



# A Corpus Analysis of Temporal Adverbs and Verb Tenses Cooccurrence in Spanish, English, and Chinese

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This study investigates the cooccurrence between temporal adverbs and grammatical tenses in Spanish and contrasts temporal specifications across Spanish, English, and Chinese. Based on a monolingual Spanish corpus and a trilingual parallel corpus, the study identified the top ten frequent single-word temporal adverbs collocating with grammatical tenses in Spanish. It also contrasted the cooccurrence of temporal adverbs and verb tenses in three languages. The results show that *aún* 'still', *hoy* 'today', and *ahora* 'now' collocate with the present tense at more than 80%. *Ayer* 'yesterday' and *finalmente* 'finally' cooccurring with the simple past tense are at 84% and 69%, respectively. Then, *mientras* 'meanwhile' collocates with the past imperfect at 55%, the highest of all. *Mañana* 'tomorrow' cooccurs with the future and present tenses at 34%. Other adverbs, *ya* 'already', *siempre* 'always', and *nuevamente* 'again', do not present a strong cooccurrence tendency with a tense overall. The contrastive analysis of the trilingual parallel corpus shows a comprehensive view of temporal specifications in the three languages. However, no clear one-to-one mapping pattern of the cooccurrence across the three languages can be concluded, which provides helpful insights for second language instruction with natural language data rather than intuition. Future research with larger corpora is needed.

**Keywords:** Corpus-based Analysis, Grammatical Tenses, Temporal Adverbs, Cross-language Comparison, Contrastive Analysis

## 1. Introduction

This study is motivated by the challenges that learners of Spanish encounter when their first language and target language are quite different in expressing tense and aspect. Spanish is considered a morphologically rich language; in contrast, Chinese has very poor morphology, whereas English is between the two. Spanish verbal inflections of tense and aspect are much more complicated than in English and Chinese. Chinese-speaking learners of Spanish tend to rely heavily on temporal adverbs or contextual clues to interpret different timeframes, a strategy they use in their native language. On the other hand, native Spanish speakers rely on verbal inflections when they process input (Sagarra & Ellis, 2013). The contrast between Spanish and Chinese in expressing the tense and aspect is difficult in comprehension and production to a certain extent for Chinese-speaking learners of Spanish. In Spanish, there are 17 verb tenses (RAE, 1973), including a combination of tense (past, present, future), mood (indicative, subjunctive, imperative), and aspect (perfective and imperfective/progressive). Some grammarians consider the conditional tense, whereas others view it as mood. On top of that, a Spanish verb ending changes when the subject varies according to such categories as the person (first, second, or third), number (singular or plural), and T-V distinction (familiar or formal). In English, there are 12 types, which are a combination of tense (past, present, and future) and aspect (simple,

progressive, perfect, and perfect progressive). Notably, Chinese has no verbal inflection; there are no changes in verb forms. Chinese can only express the sentential tense through aspectual markers, for example, aspectual particles (e.g., 了 *le*, 在 *zai*, 過 *guo*, 著 *zhe*), temporal adverbials (e.g., yesterday, now, tomorrow, etc.), and modal verbs (會 *hui*, 將 *jiang*, 要 *yao* ‘will/would’). Chinese also uses information provided by default viewpoint aspect and pragmatic reasoning to interpret time without tense morphology (Lin 2003a, 2003b, 2006). The following sentences show examples of such comparisons among Spanish, English, and Chinese.

- (1) a. Yo caminé a la escuela ayer.  
 b. I walked to school yesterday.  
 c. 我昨天走路去學校。  
 wo zuotian zoulu qu xuexiao  
 [I yesterday walk to school]
- (2) a. Él caminó a la escuela ayer.  
 b. He walked to school yesterday.  
 c. 他昨天走路去學校。  
 ta zuotian zoulu qu xuexiao  
 [he yesterday walk to school]
- (3) a. Nosotros caminamos a la escuela ayer.  
 b. We walked to school yesterday.  
 c. 我們昨天走路去學校。  
 women zuotian zoulu qu xuxiao  
 [we yesterday walk to school]

In the Spanish sentences (1a), (2a), and (3a), the verb ending denotes the past tense, person, and number. The form of a verb ending changes based on the event time and the subject. In English sentences (1b), (2b), and (3b), the verb ending denotes only the timeframe in the past but does not indicate the person and number. Then, in the Chinese sentences (1c), (2c), and (3c), the past tense is demonstrated in the temporal reference 昨天 *zuotian* ‘yesterday’ while the verb form 走路 *zoulu* ‘walk’ remains the same. Additionally, the temporal marker 昨天 *zuotian* ‘yesterday’ is typically placed at a pre-verbal position instead of a post-verbal position. In contrast, the temporal adverbials are placed mainly in a post-verbal position in English. Furthermore, the location of temporal adverbs is flexible in Spanish, being either at a pre- or post-verbal position.

Regardless of language, adverbs of time often provide clues for verb tenses. Temporal adverbials restrict the time that the temporal variable could take and specify what situation time must have. For example, the adverb ‘ago’ is used with the past tense and never collocates with the present perfect in English. Certain adverbs typically cooccur with certain tenses. In Spanish, temporal adverbs like *ayer* ‘yesterday’, *la semana pasada* ‘last week’, or *el mes pasado* ‘last month’ often cooccur with the past tenses. The adverb of time is an essential temporal reference in Chinese. Some temporal adverbs seem to be associated with one tense more frequently, although they could also cooccur with other tenses. For example, the temporal adverb “now” means ‘at the present time’, ‘at this moment’, or ‘very soon’ in English. However, it could be used with tenses other than the present tense in English. For example:

- (4) a. I thought I saw her cat here right **now**. (past tense, very recent)  
 b. I’m sorry, I have to leave **now**. (present tense)  
 c. I will call him **now**. (future tense, immediately)  
 d. **Now** stop crying. It’s going to be OK. (before an imperative to make a command stronger)

Furthermore, the semantic equivalent of ‘now’ (at this moment) is *ahora* in Spanish and 現在 *xianzai* in Chinese. So then, we wonder if the English equivalent of *ahora* in Spanish and 現在 *xianzai* in Chinese function in the same way to express the tense. What are the tenses that cooccur with certain temporal adverbs in a language? How are adverbs of time across three languages similar or different in terms of tense co-appearance?

Spanish has a much more extensive verbal inflection system than English, whereas Chinese has no verb form change at all. This study then aimed to identify the usage patterns of co-appearance between high-frequency temporal adverbs and verb tenses in Spanish through a corpus-based approach. Which Spanish temporal adverbs tend to be used together with certain verb forms? Also, this study intended to examine the relationships between temporal adverbs and verbal inflections across these three languages. It examined the co-appearance of temporal adverbs and tenses to determine the similarity and the difference across Spanish, English, and Chinese. When a time reference in Spanish and its equivalence in English and Chinese remain consistent, are they used together with the same tenses across these three languages? While the temporal reference in meaning remains the same, what are the equivalent verb tenses used in Spanish and English? Then, what aspectual markers in Chinese are used in similar contexts? We need a comprehensive account of temporal locations that indicate tense, aspect, and temporal adverbs in the surface form. Thus, this study intended to clarify the relationship between tenses and temporal adverbs in a Spanish corpus and a trilingual parallel corpus.

## 2. Literature Review

Regarding the tense and temporal adverbs combination, a few previously published studies examined temporal adverbs such as *hoy* ‘today’, *esta mañana* ‘this morning’, and *entonces* ‘then’ concerning tense and aspect in Spanish. Kempas (2007) investigated the selection between the simple past (*pretérito indefinido*) and the present perfect (*pretérito perfecto*) tenses at the present of the temporal adverb *hoy* ‘today’ in an empirical study regarding regional variations in Spain. The temporal adverb *hoy* ‘today’ denotes a hodiernal context, which is related to the current day of communication. Despite regional variations, Kempas concluded that the adverb *hoy* ‘today’ is used slightly more frequently with the present perfect than the simple past, in contrast to a common opinion (e.g., Alarcos Llorach, 1984) that the present perfect is the only cooccurrence. In another study focusing on the Spanish time adverb *entonces* ‘then’, Romera (2009) explained that *entonces* ‘then’ presented an anaphoric element directing interlocutors to find an antecedent reference conveying the information from a previous event. Thus, *entonces* ‘then’ has both anaphoric and temporal specifications; it connects two events at two points of a timeline. Kempas (2009) found that the time adverb could cooccur with either the simple past or present perfect tense in Peninsular Spanish, based on a study that examined the collocation of a different temporal adverb *esta mañana* ‘this morning’ through questionnaires. Kempas concluded that the speaker’s geographical origin was a key factor in determining the preference over the simple past tense or the present perfect rather than the distance between the movement of speaking and the event. Despite these studies, a comprehensive view of the relationship between temporal adverbs and verb tenses in Spanish in a corpus-based approach is much needed.

Previous corpus-based research has limited studies that contrasted two languages regarding temporal reference and tense. In the research on the aspect of English and Chinese using two monolingual corpora of Chinese, two corpora of American English and British English, and one parallel corpus of Chinese and English, Xiao and McEnery (2004) presented the theory and data analysis on the aspect in Chinese and the comparison of Chinese and English. They proposed a new model of aspect that differentiates (1) situation aspect in terms of verb classes on the lexical level (semantic dimension) and (2) viewpoint aspect, which refers to the morphological marking of aspect (e.g., aspect markers)

in grammatical dimension. The situation aspect is common in all languages, whereas the viewpoint aspect is language specific. They identified patterns of aspect marking with distributional information about aspect markers quantitatively and how English aspect marking was translated into Chinese. For example, simple future (the imperfective category) in English was translated into Chinese with the following top three devices: Modal (44.63%), adverb (29.75%), and unmarked (22.31%).

In another study, Rao (2011) found that the present and past tenses in Chinese are somewhat vague and overlapped in comparison with English in a contrastive analysis of the temporal reference of events at the sentence level in a corpus containing an English novel (*Little Women*) and two versions of Chinese translations. The omission of temporal adverbs appears in Chinese translation when time could be inferred from the context. Furthermore, aspect markers can be used to express both the present and the past time in Chinese without apparent differences in the usage between these two timeframes when temporal markers and modal verbs were the focus of the analysis. Rao also indicated that future time was more marked with the use of modal verbs as categorical markers than present and past time. Like the research by Xiao and McEnery (2004), the modal is used more frequently than adverbs as a temporal reference for the future tense.

While we found limited studies on temporal specification and tenses for the Spanish language, a few corpus-based studies investigated the combination of temporal adverbials and tenses in English corpora. In an early study, Crystal (1966) presented the complexity inherent in expressing the cooccurrence relationships between temporal adverbials, tenses, and aspects. He stressed that further research on temporal specification with tenses was much needed. Among various tenses in subsequent research, the present perfect has been a topic of interest because the present perfect in English is used to express a past event with continuing relevance at the present moment. The present perfect marks both the perfective aspect and the present tense in English. A few researchers have looked into the overall frequency of the present perfect verb phrase, the cooccurrence of the temporal adverbials with the present perfect, and the type and distributions of the function assigned to the present perfect constructions. In a comparative review of six previous studies between 1969 and 2002, Schlüter (2006) concluded that more than 50% of the present perfect constructions do not have a temporal specification. That is, the perfective meaning is inherent in the verb phrase itself and does not rely on additional temporal adverbials in general. Schlüter (2002) cautioned that some grammar books often hint at which temporal adverbials cooccur with the verb pattern. It is questionable whether the list of temporal adverbials that appear together with the present perfect included in grammar books is supported by empirical data. Based on the data from six corpora of British and American English, the cooccurrence of the present perfect and temporal adverbials ranges from 31% to 36%. On average, only about one out of three utterances with the present perfect collocates with a temporal adverbial. Schlüter (2002) concluded that the ten most frequent temporal adverbials cooccurring with the present perfect in American English are identical to those in British English, although their order differs slightly. The temporal adverbs are: (*ever*) *since* (+ *tmp NP/CL*) (e.g., since, ever since, since last May); *never, for* + *tmp NP* (e.g., for a long time); *now, in* + *tmp NP* (e.g., in the past year). The most frequent adverbials are utterances containing the adverb *since*, covering 14.2% of temporal adverbials collocating with the present perfect in American English, whereas in British English, this group shows 12.5%.

Finally, in a recent literary corpus study, Mulder et al. (2022) examined grammatical tenses in a corpus consisting of eight chapters from Javier Marías's Spanish novel *Así Empieza lo Malo* 'Thus bad begins' and its translation to Dutch, English, and French. They focused on the present perfect and the simple past in Spanish, including two discourse functions in the novel: Narration and dialogue. The results showed that Spanish tenses were mostly translated into one-to-one with their counterparts in the three languages in narration. In dialogue, the Spanish simple past was translated into the present perfect in Dutch and French in many instances, whereas the Spanish present perfect was translated with the simple past tense in English.

As seen in previous research, there is a lack of a comprehensive view of the temporal specification

for the cooccurrence of temporal adverbs and tenses in Spanish. Besides, this combination of temporal adverbs and tenses across different languages needs further investigation.

### 3. Methods

The study asked the following two questions:

1. What is the frequency of temporal specification of the ten most frequent temporal adverbs cooccurring with tenses in Spanish?
  - a. What are the top ten most frequently used temporal adverbs in Spanish?
  - b. What are the frequency distribution and tendency patterns of grammatical tenses of the top ten temporal adverbs?
2. What are the similarities and differences across Spanish, English, and Chinese regarding the combination of temporal adverbs and tenses?

#### 3.1. Data Source

To address the research question regarding the cooccurrence of temporal adverbs and tenses in Spanish and the comparisons across Spanish, English, and Chinese, the data sources of this study included a Spanish monolingual corpus, *Corpus del Español* (CdE) 'the Spanish Corpus', <https://www.corpusdelespanol.org/now/> and a trilingual parallel corpus, *Corpus Paralelo de Español, Inglés y Chino* (CPEIC) 'Spanish, English and Chinese Parallel Corpus', <http://140.116.245.146/cpeic/TriLin.html?role=teacher>.

The Spanish Corpus (Corpus del Español, CdE) was established by Mark Davies of Brigham Young University, consisting of five corpora: Genre/ Historical, Web/ Dialects, Now (2012-2019), Google Books n-grams (BYU), and WordAndPhrase. Users can find the frequency, distribution, use of words, phrases, and grammatical constructions in the CdE. In addition, the corpora allow users to search corpus data using advanced functions, for example, different historical periods, texts/virtual, sort/limit, and more.

The second data source was a trilingual parallel corpus, *Corpus Paralelo de Español, Inglés y Chino* (CPEIC) 'Spanish-English-Chinese Corpus', compiled from four sources: The Bible, fairy tales, United Nations documents, and movie subtitles. The total data from the four sources is 4,042,005 words, including (1) 1,205,232 Spanish words (766,952 from the Bible, 9,834 from fairy tales, 428,446 from United Nations documents, and 34,378 from movie subtitles), (2) 1,210,055 English words (820,473 from the Bible, 9,952 from fairy tales, 379,666 from United Nations documents and 30,357 from movie subtitles), and (3) 1,626,718 Chinese characters (988,895 from the Bible, 14,848 from fairy tales, 622,975 from United Nations documents and 41,148 from movie subtitles) (Lu, Cheng, Yeh, Lu, & Alegre Di Lascio, 2021).

To address the first research question about the cooccurrence of temporal adverbs with tenses, we used the monolingual Spanish corpus, CdE. We then used the trilingual parallel corpus, CPEIC, to address the second research question for a contrastive analysis across three languages.

#### 3.2. Procedures of Data Extraction and Analysis

First, we consulted the classification of Spanish verb tenses and adverbs of time in Alarcos Llorach (1984, 1994), and Butt & Benjamin (2011) to identify possible combinations of adverbs of time and related Spanish verb tenses as references. In this study, only single-word adverbs were considered, excluding other syntactic structures with adverbial functions such as prepositional phrases or finite clauses (e.g., in the morning, last night, or when you arrived home).

The following explains the data extraction and analysis with the two corpora.

### 3.2.1. Natural Corpus Analysis: Spanish (*Corpus del Español*)

To form a list of high-frequency temporal adverbs, we searched the most frequently used adverbs first and classified temporal adverbs manually. Then, we analyzed the combination of temporal adverbs and tenses to form a list of combinations. The following delineates the procedures in detail.

We used the keyword term ADV in the NOW corpus of the CdE to extract the top 100 adverbs with the frequency of occurrence. A portion of the list of 100 adverbs and frequencies are: *más* ‘more’ (21,318,671), *también* ‘also’ (11,550,766), *cuando* ‘when’ (8,629,145), *ya* ‘already’ (8,326,686), *donde* ‘where’ (7,547,153), *muy* ‘very’ (7,176,872), *como* ‘as’ (6,744,666), *así* ‘like this’ (5,971,347), *hoy* ‘today’ (5,248,013), etc. We then listed the top 10 frequently appeared temporal adverbs from the top 100 adverbs. The ten most frequent adverbs of time are *ya* ‘already’, *hoy* ‘today’, *ahora* ‘now’, *siempre* ‘always’, *mientras* ‘while’, *ayer* ‘yesterday’, *aún* ‘still’, *finalmente* ‘finally’, *mañana* ‘tomorrow’, *nuevamente* ‘again’, which were used for further searches and analyses. This final top ten adverbs excluded the temporal adverbs containing the anaphoric element that included antecedent reference conveying the information from a previous event (e.g., *luego* ‘then’, *hasta* ‘till’, *antes* ‘before’, *posteriormente* ‘afterward’, *recién* ‘recently’). We made this decision for the simplicity of further analyses of the combinations between a temporal adverb and tense across three languages in this study.

Secondly, we entered one of the top 10 temporal adverbs mentioned above and VERB as the search keyword to get the results of the top 100 items of the combination of a temporal adverb and a verb form. The same process was repeated for each of the top 10 temporal adverbs. The data generated from these searches resulted in a corpus of 6,569,888 words.

Then, we sorted verbs by tense, added the frequency of the items with the same tense, and calculated the percentage of different grammatical tenses. After extracting the data with high-frequency adverbs and verbs in different tenses in Spanish (simple present, preterit, imperfect, present perfect, past perfect, future tense, etc.), we analyzed and organized the data according to their combination types, frequency of occurrence, and distribution tendencies. For example, the combinations of *ya* ‘already’, *hoy* ‘today’, and *ahora* ‘now’ with high-frequent tense verbs are listed according to their frequency: *ya está* ‘already is’ (274,823), *ya ha* ‘already has’ (229,905), *hoy es* ‘today is’ (131,102), *hoy son* ‘today are’ (89,164), *ahora es* ‘now is’ (159,345), and *ahora está* ‘now is’ (63,315). Taking *ya* as an example, a sample list of the cooccurrence of temporal adverb and verb phrase with the frequency of occurrence and tense type is shown in Figure 1, in which A denotes the present tense; B refers to the present perfect; C is the preterit; D is the imperfect, and E is the pluperfect; F is the simple future tense; G is the conditional; H is the subjunctive.

1. YA	YA+·VERB	Frequency	Tense	2. HOY	HOY+·VERB	Frequency	Tense	3. AHORA	AHORA+·VERB	Frequency	Tense
1	YA-ESTÁ	274823	A	1	HOY-ES	131102	A	1	AHORA-ES	159345	A
2	YA-HA	229905	B	2	HOY-SON	89164	A	2	AHORA-ESTÁ	63315	A
3	YA-HABÍA	213211	E	3	HOY-ESTÁ	34611	A	3	AHORA-SON	42981	A
4	YA-ES	187296	A	4	HOY-ESTAMOS	24547	A	4	AHORA-HAY	42402	A
5	YA-SEA	171612	H	5	HOY-TIENE	24425	A	5	AHORA-TIENE	35694	A
6	YA-ESTÁN	154037	A	6	HOY-TENEMOS	23247	A	6	AHORA-HA	30232	B
7	YA-TIENE	144369	A	7	HOY-HAY	22416	A	7	AHORA-ESTAMOS	29785	A
8	YA-HAN	140660	B	8	HOY-ESTÁN	21136	A	8	AHORA-ESTÁN	29097	A
9	YA-FUE	92851	C	9	HOY-HA	17246	B	9	AHORA-TENEMOS	26325	A
10	YA-ESTABA	84439	D	10	HOY-FUE	13004	C	10	AHORA-ESTOY	19846	A
11	YA-HAY	70173	A	11	HOY-TIENEN	10245	A	11	AHORA-SERÁ	15362	F
12	YA-SON	69617	A	12	HOY-SERÁ	9524	F	12	AHORA-TIENEN	14561	A
13	YA-HABÍAN	58645	D	13	HOY-HEMOS	7923	B	13	AHORA-HAN	13949	B
14	YA-TIENEN	58428	A	14	HOY-PODEMOS	7076	A	14	AHORA-VAMOS	11553	A
15	YA-SEAN	58176	H	15	HOY-HAN	6768	B	15	AHORA-TENGO	11114	A

Figure 1. Sample List of Adverb-Verb Combinations in Spanish

### 3.2.2. Parallel Corpus Analysis: CPEIC 2.0

To address the second research question, we analyzed temporal specification with corresponding meaning in different languages in the *Corpus Paralelo de Español, Inglés y Chino (CPEIC)* ‘Spanish English-Chinese Parallel Corpus’. Based on the classifications of verb tenses within the combinations of adverbs of time in the Spanish monolingual corpus, we searched the data with the combinations of verbs and adverbs from CPEIC. First, the search condition was set as “specific adverb + verb” in the fairy tale and movie themes in CPEIC. That is, under the category of *Temas* ‘themes’, *Cuentos* ‘fairy tale’ and *Película* ‘movies’ were selected. Then, in the search section under *Español* ‘Spanish’, one adverb of time from the top 10 adverbs mentioned above was entered as a keyword, and *verbo* ‘verb’ was selected under POS. Then, we analyzed the meaning of adverbs and the relationship of verb tense crossing the three languages using the search results of CPEIC. For example, the Spanish sentence in the imperfect past tense in *Los criados le traían comida pero ya nadie venía a verlo más* corresponds to the English sentence in the past tense, ‘Servants brought him food, but hardly anyone **came** to see him anymore,’ and to the Chinese sentence, ‘每天，僕人會帶食物給他，可是再也沒有人專門來看他了。’ As shown in the parallel sentences here, the Spanish adverb *ya* has no corresponding adverb in English and Chinese. While the tense for *venía* in Spanish was the past imperfect, the tense in English was the simple past (came), and the aspect marker in Chinese was 了 *le*. LE was used in Chinese to indicate a perfective aspect. Figure 2 shows sample sentences containing the cooccurrence between *ya* ‘already’ and *hoy* ‘today’ and corresponding tenses across three languages in the database.

Spanish		English		ADV	Chinese
<b>Ya</b> lo <b>tenía</b> todo: una bellezae splendorosa, muchísima atención y un lugar maravilloso para Los criados le traían comida pero <b>ya</b> nadie <b>venía</b> a verlo más .	imperfect	He <b>had</b> it all: dazzling beauty, lots of attention, and a wonderful place to live!	past	X	他的願望都成真了。他還有什麼不滿意的呢？
Nos <b>tenemos</b> que volver <b>hoy</b> mismo a Madrid .	present	We <b>are going</b> back to Madrid <b>today</b> .	present progressive	today	我們 <b>今天</b> 就回馬德里。
Ah , Julián , eh ... ¿ ha sido por lo que <b>ha pasado hoy</b> ?	present perfect	Julián , is it because of what <b>happened today</b> ?	past	today	胡利安，這是因為 <b>今天</b> 那事嗎？
¿ Qué <b>pasó hoy</b> ?	simple past	What <b>happened today</b> ?	past	today	發生什麼了？
<b>Me meé</b> encima <b>hoy</b> , eso pasó ...	simple past	I peed myself .	past	X	我尿褲襠裡了。
Mira , yo iré cuanto antes , pero <b>hoy</b> me <b>es</b> remotamente .	present	I will go later , but <b>today</b> it <b>is</b> not remotely possible .	present	today	我會盡快去看看的，但 <b>今天</b> 實在不行。
Pues yo misma os lo preparo , si quieres . Es que <b>hoy cerrábamos</b> .	imperfect	I can do it for you , if you want . We <b>were going</b> to close <b>today</b> .	past progressive	today	我現在可以幫你們準備，本來 <b>今天</b> 關門。
<b>Hoy</b> me <b>pondré</b> a dieta .	future	I <b>will</b> have to diet <b>today</b> .	future	today	我 <b>今天</b> 要節食了。

Figure 2. Sample Temporal Adverb and Verb Combinations across Spanish, English, and Chinese

## 4. Results and Discussion

This study intended to examine how temporal adverbs are used in combination with verb tenses in Spanish and how these combinations translated across three languages differ. This section shows the analysis results using the Spanish monolingual (CdE) and trilingual parallel (CPEIC) corpora.

### 4.1. Cooccurrence of Temporal Adverb and Verb Tense in the Spanish Corpus

For the first research question, the results of corpus analysis are presented in two aspects: high-frequency temporal adverbs and the cooccurrence of temporal adverbs and verb tenses. The ten most frequently used adverbs of time in Spanish from high to low are: *Ya* (8,326,686), *hoy* (5,248,013), *ahora* (4,677,986), *siempre* (3,079,297), *mientras* (2,339,195), *ayer* (2,115,764), *aún* (2,089,991), *finalmente*

(1,031,148), *mañana* (420,187), *nuevamente* (409,891). Then, when the top 100 combinations of single-word temporal adverbs and verb tenses were taken into account, the following shows the order of temporal adverbs: *Ya* (3,053,885), *siempre* (931,417), *ahora* (885,991), *hoy* (642,219), *aún* (413,431), *mientras* (285,795), *finalmente* (122,981), *ayer* (114,955), *mañana* (97,073), and *nuevamente* (22,141). Under each temporal adverb, the cooccurrent tenses, frequency, and percentage are listed in Table 1. Given the lower frequency of tenses in the subjunctive and limited space here, all the subjunctive verb forms were clustered into one category in the table. For the same reason, some low-frequency tenses are not listed here (e.g., the present progressive, past progressive, pluperfect, etc.). Some results of the cooccurrence are unexpected, while others meet common expectations. For example, people generally believe that *ya* ‘already’ would be used more often with the present perfect, but the highest adverb-tense cooccurrence is the present tense (48%); the adverb *ya* ‘already’ is used with the present perfect at 14%. As expected, the most frequent cooccurring tense for adverbs *hoy* ‘today’ and *ahora* ‘now’ is the present tense at 85% and 83%, respectively. Similarly, the combination of *ayer* ‘yesterday’ and the preterit cover 84%, whereas the combination of *aún* ‘still’ and the present tense is 86%.

Interestingly, the temporal adverb *mañana* ‘tomorrow’ cooccurs with the simple future tense at 34% and the present tense at 34% too. Note that three verb forms typically express the future timeframe in Spanish: the morphological future, the simple present tense, and the periphrastic future (using the phrase “*ir + a*” (to be going to) in the present form (Silva-Corvalán & Terrell, 1989). Thus, it is reasonable to see the cooccurrence of *mañana* ‘tomorrow’ and the present tense at 34%.

In addition, the temporal adverb *mientras* ‘meanwhile’ collocates with the present and the imperfect past tenses at 29% and 55%, respectively. The result also indicates the semantic element of the time adverb in association with the imperfective of the lexical aspect. Interestingly, another time adverb *siempre* ‘always’ denotes repeated or habitual actions or events, which associate with the imperfective lexical aspect. The combination of *siempre* ‘always’ with the preterit is 15% but with the imperfect past is only 2%. However, the temporal adverb *siempre* ‘always’ collocates with the present and present perfect at 46% and 28%, respectively. The present perfect can express a past action continuing until the present, thus an imperfective lexical aspect. Furthermore, the time adverb *finalmente* ‘finally’ implies the endpoint of an event, which is used together with the preterit tense, a perfective aspect, at 69%. In contrast, only 1% of the *finalmente* ‘finally’ collocates with the imperfect past tense.

**Table 1.** Frequency Distribution of the Cooccurrence of Temporal Adverbs and Verb Tenses

Order	Temporal Adverbs	Present	Preterit	Past Imperfect	Future	Present Perfect	Subjunctive
1.	Ya (3053885)	1457784 (48%)	355010 (12%)	317330 (10%)	19676 (1%)	424994 (14%)	236016 (8%)
2.	Siempre (931417)	429718 (46%)	143672 (15%)	16185 (2%)	54976 (6%)	257059 (28%)	0 (0%)
3.	Ahora (885991)	735544 (83%)	11070 (1%)	12332 (1%)	67330 (8%)	52172 (6%)	1957 (0.2%)
4.	Hoy (642219)	546623 (85%)	21822 (3%)	6883 (1%)	18798 (3%)	35525 (6%)	2306 (0.4%)
5.	Aún (413431)	355160 (86%)	831 (0.2%)	32035 (8%)	2377 (1%)	0 (0%)	876 (0.2%)
6.	Mientras (285795)	84110 (29%)	9290 (3%)	156983 (55%)	0 (0%)	0 (0%)	35412 (12%)
7.	Finalmente (122981)	15378 (13%)	85113 (69%)	921 (1%)	5273 (4%)	10285 (8%)	2023 (2%)
8.	Ayer (114955)	6075 (5%)	96177 (84%)	8524 (7%)	0 (0%)	1748 (2%)	0 (0%)
9.	Mañana (97073)	33305 (34%)	16120 (17%)	2688 (3%)	33368 (34%)	5834 (6%)	2309 (2%)
10.	Nuevamente (22141)	7128 (32%)	9172 (41%)	176 (1%)	2131 (10%)	1271 (6%)	304 (1%)



## 4.2. Temporal Specification in Spanish, English, and Chinese

This section discusses the results of the data analysis from the trilingual parallel corpus to address the second research question regarding the cooccurrence of temporal adverbs and tenses compared across Spanish, English, and Chinese. The examples of three parallel languages are shown in (5) to (16), as listed below. The examples in (5) through (10) show combination patterns of *ya* ‘already’, the highest frequency of adverbs of time, and corresponding tenses in Spanish, English, and Chinese. The examples in (11) through (16) include sample sentences for *hoy* ‘today’, *siempre* ‘always’, and *mañana* ‘tomorrow’.

### 4.2.1. The Case with *Ya* ‘Already’

The analytical results of the Spanish corpus in Table 1 above show that the margin of frequency of the cooccurrence of *ya* ‘already’ with various verb tenses is smaller than that with other adverb-verb combinations, which means the temporal specification of *ya* with tenses is quite complicated. Thus, the following will discuss some examples in detail.

- (5) a. Pues ya no **me acuerdo**. (Present)  
 [Then already not myself remember]  
 b. I **can not remember** now. (Present)  
 c. 我 已經 不 記得 了。(LE)  
 Wo yijing bu jide le  
 [I already not remember LE]
- (6) a. Bueno, ya **me voy**, Benigno, nos vemos pronto. (Present )  
 OK, already myself go, Benigno, each other see early  
 b. I **am leaving**, Benigno. I will see you soon. (Present progressive)  
 c. 我 走 了, 班尼諾, 回頭見! (LE)  
 Wo zou le, Banninuo, huitoujian  
 [I go LE, Benigno, see you]
- (7) a. **Llevar** ya cuatro horas. (Present)  
 [Take already four hours]  
 b. It **has been** four hours. (Present perfect)  
 c. 已經 過 四個小時了。(LE /perfective aspect)  
 yijing guo si ge xiaoshi le  
 [already GUO four hours LE]
- (8) a. Ya lo **tenía** todo: una belleza esplendorosa, muchísima atención y un lugar maravilloso para vivir. (Imperfect Past)  
 [Already it have everything: one beauty dazzling, a lot of attention and place. wonderful to live]  
 b. He **had** it all: dazzling beauty, lots of attention, and a wonderful place to live! (Past)  
 c. 他的 願望 都 成真 了。他 還有 什麼 不滿意 的呢? (LE)  
 tade yuanwang dou chengzhen le. Ta hai you shenme bu manyi de ne?  
 [His wish all come true LE. He still have what not content NE]
- (9) a. Pero Tairon ya **cruzaba** la meta con una enorme sonrisa en su cara. (Imperfect past)  
 [But Tyrone already cross the finish line with one big smile on his face]

- b. But Tyrone **was** already **crossing** the finish line with a big smile on his face. (Past progressive)
- c. 可是泰倫 已經 **跨過** 終點線, 臉上 掛著 大大的笑容。(GUO...LE)  
keshi Tailun yijing kua guo zhongdianxian lian shang guazhu dadade xiaorong  
[But Tyrone already cross GUO finish line face on with big smile]
- (10) a. Los criados le traían comida pero ya nadie *venía* a verlo más. (Imperfect past)  
[Servant him bring food but already no one come to see him anymore]
- b. Servants brought him food, but hardly anyone **came** to see him anymore. (past)
- c. 每天, 僕人 會帶 食物 給他, 可是 再也 沒有人 專門 來看他了。(LE)  
meitian puren hui dai shiwu gei ta keshi zai ye meiyou ren zhuanmen lai kan ta le  
[Everyday servant HUI bring food to him, but no one especially come see him LE]

Using the examples in (5) through (10), Table 2 demonstrates the temporal specification in the trilingual comparisons between the cooccurrence of temporal adverbs and tenses. The adverb *ya* can be translated into “now”, “already”, and an empty space “X” in English, whereas *ya* can be translated into *已經yijing* ‘already’ and an empty space “X” in Chinese in (5) through (7). When the tenses refer to the past in (8), (9), and (10), the temporal adverbs in English and Chinese are ‘already’ and *已經yijing* or an empty space. Overall, in the combination of *ya* and tense, the non-temporal specification (empty temporal adverb) in English and Chinese was possible. In (5), (6), and (7), when the cooccurrence of *ya* is in the present tense in Spanish, the English equivalents can be in the present, present progressive, or present perfect tenses. In Chinese, the aspectual marker “LE” indicates the perfective aspect or change in a situation. In (8), (9), and (10), when the adverb *ya* is used with the past timeframe, the tense in Spanish is imperfective past; the counterpart in English is in the past or past progressive tenses. The aspectual marker “LE” or phase aspect marker “GUO” appear in Chinese to indicate the completion of an action.

**Table 2.** Sample Contractive Distribution of Temporal Adverbs and Tenses

	Adverb	Tense		Adverb	Tense		Adverb	Tense
5a	Ya	Present	6a	Ya	Present	7a	Ya	Present
5b	Now	Present	6b	X	Present	7b	X	Present perfect progressive
5c	已經yijing	LE	6c	X	LE (change in the situation)	7c	已經yijing	LE
8a	Ya	Imperfect Past	9a	Ya	Imperfect past	10a	Ya	Imperfect past
8b	X	Past	9b	Already	Past progressive	10b	X	past
8c	X	LE	9c	已經yijing	GUO...LE (phase aspect; completion of action)	10c	X	LE

#### 4.2.2. Cases with *Hoy* ‘Today’, *Siempre* ‘Always’, and *Mañana* ‘Tomorrow’

In addition to *ya* ‘already’, other high-frequency adverbs include *hoy* ‘today’, *siempre* ‘always’, and *mañana* ‘tomorrow’, which will be presented in the examples in (11) through (16) in this section.

##### *hoy* ‘today’

- (11) a. Yo iré cuanto antes, pero hoy me **es** remotamente imposible. (present)  
[I will go sooner but today for me (it) is remotely impossible]
- b. I will go later, but today it **is** not remotely possible. (present)

- c. 我會 盡快 去 看看的 但 今天 實在 不行。(X empty)  
 Wo hui jinkuai qukan kande, dan jintian really not possible.  
 [I HUI soon go check out but today really impossible]

(12) a. Hoy **he** **hecho** cien. (Present perfect)

Today I have done 100]

b. But I already **did** 100. (Past)

c. 我 今天 做 100 個 了

wo jintian zuo yibai ge le

[I today do 100 GE (measure word) LE]

Regarding the time adverb *hoy* ‘today’, the present tense covered 85% of the concurrent cases, as mentioned in the last section. Overall, the temporal adverb *hoy* ‘today’ collocates with the present tense across the three languages, which is shown in examples in (11a), (11b), & (11c). However, the present progressive appears in English translations sometimes. Then, the second highest frequent tense collocating with *hoy* ‘today’ is the present perfect tense in Spanish. The examples in (12) reveal the differences across languages. (12a) is a Spanish example in the present perfect tense, (12b) is an English example in the past tense, while a Chinese example (12c) contains an adverb of time 今天 *jintian* ‘today’ and an aspect marker 了 *le* ‘LE’, which denotes the perfective aspect.

### siempre ‘always’

(13) a. Marco, siempre **he** **querido** preguntártelo. (Present perfect)

[Marco always have wanted ask you something]

b. Marco, **I have** always **wanted** to ask you something. (Present perfect)

c. 馬可, 我 一直 想 問 你。(X empty)

Make wo yizhi xiang wen ni

[Marco, I always want ask you]

(14) a. Siempre **quiso** ser torero (Preterit)

[Always want to be bullfighter]

b. He always **wanted** to be a bullfighter. (Past)

c. 他 很 想 當 鬥牛士。(X empty)

ta hen xiang dang douniushi

[He very want be bullfighter]

In the combination of *siempre* ‘always’ with the verb tenses, (13) and (14) show the comparisons among the three languages. (13a) in Spanish and (13b) in English are in the present perfect tense. However, the Chinese counterpart has no marker in (13c), whereas the adverb is translated into 一直 *yizhi* ‘always’. The combination of *siempre* ‘always’ and the present perfect in Spanish and English presented a continuous imperfective aspect. The adverb of time 一直 *yizhi* shows something in progress; thus, an empty marker is presented in Chinese. Sentences in (14a) and (14b) in English use the preterit in Spanish and the past in English to indicate a past timeframe. However, the Chinese example (14c) contains neither a time adverb nor an aspectual marker, which implies the stative status of wanting to be a bullfighter in the past indefinitely, a characteristic of vagueness in Chinese tense expressions.

### mañana ‘tomorrow’

(15) a. Mañana la **llamo** y me dice lo que haya decidido. (Present)

[Tomorrow her call and myself say it what have decided]

b. Think about it again. I **will call** tomorrow, tell me then. (Future)

- c. 明天 我 再 打電話問妳  
 mingtian wo zai dadianhua wen ni  
 [Tomorrow I again call ask you]

(16) a. Mañana es su cumpleaños. (Present)

[Tomorrow is his birthday]

b. It is his birthday tomorrow. (Present)

c. 明天 是他生日。

Mingtian shi ta shengri

[Tomorrow is his birthday]

Finally, the monolingual Spanish corpus analysis results suggest that the cooccurrence of the adverb of time *mañana* ‘tomorrow’ with the future and present tense are the same in percentage (34%). The Spanish verbs in (15a) and (16a) are in the present tense, although the corresponding English examples (15b) and (16b) are in the future tense and the present tense, respectively. In the Chinese examples (15c) and (16c), only an adverb of time 明天 *mingtian* ‘tomorrow’ is used without any other time reference, such as the modal 將 *jian* or 會 *hui* ‘will’ often used before a verb in a sentence referring to future intent.

## 5. Pedagogical Implications

Spanish, a morphologically rich language, is difficult to learn for students whose first language is non-inflected, like Chinese. Temporal relations in Spanish and English are mainly expressed by verbal inflections and non-verbal elements like temporal adverbials. In contrast, the temporal references in Chinese are presented through aspectual markers, temporal adverbials, modal verbs, default viewpoint aspect, and pragmatic reasoning to interpret time without verbal morphology. Grammar books typically explain the verb forms of a tense, describe its functions, and in many cases, provide hints as to which temporal adverbials cooccur with the verb tense. The temporal reference in chronological time of high-frequent adverbs, such as *ahora* ‘now’, *ayer* ‘yesterday’, and *mañana* ‘tomorrow’, seems clear. These temporal adverbs would appear with their collocating present, past, or future tenses.

Foreign language learners often like to make one-to-one matching across languages as they learn a linguistic element (Andersen, 1984). Nevertheless, learners must learn to break the habit or strategy and reconstruct their interlanguage’s developing system when the tense and temporal adverb cooccurrence does not match consistently across languages. For example, *ya* ‘already’ usually collocates with the present tense in Spanish and Chinese. However, *ya* ‘already’ is more likely to collocate with the past tense, as shown in the English translation. The results of this corpus-based study demonstrate that future grammar instruction needs to consider the results of corpus-based research more. We must provide learners with more reliable information regarding the real language uses regarding temporal specifications.

When designing instructional materials, the instructor can guide students to note the differences between their assumptions about the temporal specification and the data from a corpus in a meaningful context like a story. Then, students could analyze various sample utterances by sorting the examples from a parallel corpus so that the instructor and students co-construct the rules together to deepen students’ understanding of the relationship between verb tenses and temporal adverbials.

Based on the findings of this contrastive study, Processing Instruction (VanPatten, 2002) could be applied as a principle to design learning materials. In principle, one set of exercises should focus only on one verb form, such as third-person singular past tense. Each set of exercises should contain a

considerable number of sentences to provide sufficient input data for learners to process and analyze the target forms. The input practices aim to help learners enhance the connection between a verb with its referential meaning, often temporal adverbials. Therefore, asking students to produce the target form, such as spelling or indicating the correct verb conjugations at this initial stage of form-meaning mapping in the input, is not suggested. It is better to do output practices after learners establish the interlanguage system of temporal specification for a verb form and its relation to the temporal reference. What is essential is that the designed contexts for the input and output exercises must be contextually meaningful and relevant for students.

The following illustrates an example of such an input-based exercise. The results of this corpus-based study show that the tense that collocates with *ayer* 'yesterday' and *finalmente* 'finally' are mostly in the past tense. Thus, a sample input-based exercise for the preterit in Spanish is shown below.

Instruction: Choose an appropriate adverb of time (a, b, or c) to complete the following sentences.

1. *Mi hermana caminó a la escuela \_\_\_\_*. 'My sister walked to the school \_\_\_\_.'

(a) *siempre* 'always'                      (b) *ayer* 'yesterday'                      (c) *mañana* 'tomorrow'.

2. *\_\_\_\_ ella compró el libro de texto en la librería*. '\_\_\_\_ she bought the textbook in the bookstore.'

(a) *Ahora* 'now'                              (b) *Luego* 'later'                              (c) *Mañana* 'tomorrow'.

3. *El fue a ver a su médico para un examen físico completo \_\_\_\_*. 'He went to see his doctor for a full physical examination \_\_\_\_.'

(a) *finalmente* 'finally'                      (b) *siempre* 'always'                      (c) *aún* 'still'

Like the example above, the top combination of high-frequency cooccurrence between verb tenses and frequently used temporal adverbs can be provided to beginning learners. However, the lower-frequency combination types are more subtle in temporal specifications so they should be gradually introduced to more advanced learners using monolingual and parallel corpora data.

## 6. Conclusions

This study investigated the cooccurrence of time adverbs and verb tenses based on a monolingual (Spanish) corpus and a trilingual (Spanish-English-Chinese) parallel corpus. The analysis of the Spanish monolingual corpus, the Corpus del Español, showed the top ten single-word adverbs of time and their co-occurrent tenses. The distribution tendency of the combination of high-frequency time adverbs and verb tenses in Spanish indicates that *ahora* 'now', *hoy* 'today', and *aún* 'still' cooccur mainly with the present tense more than 80%. On the other hand, temporal adverbs like *ayer* 'yesterday', *finalmente* 'finally' are more likely to cooccur with the simple past tense. Then, *mientras* 'while' appears together more frequently with the past imperfect and the present tenses, whereas *mañana* 'tomorrow' cooccurs with the future and the present tenses. The small margin of frequency of the verb-adverb cooccurrence reflects the complexity of their temporal specifications. For example, the adverb *ya* 'already' collocates with the following tenses: the present (48%), the present perfect (14%), the preterit (12%), the past imperfect (10%), the subjunctive (8%), and the future (1%). Likewise, the combinations of *nuevamente* 'again' with various tenses show a less clear tendency. Only a few time adverbs like *ahora* 'now', *hoy* 'today', and *aún* 'still' cooccurring with the present tense and *ayer* 'yesterday' with the simple past tense resulted in more than 80% in this study. The results suggest that the common strategy about certain temporal adverbials as trigger words for learning the verb tense in pedagogical grammar would not work for many adverb-tense combinations.

The contrastive analysis of trilingual parallel corpus provides a comprehensive view of the temporal specification and a window into the complexity of the cooccurrence of temporal adverbs and grammatical tenses among inflectional and non-inflectional languages. We have showed examples of

*ya* ‘already’ with different verb tenses, the frequency of temporal adverbs, and corresponding tenses in Spanish, English, and Chinese. For instance, the combination of Spanish *ya* ‘already’ and the present tense can correspond to the combinations of the adverb “now” and the present, or non-temporal specification with the present progressive and the present perfect tenses in English, as well as to the Chinese adverb 已經 *yijing* ‘already’ and aspectual marker “le” combination. Like other combinations of tense and temporal adverbs, overall, there is no one-to-one or clear pattern between Spanish and English, even though they are inflectional languages compared to Chinese. Even with high frequency temporal adverb like *hoy* ‘today’ in Spanish corpus, the co-occurrent verb tense could be the present perfect in Spanish, the past in English and aspectual marker LE in Chinese. Thus, in addition to grammatical tenses, lexical aspects should be taken into account when we contrast the temporal adverbs and tenses across languages. Unfortunately, the current study is limited by the size of the trilingual parallel corpus. With a larger parallel corpus, we might be able to draw more conclusive findings in contrastive analysis across the three languages.

Future research could develop a larger parallel corpus. The tendency pattern of temporal and non-temporal specifications across languages could also be explored further. The research scope could expand from single-word temporal adverbs to other adverbials in different syntactic structures, such as preposition phrases of time (e.g., In + temporal NP as “in the morning”, FOR+ temporal NP as in “for two months”, or other phrases like “so far” or “last year”). Different text types or discourse functions (e.g., dialogue, narrative, expository, argumentative, descriptive texts, etc.) might yield different results. In addition, the positions of temporal adverbials within sentences in relation to verb tenses also need further research.

When we apply linguistic research results to other fields, the corpus-based research findings will provide valuable insights into real language uses for instructional material design and reliable linguistic references for investigating second language acquisition in different contexts.

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