

Developmental Psychology

Interaction Dynamics with Babies During Shared Reading Practices

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Abstract: This paper examines the triadic dynamics of baby-teacher-book during shared reading in an Early Childhood Education School to explain how educational teaching practices can enhance initial reading experiences and development processes in Early Childhood. A ten-months-old baby and a teacher participated in this study and, as an instrument for data collection, reading situations were registered and later these sessions were weighted through use of microgenetic analysis. From the analysis of the data present in the detailed case, it was identified the emergence of qualitative indicators that favoured the involvement of the baby in the activity, the mediation and educational actions of the teacher and the use of the book were more frequent. The effective use of the object book with that baby has contributed to qualitative changes in the baby's development and learning and emphasizes the incentive to share reading with other children.

Keywords: reading, childhood development, pragmatics, infants

Dinâmicas de Interação em Situações de Leitura Compartilhada com Bebês

Resumo: Este estudo teve como objetivo examinar a dinâmica da tríade bebê-professora-livro durante a leitura compartilhada em uma Escola de Educação Infantil a fim de explicar como as práticas educativas de ensino potencializam experiências iniciais de leitura e processos de desenvolvimento na Primeira Infância. Uma bebê de dez meses e uma professora participaram desse estudo e como instrumento para coleta de dados foi utilizado a vídeogravação de momentos de leitura e posteriormente essas sessões foram ponderadas através da análise microgenética. A partir das análises dos dados presentes no caso detalhado, identificou-se a emergência de indicadores qualitativos que favoreceram o engajamento da bebê na atividade, sendo que a mediação e ações educativas da professora e do uso do livro foram mais frequentes. O uso efetivo do livro-objeto pode ter contribuído para mudanças qualitativas no desenvolvimento e aprendizagem da bebê e enfatiza a necessidade de incentivar o compartilhamento da leitura nessas idades.

Palavras-chave: leitura, desenvolvimento infantil, pragmática, bebês

Dinámicas de Interacción con Bebés durante Momentos de Lectura Compartida

Resumen: Este artículo tuvo como objetivo examinar la dinámica de la tríada bebé-maestra-libro durante la lectura compartida en una Escuela de Educación Infantil con el fin de explicar cómo las prácticas docentes educativas pueden potenciar las experiencias iniciales de lectura y los procesos de desarrollo en la Primera Infancia. En este estudio participó una bebé de diez meses y una maestra y como instrumento de recolección de datos se utilizó la grabación en video de los momentos de lectura y posteriormente estas sesiones fueron ponderadas a través del análisis microgenético. A partir del análisis de los datos presentes en este caso, se identificó la emergencia de indicadores cualitativos que favorecen la participación de la bebé en la actividad, siendo más frecuentes la mediación y las acciones educativas de la docente, así como el uso del libro. El uso efectivo del libro objeto con la bebé ha contribuido a cambios cualitativos en el desarrollo y aprendizaje de los niños y enfatiza el incentivo de compartir la lectura con otros niños pequeños.

Palabras clave: lectura, desarrollo infantil, pragmática, bebés

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Infants engage in continuous interaction with others, who aim to assimilate them into the culture, usage of objects, and the acquisition of language and emotions, all of which constitute part of the collective's historical heritage (Rodríguez & Moreno-Llanos, 2020). These collective practices are internalized, eventually becoming integral to an individual's semiotic development. In this context, adults play a crucial role as mediators, facilitating a child's

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connection to the world. However, as children progress in their development, the processes that were initially shared with adults are gradually assimilated by children themselves (Rodríguez & De los Reyes, 2021; Vigotski et al., 2010).

The active mediation of adults expands the scope of possibilities for children, especially in terms of their interactions with objects, which implies the presence of pragmatic rules that are neither self-evident nor inherently natural. This becomes apparent throughout analyses of how babies interact with objects (Cárdenas et al., 2020; Palacios et al., 2018). The Pragmatics of the Object perspective helps explain the pivotal role of adults as mediators between children.

Rodríguez and Moro (1998, 1999, 2002) have underscored the mediating role of others and the materiality of objects in their utilization. In the context of the child-adultobject relational triad, significant emphasis is placed on the pragmatics uses of the object, which integrates everyday practices. It is particularly crucial at a stage preceding the development of a child's verbal language. In these initial interactions, most of the time, the adults are expected to take responsibility and intentionally take the initiative in presenting objects.

The foundation of this proposal lies in the combined epistemological and theoretical principles articulated by Piaget concerning action and knowledge, as well as the mediation concepts presented by Vygotsky, whose discussion on signs, initially serving as tools for social interaction and later evolving into means for influencing individual actions, forms the cornerstone of this perspective. Additionally, key theoretical aspects within the Pragmatics of the Object perspective draw from Peirce's semiotics, who views signs as systems that evolve into the endless generation of semiosis. These insights are highlighted in works by Rodríguez (2022), Rodríguez & De los Reyes (2021), Rodríguez & Moro (1999), and Rengifo-Herrera & Rodrigues (2020).

A baby's connection with the world emerges from actions, particularly those deemed interesting events, which are coconstructed and imbued with meaning. According to Moreno-Llanos et al. (2021), the subject's understanding of an object is intricately connected to the process of controlling actions, which is facilitated through the manipulation of objects and the assignment of meaning through semiotic mediation within the context of the conventional use of the object. In the first months of life, children are nurtured and introduced to objects, their functions, and names. Caregivers are emphatic in conveying the existence of a tangible world with which children should become acquainted and take ownership.

Adult mediation facilitates children's involvement in progressively intricate triadic (adult-child-object) interactions (Cárdenas et al., 2020). Within this triadic relationship, objects are not only subject to causal laws, but also belong to a normative realm with cultural significance. Adults play a crucial mediating role in guiding children to utilize objects following their intended function and in a conventional manner. By exploring the functional use of objects, semiotic layers associated with their use, as well as a child's motor and cognitive control, can broaden during development. When examining the impact of reading on a baby's development (Septiani & Syaodih, 2020), it becomes evident that reading is a far-reaching activity that extends beyond merely going through letters or pronouncing words. The process of attributing meaning commences early in a child's life, with emergent literacy being a continuous presence in child development from birth through the preschool years.

Engaging in the act of reading with a baby, and sharing the same pictures, functions as a learning opportunity, particularly concerning the aspects in which two individuals establish a connection, exchange meanings, and engage in collective thought (Borges & Azoni, 2021; Niklas et al., 2016). The shared perspective that books provide serves as a potent tool for the early development of young children (Hoyne & Egan, 2019; Morais, 2020). Regrettably, the practice of reading in Early Childhood is frequently overlooked within Early Childhood Education procedures. Nevertheless, promoting accessibility to activities and items associated with books holds significant importance in ensuring improved educational practices and learning (Cárdenas et al., 2020).

Furthermore, the tangible nature of materials remains one of the less utilized facets in early childhood educational settings. Highlighting everyday objects in the context of reading helps foster connections between objects, their names, materiality, their function, and the act of reading. Through their notational systems, books serve as a means to depict and objectify reality, shaping it into text.

Adult mediation is instrumental in shaping the narrative into a meaningful reading experience for babies, even from an early age. Research conducted by Rossmanith et al. (2014) and Veldhuijzen van Zanten et al. (2012) observed triadic interactions involving babies as young as three months old. According to the authors, babies as young as 3-4 months are already capable of establishing fluent interactions with adults. This interaction involves increasing the baby's exposure to objects suitable for manipulation, as well as illustrated books, shared within an educational context.

Around the age of 3 months, babies' interests begin to extend beyond one-on-one interactions. Objects are intentionally introduced by adults, thereby making the objects' roles in the real world even more explicit. This transition is driven by the development of two crucial aspects: dyadic communication between the baby and the caregiver and the interaction between the baby and the object, both of which are integrated into the dynamics of the triad. Hence, starting from the end of their first year, children actively engage in triadic interactions and are deemed capable of coordinating their interactions with objects and people effectively (Rossmanith et al., 2014).

Babies who are introduced to books from their earliest moments can interact with these objects through adult mediation and multimodally explore books during reading sessions. Indeed, actions like touching and placing the book in their mouth play a vital role in the process of comprehending and grasping the materiality of the book. Considering the above, this study derives from the data collected in the research by Nascimento-Dias (2019). Its objective is to examine the dynamics within the baby-teacherbook triad during shared reading sessions within an Early Childhood Education School, shedding light on how educational teaching practices contribute to the enhancement of initial reading experiences and developmental processes in Early Childhood.

Method

Given the study's focus on dynamic and evolving processes, a methodological approach based on observational studies was employed. For data analysis, microgenetic analysis was used as it allows the study of characteristics of psychological development and the dynamics involved in interactions (Kelman & Branco, 2004; Rodríguez & Moreno-Llanos, 2020).

Participants

The study involved five babies who were enrolled in a nursery class with children up to one year old, along with one Early Childhood Education teacher. For this paper, among the participating babies, a ten-month-old baby, who will be called Dora (fictitious name), was chosen for the specific observation that unravels the most relevant aspects of this

Table 1

Session Overview

scenario, primarily due to her heightened interaction with the teacher and the book.

Instruments

The study involved *video recording* using a camera, and the collected data were later analyzed using the ELAN (free software developed by *The Language Archive*, Max Planck Institute for Psycholinguistics, version 5.2). The objective was to provide a comprehensive description and analysis of the triadic interactions between the baby, teacher, and book, following the specific criteria of microgenetic analysis.

Procedures

Data collection. Three recorded sessions of shared reading moments took place between the teacher and the class, and each video was reviewed up to four times. Following this, a thorough written analysis of the video recordings was conducted to gain an understanding of the triadic interaction between the baby, teacher, and book. The sessions that aligned with the study's objectives were selected from these records. Out of the three sessions (Table 1), the study focused its analysis on a single session, namely Session 2, where the teacher employed the handbook as an instructional tool for reading.

Comments	Participants	Pedagogical Materials	Duration (minutes)
1st Session	$\mathbf{\bullet}^{\mathbf{I}} = 2$ $\mathbf{\Theta} = 2$	Magazine	$\Delta t = 1:25$
2nd Session	$ \mathbf{\mathbf{\mathfrak{G}}}^{\mathbf{I}} = 1 \\ \mathbf{\mathfrak{G}} = 3 $	Handbook	$\Delta t = 6:02$
3rd Session	ල් = 1 ල = 3	Children's book	$\Delta t = 13:30$

Data analysis. To examine the actions in the study, the categories from Rodríguez and Moro's (1999) theory were considered. The following categories were established following the triadic observations involving the baby-teacher-book: (1) Categories related to the teacher, including Onomatopoeia; sung reading; direction of mediation, and uses of the book; and (2) Categories related to the babies: emotional-cognitive expressions and the uses of books.

These categories are defined in Table 2:

The analysis continued using the ELAN software (a free tool provided by *The Language Archive*, Max-Planck Institute of Psycholinguistics, version 5.2) to closely microgenetically observe the triadic baby-teacher-book interactions. Each category corresponded to a distinct line, totaling 7 categories in all, with 4 categories designed for the teacher and 3 for the baby. This microgenetic approach facilitated a comprehensive understanding of the actions, speech, and gestures of both the teacher and the child while providing an in-depth description of the triadic interaction involving baby Dora.

The chosen session had an average duration of 6 minutes. During this time, it was evaluated using a list of analysis categories, which were divided into two aspects. The first aspect aimed to categorize the teacher's interactions while facilitating reading to infants, while the second aspect focused on the infants' responses to both the book and the teacher.

At the time of shared reading, the material chosen by the teacher was a handbook with literacy activities which consisted of pictures, letters, numbers, and songs. The primary focus of the analysis in the triadic relationship is the book itself, regardless of whether it conforms to a specific format, and this could include literacy textbooks rather than traditional storybooks.

Table 2

Categories used in the research.

1 - Teacher Categories	Definition	
Onomatopoeia (ONO)	Refers to read onomatopoeia.	
Sung Reading (SR)	Refers to the moments when the teacher reads the book in the form of a song.	
Mediation Direction (MD)	Group: When the teacher reads the book, addressing the entire group. Specific: The teacher directs the reading to a child, directing the book to the baby or drawing their attention to the reading.	
Use of the book (Uses p.)	Conventional: Use of the object according to its function. Uses the book to read, turning the pages, pointing or highlighting the images, and decoding orally to babies.Symbolic: The object is used out of context. For example, the teacher uses the square cutout inside the book cover as a window.	
2 - Babies Categories	Definition	
a) Emotional-Cognitive Expressions		
Smile (S)	The baby smiles, expressing happiness at the activity.	
Hand movements (M)	Claps one hand against the other, as a form of applause; taps or points at the book while using the hands.	
Vocalize (V)	Babbling or repeating words spoken by the teacher.	
b) Attention	Pays keen attention to the teacher or the book.	
c) Use of the book		
Uses of the book (Uses b.)	Conventional: Use of the object according to its function. Uses the book to read, turns the pages, and points to the images.Non-conventional: Puts the book in their mouth, and sits on it.Symbolic: The use of the object is maintained, but with elements of imagination.	

Ethical Considerations

The project was approved by the Research Ethics Committee in Human and Social Sciences of Universidade de Brasília, CAAE No. 49381715.5.0000.5540, Opinion No. 1.318.356, meeting what is ethically expected for research with human beings in our country. This project originated from a research initiative initiated by the DETEDUCA group - Educación Temprana y Educación, Faculdad de Psicologia, Universidad Autónoma de Madrid, Spain, in collaboration with research groups from other Latin American countries: Mexico, Chile, Colombia, and Brazil.

The data examined in this research pertains to observations made in a daycare center affiliated with the Department of Education of the Federal District, situated in Recanto das Emas, within the Distrito Federal. This daycare center primarily caters to children from economically disadvantaged backgrounds.

Results

To illustrate the data, the results have been split into two parts. The first part provides a detailed account of the data recorded during the 2nd session, sequentially highlighting specific actions, following a sequential order, were segmented and isolated. Subsequently, a thorough analysis based on Figure 1 is presented, derived from the analysis conducted using the ELAN software. It reveals temporal relationships, frequency, and whether actions, gestures, and spoken words involving objects, adults, and children were synchronous or asynchronous. In this session, we delve into shared reading between the

specific actions that occurred. The turns corresponding to

teacher and the babies (Figure 1), utilizing the handbook. The graph on the right side emphasizes the categories, while the bottom of the graph indicates a time segment of 6 minutes. On the left side, participants and their actions are detailed. To aid the reader's understanding, captions have been provided for the acronyms at the bottom of the table.

Transcript of the Second Session

The observation records of the 2nd Session were transcribed at the outset. During this session, the teacher utilized a handbook for her interactions with the babies (Table 3). The segmented turns enable us to identify the sequence of actions, and each action is isolated as it pertains to the actions of the participants, with a particular focus on Dora's actions, which is the subject of analysis in this study.

Table 3Transcript of the second session

Turn	Action described	
1.	The teacher is sitting with 4 babies	
2.	She places an activity handbook in the middle	
3.	The babies then sat around the book	
4.	One of the children is sitting on the teacher's lap.	
5.	The teacher shows the image of children flying kites with mediation directions to the group.	
6.	Dora repeats the word kite and strikes the book with her hands.	
7.	The teacher calls Dora when she shows the pictures and pages several times, she is the child who interacts the most with the book.	
8.	Another child also taps the book with their hands.	
9.	The monitor seats a child on the wheel.	
10.	Érica climbs on the book and strikes it with her hands, the teacher sits her by her side.	
11.	Dora points to the figures.	
12.	The children are interested in the book.	
13.	Dora points to the pictures in the book, when she turns the page, she says ball and points to the object (a ball) illustrated in the book.	
14.	The children are paying attention as the teacher turns the pages and shows the images.	
15.	All the children "throw" themselves at the book and clap their hands on it.	
16.	The teacher places the children in a circle again.	
17.	The teacher draws Dora's attention to the pictures in the book again.	
18.	Dora repeats some words spoken by the teacher.	
19.	Stela gets up and seeks the monitor after a few seconds, then returns to the group.	
20.	All the children look at the book.	
21.	Maui tries to turn the page; Juba pulls the page.	
22.	The teacher closes the book and informs she will get another one.	
23.	The teacher hides the handbook behind her and takes the Galinha Pintadinha (Little Dotties) book, Juba cries asking for the handbook.	

In turns 2, 5, 7, 14, 17, and 22, the teacher engages in various actions involving the book, demonstrating conventional ways of handling it, thus allowing the babies to make contact with the object and fostering the emergence of signs and actions. The teacher sets the context for reading with the babies by sitting on the floor around the book with them. This cultural presentation illustrates how reading can be done in groups and outlines actions that are permissible or not with the book, which, in turn, demonstrates the development of meaning through mediation and the conventional use of the object.

In turn 6, Dora repeats one of the words and taps the book, indicating a significant connection with the activity being conducted. In turns 11 and 13, Dora points out something in the book that likely captured her attention. In turn 18, Dora repeats words, and the other babies join in to touch the book (Turn 19). When comparing Dora's conventional uses with the 'Attention' category, it becomes evident that her sustained attention to reading is more pronounced when she is actively engaging with the book.

As previously described Dora displays a high level of attentional involvement in turns 6, 7, 11, 13, 15, and 20. She

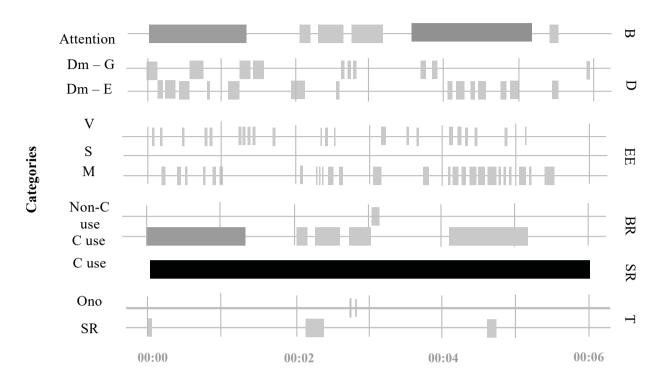
handles the book, taps it, claps, and shows a deep commitment to the shared reading activity. This description aligns well with the forthcoming analysis of the specific actions that emerged during Session 2 as a whole.

The second part of the analysis encompasses the findings and evidence obtained using ELAN (Figure 1). The software facilitated the identification of sequences that illustrate the close interaction among elements related to attention, educational intentions, object use, emotional expressions, and the guidance of mediation. This interaction, in turn, expands the processes associated with engagement during activities.

Figure 1 shows all the categories described in Table 2. The data reveals how, throughout the 6 minutes of recording, interactions with objects are intense, lasting, and relevant to the classroom dynamics. The utilization of both conventional and unconventional uses, emotional expressions, as well as communicative and educational intentions, including the Direction of Mediation (D), General Direction of Mediation (Dm G), Specific Direction of Mediation (Dm E), and Sung Reading (SR), collectively highlight Dora's deep engagement during this activity.

Figure 1

Mediation Chart with Handbook



Time in minutes

Dm G – General Direction Dm E – Specific Direction V – Vocalization S – Smile M – Hand movement Non-C use – Unconventional use C use – Conventional Use Ono – Onomatopoeia SR – Sung Reading B – Baby D – Mediation Direction EE - Emotional Expression BR – Baby reading TR – Reading teacher T – Teacher

In the graphical representation, it's evident that the teacher consistently employed the book (TR) in a conventional manner (C use) throughout the whole segment, as indicated by the darker color in the graph, reflecting the extended period of conventional use. The baby (BR) engaged in 5 instances of conventional use (C use) and 1 moment of unconventional use, which involved placing the book in her mouth (Non-C use).

An intriguing observation pertains to the Reading Direction (MD) employed by the teacher. It was directed towards the group (MD-G) at times and towards the specific baby (MD-E) at other times. Baby Dora was highly participative, which led the teacher to focus on directing reading and the book object toward her more frequently. When we compare this to the Attention category, we can observe that this direct mediation positively affected the baby's engagement in reading. Furthermore, the duration of attention can be associated with the baby's emotional expressions. It is worth noting that during moments of attention, she also responded with Vocalizations (V) and a substantial number of Hand Movements (M).

The teacher occasionally used Sung Reading (SR) during the reading, which was relevant to the images in the handbook and included popular children's songs familiar to babies. For instance, on a page featuring an image of a balloon, the teacher sang a snippet from the song "Cai, cai balão" (a well-known Brazilian nursery rhyme) and pointed to her hand. In response, Dora mirrored the gesture by pointing her finger at her open hand.

In Figure 1 of the graph, at the 4-minute mark, we can observe Dora's hand movements (M) and vocalizations (V) occurring simultaneously with specific mediation direction (MD-E). These Emotional Expressions (EE) are closely linked to intentional actions within the specific mediation context. The frequency of Emotional Expressions (EE) is quite apparent in this section of the recording. This underscores the importance of the teacher's guidance on use, specific object-related practices, and communication aspects involved in book-related activities, all of which contribute significantly to babies' engagement, learning, and development. Dora's complete involvement in the activity is evident in the graph.

The teacher's guidance on the use of the book during reading serves as a catalyst for triadic interactions. These interactions between the Adult-Object/Book-Baby begin when the adult guides the child into the realm of the material world through communicative signals. Throughout the reading process, the teacher not only mediates the storytelling but also guides the babies in their interactions with the book. For example, when babies sit on the book or put its pages in their mouths, the teacher plays a mediating role, helping the baby understand the object's function and encouraging them to use it conventionally.

The teacher employed persistent and repetitive requests to keep Dora's attention, as indicated by the specific mediation direction markings (MD - E). This strategy of capturing the baby's attention, and calling her by name, allows the child to recognize her role in the interaction, promoting her engagement as a genuine interlocutor.

Despite the educational material not being primarily designed for reading, the teacher effectively establishes connections between the images in the booklet and the babies' everyday experiences. She also incorporates sung readings, where she sings snippets from children's songs related to the images depicted in the book. For example, when there was an illustration of a balloon in the book, the teacher sang a snippet of the song "Cai, cai balão," linking the image to a well-known children's song. This means of mediation enhances the appeal of the activity, capturing the babies' attention. During these sung reading moments, babies responded by vocalizing and moving with their hands and legs.

Discussion

This research aimed to analyze the triadic babyteacher-book relationship, exploring how the dynamics of interaction enrich the babies' reading experience. From our observations, it is evident that Dora actively participated in shared reading, showing a strong focus on sustained attention (Figure 1 – Attention) and engaging in interactions through emotional expressions (Figure 1 – EE – vocalizing, smiling, and hand movements). These elements are closely connected to the method of reading mediation employed. Consequently, we can infer that the teacher's approach to mediating shared reading significantly influences the baby's actions during the reading session. It is worth highlighting that the handbook used by the teacher generated the highest level of engagement from the baby, mainly due to the variety of mediations employed by the teacher. These interactions are further exemplified in the data presented in Table 3 (Turn 5).

In this particular instance, the teacher presents an image of children flying kites with mediation directed towards the group (Turn 6). Dora responds by repeating the word "kite" and tapping the book with her hands (Turn 7). The teacher calls Dora when she shows the pictures and pages several times, she is the child who interacts the most with the book. This session illustrates how shared reading creates highly semiotic contexts that support various aspects of cognitive regulation, object use, and learning (Cárdenas et al., 2020).

The teacher's reading in this session was rich in mediation, as indicated by various elements (Figure 1 - Teacher's Reading TR, Reading Singing SR). The teacher consistently directed the baby's attention to the images in the book and incorporated children's and everyday songs relevant to the images being read. The significance of mediation and the incorporation of gestures and rhythmic-sound elements to enhance the shared reading experience are particularly emphasized (Cárdenas et al., 2020; Guevara et al., 2020; Moreno-Núñez et al., 2019; Rodríguez & De los Reyes, 2021).

Shared reading not only promotes the acquisition of language codes and language development but also enables the baby to develop various cognitive and emotional aspects, facilitating their engagement with reading. Introducing children to reading at a young age can foster aspects related to attention and executive control processes (Rodríguez & Moreno-Llanos, 2020). Figure 1 emphasizes the baby's attention span (Attention - B) and the conventional uses of the book (C use - BR) during the session (Palacios et al., 2018). Furthermore, it highlights the potential of mediation as a cultural tool that facilitates knowledge construction, which is especially enriching for early childhood. This is a crucial time when the brain undergoes significant structural development (Veldhuijzen van Zanten et al., 2012).

The research findings demonstrate the baby's active participation in the shared reading situation, even at just ten months of age. This involvement is marked by sustained attention, various uses of the book, and shifts in Mediation Direction (D) and (Dm G and MD E), as presented in Figure 1. The child's engagement is expressed through body movements, vocalizations, and gestures (Moreno-Llanos et al., 2021). These data strongly support the notion that shared reading can and should be a common practice in educational settings catering to babies and young children, as well as in family routines.

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