Hacettepe Üniversitesi Edebiyat Fakültesi Dergisi
Hacettepe University Journal of Faculty of Letters
Aralık/December 2024 – *41*(2), 349-365
doi:10.32600/huefd.1335471

Araştırma Makalesi – Research Article
Geliş Tarihi / Received:31.07.2023 Kabul Tarihi / Accepted: 13.02.2024

A Corpus Based Analysis of the Temporal Converb Clauses in Turkish

Türkçedeki Zamansıl Ulaç Tümcelerinin Derlem Temelli İncelenmesi

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Abstract

The studies in cognitive and psycholinguistics have reported that the sentential position of converb clauses which are part of adverbial clauses is influenced by syntactic, semantic and discourse factors (Diessel, 2005, 2008; Verstraete, 2004; Wiechmann & Kerz, 2013). One of the semantic factors is the iconicity of sequence and the related iconicity principle states that linguistic structures mostly mirror the structure of conceptual order (Croft, 2003). In other words, the meaning relationships that the linguistic structures bear has an effect on the positioning of those structures. For example, the temporal meaning relationship that a construction has can have an effect on the linear structure of this construction. This study aims at investigating the positioning variations of temporal converb clauses in Turkish and at revealing whether or not it is consistent with the iconicity principle. There are several endings used as temporal converb clauses in Turkish. In the study, the following nine converb endings are analysed: *-(y)IncA (when)*, *-DığIndA (when)*, *-DIğI zaman (when)*, *-ken (while)*, *-(A/I) r…-mAz (as soon as)*, *-DIğIndAn beri (since)*, *-mAdAn önce (before)*, *-DIktAn sonra (after)*, and *–DikçA (whenever)*. The data of the study were collected from the Turkish National Corpus (TNC) (Aksan et al., 2012) which contains 50 million words. After identifying 9000 samples of temporal converbs, these were first grouped based on the endings mentioned above. Then the data were analysed using chi-square test. The 2×3 X^2 analysis was employed to see the correlations between conceptual order and linear structure. The findings of the study show that temporal converb clauses in Turkish generally have a tendency to appear before the main clause. The clauses expressing priority, namely *-(y)IncA (when)*, *-DığIndA (when)*, *-DIğI zaman (when)*, *-(A/I) r…-mAz (as soon as)*, *-DIğIndAn beri (since)* and *-DIktAn sonra (after)* and the clauses expressing simultaneity, namely, *-DığIndA (when)*, *-DIğI zaman (when)*, *-ken (while)* and *–DıkçA (whenever)* are found to precede the main clauses, which is in line with iconic clause order. The converb constructions expressing posteriority, such as *–DığIndA (when)*, *-DIğI zaman (when)* and *-mAdAn önce* (before) appear to precede the main clause, which is not supported by the iconicity principle. These findings suggest that the iconicity of sequence has a role in the placement of temporal converb clauses in Turkish.
Keywords: Temporal converb clauses, iconicity of sequence, Turkish, syntax, semantics.

Öz

Bilişsel ve psikodilbilim alanındaki çalışmalar, belirteç yantümcelerinin bir parçası olan ulaç tümce yapılarındaki temel ve yan tümcelerin yerleşiminin; sözdizimsel, anlamsal ve söylemsel faktörlerden etkilendiğini bildirmiştir (Diessel,

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◊ Alan Editörü / Field Editor: Zeynep AÇAN

2005, 2008; Verstraete, 2004; Wiechmann, & Kerz, 2013). Anlamsal faktörlerden biri dizilimin ikonikliğidir ve bu ilke dilsel yapıların çoğunlukla kavramsal düzenin yapısını yansıttığını ifade eder (Croft, 2003). Başka bir deyişle, dilbilimsel yapıların taşıdığı anlam ilişkileri, bu yapıların konumlandırılmasında etkili olmaktadır. Örneğin, bir yapının sahip olduğu zamansıl anlam ilişkisi, bu yapının doğrusal yapısı üzerinde etkili olabilmektedir. Bu çalışmanın amacı, Türkçedeki zamansıl ulaç tümcelerindeki temel ve yan tümcelerin yerleşimini incelemek ve bunun ikoniklik ilkesiyle tutarlı olup olmadığını araştırmaktır. Türkçede zamansıl ulaç tümce yapılarında kullanılan çeşitli son ekler vardır. Bu çalışmada, *-(y)IncA, -DIğIndA, -DIğI zaman, -ken, -(A/I) r...-mAz, -DIğIndAn beri, -mAdAn önce, -DIktAn sonra* ve *-DIkçA* olmak üzere dokuz son ek incelenmiştir. Çalışmanın verileri 50 milyon sözcük verisine sahip Türkçe Ulusal Derleminden (TUD) toplanmıştır. Zamansıl ulaç tümcelerini içeren 9000 veri belirlendikten sonra bunlar ilk olarak yukarıda belirtilen son-ek kategorilerine göre gruplandırılmıştır. Daha sonra veriler ki-kare testi kullanılarak analiz edilmiştir. Kavramsal düzen ve doğrusal yapı arasındaki ilişkiyi görmek için 2×3 X^2 analizi uygulanmıştır. Çalışmanın sonuçları, Türkçede zamansıl ulaç yan tümcelerin genellikle ana tümceden önce ifade edilme eğiliminde olduğunu göstermektedir. Öncelik ifade eden *-(y)IncA, -DIğIndA, -DIğI zaman, -(A/I) r…-mAz, -DIğIndAn beri* ve *-DIktAn sonra* yantümceleri ile eşzamanlılık ifade eden *-DIğIndA*, *-DIğI zaman*, *-ken* ve *-DıkçA* yantümcelerin çoğunlukla ana tümcelerden önce gelmesi ikonik tümce sıralamasıyla uyumludur. *DIğIndA, -DIğI zaman* ve *-mAdAn önce* gibi sonralık ifade eden tümce yapılarında ise yantümceler genellikle ana tümceden önce gelmektedir ki bu durum ikonik tümce sıralamasına uygun değildir. Bu bulgular, sıralamanın ikonikliğinin Türkçedeki zamansıl ulaç tümcelerin yerleşiminde rol oynadığını göstermektedir.
Anahtar sözcükler: Zamansıl ulaç tümceleri, sıralamanın ikonikliği hipotezi, Türkçe, sözdizim, anlambilim.

Introduction

Languages employ different positional patterns for complex sentences comprising of two clauses, serving as the primary components of a bi-clausal structure (Diessel, 2005). Greenberg's (1963) ground-breaking research on the associations among word order shows that in languages with strict object-verb word order, adverbial clauses consistently come before the main clause or predicate.

Diessel (2001) states that there are six major positional options for adverbial clauses and develops a classification of the languages based on these. This classification includes a) rigid ADV-S/VP languages,[1] b) non-rigid ADV-S/SVP languages, c) flexible ADV-S/VP + S/VP-ADV languages, d) mixed ADV-S/VP + S/VP-ADV languages, e) non-rigid S/VP-ADV languages and f) rigid S/VP-ADV languages.

In languages with rigid ADV-S/VP structures, the adverbial clauses typically come before the main clause or predicate, almost without exception, such as in Lezgian which is exemplified in (1).

(1) Küced-aj zwer-iz zwer-iz salaz-z Cükver-ata-na
Street-from run-CON run-CON garden-DAT Cükver-come-AOR
"Cükver came running into the garden from the street."

(Haspelmath, 1995, p. 380)

Adverbial clauses usually precede the main clause or predicate in languages that are not rigidly ADV-S/SVP, but they can also appear readily at the end of the sentence, such as in Turkish which is exemplified in (2).

(2) Orman-da dolaş-ır-ken bir tilki gör-dü-m.
forest-LOC walk.about-AOR-CON a fox see-PF-1SG
'While walking in the forest I saw a fox."

(Göksel &Kerslake, 2005, p. 416)

In languages with flexible ADV-S/VP + S/VP-ADV structures, adverbial clauses appear frequently in both positions, before and after the main clause or predicate. A related example is given from French in (3).

[1] Abbreviations: ADV: adverbial clause, S: clause, VP: verb phrase, OV: Object Verb VO: Verb Object

(3) Les policiers ont disperse les manifestants en burlant.
The policemen have dispersed the demonstrators CON scream
"The policemen dispersed the demonstrators while screaming"

(Legendre, 1990, p. 106)

Languages that have both ADV-S/VP and S/VP-ADV structures show a different distributional pattern since adverbial clauses can be positioned both before and after the main clause or predicate, whereas certain semantic types of adverbial clauses consistently occur either before or after the main clause/predicate. A related example is given from Babungo (except for time and restrictive clauses) in (4):

(4) Nwe ɲyin bu fan vəŋ saŋ ɲwe
He run-PST because as they beat-PST him
"He run away because they were beating him"

(Schaub, 1985, p. 40)

In non-rigid S/VP-ADV languages, adverbial clauses are observed to come after the main clause/predicate, but they also frequently appear at the beginning of the sentence. An example from Arabana Wangkangurru is given in (5), p.

(5) Kutha palyi-wityi-ma-yangu, thika-ru karu Muniranha.
water wide-become-SP-PLUP go-back-NAR there Muniranha
"When the water had flooded right out it flowed back to there, to Muniranha 'Fish Hole'"

(Hercus, 1994, p. 273)

There is no example of adverbial clauses that (almost) always come after the main clause/predicate in rigid S/VP-ADV languages (Diesel, 2001).

Kornfilt (1997) states that normally all types of adverbial clauses in Turkish precede the main clause. Therefore, it is the default position for these clauses. However, given the general flexibility of word order in Turkish, the adverbial clause can appear in a non-default position as can be seen in (6):

(6) [Almanya-ya taşın-dığ-ın-dan beri] ondan bir haber al-a-ma-dı-m.
Almanya-DAT move-CON-3SG.POSS-ABL since him any news get-PSB-NEG-PF-1SG
Ondan bir haber al-a-ma-dı-m [Almanya'ya taşın-dığ-ın-dan beri]
Him any news get-PSB-NEG-PF-1SG Almanya-DAT move-CON-3SG.POSS-ABLsince
"[Since he moved to Germany] I haven't heard anything from her.'

(Göksel &Kerslake, 2005, p. 416)

The positional patterns of adverbial clauses are studied from discourse-pragmatic, syntactic and semantic perspectives. Verstraete (2004) analyses the position of adverbial clauses in English from discourse-pragmatic perspective, arguing that when the adverbial clause is positioned after the main clause, it typically introduces new information or serves as an additional thought. However, when the adverbial clause comes before the main clause, its aim is to organize the sequence of information in the current discourse. Diessel (2001) studies the positions of adverbial clauses from syntactic point of view and state that those adverbial clause constructions that commonly appear before the main clause or predicate are exclusive to OV languages. Both VO languages and many OV languages have adverbial clauses that are often placed either before or after the main clause. Wiechman and Kerz (2013) investigate these clauses in terms of discourse-pragmatic and processing based constraints. They conclude that discourse-pragmatic factors are more significant in the positioning of adverbial clauses than processing based constraints. Zeyrek and Kurfalı (2018) analyse explicit inter- and intra-sentential discourse connectives in Turkish Discourse Bank (TDB) (Zeyrek et al., 2013) along with their senses and the text spans they relate. The study focuses on the addition of a new set of explicit intra-sentential connectives to TDB, namely converbs. They conclude

that the subordinators tend to select certain senses not selected by explicit inter-sentential discourse connectives in the data.

Based on these assumptions, this study aims to investigate the positional patterns of various types of the temporal converb clauses in Turkish and to uncover whether or not their sentential positions are consistent with the iconicity principle. In line with the aims of the study, the study attempts to answer the following research questions:

1. What are the sentential positions of Turkish temporal converb clauses based on their subcategories?
2. Does the iconicity of sequence affect their sentential position in Turkish?

Converb Clauses

A converb is a type of verb form that is non-finite and primarily used to indicate adverbial subordination. (Göksel &Kerslake, 2005). In other words, converbs can be seen as adverbs in verbal form, similar to how participles function as adjectives in verbal form.

A detailed analysis was conducted on converb clause constructions in Turkish, which results in their detailed examination and classification into distinct categories. Kornfilt (1997) and Lewis (1986) provide a discussion on converbs and they present a list of converbs categorized based on their meanings. These converbs are classified into two primary groups: temporal converbs and manner converbs. Banguoğlu (1974) suggests the need to draw some generalizations about Turkish converbs. In this regard, he categorizes converbs into six groups based on the meaning relations they convey, including coordination, manner, comparison, contrast, cause, and time.

Koç (1988, p. 581) defines temporal converbial construction as follows: “a compound sentence containing an adverbial clause in the surface structure is derived from two sentences in the deep structure which have an abstract time element in common”. Göksel and Kerslake (2005, p. 415) give the definition of temporal converbial construction as follows: “temporal converb clauses specify the time of the situation expressed by the superordinate clause by reference to how it relates to the time of some other situation (event or state). The number of converbial forms in this class far exceeds that in any other, permitting a wide range of temporal relations to be expressed”.

There are many studies which deal with the individual temporal converbial endings in Turkish. Kornfilt (1997) has designated *-(y)IncA* (when) as a "time adverbializer." Slobin (1995), in the context of its temporal function in discourse, suggests that this converbial ending means the same as “when” in English. The *-DIğIndA* (when) converbial construction specifically indicates a temporal relationship with the matrix constructions. It adheres to the principles of simultaneity and/or overlapping in its representation, establishing internal connectivity within the discourse structure of an utterance. Temporal converb *-Dığı zaman* (when) is another explicit way of denoting simultaneity, emphasizing its function in conveying concurrent events. The temporal converbial ending *-ken* (while) “establishes a simultaneity relationship between two interconnected predications” (Aydemir, 2014, p. 35). This converbial ending can be translated to English as “while” or “as”. The *-(A/I) r... -mAz* (as soon as) construction solely indicates the anteriority of the converb clause and does not convey any additional temporal meaning such as simultaneity or posteriority (Çetintaş Yıldırım, 2004). *-DIğIndAn beri* (since) portrays the event in the converb clause as the initiator of the event in the matrix clause. The primary indication of the posteriority of the converb clause event with *-mAdAn önce* (before) is predominantly conveyed through the occurrence of the word “önce” (before). The usage of *-DIktAn sonra* (after) shows that the event of the non-finite subordinate clause happens before the event of the finite matrix clause (Akkuş, 2019). Göksel and Kerslake (2005) states that the converb form *-DIkçA* (whenever) indicates the meaning of whenever.

Table 1 presented below demonstrates how the temporal meaning relations in Turkish are conveyed, encompassing three primary categories.

Table 1: Temporal meaning relations in temporal converb constructions in Turkish.

	Priority	Simultaneity	Posteriority
-(y)IncA (*when*)	✓		
-DIğIndA (*when*)	✓	✓	✓
-DIğI zaman (*when*)	✓	✓	✓
-ken (*while*)		✓	
-(A/I) r…-mAz (*as soon as*)	✓		
-DIğIndAn beri (*since*)	✓		
-mAdAn önce (*before*)			✓
-DIktAn sonra (*after*)	✓		
-DIkçA (*whenever*)		✓	

Thompson and Longacre (1985) mention that the positioning of converbial clauses is a distinguishing feature in certain languages. For instance, languages like Mandarin, Ethiopian Semitic, Turkish, and several others exhibit the characteristic of converbial clauses preceding the main clause. While this notion holds true to some extent, meaning that the default position of a converb clause in a complex sentence is before the matrix clause, it is worth noting that the converb clause can also be positioned within the constituents of the matrix clause or even follow the matrix clause. The examples below were taken from Turkish National Corpus (TNC) (Aksan et al., 2012) from Mersin University. The tags in the parentheses were given by Turkish National Corpus (TNC) (Aksan et al., 2012). The letter W stands for written data while the letter S stands for spoken data.

(7) Bir ses gel-ince aşağı taraf-a bak-tı-m. (W-DA16B4A-3349-1165)
A noise come-CON down side-DAT look-PAST-1SG.
"I looked down when I heard a noise."

(8) Ömür-'e ben kız-acağ-ım onu gör-ünce. (S-BEABXO-0093-360)
Ömür-DAT I be angry-FUT-1SG. her see-CON
"I'll be angry with Ömür when I see her."

(9) Siz gelmeden önce bir telefon görüşme-si yap-ıyor-du-m. (W-TI42E1B-2942-459)
You come-CON a phone call-ACC make-PROG-PAST-1SG.
"I was making a phone call before you came."

(10) Bir seyis-I hastane-ye kaldır-dı-k siz gel-meden önce.
(W-QA16B2A-1314-929)
A syce-ACC hospital-DAT hospitalize-PAST-1PL. you come-CON
"We hospitalized a syce before you came."

The examples above indicate that the converb clauses in (7) and (9) are positioned at the beginning of the sentence, whereas in (8) and (10), they are situated after the main clause. With this knowledge at hand, it can be affirmed that it is not mandatory to place converb clauses in the initial position of a sentence in Turkish. The positioning of both the converb and matrix clauses within a complex sentence can vary. This prompts an intriguing inquiry about the factors that drive the sequential arrangement of main and subordinate clauses.

Iconicity of sequence

Diessel's (2005) recent research shows that how main and adverbial clauses are organized is influenced by functional and cognitive elements that originate from three sources: (a) syntactic parsing, (b)

discourse pragmatics, and (c) semantics. Iconicity appears to be a contributing semantic factor that impacts the order of clauses. The overarching concept behind iconicity is that the linguistic structure somehow mirrors the structure of conceptual order (Croft 2003, p. 102). The motivation or explanation for the structure of language lies in its alignment with the structure of conceptual order. Each conceptual category is overtly encoded in the word form. Iconicity motivates symmetry in grammatical expression, both in structural coding and cognitive potential. This study employs a subtype of iconicity known as iconicity of sequence, which involves the positioning of linguistic elements in discourse and complex sentences. Iconicity of sequence claims that the order of elements in complex sentences is affected by the meaning relationships that the complex sentences have. For example, when a temporal clause expresses a previous event, it tends to be placed before the main clause more often than when a temporal clause indicates a subsequent event.

There are studies reporting that the ordering of clauses in complex sentences often exhibits iconicity. For example, Lehmann (1974) and Haiman (1983) propose that conditional clauses usually come before the main clause because they refer to an event that happens before the one expressed in the main clause in terms of time. Clark (1973) puts forth the argument that after-clauses tend to come before the main clause more frequently compared to before-clauses. This is attributed to the fact that after-clauses refer to an event that takes place prior to the one described in the main clause, while before-clauses refer to an event that occurs afterwards. Utilizing a collection of linguistic data derived from both spoken and written English corpus, Diesel (2008) states that there exists a distinct association between the order of clauses and iconicity. Temporal clauses expressing a preceding event tend to appear before the main clause more frequently compared to temporal clauses indicating a subsequent event.

Methodology

This section elaborates on the methodology of the study. First, the converb clauses analysed in this study are given. Then, data collection is introduced. The corpus type (spoken and written), the size of the sample and raw frequencies of the data are also covered in this section. The data collection is discussed and is followed by the data analysis section.

Converb Clauses Analysed

The converb clauses analysed in this study are part of the following three categories. (a) Converbs expressing events that occur before the event mentioned in the main clause; (b) converbs expressing events which occur at the same temporal point as expressed by the embedded and main clauses and (c) converbs expressing posteriority in which the event expressed in the embedded clause occurs after the event expressed in the main clause.

Converbs expressing events that occur before the event mentioned in the main clause are made up the endings of *-(y)IncA (when)*, *-DiğIndA (when)*, *-DIğI zaman (when)*, *-(A/I) r…-mAz (as soon as)*, *-DIğIndAn beri (since)* and *-DIktAn sonra (after)*. Related examples of this category are given below.

(11) Bilgisayar-I aç-ınca bir ses duy-du-m.
computer-ACC turn on-CON a noise hear-PST-1SG
"I heard a noise when I turned on computer."

(12) Baba-m ev-e gel-diğinde yemeğ-e otur-du-k.
father-POS home-DAT come-CON meal-DAT sit-PST-1PL
"When my father came, we started eating."

(13) Zil çal-dığı zaman dışarı çık-abil-ir-siniz.
bell ring-CON when outside go-AUX-AOR-2PL
"You can go out when the bell rings."

(14) Askere git-tiğinden beri zayıfla-dı.
military go-CON since lose weight-PST-3SG
"Since he went to military, he has lost weight."

(15) Yemeği ye-r ye-mez hemen uyu-du.
meal eat-CON eat-NEG immediately sleep-PST-3SG
"As soon as he/she ate the meal, he/she slept."

(16) Para-yı öde-dikten sonra ürün-ler kargola-n-dı.
money pay-CON after product-PL ship-PAS-PST-3PL
"After the money was sent; the products were shipped."

Converbs expressing events which occur at the same temporal point as expressed by the embedded and main clauses include the following endings: *-DiğIndA (when)*, *-DIğI zaman (when)*, *-ken (while)* and *–DıkçA (whenever)*. Examples of this category are as follows:

(17) Vazo kır-ıl-dığında çocuk yer-de otur-uyur-du.
vase break-PAS-CON child floor-LOC sit-PROG-PST-3SG
"When the vase was broken, the child was sitting on the floor."

(18) Kaza ol-duğu zaman film izli-yor-du-m.
accident happen-CON when film watch-PROG-PST-1SG
"When the accident happened, I was watching TV.

(19) Memleket-e git-tikçe arkadaş-lar-ım-I ziyaret ed-er-im.
hometown go-CON friends-PL-POS-ACC visit-AOR-1SG
"Whenever I go to my hometown, I visit my friends."

(20) Bebek uyur-ken sessiz ol-malı-sınız
baby sleep-CON quiet be-AUX-2PL
"While the baby is sleeping you must be silent."

Converbs expressing posteriority are consisted of the endings of *–DiğIndA (when)*, *-DIğI zaman (when)* and *-mAdAn* önce (before). Related examples of this category are given below:

(21) Fatma ev-e gel-diğinde yemek çoktan bit-miş-ti.
Fatma home-DAT come-CON meal already finish-PER-PST
"When Fatma came home, the meal had already finished."

(22) Telefon aç-tığım zaman onlar çoktan ayrıl-mış-tı.
phone call-CON when they already leave-PER-PST
"When I called them, they had already left."

(23) Uyu-madan önce diş-ler-in-i fırçala-malı-sın.
sleep-CON before tooth-PL-GEN-ACC brush-AUX-2SG
"Before sleeping, you must brush your teeth."

Data Collection

The data of the study were collected from the Turkish National Corpus (TNC) (Aksan et al., 2012) which contains 50 million words. It comprises diverse samples of textual data from various genres spanning a 24-year period (1990-2013). The written component encompasses texts created in different domains and covering various subjects. Additionally, 2% of the TNC's database consists of transcriptions from spoken data, comprising spontaneous, everyday conversations, and speeches collected in specific communicative contexts. For this study, 1000 *-(y)IncA (when)* clauses, 1000 *–DiğIndA (when)* clauses, 1000 *-DIğI zaman (when)* clauses, 1000 *–ken (while)* clauses, 1000 *-(A/I) r…-mAz (as soon as)* clauses, 1000 *-DIğIndAn beri (since)* clauses, 1000 *-mAdAn önce (before)* clauses, 1000 *-DIktAn sonra (after)* clauses and 1000 *–DikçA (whenever)* clauses were randomly selected. These particular converbial endings were selected because they are among the most frequent temporal clauses in Turkish. Roughly 47% of the data are derived from spoken conversations, while the remaining 53% originate from various written genres. It should be noted that the nine converb constructions mentioned can also carry meanings that are not related to time. They might indicate alternative relationships in meaning, such as manner, condition, contradiction, interruption of the event expressed in the converb clause, and similar connections. Nevertheless, this study does not cover these non-temporal meaning relationships. Following the initial search, any adverbial clauses that are not pertinent to the objectives of the present study were disregarded. In particular, converb clauses that do not appear alongside a connected main clause were eliminated. Additionally, converb clauses that are linked to the main clause at the level of the speech act were excluded (See example 24).

(24) Ee! tabii onlar öyle diy-ince. (S-BEABXO-0456-621)
Well! Of course they so say-CON
"Well! Of course, when they say so."

Table 2 below shows the raw frequencies of the data analysed in this study.

Table 2: Raw frequencies of the data analysed in the study.

	Spoken	Written	Total
-(y)IncA (when)	490	510	1000
-DiğIndA (when)	420	580	1000
-DIğI zaman (when)	515	485	1000
-ken (while)	520	480	1000
-(A/I)r…-mAz (as soon as)	480	520	1000
-DIğIndAn beri (since)	420	580	1000
-mAdAn (önce) (before)	470	530	1000
-DIktAn sonra (after)	460	540	1000
–DikçA (whenever)	430	570	1000
Total	4205	4795	9000

Table 2 shows that there are 9000 samples of converbial constructions in total that are analysed in this study. 4205 of the samples are selected from spoken corpus while 4795 of them are selected from written corpus. For *-(y)IncA (when)* temporal converb clauses; there are 490 spoken and 510 written samples, for *–DiğIndA (when)* temporal converb clauses; there are 420 spoken and 580 written samples, for *-DIğI zaman (when)* temporal converb clauses; there are 515 spoken and 485 written samples, for *-ken (while)* temporal converb clauses; there are 520 spoken and 480 written samples; for *-(A/I)r…-mAz (as soon as)* temporal converb clauses; there are 480 spoken and 520 written samples. *-DIğIndAn beri (since)* temporal converb clauses have 420 spoken and 580 written samples, *-mAdAn (önce) (before)* temporal converb clauses have 470 spoken and 530 written samples, *-DIktAn sonra (after)* temporal converb clauses have 460 spoken and 540 written samples and lastly, *–DikçA (whenever)* clauses have 430 spoken and 570 written samples.

Data Analysis

Each converbial construction was coded to assess two aspects: (a) the placement of the converb clause concerning the main clause (whether it appeared initially or finally in the sentence), and (b) the conceptual order of the main and converb clauses (whether the converbial clause gives anteriority, simultaneity or posteriority meaning). The coding process was carried out independently by two researchers. The coders coded all the instances. For the placement of the converb clause concerning the main clause, the inter-coder reliability is 100% and for the conceptual order of the main and converb clauses, the inter-coder reliability is 99,2%.

The study utilized chi-square test for statistical analysis, aiming to compare the observed results. The purpose of this test is to determine whether any discrepancy between the actual and predicted data is attributed to random chance or to a correlation between the variables being examined. The 2×3 X^2 analysis was applied to see the correlation between conceptual order and linear structure The results are considered significant at $p < .05$.

Findings and Discussion

The findings of the study are analysed separately for the spoken and the written data.

The findings of the spoken data from the corpus show that there are 3760 converb clauses that appear at the beginning of sentences and 445 converb clauses that appear at the end in total. This means that approximately 89,42% of the temporal clauses come before the main clause, while only 10,58% come after it for the spoken data.

Figure 1 below shows the distribution of initial and final converb clauses that express priority, simultaneity and posteriority.

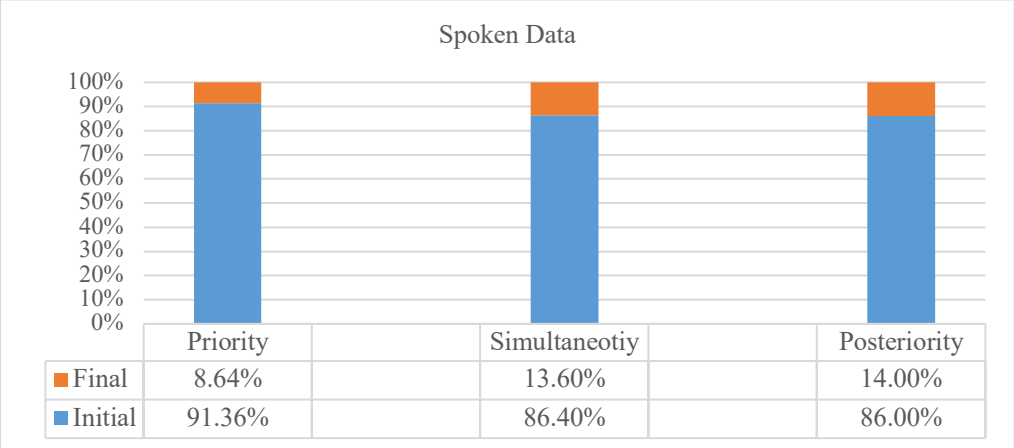

Figure 1. Conceptual order and linear structure for the spoken data

Figure 1 shows the correlation between linear structure and conceptual order in the spoken data. It illustrates that out of the prior converb clauses, 91,36% (N=2379) come before the main clause and 8,64% (N=225) come after it. Similarly, 86,40% (N=902) of the simultaneous converb clauses are positioned before the main clause and 13,60% (N=142) are positioned after the main clause. 86% (N=479) of the temporal clauses that express posteriority are placed before their corresponding main clause and 14% (N=78) are placed after their corresponding main clause. A distinct connection can be observed between the conceptual order and linear structure for the prior and simultaneous converb clause constructions. However, although there is a tendency towards an iconic clause order for the prior and simultaneous converb clause constructions, this tendency is not as much as prior and simultaneous converb clauses for the posterior

converb clause constructions. Table 3 below shows the 2×3 X^2 analysis, which was performed to examine the relation between conceptual order and linear structure for the spoken data.

Table 3: The chi-square statistic for the spoken data

	Priority	Simultaneity	Posteriority	Row Totals
Initial	2379	902	479	3760
Final	225	142	78	445
Column Totals	2604	1044	557	4205

*The chi-square statistic is *27.3227*. The p-value is < *0.00001*. The result is significant at p < *.05*

Table 3 shows the observed total numbers of the samples as well as chi-square statistic and p value for the spoken data. The relation between these variables was significant, X^2= *27.3227*, p <*0.00001*. Temporal clauses that express a prior event are more likely to appear before the main clause compared to temporal clauses indicating a simultaneous and posterior event.

For the written data, there are 4243 converb clauses that appear at the beginning of sentences and 552 converb clauses that appear at the end. Approximately 88,49% of the temporal clauses come before the main clause, while only 11,51% come after it. Figure 2 below shows the distribution of initial and final converb clauses that express priority, simultaneity and posteriority.

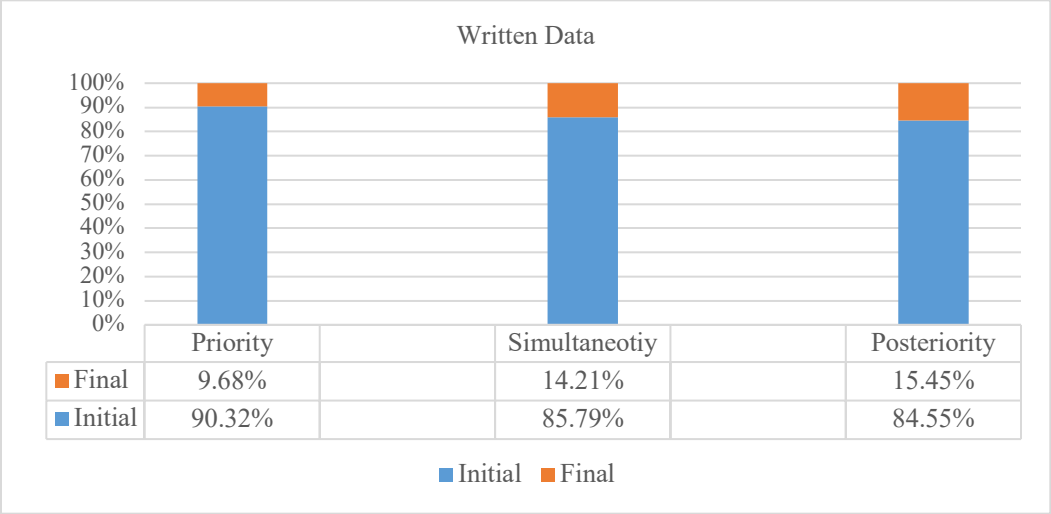

Figure 2. Conceptual order and linear structure for the written data

Figure 2 shows the correlation between linear structure and conceptual order in the written data. It illustrates that out of the prior converb clauses, 90,32% (N=2734) come before the main clause and 9,68% (N=293) come after the main clause. Similarly, 85,79% (N=978) of the simultaneous converb clauses are positioned before the main clause and 14,21% (N=162) are positioned after the main clause. 84,55% (N=531) of the temporal clauses that express posteriority are placed before their corresponding main clause while 15,45% (N=97) are placed after their corresponding main clause. Similar to the results of the spoken data, temporal clauses that express posteriority do not seem to adhere to the anticipated sequential iconicity as much as prior converb clauses do. Table 4 below shows the 2×3 X^2 analysis, which was performed to examine the relation between conceptual order and linear structure for the written data.

Table 4: The chi-square statistic for the written data

	Priority	Simultaneity	Posteriority	Row Totals
Initial	2734	978	531	4243
Final	293	162	97	552
Column Totals	3027	1140	628	4795

*The chi-square statistic is 27.6676. The p-value is < 0.00001. The result is significant at p < .05

Table 4 shows the observed total numbers of the samples as well as chi-square statistic and p value for the written data. The relation between these variables was significant, $X^2 = 27.6676$, p <0.00001. Temporal clauses that express a prior event are more likely to appear before the main clause compared to temporal clauses indicating a simultaneous and posterior event.

When we compare the spoken and written data in terms of conceptual order and linear structure, it can be said that for the prior converb clause constructions, iconic clause order is more preferred for the spoken data mora than the written data. In contrast, for the posterior converb clause constructions, iconic clause order is more preferred for the written data more than the spoken data.

Given that the placement of temporal adverbial clauses varies depending on the converb suffix used, the specific positional patterns of nine temporal clauses were also investigated. The sample sizes in the explanations show the total numbers for the linear structure and/or conceptual order. Table 5 below shows the distribution of initial and final converb clauses that express priority for *-(y)IncA (when)* temporal converb clauses.

Table 5: -(y)IncA temporal converb clauses – conceptual order and linear structure

-(y)IncA	Spoken (Conceptual Order)				Written (Conceptual Order)			
Linear Structure	Prior	Simultaneous	Posterior	TOTAL	Prior	Simultaneous	Posterior	TOTAL
Initial	418	0	0	418	429	0	0	429
Final	72	0	0	72	81	0	0	81
Total	490	0	0	490	510	0	0	510

Table 5 reveals that *-(y)IncA (when)* temporal converb clauses typically come before the main clause. Specifically, 847 of the clauses are positioned before the main clause, while 153 of them appear after it. All of the clauses express priority. The placement of the *-(y)IncA (when)* temporal converb clauses aligns with the conceptual order, as 84,12% of the prior clauses come before the main clause.

Table 6 below shows the distribution of initial and final converb clauses that express priority, simultaneity and posteriority for *–DiğIndA (when)* temporal converb clauses.

Table 6: -DIğIndA temporal converb clauses – conceptual order and linear structure

-DIğIndA	Spoken (Conceptual Order)				Written (Conceptual Order)			
Linear Structure	Prior	Simultaneous	Posterior	TOTAL	Prior	Simultaneous	Posterior	TOTAL
Initial	309	23	39	371	432	29	45	506
Final	23	10	16	49	41	12	21	74
Total	332	33	55	420	473	41	66	580

Based on the information provided in Table 6, it is evident that *–DiğIndA (when)* temporal converb clauses predominantly appear before the main clause. To be precise, 877 of the clauses are positioned before the main clause, whereas 123 of them occur after it.

Most of the *–DiğIndA (when)* temporal converb clauses express priority. Table 6 shows that there are 805 prior clauses, 74 simultaneous clauses, and 121 posterior clauses.

The placement of the *–DiğIndA (when)* temporal converb clauses aligns with the conceptual order for the prior converb clause constructions (92,05% of the clauses are initial and 7,95% of them are final). For the posterior converb clause constructions, *DiğIndA (when)* temporal converb clauses do not align with the conceptual order as prior converb clauses do (69,42% of the clauses are initial and 30,58% of them are final).

Table 7 below shows the distribution of initial and final converb clauses that express priority, simultaneity and posteriority for *-DIğI zaman (when)* temporal converb clauses.

Table 7: -DIğI zaman temporal converb clauses – conceptual order and linear structure

-DIğI zaman	Spoken (Conceptual Order)				Written (Conceptual Order)			
Linear Structure	Prior	Simultaneous	Posterior	TOTAL	Prior	Simultaneous	Posterior	TOTAL
Initial	401	43	21	465	373	33	22	428
Final	21	18	11	50	31	16	10	57
Total	422	61	32	515	404	49	32	485

Table 7 reveals that *-DIğI zaman (when)* temporal converb clauses typically come before the main clause. Specifically, 893 of the clauses are positioned before the main clause, while 107 of them appear after it. Most of the *-DIğI zaman (when)* temporal converb clauses express priority. Table 7 shows that there are 826 prior clauses, 110 simultaneous clauses, and 64 posterior clauses.

The placement of the *-DIğI zaman (when)* temporal converb clauses aligns with the conceptual order for the prior converb clause constructions clearly (93,70% of the clauses are initial and 6,30% of them are final). For the posterior converb clause constructions, *-DIğI zaman (when)* temporal converb clauses do not align with the conceptual order as prior converb clauses do (67,19% of the clauses are initial and 32,81% of them are final).

Table 8 below shows the distribution of initial and final converb clauses that express simultaneity for *–ken (while)* temporal converb clauses.

Table 8: -ken temporal converb clauses – conceptual order and linear structure

-ken	Spoken (Conceptual Order)				Written (Conceptual Order)			
Linear Structure	Prior	Simultaneous	Posterior	TOTAL	Prior	Simultaneous	Posterior	TOTAL
Initial	0	449	0	449	0	414	0	414
Final	0	71	0	71	0	66	0	66
Total	0	520	0	520	0	480	0	480

Table 8 reveals that *–ken (while)* temporal converb clauses which indicate simultaneity typically come before the main clause. Specifically, 863 of the clauses are positioned before the main clause, while 137 of them appear after it. The placement of the *–ken (while)* clauses aligns with the conceptual order, as 86,30% of the simultaneous clauses come before the main clause while 13,70% of the simultaneous clauses come after the main clause.

Table 9 below shows the distribution of initial and final converb clauses that express priority for *-(A/I) r…-mAz (as soon as)* temporal converb clauses.

Table 9: -(A/I) r…-mAz temporal converb clauses – conceptual order and linear structure

-(A/I) r…-mAz	Spoken (Conceptual Order)				Written (Conceptual Order)			
Linear Structure	Prior	Simultaneous	Posterior	TOTAL	Prior	Simultaneous	Posterior	TOTAL
Initial	433	0	0	433	468	0	0	468
Final	47	0	0	47	52	0	0	52
Total	480	0	0	480	520	0	0	520

Table 9 shows that *-(A/I) r…-mAz (as soon as)* temporal converb clauses expressing earlier events generally precede the main clause. Of them, 901 are found to appear before the main clause, while 99 of them are found to appear after it. Therefore, the sentential positions of the *-(A/I) r…-mAz (as soon as)* temporal converb clauses align with the conceptual order since 90,10% of them come before the main clause.

Table 10 below shows the distribution of initial and final converb clauses that express priority for **-***DIğIndAn beri (since)* temporal converb clauses.

Table 10: **-**DIğIndAn beri temporal converb clauses – conceptual order and linear structure

-DIğIndAn beri	Spoken (Conceptual Order)				Written (Conceptual Order)			
Linear Structure	Prior	Simultaneous	Posterior	TOTAL	Prior	Simultaneous	Posterior	TOTAL
Initial	386	0	0	386	531	0	0	531
Final	34	0	0	34	49	0	0	49
Total	420	0	0	420	580	0	0	580

Table 10 reveals that *-DIğIndAn beri (since)* temporal converb clauses expressing prior events mostly precede the main clause. 917 of the clauses are positioned before the main clause, while 83 of them appear after it. The placement of the *-DIğIndAn beri (since)* temporal converb clauses corresponds to the conceptual order as 91,70% of the prior clauses come before the main clause.

Table 11 below shows the distribution of initial and final converb clauses that express posteriority for *-mAdAn önce (before)* temporal converb clauses.

Table 11: -mAdAn önce temporal converb clauses – conceptual order and linear structure

-mAdAn önce	Spoken (Conceptual Order)				Written (Conceptual Order)			
Linear Structure	Prior	Simultaneous	Posterior	TOTAL	Prior	Simultaneous	Posterior	TOTAL
Initial	0	0	419	419	0	0	464	464
Final	0	0	51	51	0	0	66	66
Total	0	0	470	470	0	0	530	530

Table 11 indicates that *-mAdAn önce (before)* temporal converb clauses expressing posteriority generally precede the main clause. In particular, 883 of the clauses are situated before the main clause, while 117 clauses occur after it. 88,30% of the posterior clauses come before the main clause while 11,70% of them come after the main clause, which does not correspond to the conceptual order.

Table 12 below shows the distribution of initial and final converb clauses that express priority for *-DIktAn sonra (after)* temporal converb clauses.

Table 12: -DIktAn sonra temporal converb clauses – conceptual order and linear structure

-DIktAn sonra	Spoken (Conceptual Order)				Written (Conceptual Order)			
Linear Structure	Prior	Simultaneous	Posterior	TOTAL	Prior	Simultaneous	Posterior	TOTAL
Initial	432	0	0	432	501	0	0	501
Final	28	0	0	28	39	0	0	39
Total	460	0	0	460	540	0	0	540

As can be seen in Table 12, *DIktAn sonra (after)* temporal converb clauses expressing events occurring before the events expressed by the main verb typically come before the main clause. 933 of the clauses are positioned before the main clause, while 67 of them appear after it. Conceptual order and linear structure are clearly related for *-DIktAn sonra (after)* temporal converb clauses as 93,30% of the prior clauses come before the main clause while only 6,70% of them come after it.

Table 13 below shows the distribution of initial and final converb clauses that express simultaneity for *–DikçA (whenever)* temporal converb clauses.

Table 13: –DIkçA temporal converb clauses – conceptual order and linear structure

–DIkçA	Spoken (Conceptual Order)				Written (Conceptual Order)			
Linear Structure	Prior	Simultaneous	Posterior	TOTAL	Prior	Simultaneous	Posterior	TOTAL
Initial	0	387	0	387	0	502	0	502
Final	0	43	0	43	0	68	0	68
Total	0	430	0	430	0	570	0	570

Table 13 reveals that *–DikçA (whenever)* temporal converb clauses which express simultaneous events typically come before the main clause. 889 of the clauses are positioned before the main clause, while 111 of them appear after it. The placement of the converb clauses aligns with the conceptual order, as 88,90% of the simultaneous clauses come before the main clause while 11,10% of the simultaneous clauses come after the main clause.

Conclusion

As mentioned above, the aim of this study is to investigate the positioning variations of temporal converb clauses in Turkish and whether or not it is consistent with the iconicity principle. In order to achieve the goals of the study, a corpus based study was carried out by using the data from the Turkish National Corpus. Based on the findings of the study, the research questions are answered as follows.

RQ-1) *What are the sentential positions of Turkish temporal converb clauses based on their subcategories?*

The findings of the spoken and written data reveal that *-(y)IncA (when), -DiğIndA (when), -DIğI zaman (when), -ken (while), -(A/I) r…-mAz (as soon as), -DIğIndAn beri (since), -mAdAn önce (before, -DIktAn sonra (after), and –DikçA (whenever)* temporal converbial clauses in Turkish appear mostly before the main clause. In terms of the categories of the converb clauses, a similar result was found in both written and spoken data. In regard to the converbs expressing events that occur before the event mentioned in the main clause (*-(y)IncA (when)*, *-DiğIndA (when)*, *-DIğI zaman (when)*, *-(A/I) r…-mAz (as soon as)*, *-DIğIndAn beri (since)* and *-DIktAn sonra (after)*), they are generally found to come before the main clause. Concerning the converbs expressing events which occur at the same temporal point as expressed by the embedded and main clauses (*-DiğIndA (when)*, *-DIğI zaman (when)*, *-ken (while)* and *–DikçA (whenever)*), it is also found that the temporal clauses appear mostly before the main clause. Those converbs expressing

posteriority (*-DiğIndA (when)*, *-DIğI zaman (when)* and *-mAdAn* önce *(before)*) in which the event expressed in the embedded clause occurs after the event expressed in the main clause have a tendency to precede the main clause.

Those results are in line with the views of Kornfilt (1997) on the positions of adverbial clauses in Turkish. She states that all kinds of adverbial clauses in Turkish come before the main clause in a normal word order. Therefore, it is the default position for these clauses. However, given the general flexibility of word order in Turkish, the adverbial clause can appear in a non-default position. The results also support the hypothesis of Diessel (2001) on the positioning of adverbial clause constructions. He hypothesizes that the positioning of main clause/predicate and subordinate clause shows a significant correlation with the placement of the subordinator in the subordinate clause. Adverbial clauses introduced by a final subordinator tend to come before the main clause/predicate. On the other hand, adverbial clauses marked by an initial subordinator can be found in both initial and final positions, irrespective of the order of the verb and object in the sentence. Since Turkish converbial clauses include final endings, the results of this study support Diessel's (2001) hypothesis.

RQ-2) *Does the iconicity of sequence affect the sentential positions of Turkish temporal converb clauses?*

It is possible to state that the sentential position of temporal converb clauses is affected by the iconicity of sequence. Temporal converb clauses indicating either an event that occurred earlier or a simultaneous event are more commonly placed before the main clause. The positioning of these converb clause types are in line with the iconicity of sequence. However, the sentential position of the converb constructions that express posteriority is not consistent with the iconicity of sequence because only around 15% of the converb clauses are placed after the main clause. Although it seems that for *–DığIndA (when)* clauses which denote posteriority, there is a tendency for iconic clause order and for *-DIğI zaman (when)* clauses which denote posteriority, this tendency is similar, for *-mAdAn önce (before)* clauses which express pure posteriority, linear structure does not correspond to the conceptual order.

The spoken and written data reveal differential patterns for the sentential positions of the converb clauses. Converb clauses expressing priority are found to appear before the main clause, which is in consistent with the iconic clause order in the spoken sample. However, this correlation is less clear in the written sample. The converb clauses expressing posteriority are found to be consistent with the iconic clause order in the written data, which is less frequent in the spoken data. Therefore, it seems that the register type seems to have an effect on the sentential positions of the converb clauses.

As it was stated before, the principle of iconicity alone cannot fully determine the sequential organization of complex sentences. Furthermore, the principle of iconicity fails to elucidate why complex sentences with converb clauses positioned at the beginning are more frequently characterized by iconicity compared to complex sentences with converb clauses placed at the end. Additionally, it does not give information about why the placement of temporal adverbial clauses varies depending on the converb suffix used. For example, while both *-(y)IncA (when)* and *-(A/I) r…-mAz (as soon as)* introduce prior adverbial clauses, *-(A/I) r…-mAz (as soon as)* clauses are more frequently positioned before the main clause compared to *-(y)IncA (when* clauses.

The factors governing the sentential positions of these clauses should be analysed in future studies taking into consideration the syntactic and psycholinguistic factors. In order to have a full understanding of these factors, further studies are required. Further studies are also needed to reveal the effects of the register types on the word order of these and other sentence types.

Authorship Contribution:	Conceptualization: DB, EY; Data curation: DB, EY; Formal analysis: DB, EY; Funding acquisition: DB, EY; Investigation: DB, EY; Methodology: DB, EY; Project administration: DB, EY; Resources: DB, EY; Softwares: DB, EY; Supervision: DB, EY; Validation: DB, EY; Visualization: DB, EY; Writing-original draft: DB, EY; Writing-review and editing: DB, EY.
Conflict of interest:	The authors declare no potential conflict of interest.
Financial support:	The authors received no financial support for the research.
Ethics Board Approval:	The authors declare no need for ethical approval for the research.

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