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Evolution of pauses during reading in schoolchildren with different reading comprehension trajectories

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Abstract

This study examines the evolution of oral reading pauses in 27 Chilean elementary school students: nine students with high performance in reading comprehension in 4th and 6th grade; eight students with low performance in 4th grade, but high in 6th grade; and nine students with low performance. Nine university students participated as a reference group. Pauses were classified into three categories: adequate, inadequate, and silences, hesitations, and lengthening. This classification was performed using the PRAAT software. While there were no differences in adequate pauses, significant variations were observed in the frequency of inadequate pauses. The group with the lowest reading comprehension exhibited the highest frequency. In 6th grade, all students demonstrated improvement in their initial performance. However, the gap between students with higher and lower reading comprehension development persisted, while the group that increased their comprehension also tended to improve their pause management. In the case of university students, the group with strong comprehension came closer to the reference group by the time they reached 6th grade. The findings underscore the pivotal role of punctuation in guiding grammatical pauses and validate the existence of disparities in the evolution of pause usage among students with varying reading comprehension levels.

Keywords: Reading fluency; reading comprehension; oral reading; pause (speech); Elementary School.

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Evolución de las pausas de la lectura en escolares con diferentes trayectorias en comprensión lectora

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Resumen

Se examina la evolución de las pausas de la lectura oral en 26 escolares chilenos de educación básica: nueve con buen desempeño en comprensión lectora en 4.º y 6.º año; ocho con desempeño bajo en 4.°, pero bueno en 6.°, y nueve que lo mantienen bajo. Como grupo de referencia, participaron nueve estudiantes universitarios. Se clasificaron las pausas en adecuadas e inadecuadas, y en silencios, vacilaciones y alargamientos mediante el software PRAAT. No hubo diferencias en las pausas adecuadas, pero sí en la frecuencia de pausas inadecuadas. El grupo con más baja comprensión lectora presentó la frecuencia más alta. En 6.º año todos mejoraron su desempeño inicial, pero persistió la brecha entre los estudiantes con mayor y menor desarrollo en comprensión lectora, mientras que el grupo que incrementa su comprensión tiende a mejorar su manejo de pausas. Respecto de los universitarios, el grupo con buena comprensión se acercó más a ese grupo de referencia al llegar a 6.º año. Se confirma la importancia de la puntuación para guiar las pausas gramaticales y se respalda la existencia de diferencias en la evolución del uso de pausas entre estudiantes con diferente desarrollo en comprensión lectora.

Palabras clave: Fluidez lectora; comprensión lectora; lectura oral; pausas en el habla; Educación Primaria.

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INTRODUCTION

From a phonetic perspective, prosody is understood as the set of suprasegmental features characteristic of speech: stress, intonation, tone, rhythm, melody, pauses, rate of speech, and voice quality (Llisterri, 2021). From a complementary perspective, Joannette et al. (2008) see it as a communicative resource that enables the understanding and expression of communicative intentions through a cognitive process based on suprasegmental features of intonation, variations in intensity and pauses. These traits are also evident in reading aloud and are good indicators of the level of development of fluent reading skills (Dowhower, 1991; Schreiber, 1991).

Reviews and meta-analyses report that prosodic performance in fluent readers corresponds to reading with greater amplitude and variation in pitch (F0), with grouping of words into meaningful units (phrases, sentences), and with pauses whose location and duration do not interfere with the meaning of the sentences (Godde et al., 2020; Wolters, et al., 2022). Research shows that, after the initial learning of reading, poor prosodic performance is linked to low reading comprehension, even in children with decoding skills appropriate for their age (Groen et al., 2019; Miller & Schwanenflugel, 2008; see the review by Roldán et al., 2022, based on studies with Spanish-speaking children). Furthermore, prosodic performance in oral reading can predict which students belong to the group with higher or lower reading comprehension skills (Groen et al., 2019).

Pauses are one of the prosodic aspects of oral reading that first differentiates between schoolchildren with good and poor reading comprehension (Álvarez-Cañizo et al., 2015; 2018). Nevertheless, there are still few longitudinal studies on this subject. In this context, this study analyses the evolution of the use of pauses in oral reading by schoolchildren in Chile with different levels of reading comprehension and establishes comparisons with adult readers as a reference group. To contextualise the study, the following section explains the different types of pauses. In addition, a brief review of the state of the art on the use of pauses in reading aloud and their relationship to reading comprehension is presented.

REFERENCE FRAMEWORK

In spoken language, a pause corresponds to a 'silence or vocalisation inserted into speech' (Gil-Fernández, 2007, p. 544). Their location, frequency, and duration are associated with breath-voice coordination and articulatory planning (Godde et al., 2022), with the delimitation of the discourse units that structure speech, and with discourse planning (Hernández-Rodríguez and Soto-Barba, 2018). It is possible to distinguish between loud or full pauses and silent or empty pauses (Llisterri, 2021). Voiced sounds are vocalisations ('mm') or lengthening of vowels and consonants in words, while silent pauses correspond to the interruption of phonation.

When reading aloud, pauses are less frequent than in speech. Furthermore, silent pauses predominate over vocal pauses (Etxebarria et al., 2016; Gaminde et al., 2012; 2014). The research mainly focuses on the former, which can be grammatical or ungrammatical. Grammatical punctuation marks serve an important demarcative function, generally guided by punctuation. In other words, they respond more to syntactic prosody than to expressive prosody (Erekson, 2010), as they allow the reader to read while respecting the syntactic boundaries and meaning of the text. As a secondary or optional measure, the reader can also use pauses for expressive purposes, for example, by lengthening certain segments of words ('you're sooo selfish'). On the other hand, agrammatical pauses are inadequate pauses between words, causing a pause in the sentence structure and potentially altering the meaning of what is read (Gil-Fernández, 2007). For less skilled readers, intrusive pauses can also be found, which can cause phenomena such as vowel or consonant lengthening, generally related to greater difficulty in reading words ('astonnn…ished') (Borzone-de-Manrique & Signorini, 2000; Schwanenflugel et al., 2004).

Some research shows that the ability to manage pauses well during oral reading develops relatively quickly in the early years of schooling, probably because it is one of the prosodic aspects that benefits most from good word recognition (Cuadro et al., 2021; Godde et al., 2020; Groen et al., 2019; Kim et al.,

2021; Wolters et al., 2022). The study by Godde et al. (2022) is noteworthy, as it analyses the pattern of respiratory and syntactic-prosodic pauses in 295 French-speaking students between the second and seventh years of primary education, and compares it with that of 20 adults. The results revealed that second-year participants made more non-grammatical pauses, breathed more frequently, and produced more delays between inhalation and phonation. Fourth-year students, on the other hand, planned their breathing pauses better and were more guided by the score. For their part, seventh graders planned their pauses just like adults. The study concludes that proper pause management is acquired gradually between second and seventh grade, with punctuation playing an important role as a guide.

In Spain, Álvarez-Cañizo et al. (2018) describe pauses marked by punctuation marks, and pauses between and within words in 20 third-year primary school students, 20 fifth-year students and a group of adults. The total number of pauses and their duration were higher in the third-year group. Some characteristics of adult reading were found - mainly in terms of the length of pauses - among fifth-year students. Subsequently, in a longitudinal study with 40 students, Álvarez-Cañizo et al. (2020) found that inadequate pauses (not consistent with punctuation) decreased significantly between the first and second year, while their duration gradually decreased towards the third year. The number of adequate pauses (in line with the score) remained the same, but their duration decreased significantly between the second and third years.

For their part, Etxebarria et al. (2016) analysed the performance of 100 bilingual university students (Basque-Spanish) who read a news article aloud. Silent pauses were the most frequent and varied greatly in length. Although only 6% of the total corresponded to ungrammatical pauses, 35% of participants made some ungrammatical pause or some intrusive pause within a word.

Pauses and reading comprehension

One of the first studies in Spanish to address the relationship between pauses in oral reading and reading comprehension is that of Borzone-de-Manrique and Signorini (2000), conducted with 24 Argentine schoolchildren in the third year of primary school. The results showed that fewer pauses, but well-placed ones, were associated with faster reading speed and better performance in word reading and reading comprehension.

Further research confirms the link between adequate pauses in oral reading and reading comprehension. In an English-speaking context, Miller and Schwanenflugel (2008) examined 92 American schoolchildren to determine whether the development of prosodic reading at the end of the first and second years of primary school predicted performance in reading fluency and comprehension at the end of the third year, regardless of word reading skills. The most important predictors were a decrease in the number of intrusive pauses in the second year and the early acquisition of an intonation contour similar to that of adults, which in turn was determined by a decrease in inadequate pauses.

In a French-speaking context, Arcand et al. (2014) analysed the link between pauses and reading comprehension in 33 second-year primary school students. The study found that inadequate pauses negatively impacted comprehension, regardless of reading speed and accuracy. The results supported the hypothesis that using pauses while intentionally respecting punctuation marks is related to better reading comprehension. In Spain, Álvarez-Cañizo et al. (2015) studied the link between reading comprehension and various prosodic parameters of reading fluency in third and sixth year primary school students. They selected 10 students with good performance in oral and written comprehension from each year, and another 10 with good performance in oral comprehension but low performance in written comprehension. The analysis showed that lower reading comprehension was associated with a higher frequency of inadequate pauses. More recently, Fumagalli et al. (2023) relate reading fluency and comprehension in 116 fifth-year Argentine students. The group with a high level of comprehension showed significantly better performance in reading fluency, with good continuity, no intrusive pauses, and adequate delimitation of phrases and sentences in the text.

Other research has begun to investigate the pauses used by schoolchildren with a diagnosis of special educational needs related to language development. Jordán et al. (2019) describe a higher frequency

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of unnecessary pauses in children diagnosed with Specific Language Disorder, a condition associated with a risk of reading difficulties. For their part, Vásquez-Venegas et al. (2023) They compared the pauses of 20 Chilean students with typical language development (TLD) with those of five children diagnosed with autism spectrum disorder (ASD), all in fourth year. Half of the group with TLD performed well in reading comprehension and fluency, and the other half performed poorly. The group with good reading skills made fewer pauses and showed little hesitation or prolongation. The group with low reading performance paused more frequently and did not differ from children diagnosed with ASD in terms of silences and other phenomena such as lengthening, hesitations, articulatory probing, and repetitions.

In summary, evidence indicates that the ability to use pauses adequately in oral reading is acquired in the early years of schooling, guided by punctuation marks. By around the sixth year, students' performance is already similar to that of adults (Álvarez-Cañizo et al., 2018; Godde et al., 2022). Furthermore, research suggests that the way students use pauses is a good indicator of their reading skill development. However, although the relationship between pauses and reading comprehension has been documented (Borzone-de-Manrique & Signorini, 2000; Álvarez-Cañizo et al., 2015; Miller & Schwanenflugel, 2008), most research follows a cross-sectional design, limiting itself to a single moment in reading development. Furthermore, insufficient attention has been paid to the types of pauses that may occur in students' reading. This research contributes to filling these gaps through a longitudinal study that aims to examine the evolution of the use of different types of pauses in schoolchildren with different trajectories in reading comprehension. Unlike studies that compare different age groups, this analysis allows us to analyse intra-individual changes over time. Furthermore, the inclusion of a detailed typology of pauses (silences, hesitations, and prolongations) and comparison with a group of university students as a reference provide a more comprehensive perspective on reading development.

This research seeks to answer the following question: How do pauses in oral reading evolve in Chilean schoolchildren with different reading comprehension trajectories between the 4th and 6th years of primary education, and to what extent does their performance differ from or resemble that of adult readers? Schoolchildren with good reading comprehension in 4th and 6th year are expected to show better progress in the use of pauses and, by the time they reach 6th year, to narrow the gap with adults. Children who improve their comprehension should also improve their handling of pauses. On the other hand, those with low reading comprehension will pause more frequently and remain further behind adult readers.

METHOD

The design is descriptive and longitudinal. Data collection was carried out in two sessions in the 4th and 6th year, with no intervention between the two measurements.

Participants

The sample is a selection of participants from a broader study, who were assessed on reading comprehension and oral reading fluency in the 4th (2019) and 6th (2021) years of primary education. They belonged to different public schools and showed normal cognitive development, measured in 4th year using the Raven's Coloured Scale Test (Raven et al., 2004). The research complied with all ethical requirements for current research and was authorised by the ethics committee of the responsible university.

We have defined three selection profiles, representative of different trajectories in reading comprehension:

- Profile 1: students with good reading comprehension in 4th and 6th year (percentile ≥ 50).

- Profile 2: students with low reading comprehension in 4th year (percentile ≤ 40), but who had improved their performance in 6th year (percentile ≥ 45).

- Profile 3: students with sustained low reading comprehension (percentile ≤ 40 in 4th and 6th year).

Students with poor performance in word and pseudoword reading (two standard deviations below expected performance) were excluded. This had been measured in both years using the Word and Pseudoword Reading subtest of the PROLEC-R battery (Cuetos et al., 2014). Intergroup differences were not significant in 4th year (pseudowords: H = 1.8, p = .41; words: H = 3.9, p = .14) not even in 6th year (pseudowords: H = 5.3, p = .07; words: H = 3.4, p = .18).

Finally, 26 participants were selected. Their average age in 4th year was 9 years and 5 months. For the second measurement, in 6th year, they were on average 11 years and 7 months old. According to their reading comprehension profile, they were grouped as follows:

- Profile 1: n = 9 (5 girls + 4 boys)

- Profile 2: n = 8 (6 girls + 2 boys)

- Profile 3: n = 9 (6 boys + 3 girls)

As a reference group, we selected nine 4th- and 5th-year university students studying education from the same higher education institution, out of 30 who voluntarily performed the same task of reading aloud as the schoolchildren. This allowed comparisons to be made with the pauses used by adult readers.

Instruments

To measure reading comprehension and obtain aloud readings, the following instruments were used:

- Progressive Linguistic Complexity Reading Comprehension Test (CLP, as per its Spanish acronym), Form A (Alliende et al., 2004), standardised for the Chilean school population. In 4th year, Level 4, Form A (maximum 18 points) was used. In 6th year, Level 6, Form A (maximum 40 points) was applied. Scores are converted to a percentile scale. Its Cronbach's alpha is .71.

- Text for reading aloud: a fable of 215 words divided into 17 sentences was used, selected from the 4th year Language and Communication Student Textbook. According to the Inflesz readability scale (Barrio-Cantalejo et al., 2008; see https://legible.es/blog/escala-inflesz/), this text is 'fairly easy to read'.

Data collection procedure

Data collection was carried out in two sessions during the normal school day by one of the researchers and two trained examiners. The reading comprehension test was administered in each classroom, accompanied by the teacher responsible for that class. During the same week, each participant read aloud in a room free of distractions. The text was presented on paper (Calibri font, size 14) with instructions to read it aloud as best they could. A semi-professional voice recorder (TASCAM DR-40) was used for the recordings.

Analysis procedures

The text contained 36 grammatical pauses (mandatory, marked by punctuation marks). Three unmarked but grammatical pauses were also identified, as well as seven optional pauses corresponding to possible expressive lengthening, which were reviewed and validated by an expert external to the research. Overall, all of these pauses were considered adequate. Spectrograms were then generated and text objects or TextGrids were created to label and segment the acoustic signals of the pauses using Praat software. In addition, the spectrograms were compared with an auditory perception analysis. Next, reading after reading, pauses were identified and labelled as adequate or inadequate and classified as silences,

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lengthening or hesitations. Following the description by Vásquez-Venegas et al. (2023), Silences correspond to a sudden interruption in the speech chain without hesitation or prolongation of segments. Elongations are prolongations that increase the duration of a vowel or consonant segment and may or may not be preceded by silence. Hesitations correspond to silences preceded by articulatory attempts, repetitions of syllables or words, or other phenomena equivalent to errors that occur during reading aloud. For data extraction, a programming code or script for Praat (Boersma & Weenink, 2020) was used, which provided an Excel spreadsheet with the required information.

The corpus consisted of 2,526 pauses in 4th year, 895 of which were adequate and 1,631 inadequate. In 6th year, there were 1,832 pauses, 908 of which were adequate and 924 inadequate. Among university students, there were 340, with 313 adequate and 37 inadequate. The analysis was performed using SPSS v. 24.0. software. To assess normality and homogeneity of variances, the Shapiro Wilk and Levene tests were used, respectively. For intergroup comparisons by year, a non-parametric analysis of variance (Kruskal Wallis) was performed. When the analysis of variance was significant, contrasts were performed. To establish whether there were differences in the number of pauses between 4th and 6th year for each profile, the Wilcoxon test was used. In all cases, a significance level of 0.05 was used.

RESULTS

First, data on reading comprehension for each student profile is presented. Table 1 shows the descriptive statistics corresponding to the means (M) and standard deviations (SD) at the two moments of test administration.

Table 1

Reading comprehension performance by participating group

	4th year of primary education		6th year of primary education	
	Score (max: 18)	Percentile	Score (max: 40)	Percentile
Profile	**M (SD)**	**M (SD)**	**M (SD)**	**M (SD)**
Profile 1	15.78 (0.67)	96.67 (5.0)	29.33 (2.18)	82.22 (9.72)
Profile 2	8.0 (2.07)	26.25 (10.61)	23.63 (2.83)	57.50(10.35)
Profile 3	6.89 (1.76)	16.67 (8.66)	14.56 (4.85)	26.67 (12.75)

Secondly, to answer the research question, the results of the analysis of pauses are presented: total, adequate, inadequate, and subtypes. The descriptive statistics (M and SD) referring to the total number of pauses in each group are shown in table 2.

Table 2

Pauses by year and profile

	4th year of primary education		6th year of primary education	
Profiles	**M (SD)**		**M (SD)**	
Profile 1	62.44	(16.44) b	49.44	(5.83) b
Profile 2	90.25	(35.42) ab	64.25	(24.74) ab
Profile 3	138.00	(64.00) a	97.00	(41.52) a

	4th year of primary education	6th year of primary education
Profiles	**M (SD)**	**M (SD)**
University students	37.78 (3.35) c	

Note. Different letters indicate significant differences in each year according to profile, at the p < .05 level.

The analysis revealed significant differences according to profile, both in 4th year (H = 24.4, p < .01, η^2 = 0.7) and in 6th year (H = 26.1, p < .01, η^2 = 0.7). In both years, the differences between the total number of pauses made by the group with good comprehension (profile 1) and those with low comprehension (profile 3) were statistically significant, as shown by the letters. The profile 2 group ranked in the middle, with no statistically significant differences from the other two groups.

As for university students, the differences were significant with the three school profiles, both in 4th and 6th year. Finally, the total number of pauses decreased significantly in 6th year in all three profiles (profile 1: W = 2.1, p = .03, η^2 = 0.5; profile 2: W = 2.5, p = .01, η^2 = 0.6; profile 3: W = 2.7, p <.01, η^2 = 0.6).

The next step was to examine the adequate pauses. The corresponding descriptions are presented in table 3.

Table 3

Adequate pauses per year and profile

	Adequate pauses			
	4th year of primary education		6th year of primary education	
Participants	**M (SD)**		**M (SD)**	
Profile 1	35.00	(3.16) a	35.00	(4.12) a
Profile 2	32.50	(5.45) a	34.50	(3.66) a
Profile 3	35.56	(4.93) a	35.22	(5.72) a
University students	34.78 (2.45) a			

Note. Different letters indicate significant differences in each year according to profile, at the p < .05 level.

No significant intergroup differences were found in the number of adequate pauses in either 4th year (H = 1.6, p = .66, η^2 = 0.0) or 6th year of primary education (H = 0.2, p = .41, η^2 = 0.0). No differences were found when comparing 4th and 6th year in each profile. These pauses correspond almost entirely to silences coinciding with punctuation marks, with very few instances of lengthening as expressive pauses. The results for these subtypes of pauses are shown in table 4.

Table 4

Adequate pauses: silences and prolongations by year and profile

	Silences				Prolongations			
	4th year of primary education		6th year of primary education		4th year of primary education		6th year of primary education	
Profile	**M (SD)**		**M (SD)**		**M (SD)**		**M (SD)**	
Profile 1	34.67	(3.04) a	34.89	(4.26) a	0.22	(0.44) a	0.11	(0.33) a
Profile 2	32.00	(5.10) a	34.13	(3.80) a	0.50	(0.76) a	0.38	(0.52) a
Profile 3	35.44	(4.85) a	35.00	(5.59) a	0.00	(0.00) a	0.00	(0.00) a

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	Silences		Prolongations	
	4th year of primary education	6th year of primary education	4th year of primary education	6th year of primary education
Profile	**M (SD)**	**M (SD)**	**M (SD)**	**M (SD)**
University students	34.67 (2.65) a		0.11 (0.33) a	

Note. Different letters indicate significant differences in each year according to profile, at the p < .05 level.

In contrast, significant differences were found in the total number of inadequate pauses in 4th year (H = 25.3, p < .01, η^2 = 0.7) and 6th year (H = 26.5, p < .01, η^2 = 0.8). The descriptions and results of the contrasts (letters) indicating where the differences are located are presented in table 5.

Table 5

Inadequate pauses per year and profile

	Inadequate pauses			
	4th year of primary education		6th year of primary education	
Participants	**M (SD)**		**M (SD)**	
Profile 1	27.44	(14.38) b	14.44	(5.00) a
Profile 2	57.75	(36.69) ab	29.75	(22.81) ab
Profile 3	102.44	(66.04) a	61.78	(44.91) a
University students	3.0 (2.60) c			

Note. Different letters indicate significant differences in each year according to profile, at the p < .05 level.

In 4th year, there was a significant difference between the total number of inadequate pauses taken by the group belonging to profile 1 and profile 3, which is the group that takes the most pauses of this type. In 6th year, this latter group continues to take the most inadequate pauses, but the difference with their peers in profile 1 was not significant. However, in this second measurement, all three groups significantly reduced the number of inadequate pauses made in 4th year (profile 1: W = 2.3; p = .02, η^2 = 0.5; profile 2: W = 2.5, p = .01, η^2 = 0.6; profile 3: W = 2.7, p = .00, η^2 = 0.6). With regard to university students, who took few inadequate pauses, the three groups of schoolchildren showed significant differences in both the 4th and 6th year of primary education.

Table 6 shows the distribution of inadequate pauses in each subtype.

Table 6

Inadequate pauses: silences, prolongations and hesitations

	Silences				Prolongations				Hesitations			
	4th year of primary education		6th year of primary education		4th year of primary education		6th year of primary education		4th year of primary education		6th year of primary education	
Profile	M (DE)		M (DE)		M (DE)		M (DE)		M (DE)		M (DE)	
Profile 1	11.78	(7.48) bc	7.56	(3.21) b	4.67	(2.69) b	2.00	(1.87) bc	11.0	(7.53) a	4.78	(2.77) a
Profile 2	33.00	(19.59) ab	15.13	(12.56) ab	12.13	(12.65) ab	6.88	(7.36) ab	12.63	(6.82) a	7.75	(5.37) a

	Silences		Prolongations		Hesitations	
	4th year of primary education	6th year of primary education	4th year of primary education	6th year of primary education	4th year of primary education	6th year of primary education
Profile	M (DE)	M (DE)	M (DE)	M (DE)	M (DE)	M (DE)
Profile 3	60.89 (32.56) a	27.56 (18.44) a	16.11 (14.69) a	13.44 (8.20) a	25.0 (21.58) a	20.11 (19.48) b
University students	2.11 (1.05) c		0.11 (0.33) c		0.67 (1.12) c	

Note. Different letters indicate significant differences at the p < .05 level.

There were significant differences in the number of inadequate pauses of the *silences* type in 4th year (H = 28.6, p < .01, η^2 = 0.8) and in 6th year (H = 25.2, p < .01, η^2 = 0.7). In both year, the profile 3 group, with lower reading comprehension skills, made significantly more inadequate silences than the group with the best reading comprehension skills. The same is repeated in 6th year. With regard to differences with university students, these were significant in the 4th year for profiles 2 and 3, but not for profile 1. As for the decrease in inadequate silences in 6th year, it was significant for profile 2. (W = 2.5, p = .01, η^2 = 0.6) and profile 3 (W = 2.7, p < .01, η^2 = 0.6), but not for the group with good comprehension, which already had few inadequate pauses in 4th year.

As for inadequate pauses such as prolongations, intergroup differences were significant in 4th year (H = 19, p < .01, η^2 = 0.5) y in 6th year (H = 23.9, p < .01, η^2 = 0.7). In both years, profiles 1 and 3 differ from each other, with profile 3 incurring a significantly higher number of prolongations. In addition, the three groups made significantly more prolongations than the university students. Finally, in 6th year, all three groups reduced these inadequate pauses, but only for profile 1 was the difference significant (W = 2.2, p = .03, η^2 = 0.5). As for profile 2, it was found that W = 1.6, p = .11, η^2 = 0.4. For profile 3, W = 0.9, p = .41, η^2 = 0.2.

Finally, the analysis revealed significant differences in pauses caused by *hesitations* in both 4th year (H = 20.3, p < .01, η^2 = 0.6), and in 6th year (H = 20.0, p < .01, η^2 = 0.6). The differences were significant between each profile and university students, but not between the profiles. The comparison between 4th and 6th year showed that the decrease in the number of hesitations was significant for schoolchildren with profile 2 (W = 2.4, p = .02, η^2 = 0.6), but it was not enough for schoolchildren in profile 1 (W = 2.0, p = .05, η^2 = 0.5) or profile 3 (W = 1.5, p = .14, η^2 = 0.4).

DISCUSSION AND CONCLUSIONS

The aim of this study is to analyse, from a longitudinal perspective, pauses in oral reading in students with three different profiles of reading comprehension development: good comprehension in 6th and 6th year; low comprehension in 4th year but good in 6th year; and low comprehension in both years. We analysed their performance and compared it with a group of university students.

In all three profiles, there was a decrease in the total number of pauses in 6th year, but the difference between the highest and lowest performing groups in reading comprehension remained significant. Similarly, the three groups showed significant differences compared to university students. In this regard, our results are consistent with previous studies such as that by Álvarez Cañizo et al. (2018), which found that third-year children took more pauses than fifth-year children, although both groups took more pauses than the adult participants.

We then quantified the adequate and inadequate pauses. The three profiles showed practically the same number of adequate pauses in both years, with a performance similar to that of university students and closely matching the number of punctuation marks in the text. This is consistent with research showing that the ability to plan pauses is acquired with significant support from scoring (Godde, 2022; Álvarez Cañizo et al., 2020). In this study, as in Godde's (2022), we find that in 4th year, children were

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already able to read while respecting the grammatical pauses marked by punctuation, even if their reading comprehension remained low. In other words, it seems that at this school level, most students are already aware of the role of punctuation marks and use them to pause where necessary. This explains why no differences or interactions were found between the year and profile variables, nor with university students, suggesting a certain ceiling effect that leaves no room for changes that could impact performance.

Inadequate pauses are a good indicator of reading skill development in school-age children and confirm that lower reading comprehension is linked to more ungrammatical or inadequate pauses in oral reading (Álvarez-Cañizo et al., 2015; Arcand et al., 2014; Borzone-de-Manrique & Signorini, 2000). This could be observed in 4th year, as the frequency of inadequate pauses marks a significant gap between those who show better development in comprehension and those with lower reading comprehension, while profile 2 falls between the two groups. Subsequently, with two more years of schooling, we found positive developments in all three profiles. However, although all three groups demonstrated potential for improvement, the reduction in inadequate pauses was only significant for the profile with good comprehension in both years, which was the group that came closest to the performance of university students.

As for subtypes of inadequate pauses, silences were the most frequent. These intrusive pauses disrupt reading continuity and could reflect a lower efficiency in integrating words into the syntactic chain in the absence of punctuation or the need to plan the discourse articulation process. The group with the lowest reading comprehension scores made more of these types of pauses, although the difference with students in profile 2 was not statistically significant in either 4th or 6th year. The latter group reduced inadequate silences in 6th year, but did not achieve the performance of adult readers.

Prolongations also make it possible to differentiate between the group with the best track record in comprehension and the group that showed its low performance. In 6th year, all three groups reduced these pauses, although the differences were not significant compared to the first measurement. However, the decrease in prolongations in profile 1 allowed this group to catch up with the university students. As for hesitations, significant differences were only found among university students, and 4th and 6th year in profile 3.

In conclusion, the results support the initial prediction that differences in the development trajectories of reading comprehension may be linked to differences in the evolution of pause use in oral reading. Two factors are essential. On the one hand, the interpretation of punctuation marks, which allows children to make grammatical pauses without difficulty. On the other hand, the frequency of silences, hesitations and inadequate prolongations seems to be a relevant marker of the evolution of pause management. Taken together, these results suggest that the level of automaticity in reading continues to be a factor in the performance of schoolchildren with lower reading comprehension skills. Even though we selected participants who had no difficulty reading words and found no intergroup differences in this skill, its subsequent development could have been a factor linked to their own trajectories in reading comprehension and fluency. Phenomena such as prolongations and hesitations during reading aloud generate inadequate pauses that reflect a conscious effort to read words correctly, to the detriment of reading comprehension. In this sense, the improvement in understanding among students in profile 2 could be related to an improvement in this aspect.

In summary, this research, from an evolutionary perspective, helps to understand how the acquisition of pauses, a key element of reading fluency, varies in schoolchildren with different profiles of reading comprehension development. Added to this is the methodological relevance of the study, which incorporates a detailed analysis of pause subtypes and establishes a point of comparison with expert readers. Together, these elements contribute to a more accurate description of the characteristics that distinguish fluent reading in the intermediate stages of reading learning.

A practical implication of the study is that it suggests that oral reading should continue to be practised throughout primary education, as it provides important information about the individual development of reading skills in the classroom. Similarly, it is very important that children learn the meaning of punctuation marks in their early years at school and have opportunities to demonstrate how

they are progressing in their use as a guide to making grammatical pauses when reading. However, achieving fluent reading, without intrusive or ungrammatical pauses, does not depend solely on that. Targeted practice and specific support are required for children to read without hesitation or prolongation, which seem to indicate that the automaticity of reading still needs to be improved in order to achieve good fluency.

One limitation of this research is that data for 6th year correspond to 2021, when almost two years of remote learning had passed, during which many reading-related practices were interrupted or became less regular. Without this factor, the participants' potential for improvement would probably have been better reflected in the results.

As a projection, it is suggested to explore the link between word reading and pauses, taking into account their duration. We believe this variable is potentially relevant for exploring the cognitive effort involved in word decoding and articulatory planning. Other measures that could enrich future research include speech rate, intonation, syntactic grouping, and melodic variation. It would be valuable to explore how these prosodic parameters interact in reading learning, in order to advance towards a more comprehensive understanding of reading development in Chilean schoolchildren.

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AUTHORS' CONTRIBUTIONS

Beatriz Arancibia-Gutiérrez: Project management; Formal analysis; Conceptualisation; Data curation; Writing – original draft; Writing – review and editing; Research; Methodology; Resources; Supervision; Validation; Visualisation; Fund acquisition.

Hernán León-Valdés: Conceptualisation; Writing – review and editing; Research; Methodology; Resources; Supervision; Validation.

Inger Vásquez-Yáñez: Formal analysis; Data curation; Writing – revision and editing; Research; Methodology; Software; Visualisation.

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