

A Comparison Analysis of Spanish Phonological System and English Phonological System

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Abstract: Nowadays, a total of 580 million people speak Spanish in the world, and over the years, Spanish has become a worldwide language spoken by millions. As there is an increasing number of English learners around the globe who speak Spanish as well, it is worthwhile to study the benefits and the obstacles during the learning process. However, most of the study existed focus on the pronunciation and dialects of Spanish and English, and there are few studies focus on the phonological system analysis of both languages. In this research, the phonological systems of Spanish and English are briefly reviewed. By comparing the vowels and consonants in both languages, it highlights the differences and challenges that learners may face when learning Spanish and English phonology. The characteristics of the two languages are highly different, despite the fact that they share a few other phonological patterns and many phonemes, such as vowel sounds, consonant sounds, sentence structure, and sentence stress. This study also emphasizes the importance of practice and understanding these distinctions to improve pronunciation and communication skills in both languages.

Keywords: Spanish phonological system, English phonological system, comparison

1. Introduction

Spanish is the official languages in 18 American nations as well as the Commonwealth of Puerto Rico. From the 15th century to the 19th century, Spain established a huge colonial empire through conquest and colonization, including South America, North America, the Caribbean and Asia. Through brutal policies of conquest, plunder, and colonialism, they took vast amounts of wealth and resources from the local population. However, this colonial behavior also resulted in a large number of deaths of the local population, and at the same time had a profound impact on the local language and culture. Because of the spread and importance of Spanish, many English learners are also studying Spanish. Spanish is the most popular target language among English native speakers in the United States, which is not unexpected given that more than 43 million Americans speak Spanish as their first language.

Most of the existing studies focus on the pronunciation differences between Spanish and English as well as their dialects. However, few studies have combined the analysis of both Spanish phonological system and English phonological system.

To address a research void, the phonological systems of Spanish and English were compared. This study not only compares the phonological systems of Spanish with English, but also highlights some of these distinctive phonological features that are crucial for learning both languages, Spanish and

English. This article has three parts, in addition to an introduction and a conclusion. The author will explain the context, goal, significance, and organization of this research in the introduction. The Spanish phonological system is a major topic in the first section. The article's second section will focus on the phonetic structure of English. The third part discusses the comparison analysis of Spanish phonological system and English phonological system, which can further be divided into analysis of vowels, consonants, syllable structure and syllable stress.

2. The Phonological System of Spanish

2.1. The Main Features of Vowels in Spanish

The Spanish phonemic inventory has five vowel phonemes: /a/, /e/, /i/, /o/, and /u/[1]. In comparison to English, which has various tense and lax vowels, for example, /A/, /ae/, /ç/ and diphthongs. When the high vowels /i/ and /u/ are unstressed and adjacent to another vowel, they reduce and become glides, [j] and [w], respectively. The stressed mid vowels /e/ and /o/ may exchange with the diphthongs /je/ and /we/, depending on the lexical context [2].

As a result, [i] and [u] are pronounced with relatively high tongue positions, [e] and [o] are pronounced with a somewhat flat tongue position, while [a] has a moderate height. The graph shows that [i] and [e] are pronounced with the tongue arched forward, [a] is pronounced with the tongue arched backward with respect to the horizontal axis, and [o] and [u] are pronounced with the tongue arched forward with regard to the horizontal axis [2]. Additionally, whether a vowel is rounded or unrounded can be determined by the lip position during articulation. Looking at the lip position in the first syllable of words like “piso,” “puso,” you can discern that [o] and [u] are articulated with rounded lips, whereas the other three vowels are articulated with unrounded lips. It is critical to understand that, in contrast, tongue height and horizontal position alone are sufficient to distinguish each of the five Spanish vowel sounds, negating the need for lip-rounding.

With this framework, a graphic representation of the five Spanish vowels is presented in Table 1 below.

Table 1: Spanish phonemes: vowels.

	Front	Central	Back
High	i		u
Mid	e		o
Low		a	

2.2. The Main Features of Consonants in Spanish

For Spanish, there are 18 consonant phonemes that are frequently mentioned. The components of these phonemes are the voiceless fricatives, /f/, /s/; the voiceless unaspirated stops, /p/, /t/, and /k/; the voiced stops, /b/, /d/, and /g/, and /x/ (voiceless velar); the glides, /w/ and /j/; the lateral, /l/; the affricate, /tʃ/; the alveolar flap /r̄/; the nasals, /m/, /n/, and /ɲ/ (voiced palatal) the alveolar trill /r/. The three voiced stops, /b, d, and g/, are distributed in a complimentary manner [3]. Depending on their context, these sounds can vary between approximate and plosive allophones. The Spanish consonant system, as a whole, offers a wide variety of sounds with distinct phonetic characteristics and patterns of change.

With this framework, a graphic representation of the five Spanish vowels may be found in Table 2 below.

Table 2: Spanish phonemes: consonants.

	Bilabial	Labial-dental	Dental	Alveolar	Palatal	Velar	Bilabial-velar	Glottal
Stop	p b		t d			k g		
Fricative		f		s	y	x	w	(h)
Affricate					tʃ			
Nasal	m			n	ɲ			
Lateral				l				
Tap				r̄				
Trill				r				

3. The Phonological System of English

3.1. The Main Features of Vowels in English

The 20 vowel phonemes that make up the English vowel system can be categorized according to their height, backness, and rounding. In terms of height, English vowels can be high, mid, or low, depending on during articulation, the position of the tongue. The location of the uppermost section of the tongue is referred to as backness, which can be front, central, or back. Rounding distinguishes between unrounded or rounded lips during vowel production. English vowels can be categorized into these feature groups, allowing for a comprehensive understanding of their differences and variations. Vowels are phonetically reduced prior to fortis consonants inside the same syllable, such as /t t f/, rather than prior to lenis consonants like /d d v/ or in open syllables. In contrast to the vowels in the phrases *save, ridge* and *need*, respectively, the vowels in the terms *rich, safe* and *tidy* are substantially shorter. Additionally, the vowel in *light* is shorter than the one in *lie*. Vowel length is a key indicator of whether a consonant is lenis or fortis since lenis consonants commonly lack voice towards the conclusion of a syllable. Only unstressed syllables include the vowel, which is more open in quality at stem-final places [4].

With this framework, a graphic representation of the five Spanish vowels is shown in Table 3 below.

Table 3: English phonemes: vowels.

		Front	Central	Back
High	Tense	i		u
	Lax	ɪ		ʊ
Mid	Tense	e		o
	Lax	ɛ	ə	(ɔ)
Low	Lax	æ	ʌ	a

3.2. The Main Features of Consonants in English

The English consonant system can be described by four primary phonological features, place of articulation, namely manner of articulation, voicing, and nasalization. Place of articulation refers to the location in the vocal tract where airflow is obstructed to produce a consonant sound. English consonants are produced at different places, such as the alveolar ridge, lips (bilabial), hard palate (palatal), teeth (dental), (alveolar) and back of the tongue against the soft palate (velar). Manner of

articulation explains how airflow is modified or obstructed to create a consonant sound. English consonants can be stops (full obstruction and release), fricatives (partial obstruction resulting in friction), affricates (stop followed by fricative release), nasals (airflow through the nose), or approximants (narrowing of the vocal tract without significant obstruction). Vocal cord vibration during the creation of a consonant sound is known as voicing. Consonants in English can be voiced (the vocal chords vibrate) or voiceless (the vocal cords do not vibrate). For instance, the /p/ sound in “put” is voiceless, while the /b/ sound in “ball” is voiced. Nasalization refers to whether airflow goes through the oral cavity or the nasal cavity while producing a consonant sound. English consonants can be oral (airflow through the mouth) or nasal (airflow through the nose). For example, /n/ in “no” is a nasal consonant, while /t/ in “top” is oral.

Obstruents, for example, /p b/ and /s z/, are fortis and lenis when they come in pairs. Fortis obstruents, for example, /p t s/, are always voiceless and take more effort to pronounce compared to lenis consonants, such as /b d z/. At the start and the conclusion of utterances, Lenis consonants are partially voiced, and they are completely voiced in between vowels. In most dialects, fortis stops like /p/ have extra articulatory or acoustic characteristics. They are commonly unreleased [p̚] or pre-glottalized [ʔp] at the final position of a syllable as they appear individually at the very start of a stressed syllable. Additionally, they are aspirated [p^h] while they appear by themselves at the beginning of a stressed syllable [4].

These phonological features provide a framework to classify and differentiate the various consonant sounds in English, offering a concise overview of the English consonant system.

Given this structure, the five Spanish vowels may be rendered schematically, as seen in Table 4 below.

Table 4: English phonemes: consonants.

		Bilabia	Labiodent	Denta	Alveola	Post- alveola	Palata	Vela	Glotta
		l	al	l	r	r	l	r	l
Stop	voiceles				t			k	
	s	p							
Affricate	voiced				d			g	
	s					tʃ			
Fricative	voiced					dʒ			
	voiceles		f	θ	s	ʃ			h
Nasal	voiced		v	ð	z	ʒ			
	lateral	m			n			ŋ	
Approxima nt	lateral				l				
	central	w			ɹ		j		

4. The Comparison of Spanish Phonological System and English Phonological System

4.1. The Comparison of Vowels Between Spanish and English

Initially, Spanish possesses a vowel system that is both straightforward and balanced, comprising five vowels. The prevalence of five-vowel systems, specifically symmetrical ones like Spanish, is widespread across languages. When Spanish vowels are organized based on their articulation placement, they form a triangular pattern. In contrast, the English vowel system is more intricate and

takes on a quadrilateral shape due to the presence of a front-back distinction among low vowels as well.

Additionally, similar to English, Spanish allows for two vowel segments to form a single syllable. This occurs when the vowels are pronounced rapidly, leading to the reduction of one of the elements and its loss of full vowel status. For instance, in the word “cuatro” (four), the pronunciation [ˈkwa.tro] exemplifies this phenomenon. Moreover, Spanish goes a step further as even three vowels can combine to form a single syllable known as triphthongs. An example of a triphthong is found in the word “cambiáis” (you-plural change), where the pronunciation [kam.ˈbja:is] reflects this feature. It is interesting to notice that the majority of triphthongs in Spanish are found in the verb form “vosotros,” which is only found in the Peninsular Spanish dialect.

Maximum vibrations in the acoustic spectrum for both the Spanish and English vowel systems are frequently identical, according to observations. Vowel /u/’s spectrographic investigation does not support acoustical equivalency [5]. Spanish speakers distinguish Spanish vowels with 99% precision in environment and 97% precision alone, which is notable given how easily distinct they are. In contrast, English speakers accurately recognize vowels in context at 83% and at 58% when they are separated. Children who speak Spanish are less likely to neglect vowels while writing because of the strong vowel signals. Vowels, on the other hand, provide unique challenges for English speakers, who are more inclined to delete them [2].

4.2. The Comparison of Consonants Between Spanish and English

Both Spanish and English have two sets of voiced stops and stops-voiceless stops. Despite their apparent similarity, however, in Spanish, each of the three phonemes in question has just one conceivable syllable-initial allophonic expression. Spanish voiceless stops have a crisp and unaspirated quality, while Spanish voiced stops are often softer and approximant-like in their pronunciation.

Secondly, the number and phonetic realization of fricative phonemes vary across different dialects of Spanish, unlike in English. Spanish has only one voiced fricative, represented by /j/, for example in words like “yo” (I). When listening in English and Spanish, listeners focused on transitional information to find these phonemes. When identifying the identical sounds, listeners from languages without this pair did not pay attention to such information [6]. While the pronunciation of Spanish /f/ is generally not difficult for English-speaking students, the other voiceless fricatives can pose challenges. The sounds represented by /θ/ and /x/ may require more practice and adjustment for English speakers to accurately produce.

Thirdly, English lacks a palatal nasal sound, which is often compared to the sound found between vowels in words like “onion” and “canyon.” Native English speakers typically require significant practice before mastering the pronunciation of “la ñe” (the letter ñ). On the other hand, the distribution of nasals in Spanish is somewhat limited. Only the alveolar nasal (/n/) is found in word-final position. As a result, borrowed words that end in /ŋ/ or /m/ are typically adapted in Spanish with a final /n/. For example, “Adam” becomes “Adán” and “champagne” becomes “champán.”

It is worth noting that Spanish distinguishes between two rhotic sounds: a voiced alveolar trill /r/ and a simple voiced alveolar tap /ɾ/. These sounds can be heard in words like “pero” (but) and “perro” (dog). To produce the tap, the tongue tip makes a brief touch with the alveolar crest, but the trill requires several quick touches. While pronouncing the alveolar approximant /ɹ/ is frequently a recognizable feature of a foreign accent, it is vital to realize that students should focus on not “swallowing” the sound rather than worrying about rolling their “r’s.” In many British dialects, the /r/ sound in syllable-final position is not pronounced, as can be observed in words like “morning” or “car.” English speakers often apply this phonological rule automatically, without realizing it. However, when speaking Spanish, it requires significant practice to avoid dropping the final /r/ sound in Spanish

words. For example, English speakers might unintentionally pronounce words like “amó” (he loved) and “amor” (love) in the same way. Therefore, it is crucial for students to invest time and effort into practicing not omitting the coda /r/ sounds in Spanish. Interestingly, the two rhotics in Spanish are contrastive, which can form minimal pairs like “pero”–”perro”. According to the findings of the current longitudinal investigations, native English speaking Americans speakers are significantly and statistically significantly more accurate at creating the two Spanish rhotics as their degree of Spanish competence rises. Although the more skilled students were able to generate both Spanish rhotics more precisely, the voiced alveolar tap was more precise than the voiced alveolar trill [7].

4.3. The Comparison of Syllable Structure Between Spanish and English

The way that syllable cues are presented in Spanish and English differ greatly from one another. Compared to English, Spanish provides more constant syllabic signals and has a more distinct syllable structure. In addition, CVC and CV are the two dominant structures in English, although CV holds the majority in Spanish all by itself [8]. The open CV syllable, which is the most prevalent syllable form in Spanish, is another reason why syllable boundaries are generally distinct in Spanish. Examples of such syllables include ca-si-ta. The most typical syllable form in English is the closed CVC, and sometimes a consonant’s syllable of origin is unclear [2].

4.4. The Comparison of Syllable Stress Between Spanish and English

Since the gaps between stressed syllables generally have the same length, English might be considered a stress-timed language, whereas Spanish is syllable-timed in that it frequently has syllables of identical length [9]. Spanish is a syllabic language, meaning that no matter where the stress is placed inside a word, each syllable lasts the same amount of time. This adapts to the fluent Spanish pronunciation of syllables. On the other hand, the accentual rhythm of English speech distinguishes it from other languages. To put it another way, accented syllables in words often last longer than unaccented ones [10].

In English but not in Spanish, it has been demonstrated that a kid’s capacity to identify word-starting phonemes is impacted by syllable stress. For Spanish speakers, the syllable seems to be an important processing unit because of its prominence in the language. In contrast, English speakers appear to have a major and early-developing processing unit called the intrasyllabic onset-rime unit, for example, h-ook and l-ook. Thus, onset-rime activities are typically seen on English phonological awareness tests [2].

5. Conclusion

In conclusion, there are certain phonological system parallels between Spanish and English, but there are also many distinctions between the two languages. This article demonstrated that although both languages share phonological patterns and several phonemes, for instance, vowel sounds, consonant sounds, sentence structure, and sentence stress, the characteristics are significantly different. For example, two rhotic sounds—a simple voiced alveolar tap /r/ and a voiced alveolar trill /r/ are quite different between Spanish and English. Therefore, there are a variety of methods to aid learners in honing their speaking abilities, particularly pronunciation, intonation and sentence stress, and learners need to consider a variety of factors when learning about pronunciation in order to properly articulate words in the targeted language.

References

- [1] Wikipedia contributors. (2023, September 22). Spanish language. In *Wikipedia, The Free Encyclopedia*. Retrieved 07:14, September 22, 2023.

- [2] Gorman, B. K., & Gillam, R. B. (2003). *Phonological awareness in Spanish: A tutorial for speech—Language pathologists*. *Communication Disorders Quarterly*, 25(1), 13-22.
- [3] Goldstein, B. (2001). *Transcription of Spanish and Spanish-influenced English*. *Communication Disorders Quarterly*, 23(1), 54-60.
- [4] Wikipedia contributors. (2023, September 18). *English language*. In *Wikipedia, The Free Encyclopedia*. Retrieved 09:02, September 22, 2023.
- [5] Mendez, A. (1982). *Production of American English and Spanish Vowels*. *Language and Speech*, 25(2), 191–197.
- [6] Cutler, A., Cooke, M., Garcia-Lecumberri, M. L., & Pasveer, D. (2007). *L2 consonant identification in noise: Cross-language comparisons*. In *Interspeech 2007* (pp. 1585-1588). *Causal productions*.
- [7] Face, T. L. (2006). *Intervocalic rhotic pronunciation by adult learners of Spanish as a second language*. In *Selected proceedings of the 7th Conference on the Acquisition of Spanish and Portuguese as First and Second Languages* (pp. 47-58). Somerville, MA: Cascadia Proceedings Project.
- [8] Delattre, P., & Olsen, C. (1969). *Syllabic features and phonic impression in English, German, French and Spanish*. *Lingua*, 22, 160-175.
- [9] Flege, J. E., & Bohn, O. S. (1989). *An instrumental study of vowel reduction and stress placement in Spanish-accented English*. *Studies in second language acquisition*, 11(1), 35-62.
- [10] Silva Valencia, J. C. (2022). *A Comparative Linguistic Analysis of English and Spanish Phonological System*. *GIST Education and Learning Research Journal*, 25, 139-155.