European Journal of Education Studies
ISSN: 2501 - 1111
ISSN-L: 2501 - 1111
Available online at: www.oapub.org/edu

DOI: 10.46827/ejes.v13i7.6769 Volume 13 | Issue 7 | 2026

RHYTHM, MOVEMENT, AND STORY: A PSYCHOMOTOR PRE-LITERACY INTERVENTION WITH PRESCHOOL CHILDREN IN RESIDENTIAL SOCIAL CARE. A LONGITUDINAL CASE STUDY

Panagoula Papadimitropoulou[1],
Eleni Konstantinidou[2i],
Vasilios Koutras[3]
[1]Instructor, Dr.,
School of Pedagogical and Technological Education,
Patras, Greece
[2]Doctoral Candidate,
Department of Early Childhood Education,
University of Ioannina,
Ioannina, Greece
[3]Professor, Dr.,
Department of Early Childhood Education,
University of Ioannina,
Ioannina, Greece

Abstract:
Children growing up in residential social care remain conspicuously underrepresented in early literacy research, despite facing well-documented developmental risks. This longitudinal qualitative case study examines a psychomotor and rhythmic intervention designed to support pre-reading and cognitive skills in two focal preschool children embedded in a mixed-age group of five (two preschoolers, two Grade 1 students, and one Grade 2 student) attending a Greek residential care center. The six-month protocol comprised 52 sessions delivered twice weekly (45 minutes per session) and combined movement, rhythmic activities, storytelling, dramatization with finger puppets and marionettes, and the collaborative composition of short poems for each letter of the alphabet, structured around a stable session sequence of activation, main activity, and relaxation. Data were collected through systematic observation, letter recognition checklists, poem recall tasks, and engagement coding at baseline, post-intervention, and three months after the focal children transitioned to Grade 1. Findings document gains in letter recognition, phonological sensitivity, sustained attention, and active participation, with substantial maintenance of these gains at follow-up. The study contributes a theoretically integrated, replicable protocol grounded in embodied cognition, rhythm-based literacy theory, and sociocultural perspectives, and offers

[i] Correspondence: email elkonstan2002@yahoo.com

exploratory evidence that low-cost multisensory interventions delivered in residential settings can support school readiness and the transition to formal schooling.

Keywords: embodied cognition; phonological awareness; rhythm-based pedagogy; residential care; early literacy; case study

1. Introduction

Early childhood is widely recognized as a foundational period for the development of skills that underpin later school success, particularly in the domains of language, literacy, and self-regulation (Duncan, Magnuson, & Votruba-Drzal, 2020; Snow, 2017). Within this period, the emergence of pre-reading skills, including phonological awareness, letter knowledge, and sound-symbol correspondence, has been consistently identified as a key predictor of later reading achievement (Goswami, 2011; Lonigan, Burgess, & Schatschneider, 2018; Melby-Lervåg, Lyster, & Hulme, 2016). Targeted educational interventions during the preschool years can therefore have lasting effects on academic trajectories, particularly when they engage children actively and multimodally (Bailey, Duncan, Odgers, & Yu, 2017; Tsampalas *et al.*, 2018).

However, the children most likely to benefit from such interventions, those growing up in adverse circumstances, remain among the least visible in the early literacy evidence base. Children residing in residential social care settings, in particular, are rarely the focus of intervention studies, despite evidence that early experiences of family disruption, limited caregiver continuity, and reduced exposure to language-rich activities place them at heightened risk for delays in language and cognitive development (Melhuish *et al.*, 2015; Rosu *et al.*, 2024; Yoshikawa *et al.*, 2013). The result is a clear empirical and practical gap: tools and protocols that are well-established for mainstream preschool populations may not be readily transferable to settings where small group sizes, mixed-age learning, and complex life histories shape the conditions of practice.

A parallel body of work suggests that one promising response to this gap lies in interventions that integrate movement, rhythm, and language. Theoretical accounts of embodied cognition argue that early learning is fundamentally rooted in bodily action and sensory engagement with the environment (Papadimitropoulou *et al.*, 2025; Papadimitropoulou *et al.*, 2026a; Shapiro, 2019; Wilson, 2002), an idea with deep roots in psychomotor traditions (Le Boulch, 1981; Wallon, 1970; Zaragas *et al.*, 2023). Concurrently, the temporal sampling framework advanced by Goswami (2011, 2019) posits that sensitivity to speech rhythm and prosody is a foundational mechanism linking auditory processing to phonological awareness and, ultimately, to reading. Empirical work on rhythm- and music-based pedagogy has accumulated evidence that such activities can support phonological skills, attention, and executive functioning in young children (Cumming, Wilson, & Goswami, 2019; Frischen, Schwarzer, & Degé, 2019; Gordon, Fehd, & McCandliss, 2015; Sofologi *et al.*, 2023; Tierney & Kraus, 2013). Yet the

integration of these strands into a coherent, classroom-ready protocol applied within residential care contexts has, to our knowledge, not been documented.

The present study addresses this gap by designing, implementing, and longitudinally evaluating a psychomotor and rhythmic pre-literacy intervention conducted over six months in a residential social care center, with two focal preschool children embedded in a mixed-age learning group. The contribution is threefold. First, the study offers a theoretically integrated framework that weaves embodied cognition, rhythm and phonology theory, and sociocultural accounts of learning into a single, internally consistent intervention rationale. Second, it provides a detailed, transparent, and replicable protocol that practitioners and researchers working in similar low-resource or vulnerable settings can adapt. Third, by including a three-month follow-up after the focal children had transitioned to Grade 1, it contributes exploratory evidence regarding the maintenance and transfer of early literacy and cognitive skills, an issue that remains underexplored in interventions for children in care (Bailey *et al.*, 2017).

Three research questions guide the study. First, to what extent does participation in a structured psychomotor and rhythmic intervention support the development of pre-reading skills, specifically phonological sensitivity and letter recognition, in preschool-aged children residing in social care? Second, how does the intervention shape cognitive engagement, particularly sustained attention, recall, and active participation, across the course of the program? Third, to what extent are the observed gains maintained three months after the focal children have transitioned to formal primary school? The remainder of the article situates the study within its theoretical context, describes the protocol and analytic approach, and presents findings alongside their interpretation, before considering implications and limitations.

2. Theoretical Framework

Three theoretical threads converge in the design of the present intervention: embodied cognition and psychomotor development, the link between rhythm and phonological awareness, and the role of narrative, drama, and active engagement in early literacy. Although each is well established in its own right, their integration within a single applied protocol, particularly for children in residential care, remains rare.

2.1 Embodied Cognition and Psychomotor Development

The view that cognition is grounded in bodily action has a long lineage in developmental psychology and early childhood pedagogy. Wallon (1970) emphasized the inseparability of movement and emotion in the constitution of mental life, arguing that the child's psychological development proceeds through the dynamic interplay between body and environment. Le Boulch (1981) extended this account into an explicitly educational framework, positioning movement as a primary medium through which children organize perception, thought, and self-awareness. Piaget's (1962) account of the transition from sensorimotor activity to symbolic representation likewise places action at the origin

of conceptual development, with symbolic play serving as a critical bridge between embodied experience and abstract thought.

Contemporary work in embodied cognition reinvigorates these claims with new empirical and theoretical resources. Wilson (2002) and Shapiro (2019) argue that cognitive processes cannot be cleanly separated from the sensorimotor systems through which agents engage the world. Empirically, studies of physical activity and executive functioning consistently show that movement-rich learning environments support attention, working memory, and self-regulation in young children (Diamond, 2013; Donnelly *et al.*, 2016; Sarris *et al.*, 2024a, 2024b, 2024c; Tomporowski *et al.*, 2015). For the present study, this body of work motivates a design in which letters, sounds, words, and stories are not merely heard or seen, but enacted with the body.

2.2 Rhythm and Phonological Awareness

A second, more specific thread links rhythmic perception and production to the development of phonological awareness, widely regarded as among the strongest predictors of later reading achievement (Hulme & Snowling, 2013; Melby-Lervåg *et al.*, 2016). Goswami's (2011, 2019) temporal sampling framework offers a particularly influential account: sensitivity to the rhythmic envelope of speech, especially to stress patterns and syllable onsets, scaffolds the child's ability to segment the speech stream into phonological units. On this account, difficulties in tracking speech rhythm contribute to phonological deficits and, ultimately, to reading difficulties.

Patel (2008) provides complementary neurocognitive evidence that music and language draw on shared mechanisms for processing temporal structure, an observation that helps to explain why rhythmic and musical activities can have transfer effects on language. A growing body of intervention and correlational work supports this idea. Music and rhythm training have been linked to improvements in phonological awareness and reading in school-aged children (Gordon, Fehd, & McCandliss, 2015; Tierney & Kraus, 2013), while sensitivity to prosodic structure has been related to reading outcomes in both typical and atypical readers (Cumming, Wilson, & Goswami, 2019). Frischen, Schwarzer, and Degé (2019) further demonstrate that rhythm-focused training can support executive functions in preschool-aged children, while recent systematic work confirms the value of integrated music and movement pedagogy in basic education (Del Barrio & Arús, 2024; Sarris *et al.*, 2024a, 2024b, 2024c). These findings provide the theoretical warrant for the present intervention's heavy reliance on rhythmic recitation, syllable clapping, body percussion, and the collaborative composition and repetition of short rhyming poems.

2.3 Narrative, Drama, and Active Engagement

The third thread foregrounds the social and symbolic dimensions of early literacy. Bruner (1990) argued that narrative is a primary mode through which children organize experience and construct meaning. Vygotsky (1978), from a sociocultural perspective, emphasized that higher cognitive functions develop through guided participation in

culturally organized activity, mediated by language and tools. Within this tradition, dramatization, role play, and shared storytelling are not peripheral enrichments but central engines of cognitive and linguistic development.

Recent empirical work elaborates these claims. Narrative play and shared book reading have been linked to vocabulary growth, comprehension, and school readiness (Justice, Jiang, & Strasser, 2018; Nicolopoulou, McDowell, & Brockmeyer, 2015). Active, multimodal engagement with text, including activities that combine listening, speaking, moving, and producing, has been shown to support both linguistic and cognitive development more broadly (Hadley *et al.*, 2020). Frameworks for social and emotional learning further highlight the role of structured, rhythmic, and predictable group activities in supporting attention regulation and cooperation, particularly in children whose self-regulation capacities are still consolidating (CASEL, 2020). Together, these literatures motivate the intervention's emphasis on collaborative story creation, dramatization with finger puppets and marionettes (Sarris & Papadimitropoulou, 2014; Papadimitropoulou *et al.*, in press), and the embedding of letter learning within meaningful narrative episodes.

2.4 Integration and Rationale for the Present Study

Although each of these three lines of work is robust on its own, their explicit integration within an applied early literacy intervention remains uncommon, and is, to our knowledge, undocumented in residential social care settings. The present protocol is grounded in the assumption that embodied, rhythmic, and narrative dimensions of learning are mutually reinforcing rather than additive: rhythm makes language tractable for the developing phonological system, narrative gives the rhythm meaning, and the body anchors both in lived experience. The mixed-age structure of the learning group, in turn, draws on Vygotskian principles by positioning slightly older peers as collaborative models within the zone of proximal development. The resulting design seeks to offer a feasible, theoretically coherent response to the literacy needs of a small and underserved population, while also generating preliminary evidence about whether such an integrated approach can produce gains that persist into the early primary years.

3. Material and Methods

3.1 Research Design

This study employed a qualitative longitudinal case study design with embedded descriptive indicators (Cohen, Manion, & Morrison, 2018; Creswell, 2014). Case study methodology was selected for its capacity to provide an in-depth understanding of complex pedagogical processes in authentic, ecologically valid settings (Bronfenbrenner & Morris, 2006), particularly when working with small populations for whom larger experimental designs would be impractical and potentially inappropriate. The decision to proceed without a control group reflected both pragmatic constraints (the small size and specific composition of the residential group) and the exploratory aim of the study,

which sought to document a feasible protocol and its observed effects rather than to establish causal claims (Leon, Davis, & Kraemer, 2011; Shadish, Cook, & Campbell, 2002). Findings should therefore be interpreted as illustrative and hypothesis-generating rather than confirmatory.

3.2 Setting and participants

The intervention took place in a Greek residential social care center serving children who, for varying reasons related to family circumstances, were living outside their family homes. Five children participated in the mixed-age learning group: two focal preschool-aged children in their final year before primary school entry, two Grade 1 students, and one Grade 2 student. The two preschoolers constituted the focal participants of the study; the older children participated in the same sessions and contributed to the social and collaborative texture of the group, in line with the rationale for mixed-age learning environments (Justice *et al.*, 2018; Nicolopoulou *et al.*, 2015; Vygotsky, 1978). All five children attended on a voluntary basis without external pressure, and attendance across the program was consistently high.

3.3 Ethical Considerations

The study was conducted in accordance with the ethical principles of the Declaration of Helsinki and with established guidelines for educational research with vulnerable populations.

3.4 Duration and implementation

The intervention was implemented during the final six months of preschool (early March to early September), comprising 52 sessions delivered twice weekly during after-school hours at the residential center. Each session lasted 45 minutes, a duration consistent with recommendations for sustained attention in this age range (Diamond, 2013). No break was taken during the summer holidays; this was possible because the children and the practitioner remained together in the center throughout the summer, a circumstance that, in line with recent evidence on the protection of early literacy gains across summer breaks (Vosslamber *et al.*, 2025), is likely to have contributed to the stability of the observed outcomes. Missed sessions, when they occurred, were promptly rescheduled.

3.5 Intervention Protocol

Each session followed a stable three-phase structure: a brief activation (5 to 10 minutes), a main activity (approximately 20 minutes), and a relaxation phase (approximately 5 minutes). The activation phase consisted of rhythmic walking and synchronized body percussion (clapping, foot-stamping) designed to orient attention and activate motor and rhythmic systems (Frischen *et al.*, 2019; Goswami, 2019). The main activity drew on four interrelated activity blocks (rhythm and storytelling, music and movement games, body and space, and rhythm and speech), described in detail below. The session concluded

with breathing exercises and slow, controlled movements, intended to support gradual de-arousal and the development of self-regulation (Blair & Raver, 2015).

The substantive content was organized around the sequential introduction of the letters of the Greek alphabet, with two consecutive sessions devoted to each letter. The final four sessions of the program revisited previously introduced letters in groups of six, supporting consolidation. For each letter, the following sequence of activities was used: (a) presentation of the letter through a short story, drawing on the Greek children's series "Alphabet with Stories" (Tsilimeni, 2005–2010) and on episodes of the Greek state television series "A Letter, A Story"; (b) co-construction of a new story by the children; (c) dramatization of the story using finger puppets or marionettes; (d) collaborative composition of a short four-line poem (one stanza) featuring the letter; and (e) rhythmic recitation of the poem with synchronized body movements (clapping, knee-tapping, foot-stamping) used to mark each syllable. Previously composed poems were systematically revisited throughout subsequent sessions, supporting both recall and the consolidation of phonological patterns. The full structure of the program is summarized in Table 1.

Table 1: Structure of the Intervention Program

Phase	Activity	Aim	Theoretical basis
1	Storytelling for each letter	Language comprehension, narrative structure	Bruner (1990)
2	Children's story creation	Linguistic expression, creativity	Piaget (1962)
3	Dramatization with finger puppets / marionettes	Symbolic thinking, emotional engagement	Vygotsky (1978)
4	Collaborative poem composition	Phonological awareness, rhythm	Goswami (2011)
5	Rhythmic recitation of poems	Memory, recall	Baddeley (2000)
6	Motor-rhythmic activities (body percussion)	Attention, self-regulation	CASEL (2020)

3.6 Data Collection

Data were collected through four complementary qualitative and descriptive strategies. First, systematic observation was conducted by the practitioner-researcher during every session, with structured field notes documenting children's engagement, participation in each activity block, social interactions, and behavioral indicators of attention and self-regulation. Second, a letter recognition checklist covering the 24 letters of the Greek alphabet was administered at three time points: baseline (at the start of the intervention), post-intervention (at the conclusion of the six-month program), and follow-up (three months after the focal children's entry into Grade 1). Third, poem recall was assessed at the same three time points by inviting each focal child to recite previously learned poems; recall was recorded as the number of four-line stanzas the child could produce without prompting. Fourth, engagement was coded across three dimensions (sustained attention,

active participation, and cooperation with peers) using a three-level qualitative scale (low / medium / high) applied at the session level.

3.7 Data Analysis

Field notes were analyzed using a thematic approach following established guidance for qualitative analysis in education (Saldaña, 2016), with themes organized around the three research questions: pre-reading skill development, cognitive engagement, and skill maintenance. Descriptive summaries of letter recognition, poem recall, and engagement codings were compiled across the three time points to complement the thematic analysis. To support trustworthiness (Lincoln & Guba, 1985), procedures included prolonged engagement with the participants over the six-month program and three-month follow-up, persistent observation across multiple session types, and triangulation across observational, behavioral, and task-based data sources. The qualitative nature of the data set, combined with the small number of focal participants, places this study within an exploratory rather than confirmatory frame (Creswell & Plano Clark, 2018).

4. Results and Discussion

The findings of the study are presented and discussed under three headings, corresponding to the research questions: pre-reading skills, cognitive engagement, and maintenance at the three-month follow-up. Given the case study design and the small number of focal participants, results are reported in descriptive and qualitative terms; numerical indicators are expressed as counts or ranges rather than as percentages, in order to avoid the misleading precision that can attach to proportions calculated from very small samples. Illustrative vignettes drawn from the field notes are interspersed throughout to convey the texture of the observed processes. A descriptive summary of the indicators across time points is presented in Table 2.

Table 2: Descriptive Indicators of Pre-Reading and Cognitive Skills Across Time Points (n = 2 Focal Children)

Indicator	Baseline	Post-intervention	Follow-up (3 mo.)
Letter recognition (out of 24)	5–7	21–22	18–20
Poem recall (stanzas out of 24)	Not applicable	17–19	14–17
Sustained attention (minutes)	5–7	15–20	12–18
Active participation	Low / Medium	High	High
Cooperation with peers	Medium	High	High

Note: Ranges reflect variation between the two focal preschool children. Poem recall is reported as the number of four-line stanzas produced without prompting, out of 24 poems collaboratively composed across the program.

4.1 Pre-reading Skills

At baseline, the two focal children could recognize between five and seven letters of the Greek alphabet, primarily those that featured prominently in their own names or in environmental print familiar from the residential center. By the end of the six-month

intervention, both children could identify 21 or 22 of the 24 letters and could produce the dominant sound associated with each. Three months into Grade 1, recognition had stabilized at 18 to 20 letters per child, a modest decline relative to the post-intervention peak, but well above baseline.

Beyond the discrete recognition task, both children showed marked development in phonological sensitivity over the course of the program. Early in the intervention, syllable-clapping during poem recitation often lagged behind the practitioner's lead and frequently misaligned with syllable boundaries. By the third month, both children could maintain syllable-level synchrony in familiar poems and, by the end of the program, could initiate and lead syllable clapping in novel verses. This shift was particularly visible in the second focal child, who initially resisted rhythmic activities but became, by the final months, the most consistent rhythm leader in the group.

These observations align with the prediction, central to Goswami's (2011, 2019) temporal sampling framework, that supporting rhythmic perception and production scaffolds the emergence of phonological awareness. The combination of letter-anchored stories, dramatization, and rhythmically organized poems appears to have offered multiple, mutually reinforcing routes into the sound-symbol relationship (Patel, 2008), and the observed gains in letter recognition are consistent with broader evidence linking phonological awareness and letter knowledge as joint predictors of reading development (Lonigan *et al.*, 2018).

> **Vignette 1:**
> *During the eighteenth session, the children were composing a poem for a letter they had encountered the previous week. One of the focal preschoolers, who had been hesitant to contribute earlier in the program, proposed a four-syllable word, clapped its syllables on her own initiative, and asked the older children to do the same. The group's spontaneous adoption of her rhythm, rather than the practitioner's, marked a visible shift in the child's positioning within the group as well as in her relationship to the phonological structure of language.*

4.2 Cognitive Engagement

Cognitive engagement, operationalized as sustained attention, active participation, and cooperation with peers, increased markedly over the program. At baseline, sustained engagement with a single activity rarely exceeded five to seven minutes; by the end of the intervention, both focal children could sustain attention through 15- to 20-minute story and poem sequences. Active participation, which at the outset was uneven and often passive, particularly for one of the focal children, became consistently high by the second half of the program, with both children initiating contributions to stories, asking to lead recitations, and supporting the older children in collaborative episodes.

The improvement in recall was perhaps the most striking dimension of engagement-related change. Initially, recall of even short poems was fragmentary and required heavy prompting. By the final months of the intervention, both children could

produce 17 to 19 of the 24 four-line poems composed across the program. This pattern is consistent with the broader literature on repeated retrieval as a mechanism for consolidating learning (Karpicke & Blunt, 2011; Roediger & Butler, 2011), and aligns with theoretical accounts linking rhythmic organization of verbal material to working memory and long-term retention (Baddeley, 2000; Patel, 2008). The emotional and symbolic salience of the dramatized stories, with finger puppets that sometimes-voiced themes drawn from the children's own lives in the residential center, likely contributed to this consolidation by engaging affective systems that are now widely recognized as central to learning (Immordino-Yang & Damasio, 2007).

Vignette 2

In the thirty-fourth session, returning to a poem composed three weeks earlier, both focal children produced the full stanza without prompting and then spontaneously enacted the accompanying story with the finger puppets they had previously used. The reactivation of poem, narrative, and embodied gesture as a single integrated unit, rather than as separable items, suggests that the multimodal architecture of the intervention was indeed supporting integrated encoding.

4.3 Maintenance at the Three-month Follow-up

The three-month follow-up assessment, conducted after the focal children had transitioned to Grade 1, offered the most distinctive contribution of the study. Letter recognition remained at 18 to 20 letters per child, sustained attention during structured tasks was maintained at 12 to 18 minutes, poem recall held at 14 to 17 of 24 stanzas, and qualitative ratings of participation and cooperation remained high. The reduction relative to the post-intervention peak is consistent with the partial fade-out commonly observed in early childhood interventions (Bailey, Duncan, Odgers, & Yu, 2017), but the magnitude of the decline was modest, and key skills, particularly letter recognition and active classroom participation, appeared to transfer effectively into the new educational setting. Several features of the design plausibly contributed to this stability. The continuous, unbroken delivery of the program across the summer (Vosslamber *et al.*, 2025), the embodied and rhythmic organization of the learning material (Goswami, 2011; Patel, 2008; Shapiro, 2019), the depth of repetition and structured retrieval built into the protocol (Karpicke & Blunt, 2011), and the rich social and affective scaffolding provided by the mixed-age group (Justice *et al.*, 2018; Vygotsky, 1978) each have independent literatures supporting their role in promoting maintenance and transfer. The convergence of these mechanisms within a single, coherent design may help to explain the observed durability of the gains. For children in residential care, who often experience discontinuity across educational and developmental transitions (Melhuish *et al.*, 2015; Yoshikawa *et al.*, 2013), the prospect of carrying competencies forward across the boundary into formal schooling is of particular importance, both for academic outcomes and for the children's developing sense of themselves as learners.

Vignette 3

At the follow-up assessment, one focal child, now midway through Grade 1, spontaneously recited a poem from the program when shown a card with its initial letter, and then explained that this was the one the group had composed with the puppet who had lost her hat. The continued availability of the multimodal episode three months later, retrievable through a single letter cue, suggests that the integration of narrative, rhythm, and embodied gesture supported a particularly robust form of memory access.

4.4 Limitations

These findings should be interpreted with caution. As a case study with two focal participants, the work makes no claim to statistical generalization, and the descriptive indicators reported above must be read as illustrative rather than as estimates of typical effects in this population (Cohen *et al.*, 2018; Shadish *et al.*, 2002). The absence of a comparison group means that maturational change, parallel school experiences, and other contextual factors cannot be disentangled from the contribution of the intervention itself. Observations were carried out primarily by the practitioner-researcher, which introduces the possibility of confirmation bias; while triangulation across multiple data sources and the inclusion of task-based indicators were intended to mitigate this risk, larger studies would benefit from independent observation and from standardized phonological and cognitive measures. Future work should examine the protocol with larger samples, with comparison groups drawn from comparable residential and community settings, and with the addition of mixed-method assessments. Despite these limitations, the convergence of observations across activities, time points, and indicators provides a coherent and theoretically interpretable picture, one that justifies further investigation of integrated psychomotor, rhythmic, and narrative approaches in early literacy work with children in social care.

5. Conclusion

Children living in residential social care occupy a small but significant corner of the early childhood landscape, and the literacy and cognitive supports available to them are rarely the focus of empirical investigation. The present case study contributes a theoretically integrated and replicable protocol, anchored in embodied cognition, rhythm and phonology theory, and sociocultural perspectives on learning, and offers exploratory longitudinal evidence that such an approach can support letter recognition, phonological sensitivity, sustained attention, active participation, and the maintenance of these gains across the transition to formal schooling. The intervention requires no specialized equipment beyond what is typically available in residential and preschool settings, and can be delivered by educators and caregivers familiar with rhythmic, narrative, and dramatic activities. Although the small sample and absence of a control group preclude causal claims, the convergence of observations across multiple indicators and time points suggests that integrated psychomotor, rhythmic, and narrative approaches deserve fuller

investigation as a feasible response to the literacy needs of children in residential care, and more broadly as a model for early childhood pedagogy that places the body, the voice, and the story at the centre of learning.

Conflict of Interest Statement
The author(s) declare(s) no conflicts of interest.

About the Authors
Panagoula Papadimitropoulou is a psychologist and educator teaching at European University Cyprus, University of Patras, and ASPETE. She studied Psychology and Education at the University of Ioannina, completed postgraduate studies in Career Counseling at the University of Patras and in Educational Sciences at the University of Rouen, France, and earned her PhD from the University of Ioannina. Her research interests focus on counseling, developmental and educational psychology, psychoeducation, and teaching methodology, with particular emphasis on psychomotricity, rhythmic education, and the promotion of learning and mental health in children with and without typical development.
Eleni Konstantinidou is a special educator teacher and a doctoral candidate at the Department of Early Childhood Education, University of Ioannina, Greece. Her research focuses on psychomotor pre-literacy interventions with preschool children.
Vasilios Koutras is a psychiatrist and a professor of Health Education at the Department of Early Childhood Education, University of Ioannina, Greece. His academic and research interests focus on psychoeducation and the development and promotion of intervention programs for children with and without typical development. His work mainly focuses on the promotion of mental health, inclusion, psychosocial development, and the implementation of supportive educational interventions for children in early childhood and school settings.

References

Baddeley, A. (2000). The episodic buffer: A new component of working memory? *Trends in Cognitive Sciences, 4*(11), 417–423. https://doi.org/10.1016/s1364-6613(00)01538-2

Bailey, D. H., Duncan, G. J., Odgers, C. L., & Yu, W. (2017). Persistence and fadeout in the impacts of child and adolescent interventions. *Journal of Research on Educational Effectiveness, 10*(1), 7–39. https://doi.org/10.1080/19345747.2016.1232459

Blair, C., & Raver, C. C. (2015). School readiness and self-regulation: A developmental psychobiological approach. *Annual Review of Psychology, 66*, 711–731. https://doi.org/10.1146/annurev-psych-010814-015221

Bronfenbrenner, U., & Morris, P. A. (2006). The bioecological model of human development. In W. Damon & R. M. Lerner (Eds.), *Handbook of child psychology* (6th ed.). Wiley. Retrieved from https://childhelp.org/wp-content/uploads/2015/07/Bronfenbrenner-U.-and-P.-Morris-2006-The-Bioecological-Model-of-Human-Development.pdf

Bruner, J. (1990). *Acts of meaning*. Harvard University Press. Retrieved from https://mf.media.mit.edu/courses/2006/mas845/readings/files/bruner_Acts.pdf

Collaborative for Academic, Social, and Emotional Learning. (2020). *What is the CASEL framework?* CASEL. Retrieved from https://casel.org/fundamentals-of-sel/what-is-the-casel-framework/

Cohen, L., Manion, L., & Morrison, K. (2018). *Research methods in education* (8th ed.). Routledge. Retrieved from https://www.researchgate.net/publication/44824604_Research_Methods_in_Education

Creswell, J. W. (2014). *Research design: Qualitative, quantitative, and mixed methods approaches* (4th ed.). Sage. Retrieved from https://books.google.ro/books/about/Research_Design.html?id=4uB76IC_pOQC&redir_esc=y

Creswell, J. W., & Plano Clark, V. L. (2018). *Designing and conducting mixed methods research* (3rd ed.). Sage. Retrieved from https://books.google.ro/books/about/Designing_and_Conducting_Mixed_Methods_R.html?id=YcdlPWPJRBcC&redir_esc=y

Cumming, R., Wilson, A., & Goswami, U. (2019). Basic auditory processing and sensitivity to prosodic structure in children with dyslexia. *Scientific Studies of Reading, 23*(1), 1–17. https://doi.org/10.3389/fpsyg.2015.00972

Del Barrio, L., & Arús, M. E. (2024). Music and movement pedagogy in basic education: A systematic review. *Frontiers in Education, 9*, 1403745. https://doi.org/10.3389/feduc.2024.1403745

Diamond, A. (2013). Executive functions. *Annual Review of Psychology, 64*, 135–168. https://doi.org/10.1146/annurev-psych-113011-143750

Donnelly, J. E., Hillman, C. H., Castelli, D., Etnier, J. L., Lee, S., Tomporowski, P., Lambourne, K., & Szabo-Reed, A. N. (2016). Physical activity, fitness, cognitive

function, and academic achievement in children: A systematic review. *Medicine & Science in Sports & Exercise, 48*(6), 1197–1222. https://doi.org/10.1249/mss.0000000000000901

Duncan, G. J., Magnuson, K., & Votruba-Drzal, E. (2020). Boosting family income to promote child development. *Future of Children, 24*(1), 99–120. https://doi.org/10.1353/foc.2014.0008

Frischen, U., Schwarzer, G., & Degé, F. (2019). Comparing the effects of rhythm-based and pitch-based music training on executive functions in preschool children. *Frontiers in Integrative Neuroscience, 13*, 41. https://doi.org/10.3389/fnint.2019.00041

Gordon, R. L., Fehd, H. M., & McCandliss, B. D. (2015). Does music training enhance literacy skills? A meta-analysis. *Frontiers in Psychology, 6*. https://doi.org/10.3389/fpsyg.2015.01777

Goswami, U. (2011). A temporal sampling framework for developmental dyslexia. *Trends in Cognitive Sciences, 15*(1), 3–10. https://doi.org/10.1016/j.tics.2010.10.001

Goswami, U. (2019). Speech rhythm and language acquisition: An amplitude modulation phase hierarchy perspective. *Annual Review of Linguistics, 5*, 151–169. https://doi.org/10.1111/nyas.14137

Hadley, E. B., Dickinson, D. K., Hirsh-Pasek, K., & Golinkoff, R. M. (2020). Building semantic networks: The impact of a vocabulary intervention on preschoolers' depth of word knowledge. *Early Childhood Research Quarterly, 53*, 214–226. https://doi.org/10.1002/rrq.225

Hulme, C., & Snowling, M. J. (2013). Learning to read: What we know and what we need to understand better. *Child Development Perspectives, 7*(1), 1–5. https://doi.org/10.1111/cdep.12005

Immordino-Yang, M. H., & Damasio, A. (2007). We feel, therefore we learn: The relevance of affective and social neuroscience to education. *Mind, Brain, and Education, 1*(1), 3–10. https://doi.org/10.1111/j.1751-228X.2007.00004.x

Justice, L. M., Jiang, H., & Strasser, K. (2018). Linguistic environment of preschool classrooms: What dimensions support children's language growth? *Early Childhood Research Quarterly, 42*, 79–92. https://doi.org/10.1016/j.ecresq.2017.09.003

Karpicke, J. D., & Blunt, J. R. (2011). Retrieval practice produces more learning than elaborative studying with concept mapping. *Science, 331*(6018), 772–775. https://doi.org/10.1126/science.1199327

Le Boulch, J. (1981). *Le développement psychomoteur de la naissance à 6 ans*. ESF. Retrieved from https://media.electre-ng.com/extraits/extrait-id/e6071ff319cf4265b9d76281a77802ebfd167e99e1f6c0430caa9901e7595c12.pdf

Leon, A. C., Davis, L. L., & Kraemer, H. C. (2011). The role and interpretation of pilot studies in clinical research. *Journal of Psychiatric Research, 45*(5), 626–629. Retrieved from https://doi.org/10.1016/j.jpsychires.2010.10.008

Lincoln, Y. S., & Guba, E. G. (1985). *Naturalistic inquiry*. Sage. Retrieved from https://uk.sagepub.com/en-gb/eur/naturalistic-inquiry/book842

Lonigan, C. J., Burgess, S. R., & Schatschneider, C. (2018). Examining the simple view of reading with elementary school children: Still simple after all these years. *Remedial and Special Education, 39*(5), 260–273. Retrieved from https://files.eric.ed.gov/fulltext/EJ1191983.pdf

Melby-Lervåg, M., Lyster, S. A. H., & Hulme, C. (2016). Phonological skills and their role in learning to read: A meta-analytic review. *Psychological Bulletin, 138*(2), 322–352. https://doi.org/10.1037/a0026744

Melhuish, E., Ereky-Stevens, K., Petrogiannis, K., Ariescu, A., Penderi, E., Rentzou, K., Tawell, A., Slot, P., Broekhuizen, M., & Leseman, P. (2015). *A review of research on the effects of early childhood education and care on child development*. CARE Project, European Commission. Retrieved from https://www.researchgate.net/publication/291970194_A_review_of_research_on_the_effects_of_early_childhood_Education_and_Care_ECEC_upon_child_development_CARE_project

Nicolopoulou, A., McDowell, J., & Brockmeyer, C. (2015). Narrative play and emergent literacy: Storytelling and story-acting meet journal writing. *Early Childhood Research Quarterly, 32*, 170–181. Retrieved from https://www.researchgate.net/publication/296211775_Nicolopoulou_et_al_-_Narrative_Play_Emergent_Literacy_2006

Papadimitropoulou, P., Katsis, I., Zaragas, H., & Skordilis, E. (2025). Co-education and inclusion of children with and without typical development in the general classroom: Contribution of psychomotor rhythmic and psychoemotional education. *European Journal of Special Education Research, 11*(6), 125–140. https://doi.org/10.46827/ejse.v11i6.6359

Papadimitropoulou, P., Katsis, I., Zaragas, H., Skordilis, E., Chatzipetrou, P., & Tsodoulou, T. (2026). Psychomotor education, rhythm, and play: Factors enhancing socio-emotional development in preschool education. *European Journal of Open Education and E-learning Studies, 11*(1), 73–84. https://doi.org/10.46827/ejoe.v11i1.6650

Papadimitropoulou, P., Konstantinidou, E., Zaragas, C., & Skordilis, E. (in press). *Movement, rhythm and psychoeducation of children through children's drawing*. Akakia Publications.

Patel, A. D. (2008). *Music, language, and the brain*. Oxford University Press. Retrieved from https://books.google.ro/books/about/Music_Language_and_the_Brain.html?id=EkItxyZqNecC&redir_esc=y

Piaget, J. (1962). *Play, dreams and imitation in childhood*. Norton. https://doi.org/10.4324/9781315009698

Roediger, H. L., & Butler, A. C. (2011). The critical role of retrieval practice in long-term retention. *Trends in Cognitive Sciences, 15*(1), 20–27. https://doi.org/10.1016/j.tics.2010.09.003

Rosu, D., Cojanu, F., Vișan, P.-F., Sămărescu, N., Ene, M. A., Muntean, R.-I., & Ursu, V. E. (2024). Structured program for developing the psychomotor skills of

institutionalized children with special educational needs. *Children, 11*(1), 102. https://doi.org/10.3390/children11010102

Saldaña, J. (2016). *The coding manual for qualitative researchers* (3rd ed.). Sage. Retrieved from https://books.google.ro/books/about/The_Coding_Manual_for_Qualitative_Resear.html?id=RwcVEAAAQBAJ&redir_esc=y

Sarris, D. & Papadimitropoulou, P. (2014). The Symbolic Play as a means for treating learning disabilities for children aged 5-9 years old. In A.Giotsa (Eds), *Psychological and Educational Approaches in Times of Crisis*, (pp.79-92). Untested Ideas Research Center. Retrieved from https://www.researchgate.net/publication/371510776_The_Symbolic_Play_as_a_means_for_treating_learning_disabilities_for_children_aged_5-9_years_old

Sarris, D., Tsodoulos, K., Travlos, K.A., Siafaka, V., Skordilis, E., Christopoulou, F., Papadimitropoulou, P., Mavropalias, T., Thanou, E. (2024a). Factors influencing the Social-Emotional Behavior of children with autism: The influence of Psychomotor Clumsiness. *European Journal of Special Education Research, 10*(7), 97-122. http://dx.doi.org/10.46827/ejse.v10i7.5639

Sarris, D., Tsodoulos, K., Skordilis, E., Zaragas, H., Koutras, V., Papadimitropoulou, P., Chatzipetrou, P. (2024b). Factors influencing self-esteem in children with autism. The role of psychomotor clumsiness. *European Journal of Special Education Research, 10*(8), 54-72. http://dx.doi.org/10.46827/ejse.v10i8.5736

Sarris, D., Charmpatsis, Ch., Katsarou V. D., Mavropalias, Tr., Efthymiou, E., Travlos, K. A., Papantoniou, G., & Papadimitropoulou, P. (2024c). Developmental Coordination Disorder and social competence in preschool children. *European Journal of Special Education Research, 10* (6), 1-15, DOI: http://dx.doi.org/10.46827/ejse.v10i6.5504

Shadish, W. R., Cook, T. D., & Campbell, D. T. (2002). *Experimental and quasi-experimental designs for generalized causal inference*. Houghton Mifflin. Retrieved from https://books.google.ro/books/about/Experimental_and_Quasi_experimental_Desi.html?id=o7jaAAAAMAAJ&redir_esc=y

Shapiro, L. (2019). *Embodied cognition* (2nd ed.). Routledge. Retrieved from https://books.google.ro/books/about/The_Routledge_Handbook_of_Embodied_Cogni.html?id=5SoHEQAAQBAJ&redir_esc=y

Snow, C. E. (2017). Early literacy development and instruction: An overview. *Annual Review of Applied Linguistics, 37*, 21–35. Retrieved from https://www.taylorfrancis.com/chapters/edit/10.4324/9781315766027-2/early-literacy-development-instruction-catherine-snow

Sofologi, M., Kamari, A., Kougioumtzis, G., Tatsiopoulou, P., Bonti, E., Papadimitropoulou, P., Sarris, D. (2023). Emphasizing the Developmental Trajectory of Executive Functions in Preschool, School Children, Adolescence, and Its Relations With School Performance: The Development of Executive Functions. In D. Katsarou (Eds) *Developmental Language Disorders in Childhood and Adolescence*

(pp 224-238). IGI Global. Retrieved from https://www.igi-global.com/chapter/emphasizing-the-developmental-trajectory-of-executive-functions-in-preschool-school-children-adolescence-and-its-relations-with-school-performance/332672

Tierney, A., & Kraus, N. (2013). Music training for the development of reading skills. *Progress in Brain Research, 207*, 209–241. https://doi.org/10.1016/b978-0-444-63327-9.00008-4

Tomporowski, P. D., McCullick, B., Pendleton, D. M., & Pesce, C. (2015). Exercise and children's cognition: The role of exercise characteristics and a place for metacognition. *Journal of Sport and Health Science, 4*(1), 47–55. https://doi.org/10.1016/j.jshs.2014.09.003

Tsilimeni, T. (2005–2010). *Αλφαβητάρι με ιστορίες* [Alphabet with stories] (24 vols.). Kalentis.

Tsampalas, E., Sarris, D., Papadimitropoulou, P., Vergou, M., & Zakopoulou, V. (2018). Learning paths and learning styles in dyslexia: Possibilities and effectiveness—Case study of two elementary school students aged 7 years old. *European Journal of Special Education Research, 3*(1), 25–41. https://doi.org/10.5281/zenodo.1095187

Vosslamber, A., Walker, J., Millar-Swan, A., Motha, J., & Gillon, G. (2025). The impact of Better Start Literacy Approach teaching on the retention of children's early literacy skills over the summer holidays. *New Zealand Journal of Educational Studies, 60*, 435–449. https://doi.org/10.1007/s40841-025-00405-2

Vygotsky, L. S. (1978). *Mind in society: The development of higher psychological processes*. Harvard University Press. https://doi.org/10.2307/j.ctvjf9vz4

Wallon, H. (1970). *De l'acte à la pensée*. Flammarion. Retrieved from https://books.google.ro/books/about/De_l_acte_%C3%A0_la_pens%C3%A9e.html?id=gDjFxgEACAAJ&redir_esc=y

Wilson, M. (2002). Six views of embodied cognition. *Psychonomic Bulletin & Review, 9*(4), 625–636. https://doi.org/10.3758/bf03196322

Yoshikawa, H., Weiland, C., Brooks-Gunn, J., Burchinal, M., Espinosa, L., Gormley, W., Ludwig, J., Magnuson, K. A., Phillips, D., & Zaslow, M. (2013). *Investing in our future: The evidence base on preschool education*. Society for Research in Child Development. Retrieved from https://eric.ed.gov/?id=ED579818

Zaragas, H., Fragkomichelaki, O., Geitona, M., Sofologi, M., Papantoniou, G., Sarris, D., Pliogou, V., Charmpatsis, C., & Papadimitropoulou, P. (2023). The Effects of Physical Activity in Children and Adolescents with Developmental Coordination Disorder. *Neurology International 15*(3), 804-820. https://doi.org/10.3390/neurolint15030051