

Research Article

Reading Aloud and the Use of CAS-2 Battery to Assess Cognitive Skills Improvement

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Background. Research has suggested that exposure to reading can act positively on vocabulary development and other cognitive skills required in the early-school years. This paper presents the results of a quasi-experimental study that analyses the relationship between exposure to reading aloud to children and the development of basic cognitive skills, which are essential from the first days of school for the acquisition of all subsequent learning. This research has two objectives: first, to highlight the benefits of reading aloud in the first years of schooling, with particular reference to cognitive skills; second, to propose the Cognitive Assessment System Second Edition (CAS-2) as an instrument able to monitor and quantify the cognitive effects of this practice. **Methods.** This research involved a sample of 152 children from primary schools in Italy. After thorough teacher training on the proposed method of reading aloud, the teachers undertook daily reading training for approximately 3 months. The children in the experimental and control groups underwent ex ante and ex post individual administration of the CAS-2 test. A mixed model with a 2×2 design was used to verify the effect of the training. **Results.** With regard to the first aim, this study confirmed the hypotheses by highlighting the benefits of reading aloud training. The results on the Full CAS-2 Scale show significant increases in the experimental group compared to the control group. Furthermore, the improvement of the experimental group is evident in all the sub-dimensions investigated (Planning, Attention, Simultaneous, Successive). **Conclusions.** These results confirm the effect of reading aloud on cognitive skills development and the sensitivity of the CAS-2 as an instrument to detect its effects. Future research could explore the use of the CAS-2 battery in student populations of higher school grades, as well as observe the stability of the benefits over time.

1. Introduction

The early years of primary school are crucial for building the essential foundation for later learning. Many strategic skills are mobilised during these years, and each child must test their prior skills and develop new ones in a context in which they interact with their peers and observe their relative abilities. Early-school experiences are also important in consolidating children's self-esteem and sense of self-efficacy, and thus motivation [1, 2].

The prerequisites that enable a successful encounter with the school experience are many and complex. The main ones include metaphonological skills and auditory-visual discrimination, comprehension skills, basic logical-mathematical skills, narrative skills, and grapho-motor skills [3–11]. Although these skills and competencies are often taken for granted in primary schools, placing the responsibility for

their development on the family or pre-school, they are predictive of future educational success [12]. At the foundation of these skills are basic cognitive functions such as perception, attention, memory, language, praxic skills, and executive functions. These constitute the mental skills that are necessary to perform any task, from the simplest to the most complex. Cognitive skills include awareness, information and memory management, and reasoning. Possessing good cognitive functions means being able to think, learn, and understand [13–15].

Uno et al. [16] highlighted the close relationship between reading-writing ability and cognitive ability in 495 Japanese primary school children. In particular, they revealed that in “normed” children, the size of vocabulary possessed was the most powerful predictor for all other cognitive abilities (i.e., arithmetic, visuospatial, and phonological processing). International research in the field has documented how exposure

to reading represents a practice that can act positively on vocabulary development and other cognitive skills from the earliest years of life [17–27]. Systematic exposure to reading aloud is, therefore, effective in reinforcing the development of many of the skills required in the early-school years. Many studies in the literature have found that there is a relationship between reading or exposure to reading and increases in productive language (in everyday language use) and receptive language (in meaning comprehension and inferential processes) [21, 28]. Research also confirms that situations of poverty are related to a lack of exposure to books and printed materials [29], because this lack inevitably results in fewer literacy stimuli, fewer opportunities to acquire new words, and therefore, the possibility of cognitive and comprehension gaps in the early stage of schooling that will affect subsequent learning [7, 25, 30–32].

The introduction of reading aloud in classrooms is not only a good educational practice that supports multiple dimensions of development but is also a true democratic action that can respond to the serious social injustices to which children are exposed. Schools represent the only environment where it is possible to reach all students, seeking to limit (if not nullify) the negative effects that are associated with socio-economic and cultural disadvantage. The positive effects of such a practice are evident in every order and grade. Beyond the strategic role that reading aloud should play in the O/6 educational system, it would be advisable for the later grades to assume the need to offer it systematically. If, in early childhood, there are short-term benefits associated with the acquisition of language skills [33], at older ages, these benefits extend to increasingly complex and enduring skills [34]. Given its direct effects on motivation and the development of skills necessary for independent reading, reading aloud should be pursued continuously throughout the entire cycle of education and instruction [35].

1.1. Cognitive Benefits of Shared Reading Aloud. Different research on reading aloud practised in primary school has highlighted numerous benefits [36, 37]. In this particular age group, reading aloud carried out by the teacher is found to positively affect children's comprehension and lexical development more markedly than silent reading [38]. Positive effects are also evident in later school grades, particularly on engagement levels and learning, so that reading aloud can be identified as one of the most effective practices in building lifelong readers [39]. Of relevant interest is what reading aloud produces in terms of the community of readers, positive climate, and sharing in school and educational settings. Indeed, reading produces such effects through first-hand experience of the pleasure associated with this activity, both by students and teachers [40]. The benefits gained continue and are enhanced in subsequent school orders [41].

The ability to maintain attention over an extended period of time is also among the cognitive skills that are promoted and enhanced by listening to reading aloud in the early years of schooling [42]. Indeed, listening to stories allows the child to exercise their ability to maintain constant attention to auditory input. This element is absent in other situations

(e.g., social interactions) where the continuous alternation between environmental stimuli may disabuse children of sustained attention, which is essential for both individual reading and educational success [43].

In addition, research shows that reading aloud promotes the student's development of attentional skills, their acquisition of higher levels of well-being, and increased concentration [44]. It also allows children's attention spans and listening skills to be expanded [23], simultaneously contributing to their language enrichment [19]. This directly proportional link between attentional skills, reading skills, and school performance has been shown in a study with 11–13-year-old children [45]. This study investigated the relationship between certain attentional components (e.g., visual reaction times, span, and selectivity), which are strongly implicated in reading performance and reading skills. This research showed the positive effects of reading aloud on these attentional components. In general, the effects of repeated exposure to narrative material are also evident and widespread for memory domains and affect several mnemonic components, such as prose memory, word learning, verbal short- and long-term memory [46–49].

Other studies have highlighted how reading practice is an effective tool to stimulate problem-solving skills and how teaching reading and inference strategies can increase the effectiveness of reading and text comprehension [50, 51]. The complex mental operation underlying problem-solving requires the acquisition of other types of skills for it to be successful, such as reading comprehension, reading, and the use of mathematical knowledge and operations [52]. As evidence of this link, a 2-year longitudinal study with 8- and 9-year-old children found that relevant reading difficulties can affect mathematical progress over time but that the opposite cannot be said (i.e., that reading ability is affected by the presence of relevant mathematical difficulties) [53]. Vilenius-Tuohimaa et al. [54] studied a sample of 9–10-year-old children and found that reading comprehension skills significantly and positively influence the ability to solve mathematics problems based on written stories. With regard to secondary students, research by Beal et al. [55] also found that as reading skills increased, so did the ability to solve mathematical problems.

Soto et al. [56] also observed how the metacognitive component, which they defined as the individual's ability to reflect on their own thoughts and cognitive processes, correlates positively with reading comprehension performance and the ability to answer inferential questions. Thus, the results of this work emphasise how metacognitive strategies related to the skills of planning (i.e., engaging in processes aimed at preparing for a reading task), monitoring (i.e., recognising comprehension problems and necessary adjustments during reading) and evaluating (i.e., assessing and recognising successes and failures during reading) improve these students skills in text comprehension and analysis of the information provided in the text.

1.2. Cognitive Assessment System Second Edition (CAS-2): An Instrument for Measuring Cognitive Basic Skills. There is evidence in the literature that reading aloud can develop

the cognitive and basic skills that are necessary to achieve academic success. The influence that exposure to reading has not only on the child's schooling but also on the child's own perception of themselves as a student is also relevant [57]. Early childhood education services and schools (in general) must set themselves the goal of nullifying or mitigating disparities through tools and practices, such as reading aloud, to promote language and all those skills that are called *emergent literacy* [58, 59]. These skills will be needed by the child to learn to read and comprehend at the beginning of primary school and to cope with all subsequent learning (of which reading and comprehension are fundamental mediators). If developed at an early age, narrative comprehension facilitates the activation and development of those neural circuits that control executive functions (e.g., planning, attention control, execution monitoring, flexibility in strategy choice, working memory, and processing speed), which strongly influence the learning of reading-writing and consequently future school success [60].

In this context, the presence in the literature of an instrument able to measure basic cognitive functions is interesting. The CAS-2 has been used in many contexts to monitor and concretely observe the benefits determined by intensive and systematic exposure to shared reading aloud [20]. The CAS-2 is a battery of individually administered tests that assess the neurocognitive abilities of children and young people between 5 and 18 years old. It is derived from the PASS theory, which stands for Planning, Attention, Simultaneous, Successive [61], and is the only tool that is based entirely on this theory (for more information, see [62]). PASS theory is an alternative to the intelligence approaches that traditionally include verbal, nonverbal, and quantitative tests and is based on the three functional units that (according to Lurija) work in concert and are necessary for any type of mental activity [63, 64]. The three types of cognitive processes responsible for mental activity are associated with three functional units of the brain [65]. These processes refer to the mental activities involving the cognitive attention (first unit), simultaneous and successive (second unit), and planning (third unit) ([61], p. 67), as follows:

- (i) *Planning*: A cognitive process requiring the individual to determine, select, and use a strategy to solve a problem.
- (ii) *Attention*: A cognitive process requiring the individual to selectively attend to a particular stimulus and inhibit attending to competing stimuli.
- (iii) *Simultaneous*: A cognitive process involving integrating separate stimuli into a single whole or group.
- (iv) *Successive*: A cognitive process requiring the serial ordering of things.

In general, PASS processes form an interrelated system of cognitive processes that interact with the knowledge base and skills possessed by an individual.

For example, a child in the early stages of reading might use planning processes to decide what to read and what comprehension strategies to use (e.g., looking at illustrations)

to find the first page and to determine how to decode each word. Attention is required to focus on the book that they are reading and to ignore potential distractions. Simultaneous processing is involved in the ability to access the sentence as a whole to grasp its meaning, while later processing is used to decode words and understand information based on syntax or order of events [63].

CAS is a tool to assess and quantify PASS processes [66].

Numerous studies have shown that measures of PASS processes enjoy construct validity and are significantly correlated with academic performance [67, 68]. Studies in typically developing children and children with learning disabilities have confirmed the association between PASS cognitive processes and academic achievement [69–73]. In a recent meta-analysis, Georgiou et al. [74] found that the correlations between PASS processes and achievement in reading and mathematics were significantly stronger than those reported in previous meta-analyses conducted on other measures of intelligence.

1.3. Research Background and Context. The theoretical framework and research presented here are part of the educational policy of the “*Reading: So Cool!*” (in Italian “*Leggere: Forte!*”) project, which started in 2019. This project is promoted by the Tuscany Region in collaboration with the University of Perugia (Department of Philosophy, Social and Human Sciences and Education), the Cepell (“Centro per il libro e la lettura”: “Centre for Book and Reading” of the Ministry of National Heritage and Culture), the Tuscan Regional Office for Education, Indire (National Institute of Documentation, Innovation and Educational Research), and LaAV (National Movement of Volunteers for Reading Aloud, Nausika Association) [18]. This project aims to fight school dropout and offer all children and young people between the ages of 0 and 19 the opportunity to achieve educational success through the daily inclusion of reading aloud carried out by teachers and following a defined method [17]. Therefore, this research is placed at the service of educational policy while producing relevant scientific results. Evidence of the results obtained both strengthens the teachers’ motivation; provides authority for educational policy; enables the identification of strengths, critical issues, and solutions; and enriches the literature on reading aloud in school settings.

This paper will focus on the outcomes observed through one of the evidence-based research tools conducted within the project. Among the various standardised tests, CAS-2 was used to highlight the effects of daily, progressive, intensive, and bibliovariety-oriented reading aloud practice, according to the method to which *Reading: So Cool!* adheres [17, 18, 20], on the development of basic cognitive functions in the first grades of Tuscan Primary School.

1.4. The Present Study. This study aims to observe and quantify the effects of daily sessions of shared reading aloud on the basic cognitive skills of first-grade students. The hypothesis is that reading aloud is more effective than traditional teaching in enhancing cognitive skills assessed by the CAS-2 battery.

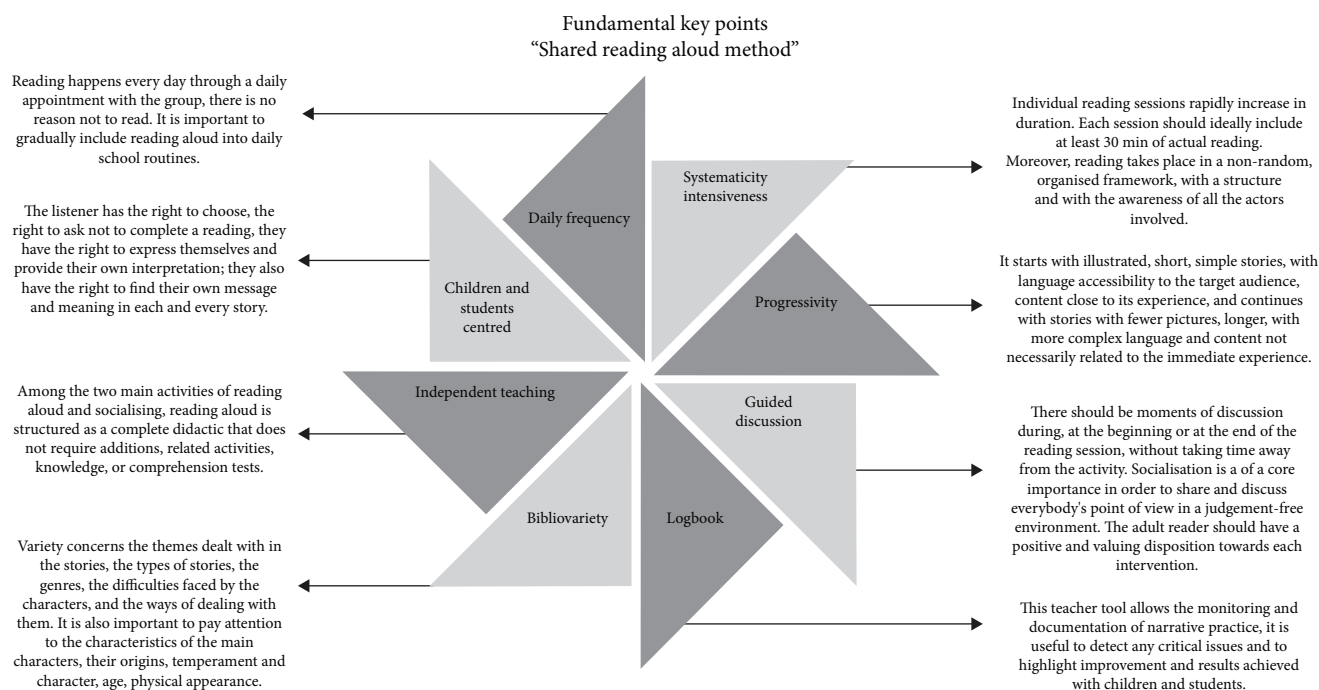


FIGURE 1: Fundamental key points of shared reading aloud method.

In the classes where this practice was introduced, the children were read novels and short stories by Italian teachers. To make the didactic intervention effective and to ensure the success of the practice, it was necessary to follow a correct protocol and some fundamental principles. The teachers followed a specific programme [17, 20] in which they had been previously trained on the shared reading aloud method developed over the past decade by Batini and his team at the University of Perugia (for details of the method in Italian, see [75]; for English see [76]; (see Figure 1 for details).

Here, we summarise its main features.

Reading: It is carried out by teachers, who act as implicit models; it is systematic and intensive, organised within the classroom structure, and then done regularly, with a minimum frequency of three times a week and a duration that increases slowly. It envisages a progressive progression, i.e., it starts with short, illustrated stories that are then replaced with stories in which the length and complexity of the texts increase. It provides for socialisation; at the beginning and end of the reading session, the children are encouraged to discuss the story in a welcoming and accepting environment created by the teacher, possibly making connections with other texts. Bibliovariety is promoted: The choice of books should vary with respect to themes, genres, types of characters, contexts in which the story develops, narrative events, etc. The focus is also placed on the student/participant; the children are at the centre of the experience, to which they are invited to contribute. Shared reading aloud is an autonomous didactic activity; there are no tests, formal comprehension assessments, summaries, analyses of various kinds. An activity log, in the form of a diary, is planned as a daily documentation and reflection to monitor adherence to the

protocol of the read aloud programme and intervene in the event of significant deviations or other problems that emerge (see Figure 1 for details).

The purpose of this research is to measure the effectiveness and promote the practice of reading aloud in the school setting and to show its effects, especially in relation to everyday teaching practices. Indeed, the conditions and reactions that occur in the natural environment with real classrooms are different from those that can be obtained in a laboratory setting, where the artificiality of the place and situation would not allow any generalisation. Although the units of observation are individual students, the groups considered in the sampling phase were classes.

2. Materials and Methods

2.1. Sample and Procedure. The study, conducted within the school environment, involved a total sample of 152 children (9 classes) from five primary schools in the Tuscany Region (Centre of Italy) involved in the “*Reading so cool!*” project.

Teachers who guaranteed consistency in the method were selected. At the beginning of the 2021–22 school year, experimental classes were chosen from those that guaranteed method consistency, readiness, and consistency. From the remainder, control classes were randomly chosen.

While children in the control condition classes kept doing regular Italian language instructional activities (text comprehension, grammar, lexicon, etc.), in the experimental classes, children were subjected to the daily and intensive practice of reading aloud.

Therefore, the final sample consisted of 67 children (4 classes) belonging to the control group (referred to as “control”) and 85 children (5 classes) for the experimental groups

TABLE 1: Sample description.

	Control	Reading aloud
N	67	85
N classes	4	5
Age average (range)	6.12 (DS 0.33)	6.18 (DS 0.38)
Sex (males/females)	38/29	40/45

(referred to as “reading aloud”). See Table 1 for sample description.

This research was developed over a 5-month period starting in February 2022. At the beginning (Time 0) and at the end (Time 1) of the study, students belonging to both groups (experimental and control) were administered the CAS-2 [66] in individual settings to assess their basic cognitive functions.

Following the first investigation (Time 0), in the experimental classrooms, an intensive reading aloud training was started. The intervention consisted in replacing up to 30 min/day of normal teaching activities with reading aloud. The experimental sample underwent reading training for an average of 61 days (SD = 16, range = 49–89), for an average of 13 weeks (SD = 4, range = 10–20), with an average daily reading time of 34 min (SD = 15, range = 19–49).

At the end of the training period, the groups were again involved in the second phase of data collection. This allowed us to detect any improvements (or worsenings) in the scores by observing gains or decreases in the skills associated with the dimensions considered. By analysing the results of the CAS-2 battery, we want to highlight differences in increasing cognitive abilities between experimental and control groups, randomly selected.

2.2. Measures and Data Analysis. The CAS-2 is a measure of intelligence, related to academic success, and focuses less on knowing things and more on thinking skills [74].

The proposed CAS-2 battery [66] consists of eight subtests, organised according to the four PASS processes (Table 2). Each PASS scale, as well as the CAS-2 Full Scale, yields a standard score with a mean of 100 and a standard deviation of 15. The Full Scale (FS) score is based on an equally weighted aggregate of the PASS subtests and is interpreted as an estimate of overall cognitive functioning. Naglieri and Das [66] stated that PASS scale scores can be used to identify strengths and weaknesses in cognitive processing [62].

By comparing the results obtained in the CAS-2 battery from the experimental and the control group, any differences can be traced back to the effects of exposure (or lack of exposure) to reading aloud. A mixed model with a 2×2 design was used to verify the effect of the narrative training, where the variable “time” (with two levels: time 0 and time 1) constitutes the *within-subjects factor* while the variable “group” (with two levels: control and experimental) represents the *between-subjects factor*. The group-time interaction provided the measure of the significance of the intervention’s impact in the experimental classes compared to the control. The results shown below highlight the increases (and possible decreases) of the

TABLE 2: Subscales and subtests of the CAS-2 battery [66], organised according to the four processes PASS.

Processes	Subtests
Planning	Number matching (MN)
	Planned codes (PC)
Attention	Expressive attention (EA)
	Number identification (ND)
Simultaneous	Nonverbal matrices (NVM)
	Verbal-spatial relations (VSR)
Successive	Word series (WS)
	Sentence repetition (SR)

two groups, experimental and control, between the first and second test administration.

3. Results

The results from the data analysis highlight the effect of narrative training on basic cognitive skills.

Descriptive analysis of control group (0) and experimental group (1) scores for all CAS-2 scales at time 0 (T0) and time 1 (T1) are reported in Table 3.

The difference between the two groups’ Full Scale scores baseline at T0 was preliminarily tested and found to be statistically non-significant (Table 4).

A mixed model 2 (time: pre vs. post) \times 2 (condition: experiment vs. control) was performed on the data, with time as a within-subject factor and group as a between-subject factor. As shown in Table 5, the group condition has a statistically significant effect on the scaled scores of the CAS-2 Full Scale ($F = 5.619$; $p = 0.019$; observed power = 0.654).

Figure 2(a) shows the statistically significant difference between the increased index (T1 Mean Score–T0 Mean Score) in cognitive skills of the experimental group (increment = 8.78) and the control group (increment = 3.52). Moreover, the analyses show that the control group, starting from an initial Full Scale mean score of 84.16, reaches a final mean score of 87.69. The experimental group, on the other hand, starting from an initial score of 86.28, reaches a final mean score of 95.06 (Figure 2(b)).

Moreover, the results show the same trend in all subscales of the CAS-2 battery (Planning, Attention, Simultaneous, Successive): as Figure 3 illustrates, the increase in each cognitive skill assessed is greater in the experimental group than in the control group.

4. Discussion

This work aimed to observe and quantify cognitive skills improvement, as measured by the CAS-2, at the end of reading aloud training, in a sample of first-grade students in primary school.

Therefore, this study pursues a twofold research intent: first, to validate what is already in the literature regarding the effectiveness of reading aloud practice in the acquisition and enhancement of children’s psycho-cognitive skills by providing specific confirmations on the effects of an intensive,

TABLE 3: Descriptive analysis of control group (0) and experimental group (1) scores for all CAS-2 scales at time 0 (T0) and time 1 (T1).

Measures	Group	Descriptive statistics				
		Mean	Std. deviation	Std. error	Minimum	Maximum
Planning IS—T0	0	86.60	14.438	1.764	54	117
	1	85.22	11.227	1.218	57	120
Planning IS—T1	0	87.93	15.339	1.874	55	125
	1	92.33	12.821	1.391	65	122
Attention IS—T0	0	87.19	17.162	2.097	53	120
	1	88.87	13.424	1.456	60	122
Attention IS—T1	0	92.43	17.042	2.082	56	128
	1	95.71	13.608	1.476	56	122
Simultaneous IS—T0	0	87.87	12.527	1.53	54	122
	1	91.32	13.347	1.448	57	118
Simultaneous IS—T1	0	92.52	13.151	1.607	57	118
	1	99.80	10.943	1.187	64	122
Successive IS—T0	0	87.61	12.415	1.517	46	121
	1	91.21	11.347	1.231	71	121
Successive IS—T1	0	89.27	13.076	1.598	54	125
	1	97.14	11.973	1.299	67	130
Full Scale IS—T0	0	84.16	13.93	1.702	45	110
	1	86.28	11.209	1.216	63	121
Full Scale IS—T1	0	87.69	15.464	1.889	48	118
	1	95.06	11.777	1.277	62	124

TABLE 4: Scores of the two groups (experimental and control groups) at baseline (T0).

	Control	Reading aloud	Sig.
Full Scale score	84.16	86.28	0.301

TABLE 5: Results of mixed model 2×2 with time (T0–T1) as a within-subject factor and group condition (experimental and control) as a between-subject factor.

Tests of between-subjects effects					
Measure: CAS-2 Full Scale IS					
Source	Type of III sum of squares	df	F	Sig.	Observed power
Group	1687299	1	5.619	0.019	0.654

Computed using $\alpha = 0.05$.

method-specific, medium-to-short duration, age-specific intervention; and second, to confirm the usefulness of the CAS-2 as an effective tool at detecting cognitive skills elicited by reading aloud.

With reference to the first aim, this study has confirmed the hypotheses by highlighting the benefits resulting from the reading aloud training. The CAS-2 Full Scale, which represents the overall score resulting from all subtests administered, is highly significant and shows a remarkable positive increase in the experimental group.

Furthermore, the cognitive improvement of the group exposed to shared reading aloud practice is evident in all

the cognitive subdimensions investigated by the CAS-2 battery (Planning, Attention, Simultaneous, Successive): the increases in the mean scores of all these subscales are greater in the experimental group than in the control group.

This demonstrates that when narrative training is carried out systematically and daily, it produces a significant transversal effect on several basic cognitive skills that have significant predictive value for child development [77, 78].

The present study thus confirmed the role of reading aloud as a tool that can produce cognitive benefits in primary school children and also highlighted the usefulness of CAS-2 in detecting them. Indeed, it is very important to identify quantitative, not just qualitative, tools that can monitor outcomes and ensure the effectiveness and quality of educational actions.

From the findings of this paper, it seems important to emphasise how these data are consistent with the educational policy promoted by the “Reading: so Cool!” [17, 18, 20] within which they are situated. In fact, as revealed by the analyses presented, reading aloud is outlined as a democratic policy action, as well as an educational one, capable of enhancing and supporting the development of those cognitive skills that are also crucial for successful schooling and the achievement of educational success. According to previous statements in numerous studies in the literature [38, 50, 51], the skills of planning, monitoring, and understanding external stimuli and their meaning represent tools that strongly influence the individual’s schooling, thus delimiting themselves as protective factors against the problem of school dropout [79].

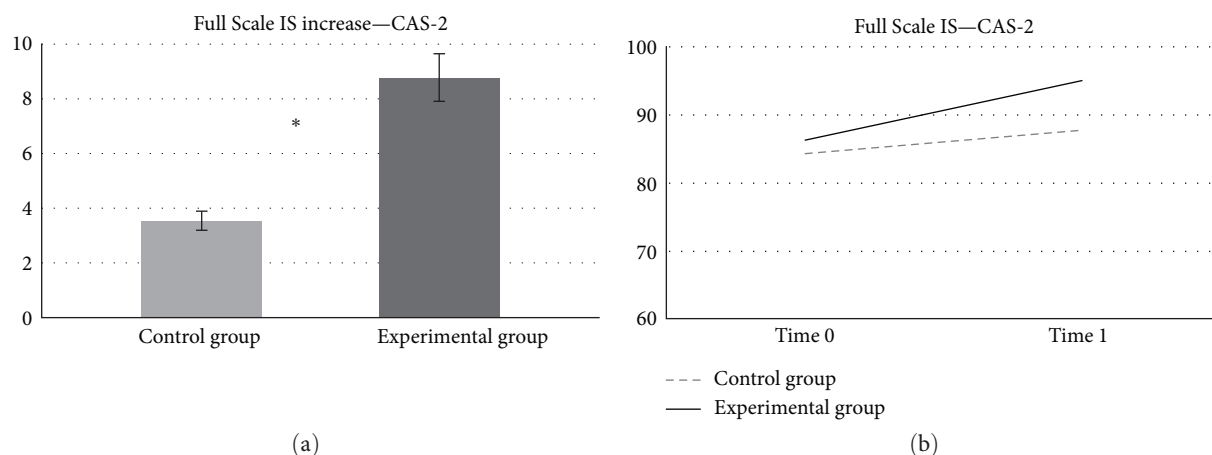


FIGURE 2: (a) Difference between the experimental group and control group increase values in Full Scale. (b) Differences at T0 and T1 of the experimental group and the control group in Full Scale IS.

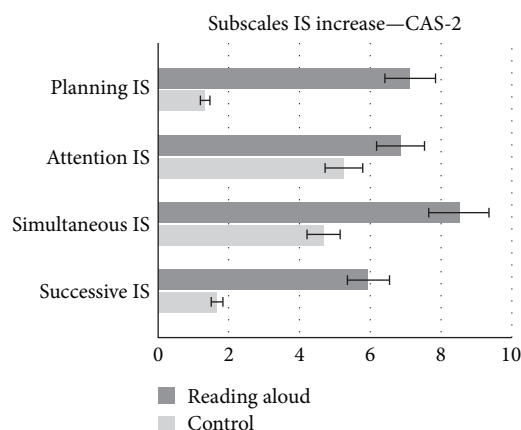


FIGURE 3: Differences between the experimental group and control group increase values in each CAS-2 subscale.

Consequently, it seems logical to affirm the importance of reading aloud as a tool that can act positively on individual educational success and preventively on the school dropout issue.

There are also some limitations of the present study. In particular, although adequate initial teacher training was provided, it is possible that the method and its principles were adopted differently by different teachers. In fact, the involvement of a large number of schools and classes did not make it possible for reading aloud to be carried out by only one person. Second, and related to what has just been said, ideally, the participants would have been randomly assigned to intervention conditions and would all have received the intervention from the same person in order to ensure that the groups were equally matched and that there were minimal differences in intervention delivery. However, in order to monitor as possible these elements and the consistency of the application of the method throughout the project, regular monitoring meetings were scheduled in order to detect any critical issues in its application and find solutions.

Future studies could further investigate the use of the CAS-2 battery in populations of students in higher school

grades undergoing read aloud training. Further work could also analyse the correlation between results from CAS-2 with different instruments that can investigate similar cognitive abilities, to further strengthen these results. Finally, follow-up studies could be useful in observing and quantifying the stability over time of the noted benefits, both among those who have continued reading aloud activity over the years in a structured, daily setting and among those who, at the end of intensive training, have subsequently stopped this activity.

The potentials of reading aloud are many, and each research offers great opportunities to draw new educational geographies and future goals [80].

Data Availability

The data sets generated and/or analysed during this study are not publicly available due to the fact that his wording is not in the consent collected from the parents of the participating students. However, they are available from the corresponding author upon reasonable request.

Additional Points

Highlights. *What is already known about this topic.* Reading aloud can produce significant effects on cognitive, emotional, relational, comprehension, language, and memory. CAS is a validated tool that can assess and quantify PASS processes (Planning, Attention, Simultaneity, Successive). The school represents the only environment in which it is possible to reach all students, attempting to limit (if not eliminate) the negative effects associated with socio-economic and cultural disadvantage. *What this paper adds.* Shared reading aloud in the classroom produces a significant cross-sectional effect on several basic cognitive skills, which have significant predictive value for the child's development. Shared reading aloud, through adult mediation, when conducted effectively, is able to reinforce cognitive skills and, gradually, reinforce learning. This is of particular importance for overall development and educational success. The CAS-2 proves to be an effective tool for detecting cognitive skills enhanced by shared reading aloud. *Implications for theory, policy, or practice.* Shared

reading aloud in the classroom should be done regularly and intensively, becoming an established part of the school curriculum. Teachers need to ensure that students have access to a variety of texts, genres, themes, cultures, types of characters, and stories to guarantee the inclusion of each participant. Students/participants are at the centre of interventions with shared reading aloud. Teachers need to have a positive disposition towards the students/participants, the stories, and the ability to genuinely, attentively, and curiously listen to each other.

Ethical Approval

This study received formal, prospective approval from an ethics committee: University of Perugia, Comitato Universitario di Bioetica, no. 2019-27.

Disclosure

This paper has been professionally proofread by PRS.

Conflicts of Interest

The authors declare that they have no conflicts of interest.

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