

ORIGINAL ARTICLE

# Performance of early literacy students in cognitive-linguistic skills during the pandemic

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**Abstract**

**Introduction:** the Covid-19 pandemic made discrepancies between the different educational realities more evident for schoolchildren in the beginning of literacy.

**Objective:** to characterize the performance of cognitive-linguistic skills of students in early literacy phases during the pandemic.

**Methods:** twenty-two elementary school students participated in this study, distributed in GI 1st year students and 2nd year GII students, submitted to the application of the Cognitive-Linguistic Skills Assessment Protocol for students in the initial stage of literacy.

**Results:** students from GI and GII showed average performance for writing the name and writing the alphabet in sequence. The GI presented a refusal response for the subtests of word dictation, pseudoword dictation and picture dictation, word repetition and visual sequential memory of shapes and poor performance for alphabet recognition in random order and average performance for alphabet recognition in sequence. GII showed lower performance for the subtests of word dictation, pseudoword dictation, picture dictation and superior performance for alphabet recognition in random order, alphabet in sequence and visual sequential memory of shapes.

**Discussion:** the appropriation of the letter-sound relationship mechanism raises questions, since it evidenced the difficulty of all students in cognitive-linguistic skills necessary for the full development of reading and writing in an alphabetic writing system such as Brazilian Portuguese .

**Conclusion:** students in the 1st and 2nd years showed lower performance in cognitive-linguistic skills important for learning reading and writing.

**Keywords:** literacy, pandemic, learning, child development, education.

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## Authors summary

### Why was this study done?

With the closing of schools during the Covid-19 pandemic, discrepancies between educational realities became more evident, worsening the teaching-learning relationship and compromising the initial literacy process, a period that is extremely important for the acquisition and development of skills necessary for reading, writing and math. Thus, the authors propose to characterize the performance of cognitive-linguistic skills of students in the initial stage of literacy during the pandemic.

### What did the researchers do and find?

This study aims to characterize the performance of cognitive-linguistic skills of students in the initial stage of literacy during the pandemic through the application of the Cognitive-Linguistic Skills Assessment Protocol for students in the initial stage of literacy. This study is based on national and international scientific literature that highlights the need to understand the impact of the pandemic and, consequently, social isolation, on schoolchildren's learning.

### What do these findings mean?

There are still few studies that show the impacts of the COVID-19 pandemic on the learning of students in the initial literacy phase. This study showed that both 1st and 2nd year students had difficulties with the cognitive-linguistic skills necessary for the acquisition and development of reading and writing, showing that the lack of mastery of these skills makes reading and writing competences are poor: compromised, since these students, despite mastering and knowing the alphabet, do not know how to perform the synthesis for the formation of read or written words.

## INTRODUCTION

Covid-19 spread rapidly around the world in 2020 and generated the unprecedented situation of 90% of the student population being isolated worldwide<sup>1</sup>. In this pandemic scenario, social isolation was initiated as a measure of prevention and attenuation of the virus, among these measures, in addition to the closing of many educational institutions, the suspension of in-person classes and remote teaching were implemented<sup>2</sup>.

As for remote learning, it was implemented on an emergency basis, that is, they will only return to the face-to-face format once the health crisis has been resolved or controlled, thus providing students with temporary access to educational content in a way that minimizes effects of social isolation on their education and learning<sup>3</sup>.

However, the Covid-19 pandemic made the discrepancies between the different realities experienced by young students even more evident, access to virtual classes using more advanced digital tools and teachers trained to practice was not egalitarian or homogeneous between the systems of public and private education<sup>2,3</sup>.

Therefore, more than an educational problem, the blocking of access to school reconfigured the education system, society and, consequently, the role of speech therapy in clinical speech therapy.

Based on the above, this study aimed to investigate whether the period of remote access education established during the pandemic compromised the development of cognitive-linguistic skills necessary for the full literacy of students in the initial literacy phase.

Therefore, the aim of this study was to characterize the performance of cognitive-linguistic skills of schoolchildren at an early stage of literacy during the pandemic.

## METHODS

### Study design

This is a cross-sectional study.

### Location and period of study

The evaluation was carried out at the Laboratory for Investigation of Learning Deviations (LIDA) located at CER II - Specialized Center in Rehabilitation of FFC/UNESP - Marília-SP.

Data collection was carried out during the Covid-19 Pandemic period, and all safety standards determined by the FFC/UNESP-Marília-SP COVID-19 Committee were followed. The protocol was applied individually, in a well-ventilated environment, from July to August 2021.

The procedure of this study was applied in person and followed the guidelines described in the Prope Normative Instruction n° 01 (<https://www2.unesp.br/portal#!/covid19/reorganizaodastividades/normativas/>) in relation to the propagation of the Covid-19 virus, and the recommendations of the World Health Organization (WHO) regarding the correct use of personal protective equipment (PPE) by the researcher, such as: goggles, face shield, surgical mask, waterproof long-sleeved apron and procedure gloves.

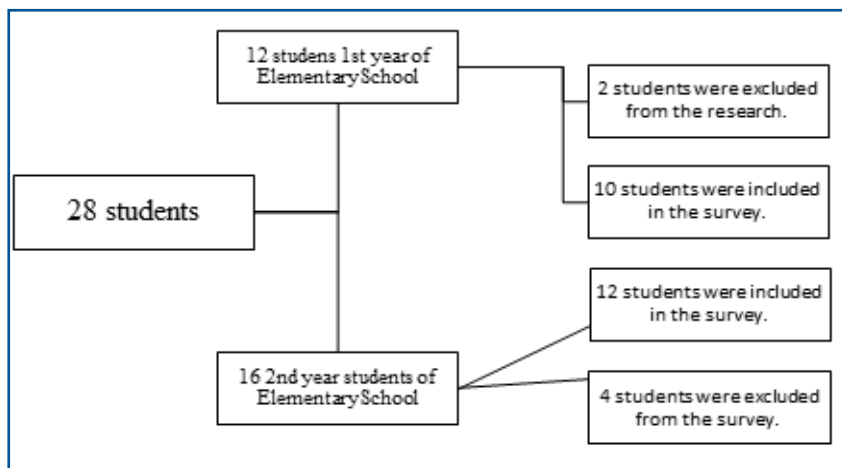
As fundamental practices and principles in the prevention of COVID-19, according to the normative document mentioned above, the following were also adopted: frequent hand washing – at least every 2 hours; social distance – individuals must maintain a minimum distance of 1.5m from each other; proper use of a face mask during the entire period you remain on campus, including outdoors; self-assessment for symptoms of COVID-19; the subjects and their guardians only accessed the areas necessary to carry out the research.

Data collection was performed by limited personal contacts through social distancing in a properly ventilated room and distancing, with the availability of a surgical mask and alcohol for all participants.

In addition, all participants had their temperature measured before and after the procedures performed in all collection sessions. The researcher used a triple surgical mask, a disposable apron and a Face Shield. At the end of each individual service, the rooms were completely sanitized by the CER II cleaning team.

### Study population and eligibility criteria

A total number of 28 students, with complaints of learning problems, were referred by municipal public schools in the region of Marília-SP, of both genders, aged from 6 years to 7 years and 11 months of the 1st and 2nd year of the Elementary School I, according to the flowchart shown in Figure 1.



**Figure 1:** Distribution of the number of subjects with complaints of learning problems referred by municipal public schools in the region of Marília-SP

From the analysis that 6 students were unable to read and write, the number of participants was redefined to 22 students, of both genders, aged from 6 years to 7 years and 11 months of the 1st and 2nd year of Elementary School I divided into two groups:

- Group I (GI): composed of 10 students from the 1st year of Elementary School I, 50% male and 50% female
- Group II (GII): composed of 12 students from the 2nd year of Elementary School I, 83.33% male and 16.66% female.

The students in this study did not present hearing and visual impairments in their school records at the time of referral, and all parents or guardians signed the Informed Consent Form.

All students were submitted to the application of the collective and individual version of the Cognitive-Linguistic Skills Assessment Protocol for students in the initial phase of literacy<sup>4</sup>, consisting of the following tests: Name writing, Alphabet writing in sequence, Copy of forms, Word and pseudo word dictation, Figure dictation, Number dictation, Sequence alphabet recognition, Random alphabet recognition, Word reading, Non-word

reading, Rhyme, Alliteration, Syllable segmentation, Sound discrimination, Repetition of words, Repetition of non-words, Repetition of numbers in reverse order, Fast automatic naming of figures, Fast automatic naming of digits, Visual shape memory.

### Data analysis

Data analysis was performed using the Statistical Package for Social Sciences, version 25.0. The results were analyzed statistically with a significance level of 5% (0.050).

### Ethics Committee Approval

This study was approved by the Research Ethics Committee of the Faculty of Philosophy and Sciences of the Universidade Estadual Paulista “Júlio de Mesquita Filho” - FFC/UNESP - Marília-SP, under number 4.862.668.

## RESULTS

In table 1, it was possible to verify that there was a statistically significant difference with the application of the Likelihood Ratio Test in order to verify possible differences between the groups in this study.

**Table 1:** Frequency distribution of the performance classifications of students from GI and GII in the Cognitive-Linguistic Skills Assessment Protocol. Likelihood Test (p<0.05).

Subtests	Classification	Groups				p value
		GI		GII		
		Freq.	Perc.	Freq.	Perc.	
EDN	Refusal	0	0.00%	0	0.00%	0.036*
	Bottom	4	40.00%	1	8.30%	
	Medium	6	60.00%	6	50.00%	
	Higher	0	0.00%	5	41.70%	
CF	Refusal	0	0.00%	0	0.00%	0.015*
	Bottom	4	40.00%	0	0.00%	
	Medium	6	60.00%	12	100.00%	
	Higher	0	0.00%	0	0.00%	
DP	Refusal	7	70.00%	2	16.70%	0.027*
	Bottom	3	30.00%	7	58.30%	

**Continuation - Table 1:** Frequency distribution of the performance classifications of students from GI and GII in the Cognitive-Linguistic Skills Assessment Protocol. Likelihood Test ( $p < 0.05$ ).

Subtests	Classification	Groups				p value
		GI		GII		
		Freq.	Perc.	Freq.	Perc.	
DPP	Medium	0	0.00%	3	25.00%	0.036*
	Higher	0	0.00%	0	0.00%	
	Refusal	7	70.00%	2	16.70%	
	Bottom	3	30.00%	9	75.00%	
DF	Medium	0	0.00%	1	8.30%	0.023*
	Higher	0	0.00%	0	0.00%	
	Refusal	8	80.00%	2	16.70%	
	Bottom	2	20.00%	6	50.00%	
RAS	Medium	0	0.00%	2	16.70%	0.002*
	Higher	0	0.00%	2	16.70%	
	Refusal	2	20.00%	0	0.00%	
	Bottom	3	30.00%	0	0.00%	
RAOA	Medium	4	40.00%	1	8.30%	0.006*
	Higher	1	10.00%	11	91.70%	
	Refusal	2	20.00%	0	0.00%	
	Bottom	4	40.00%	0	0.00%	
RP	Medium	3	30.00%	3	25.00%	0.030*
	Higher	1	10.00%	9	75.00%	
	Refusal	5	50.00%	0	0.00%	
	Bottom	1	10.00%	1	8.30%	
MSF	Medium	3	30.00%	5	41.70%	0.031*
	Higher	1	10.00%	6	50.00%	
	Refusal	5	50.00%	0	0.00%	
	Bottom	2	20.00%	2	16.70%	
	Higher	2	20.00%	5	41.70%	
	Higher	1	10.00%	5	41.70%	

Caption: EDN: name spelling, CF: copying forms, DP: word dictation, DPP: pseudoword dictation, DF: picture dictation, RAS: alphabet sequence recognition, RAOA: alphabet recognition in random order, RP : word repetition, RANF: fast automatic picture naming, RAND: fast automatic digit naming, MSF: sequential visual memory of shapes.

In table 1, it was possible to verify that the students from GI and GII showed average performance for writing the name and writing the alphabet in sequence. The GI presented a refusal response for the subtests of word dictation, pseudoword dictation and picture dictation, word repetition and visual sequential memory of shapes, in addition to lower performance for alphabet recognition in random order and average performance for alphabet recognition in sequence.

GII showed lower performance for the subtests of word dictation, pseudoword dictation, picture dictation, in addition to superior performance for alphabet recognition in random order, alphabet in sequence and visual sequential memory of shapes.

## DISCUSSION

All over the world, the pandemic caused substantial changes in the most varied domains and the Education

sector was no exception. The unprecedented current situation required a rapid transition from face-to-face teaching-learning to Virtual Education and now to a Hybrid Modality.

The process of developing reading and writing before the pandemic was already questionable and widely discussed due to the fact that current literacy methodologies in Brazil do not focus on the explicit teaching of the alphabetical and orthographic principle of the Portuguese language<sup>5</sup>. Now, in a virtual education system, issues related to the appropriation of knowledge of the letter-sound relationship mechanism bring questions and discussions, since, among the results of this study, it was possible to observe the difficulty of both 1st and 2nd year students in cognitive-linguistic skills necessary for the full development of reading and writing in an alphabetic writing system such as Brazilian Portuguese.

Today, clinical professionals, such as speech

therapists, when receiving students with complaints of learning problems, we must consider more than the complaints of parents or teachers, we must consider the context of exposure to teaching-learning situations and the consequences of their deprivation.

With the pandemic, especially in public education, many issues were raised on the agenda, such as the lack of infrastructure in schools, inequality in access to a good internet signal by families, since, according to the IPEA<sup>6</sup>, only 40% of students they were not able to take classes via remote learning, nor did they have the support of their parents to carry out activities using remote access. Furthermore, the Brazilian Society of Pediatrics<sup>7</sup> replied that, with the pandemic, there was a significant change in the families' routine, as many parents needed work at home-office and share household chores with work and childcare.

Thus, the repercussions on academic learning of Brazilian students are still invaluable, because the academic learning problems in Brazil are not recent and date back to before the beginning of the COVID-19 pandemic. Overlapping reading and writing difficulties can lead to varied, distinct and perhaps incomparable repercussions.

The beginning of literacy, a phase in which the students in this study are now, is an important period for the acquisition of cognitive-linguistic skills, considered predictors for the learning of reading and writing<sup>8-10</sup> and the delays resulting from an inadequacy of the teaching the alphabetic and spelling principle, that is, teaching the letter-sound conversion mechanism, can trigger difficulties in reading and writing words.

In this study, we found that among the students in the GI group there was a refusal response for the tasks of dictation and repetition of words and visual sequential memory of shapes and lower performance for alphabet recognition in random order, while the students from GII showed lower performance for the dictation tasks, showing that just the knowledge of the sequence of the letters of the alphabet for the two groups was not a guarantee of acquisition for the application of the alphabetic and orthographic principle at the time of writing.

The results of this study indicate that health professionals, including speech therapists, should be prepared to establish an interface between health and education during our clinical diagnostic and interventional reasoning.

This is because, according to UNESCO, the natural drop in learning could expand for more than a decade if public policies that invest in educational improvements are not created<sup>11</sup>, which means that it is not enough just to immediately improve distance learning, but it is urgently necessary to think and rethink public policies that represent the planning of academic learning recovery strategies<sup>12</sup>.

In addition, the lack of knowledge about the instructional teaching of the alphabetical and orthographic principle of the teacher-literate and the lack of professionals such as the educational speech therapist at the school means that the teaching-learning relationship of students in the initial stage of literacy is at risk, since the lack of a qualified and trained educator, from the early identification of reading and writing problems in the

classroom, can contribute to educational planning without the development of necessary strategies for the acquisition and development of decoding mechanisms and codification of our Portuguese Language Writing System.

The data from this study remind us of the need to think, as clinical and educational speech therapists, that there is still a lot to be done for these students. In a literature review carried out, the authors<sup>13</sup> found 15 scientific articles in 2020 that discussed the impacts of the pandemic on schoolchildren and observed a frequency of psychological and eating disorders and negative emotions in 40% of the articles, anxiety in 33%, depression in 26%; irritability, sedentary lifestyle and sleep disorders were mentioned in 20% of the articles, stress and post-traumatic stress disorder in 6% of the articles.

The data collected in the study mentioned above are alarming, since the referrals to the speech therapy clinic will be carried out by the school and if the educational speech therapist is not able to conduct these referrals well, most of these children will probably be misdiagnosed, however, we should consider that four of the articles in this study reported that the social and educational isolation suffered by the child population made them vulnerable to the occurrence of symptoms of lack of social contact, lack of need for social communication, inattention and hyperactivity, in addition to anxiety, irritability, obsession, hostility and impulsivity that can compromise the formation of memory for learning.

Based on the data found in this study, we conclude this article by highlighting the need for the clinical and/or educational speech therapist to act as overseers of the acquisition and development of school learning, helping to plan specific actions to promote normal development and detection of deviant processes from the teaching-learning process, thus gaining an important space with teachers and educational staff regarding relevant discussions not only about the importance of cognitive-linguistic skills for the development of academic learning, but also about the milestones of child development and predictors of literacy, so important to ensure the success of reading and writing for these students in the initial stage of literacy and so disregarded or not prioritized during the remote teaching-learning process during the COVID-19 pandemic.

## ■ CONCLUSION

First- and second-year literacy students showed lower performance in cognitive-linguistic skills that are important for the development and learning of reading and writing. knowing how to perform the tasks requested because they are probably not literate and do not know how to use the cognitive-linguistic skills necessary to trigger the analysis and synthesis processes necessary for the formation of words for both reading and writing.

## Authors' contribution

MTF, NLS, IA and NDB were responsible for collecting and tabulating the data and preparing the manuscript; CG and SAC were responsible for the project and study design and general guidance on the stages of execution and elaboration of the manuscript.

### Funding

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### Conflict of interest

I declare that there was no conflict of interest

### Confirmations

All authors approved the final version of the manuscript for submission.

## ■ REFERENCES

1. Arruda EP. Educação Remota Emergencial: elementos para políticas públicas na educação brasileira em tempos de Covid-19. Em Rede- Revista de Educação à Distância. 2020; 7(1): 257-275.
2. Camacho ACLF, Joaquim FL, de Menezes HF, Sant'Anna RM. A tutoria na educação à distância em tempos de COVID-19: orientações relevantes. Research, Society and Development. 2020; 9(5): e30953151-e30953151.
3. Joye CR, Moreira MM, Rocha SSD. Educação a Distância ou Atividade Educacional Remota Emergencial: em busca do elo perdido da educação escolar em tempos de COVID-19. Research, Society and Development. 2020; 9(7): e521974299-e521974299.
4. Silva C, Capellini AS. Protocolo de avaliação das habilidades cognitivo-linguísticas para escolares em fase inicial de alfabetização. Booktoy. 2019; 1: 1-55.
5. Pacheco LP, Hubner LC. Como o distanciamento social em tempos de pandemia desafia os estágios iniciais da aprendizagem da leitura em crianças. Signo. 2021; 46(85): 58-69.
6. Nascimento PM, Ramos DL, Melo AAS, Castioni R. Acesso Domiciliar à Internet e Ensino Remoto Durante a Pandemia. 2020.
7. Almeida RS, Brito AR, Alves ASM, Abranches CD, Wanderley D, Crenzel G, Lima RC, Barros VFR. Pandemia de COVID-19: guia prático para promoção da saúde mental de crianças e adolescentes. Residência Pediátrica; 2020.
8. Cunha VLO, Capellini SA. Análise psicolinguística e cognitivo-linguística das provas de habilidades metalinguísticas e leitura realizadas em escolares de 2ª a 5ª série. Revista Cefac. 2010; 12: 772-783.
9. Silva C, Capellini SA. Indicadores cognitivo-linguístico em escolares com transtorno fonológico de risco para a dislexia. Distúrbios da Comunicação. 2019; 31(3): 428-436.
10. Santos B, Capellini SA. Programa de remediação com a nomeação rápida e leitura para escolares com dislexia: elaboração e significância clínica. CoDAS. Sociedade Brasileira de Fonoaudiologia. 2020; 32.
11. UNESCO. A Comissão Futuros da Educação da UNESCO apela ao planejamento antecipado contra o aumento das desigualdades após a COVID-19. Paris: UNESCO, 16 abr. 2020.
12. Queiroz M, Sousa FGA, Paula GQ. Educação e Pandemia: impactos na aprendizagem de alunos em alfabetização. Ensino em Perspectivas 2.4. 2021, 1-9.
13. Almeida. IMG, Júnior, AAS. Os impactos biopsicossociais sofridos pela população infantil durante a pandemia do COVID-19. Research, Society and Development. 2021; 10(2): 1-10.

## Resumo

**Introdução:** a pandemia do Covid-19 tornou mais evidentes as discrepâncias entre as diferentes realidades educacionais para os escolares em início de alfabetização.

**Objetivo:** caracterizar o desempenho de habilidades cognitivo-linguísticas de escolares em fase inicial de alfabetização durante a pandemia.

**Método:** participaram deste estudo 22 escolares do Ensino Fundamental I, distribuídos em GI escolares do 1º ano e GII escolares do 2º ano, submetidos a aplicação do Protocolo de Avaliação das Habilidades Cognitivo-Linguísticas para escolares em fase inicial de alfabetização.

**Resultados:** os escolares do GI e GII apresentaram desempenho médio para escrita do nome e escrita do alfabeto em sequência. O GI apresentou resposta de recusa para os subtestes de ditado de palavras, ditado de pseudopalavras e ditado de figuras, repetição de palavras e memória sequencial visual de formas e desempenho inferior para reconhecimento do alfabeto em ordem aleatória e desempenho médio para reconhecimento do alfabeto em sequência. O GII apresentou desempenho inferior para os subtestes de ditado de palavras, ditado de pseudopalavras, ditado de figura e desempenho superior para reconhecimento do alfabeto em ordem aleatória, alfabeto em sequência e memória sequencial visual de formas.

**Discussão:** a apropriação do mecanismo de relação letra-som traz questionamentos, uma vez que, evidenciou a dificuldade de todos os escolares em habilidades cognitivo-linguísticas necessárias para o pleno desenvolvimento da leitura e da escrita em um sistema de escrita alfabético como o Português Brasileiro.

**Conclusão:** os escolares do 1º e 2º anos apresentaram desempenhos inferiores em habilidades cognitivo-linguística importantes para a aprendizagem da leitura e escrita.

**Palavras-chave:** alfabetização, pandemia, aprendizagem, desenvolvimento infantil, educação.

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