observed)	Correct (Expected)	False (Expected)	Ki-squared	p-value
German participants learning Turkish	14	6	15	5	0.067	
German participants learning English	18	2	15	5	0.600	
Turkish participants learning German	12	8	15	5	0.600	
Turkish participants learning English	16	4	15	5	0.067	
Total	60	20	60	20	5.327	.15

The results of the chi-square test of independence showed that there was no significant relationship between the participant groups and their performance in the Picture Selection Activity ($p = .15$). This reveals that the ability to select the correct picture according to the given criteria does not show a significant difference between the groups.

Table 6. Intergroup Chi-Square Test Results for Connecting Sentences Activity

Group	Correct (Observed)	False (Observed)	Correct (Expected)	False (Expected)	Ki-squared	p-value
German participants learning Turkish	12	8	15	5	0.600	
German participants learning English	19	1	15	5	1.067	
Turkish participants learning German	14	6	15	5	0.067	
Turkish participants learning English	16	4	15	5	0.067	
Total	61	19	60	20	1.801	.61

The chi-square test of independence revealed that there was no significant relationship between the participant groups and their performance on the Connecting Sentences activity (p = .61). This means that the ability to connect sentences correctly did not differ significantly between the groups of German participants learning Turkish, German participants learning English, Turkish participants learning German, and Turkish participants learning English.

Table 7. Intergroup Chi-Square Test Results for Translation Activity

Group	Correct (Observed)	False (Observed)	Correct (Expected)	False (Expected)	Ki-squared	p-value
German participants learning Turkish	15	5	15	5	0.000	
German participants learning English	19	1	15	5	1.067	
Turkish participants learning German	13	7	15	5	0.267	
Turkish participants learning English	18	2	15	5	0.600	
Total	65	15	60	20	1.934	.58

The results of the Chi-square test for the translation activity showed that there was no significant difference in performance between the participant groups (p = .58). This finding indicates that sentence translation proficiency was comparable between the German learners of Turkish, German learners of English, Turkish learners of German, Turkish learners of German and Turkish learners of English participant groups.

Table 8. Intergroup Chi-Square Test Results for Sentence Correction Activity

Group	Correct (Observed)	False (Observed)	Correct (Expected)	False (Expected)	Ki-squared	p-value
German participants learning Turkish	17	3	16.25	3.75	0.046	
German participants learning English	18	2	16.25	3.75	0.192	
Turkish participants learning German	16	4	16.25	3.75	0.004	
Turkish participants learning English	18	2	16.25	3.75	0.192	
Total	69	11	65	15	0.434	.93

The chi-square test for the Sentence Correction activity showed that there was no significant relationship between the groups and their performance (p = .93). This result indicates that there is no significant difference in sentence correction skills between German participants learning Turkish, German participants learning English, Turkish participants learning German, and Turkish participants learning English.

Table 9. Intergroup Chi-Square Test Results for the Repetition of Sentences with Adjective Clauses Activity

Group	Correct (Observed)	False (Observed)	Correct (Expected)	False (Expected)	Ki-squared	p-value
German participants learning Turkish	12	8	13.75	6.25	0.228	
German participants learning English	16	4	13.75	6.25	0.364	
Turkish participants learning German	11	9	13.75	6.25	0.545	
Turkish participants learning English	16	4	13.75	6.25	0.364	
Total	55	25	55	25	1.501	.68

The analysis of the Sentence Repetition Activity with Adjective Clauses using the Chi-square test revealed that there was no significant difference between the participant groups (p = .68). This suggests that the capacity to correctly repeat adjective clauses was similar among the groups of German participants learning Turkish, German participants learning English, Turkish participants learning German, and Turkish participants learning English.

The overall results show that there is no significant correlation between the participant groups and their performance in the activities of Linking Sentences, Translation, Sentence Correction and Sentence

Repetition with Adjective Clauses. The p-values for all activities are greater than the significance level of .05, indicating that the ability to perform these activities does not differ significantly between the groups of German participants learning Turkish, German participants learning English, Turkish participants learning German, and Turkish participants learning English.

Discussion

This study aimed to investigate the acquisition of adjective clauses with five different data collection tools based on Talmy's (1975) figure-ground relationship utilizing the Gestalt theory in second language learning. These data collection tools consisted of Picture Selection, Sentence Linking, Translation, Sentence Correction and Sentence Repetition with Adjective Clauses. The participants in the study were German learners of Turkish, German learners of English, Turkish adults learning English and Turkish adults learning German. The results of the chi-square tests showed that there were no significant differences in performance across activities between the different groups of participants. In particular, there were no significant differences in performance on the activities of selecting pictures ($\chi^2(3, N = 80) = 5.327$, $p = .15$), linking sentences ($\chi^2(3, N = 80) = 1.801$, $p = .61$), translating sentences ($\chi^2(3, N = 80) = 1.934$, $p = .58$), correcting sentences ($\chi^2(3, N = 80) = 0.434$, $p = .93$) and repeating adjective clauses ($\chi^2(3, N = 80) = 1.501$, $p = .68$) skills did not differ significantly between groups.

Research Question 1 and Discussion: In what ways do German adults learning Turkish understand and produce adjective clauses in subject and object position according to the relation between figure and ground?

The performance of German adult learners of Turkish in comprehending and producing adjective phrases presents a mixed picture. The participants showed a strong proficiency in the Sentence Correction activity (85% correct), indicating a good ability to apply the grammatical rules of adjective phrases in writing. Their performance in the Translation activity (75% correct) also shows that they have a solid grasp of the syntactic structure and semantics of Turkish adjective phrases. However, their low success rates in Picture Selection and Sentence Repetition with Adjective Clauses (70% and 60% correct, respectively) indicate difficulties in interpreting and producing adjective clauses in more dynamic or spontaneous contexts. This may be attributed to the fact that there are significant typological differences between German and Turkish, especially in terms of word order and articulatory morphology, which may create difficulties for German learners in processing and producing Turkish adjective clauses (Göksel & Kerslake, 2005).

Moreover, performance on the Connecting Sentences activity (60% correct) suggests that German learners may find it particularly difficult to integrate adjectival clauses into larger sentence structures in Turkish. This may be related to differences in the use of case markers and verb-final word order in Turkish, which require learners to adapt syntactic processing strategies (Juffs, 2005). The findings show that German adults learning Turkish can comprehend and produce adjective sentences in subject and object position to a similar extent as learners of the other language pairs in the study. This suggests that the cognitive mechanisms underlying the comprehension and construction of complex sentences such as adjective sentences may be similar across different language pairs and learner backgrounds. The lack of significant differences in performance can be attributed to the fundamental role of the figure-ground relationship in cognitive processing, as suggested by cognitive linguistic theory (Talmy, 1975; Langacker, 2000; Grundy, 2004). This relationship may influence how learners acquire complex syntactic structures in a second language, regardless of their first language.

Research Question 2 and Discussion: In what ways do German adult learners of English comprehend and produce adjective clauses in subject and object position according to the relation between figure and ground?

German adult learners of English showed a high level of proficiency in understanding and producing adjective clauses in both subject and object position. Their performance was particularly strong in the Linking Sentences and Translation activities, with 95% correct responses in each, demonstrating a solid grasp of the syntax and semantics of English adjective clauses. This is in line with Gass and Selinker's (2008) findings suggesting that students from Germanic language backgrounds such as German may have an advantage in acquiring English syntax due to structural similarities between the languages. However, the slightly lower success rate (80%) in the Sentence Repetition activity with Adjective Clauses suggests that although German learners are adept at recognizing and translating adjective clauses, they may face difficulties in accurately reproducing them in spontaneous speech. This is consistent with the idea proposed by Hawkins and Chan (1997) that production activities are generally more demanding than recognition activities, requiring a deeper level of processing and integration of linguistic knowledge.

Although Langacker (2000) supports the idea that the cognitive mechanisms that enable the acquisition of complex sentence structures are universal across different language pairs and that the figure-ground relation, a key concept in Cognitive Linguistics, plays an important role in how learners mentally organize and process adjective sentences, one of the most important difficulties that arise is the syntactic differences between German and English. German has a more flexible word order and uses cases to indicate grammatical functions, while English relies more on word order. This difference can cause German learners to have difficulty in forming adjective clauses in English, especially in object positions where word order is crucial for comprehensibility (Kuno, 1974, 1975; Keenan & Comrie, 1977). Studies on second language acquisition have shown that learners often transfer patterns from their first language into the second language. For example, Izumi (2003) found that learners' comprehension and production of relative clauses are influenced by the typological features of their first language. Similarly, German learners of English may influence the use of adjective clauses by transferring the syntactic patterns of their native language into English.

Research Question 3 and Discussion: In which ways do Turkish EFL learners understand and produce adjective clauses in subject and object position according to the relation between figure and ground?

Turkish adult learners of English showed strong competencies in both understanding and producing adjective clauses, with the highest success rates observed in Translation and Sentence Correction activities (90% correct each). This shows that Turkish students have the ability to correctly interpret and apply English grammar rules in writing. The relatively high performance in the Selecting Pictures and Linking Sentences activities (80% correct each) also indicates a good grasp of the syntactic and semantic aspects of English adjective clauses. Performance in Sentence Repetition with Adjective Clauses (80%) implies that Turkish learners, similar to German learners, may find it more difficult to produce adjective clauses spontaneously. This may be attributed to typological differences between Turkish and English, especially in terms of syntax and word order, which may create additional difficulties for Turkish learners in oral production activities (Özçalışkan & Stoll, 2018).

Research has shown that learners often transfer typological features from their first language to their second language. The fact that Turkish is an agglutinative language with flexible word order may affect

how Turkish adults learn and use adjective clauses in English (Jarvis & Pavlenko, 2008).Because Turkish allows for greater flexibility, Turkish learners of English may struggle with the syntax required in English adjective clauses, especially in object positions (Özçalışkan, 2005). Turkish learners may have difficulty with the use of adjective clauses in English because Turkish adjective clauses usually use a participle structure without pronouns (Gass & Selinker, 2008).

Research Question 4 and Discussion: In which ways do Turkish adults learning German understand and produce adjective clauses in subject and object position according to the relation between figure and ground?

Turkish adults learning German showed a range of competences in understanding and producing adjective clauses. The Sentence Correction activity had the highest success rate (80%), indicating a good ability to apply grammatical rules in written form. The Linking Sentences activity also had a relatively high success rate (70%), indicating an understanding of the syntactic structure of German adjective clauses. However, performance in the Picture Selection and Sentence Repetition with Adjective Clauses activities was lower (60% and 55% correct, respectively), indicating difficulties in interpreting and producing adjective clauses in more complex or spontaneous contexts. This may be due to the greater syntactic complexity of German adjective clauses compared to Turkish, as well as differences in word order and case marking (Hopp, 2009). Turkish adults learning German may face difficulties with the German case system, which is crucial for forming adjective clauses in subject and object positions. Turkish does not have as comprehensive a case system as German (Hopp, 2009). Similar to English learners, Turkish learners may also find difficulties in the use of adjectival clause pronouns in German, especially in object positions where the case of the pronoun must match the role of the noun it replaces. Turkish learners may find the verb-final word order in German subordinate clauses, including adjectival clauses, challenging because of the verb-second rule in main clauses (Wegener, 2005).

General Discussion

The findings of this study are to some extent in line with the theoretical framework of cognitive linguistics, in particular the figure-ground relation proposed by Talmy (1975) and further elaborated by Langacker (2000) and Grundy (2004). However, differences at the linguistic level should not be overlooked because empirical findings show that Turkish adults learning English and German face different difficulties in comprehending and producing adjective sentences with subject and object positions (Hopp, 2009; Wegener, 2005). While the strict syntactic structure of English and the use of pronouns in adjective clauses pose significant obstacles, the case system and word order in subordinate clauses pose a challenge for German. Language teaching for Turkish learners should address these specific issues by providing targeted instruction and practice in forming and using adjective clauses in both languages. Understanding these challenges can help educators develop more effective teaching strategies to support Turkish learners' acquisition of complex syntactic structures in English and German.

On the other hand, the lack of significant differences in the findings of this study suggests that the cognitive mechanisms underlying the comprehension and construction of complex sentences, such as those containing adjectival clauses, may be similar across different language pairs and learner backgrounds. This supports the idea that the figure-ground relation is a fundamental aspect of cognitive processing in language and influences how learners acquire complex syntactic structures. Moreover, the results contribute to the existing literature on the acquisition of adjective clauses within the framework

of cognitive linguistics. By focusing on the figure-ground relation, this study contributes to the understanding of how learners navigate the complexity of syntactic structures in a second language. Interdisciplinary insights from cognitive neuroscience, psychology and affective-motor studies (Barsalou, 2010; Evans, 2012; Gallese & Lakoff, 2005) further enrich the interpretation of the findings by emphasizing the role of cognitive processes in language acquisition.

The findings also have implications for language teaching and curriculum design. Given the similarity in performance between the different groups, language educators might consider emphasizing cognitive strategies that make use of figure-ground relations when teaching complex sentence structures. This approach may promote a deeper understanding of syntactic relations and improve learners' ability to construct and understand complex sentences in a second language. Furthermore, this study emphasizes the importance of incorporating the principles of cognitive linguistics into second language acquisition research. Understanding the cognitive mechanisms underlying language learning can provide valuable insights into the processes of acquiring and processing complex linguistic structures. Future research could further explore the role of cognitive factors in language acquisition and their impact on teaching and learning strategies.

The study underscores the relevance of cognitive linguistic theories, specifically the figure-ground relationship, in understanding the acquisition of complex syntactic structures like adjective clauses. This perspective suggests that cognitive processes underlying perception and attention significantly influence how learners comprehend and produce language.The findings support the idea that the cognitive mechanisms involved in language acquisition are universal, regardless of the learners' first language. This aligns with cognitive linguistic theories that emphasize the fundamental role of figure-ground relations in organizing linguistic information.The study highlights the importance of incorporating cognitive strategies into language teaching. Educators should emphasize the figure-ground relationship to help learners better understand and construct complex sentences. This approach can enhance learners' ability to parse and produce syntactic structures more effectively.The diverse proficiency levels observed across different activities suggest that language instruction should be multifaceted, addressing both comprehension and production skills. This comprehensive approach can help learners develop a balanced proficiency in both recognizing and using complex grammatical structures.The study's findings indicate the need for language curricula to integrate a variety of activities that target different aspects of language learning, such as picture selection, sentence linking, translation, sentence correction, and repetition. This can provide a more holistic learning experience and cater to different learning styles.Given the challenges faced by learners in spontaneous production activities, curricula should include more opportunities for practice in dynamic and interactive contexts. This can help learners become more comfortable and proficient in using complex structures in real-time communication.The interdisciplinary insights from cognitive neuroscience, psychology, and affective-motor studies emphasize the importance of a holistic understanding of language acquisition. Integrating these perspectives into linguistic research can provide deeper insights into the cognitive processes involved in learning complex syntactic structures.

Based on the findings of the study, it is recommended that language educators integrate cognitive linguistic strategies, particularly the figure-ground relationship, into their teaching methods to enhance the understanding and production of complex syntactic structures like adjective clauses. Incorporating a variety of activities that balance comprehension and production skills, such as picture selection, sentence linking, translation, and sentence correction, can provide a comprehensive learning experience. Additionally, creating opportunities for dynamic, spontaneous language use through role-

plays and discussions can help learners become more proficient in real-time communication. Regular formative assessments and detailed feedback can further support learners' progress. Teacher training programs should emphasize these cognitive approaches to ensure effective implementation.

Conclusion

In conclusion, this study investigated the ability of adult learners in different language pairs to comprehend and produce adjective clauses in subject and object position: German adults learning Turkish and English and Turkish adults learning German and English. The findings revealed different levels of proficiency between the groups, showing that performance was generally higher in written activities compared to activities requiring spontaneous production. German adults learning English showed the highest overall proficiency, possibly benefiting from the structural similarities between German and English. Turkish adults learning English also showed particularly strong performance in written activities, while Turkish adults learning German faced more difficulties, possibly due to the greater syntactic complexity of German relative sentences. While German adults learning Turkish showed proficiency in written activities, they faced difficulties in activities involving dynamic interpretation and production of adjectival clauses, reflecting typological differences between German and Turkish.

The study emphasizes the importance of considering both subject and object positions in adjective clauses and the distinction between comprehension and production activities. The results underline the difficulties learners face when spontaneously producing adjective clauses and reveal the need for targeted practice in this area. Furthermore, this research contributes to the field of second language acquisition by providing insights into how learners of typologically different languages understand and produce complex grammatical structures. The findings have implications for language teaching by emphasizing the importance of including a variety of activities that address both the comprehension and production of adjective clauses. Future research could further explore the cognitive mechanisms underlying the acquisition of adjective clauses by incorporating perspectives from cognitive linguistics and Gestalt theory to enhance our understanding of language learning processes.

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