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# IMPACT OF A STRUCTURED PSYCHOMOTOR PROGRAM ON THE DEVELOPMENT OF ELEMENTARY SCHOOL CHILDREN

# IMPACTO DE UM PROGRAMA PSICOMOTOR ESTRUTURADO NO DESENVOLVIMENTO DE CRIANÇAS DO ENSINO FUNDAMENTAL

# IMPACTO DE UN PROGRAMA PSICOMOTOR ESTRUCTURADO EN EL DESARROLLO DE NIÑOS DE EDUCACIÓN PRIMARIA

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## ABSTRACT

This study investigated the impact of a structured psychomotor program, implemented over six months, on first-grade elementary school students at a municipal school in Anápolis - GO. Oliveira's (2008) psychomotor battery was applied through a quasi-experimental approach with an intervention and control group, complemented by instruments and analyses in accordance with the current guidelines of the Brazilian Psychomotricity Association (ABP). The results suggest that, in the intervention group (n=22), 86.4% of children with psychomotor developmental delays reached the expected levels for their age in critical domains such as body image, laterality, and spatial-temporal concepts. Furthermore, 94.7% of children who were already at the expected level (n=19) showed significant progress in all dimensions assessed. The results support the hypothesis that structured psychomotor interventions are essential predictors of children's comprehensive development and the cognitive maturation necessary for the literacy process. The study contributes to the literature by strengthening the empirical connections between psychomotor development and school readiness, providing a practical model for implementation in educational settings.


**Keywords:** Psychomotor Skills. Physical Education. Child Development. Literacy. School Readiness.


## RESUMO

Este estudo investigou o impacto de um programa psicomotor estruturado, implementado ao longo de seis meses, em alunos do primeiro ano do ensino fundamental de uma escola municipal de Anápolis – GO. A bateria psicomotora de Oliveira (2008) foi aplicada por meio



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de uma abordagem quase experimental, com grupo de intervenção e grupo controle, complementada por instrumentos e análises em conformidade com as diretrizes atuais da Associação Brasileira de Psicomotricidade (ABP). Os resultados sugerem que, no grupo de intervenção (n = 22), 86,4% das crianças com atraso no desenvolvimento psicomotor alcançaram os níveis esperados para a idade em domínios críticos como esquema corporal, lateralidade e conceitos espaço-temporais. Além disso, 94,7% das crianças que já se encontravam no nível esperado (n = 19) apresentaram progressos significativos em todas as dimensões avaliadas. Os achados sustentam a hipótese de que intervenções psicomotoras estruturadas são preditores essenciais do desenvolvimento integral infantil e da maturação cognitiva necessária ao processo de alfabetização. O estudo contribui para a literatura ao fortalecer as conexões empíricas entre o desenvolvimento psicomotor e a prontidão escolar, oferecendo um modelo prático de implementação em contextos educacionais.

**Palavras-chave:** Habilidades Psicomotoras. Educação Física. Desenvolvimento Infantil. Alfabetização. Prontidão Escolar.

**RESUMEN**

Este estudio investigó el impacto de un programa psicomotor estructurado, implementado durante seis meses, en estudiantes de primer grado de educación primaria de una escuela municipal de Anápolis – GO. La batería psicomotora de Oliveira (2008) se aplicó mediante un enfoque cuasi experimental, con grupo de intervención y grupo control, complementada con instrumentos y análisis de acuerdo con las directrices actuales de la Asociación Brasileña de Psicomotricidad (ABP). Los resultados sugieren que, en el grupo de intervención (n = 22), el 86,4% de los niños con retraso en el desarrollo psicomotor alcanzaron los niveles esperados para su edad en dominios críticos como el esquema corporal, la lateralidad y los conceptos espacio-temporales. Además, el 94,7% de los niños que ya se encontraban en el nivel esperado (n = 19) mostraron avances significativos en todas las dimensiones evaluadas. Los hallazgos respaldan la hipótesis de que las intervenciones psicomotoras estructuradas son predictores esenciales del desarrollo integral infantil y de la maduración cognitiva necesaria para el proceso de alfabetización. El estudio contribuye a la literatura al fortalecer las conexiones empíricas entre el desarrollo psicomotor y la preparación escolar, proporcionando un modelo práctico para su implementación en contextos educativos.

**Palabras clave:** Habilidades Psicomotoras. Educación Física. Desarrollo Infantil. Alfabetización. Preparación Escolar.

## 1 INTRODUCTION

Human movement is the first and most fundamental form of communication and interaction of the being with the world. From intrauterine reflexes to the complex motor coordination required in daily activities, psychomotricity reveals itself as the essential articulation between body, mind, and environment. In recent decades, psychomotor education has transcended its traditional view, previously restricted to the development of motor skills, to consolidate itself as an interdisciplinary approach that integrates the cognitive, affective, and social dimensions into the educational process [1,2,3].

School physical education, when based on the principles of psychomotricity, becomes a powerful pedagogical tool for the child's holistic development. The inclusion of psychomotor activities in the curriculum not only enhances fundamental motor skills but also establishes the neural bases for advanced cognitive processes, particularly during the critical period of brain development between the ages of six and eight [4,5].

Recent research has revealed a significant correlation between deficiencies in psychomotor skills and difficulties in the literacy process, reinforcing the need for early, evidence-based interventions, especially in the first years of elementary school, when the central nervous system is in its most plastic phase [2,6].

The contemporary view of psychomotricity in education includes two complementary approaches: a functional one, which focuses on the development of specific skills, and a relational one, which sees movement as a form of expression and social interaction[7]. This duality allows for the understanding of psychomotricity not only as preparation for academic success but as a basis for the construction of identity, autonomy, and the socio-emotional competencies essential for the development of a complete individual [1,2].

Despite its proven importance, the systematic application of psychomotor practices in Brazilian schools has faced challenges such as curriculum overload, sometimes insufficient teacher training, and the primacy of cognitivist approaches [4,3]. This scenario highlights the relevance of empirical studies that clearly demonstrate the benefits of structured psychomotor interventions.

Given this context, the present study sought to answer the following question: What is the influence of a structured psychomotricity program, implemented over six months, on the psychomotor development of 1st-grade elementary school students, and how do these changes relate to school readiness indicators?

The study aimed to evaluate the impact of a structured psychomotor program on the development of elementary school students at a municipal school, analyzing multiple

dimensions of psychomotor development and its relationship with school readiness indicators.

## 2 METHODOLOGY

This is a quasi-experimental study with a non-equivalent control group and repeated measures (pre-test and post-test), conducted in accordance with methodological guidelines for research in child development. The study was approved by the Research Ethics Committee of the University Center of Anápolis – UniEVANGÉLICA (Opinion No. 4,124,742).

A total of 41 first-year elementary school students from a municipal school in the city of Anápolis–GO participated in the research, with a mean age of 6.8 years (SD = 0.4). The participants were divided into two groups: the Intervention Group (IG), consisting of 22 students (12 boys and 10 girls), and the Control Group (CG), consisting of 19 students (10 boys and 9 girls).

To assess the psychomotor level, the test battery proposed by Oliveira [7] was used, which evaluates the following components: motor coordination, balance, body schema, laterality, and spatial and temporal structuring. The assessments were carried out at two distinct moments: before the start of the intervention (pre-test) and after six months of intervention (post-test).

The intervention program consisted of 24 psychomotor sessions, held once a week, during Physical Education classes, each lasting 50 minutes. The activities were based on the principles of psychokinetics by Le Boulch [8] and organized in a playful and recreational manner, focusing on the development of different psychomotor elements. Each week, two psychomotor aspects were prioritized. In one week, global motor coordination and balance were worked on throughout the two classes; in the following week, the focus was on the development of body schema and fine motor skills. Throughout the entire intervention, the systematic consideration of all psychomotor elements was sought.

The activities were carried out through group play, stimulating creativity, cooperation, and teamwork. For this purpose, various materials were used, such as balls, hoops, ropes, fabrics, newspapers, sticks, and cardboard boxes. At the beginning of each class, a reflective moment was promoted, aimed at reviewing the experiences lived in the previous class, favoring the development of memory and the consolidation of acquired knowledge. It is noteworthy that all psychomotor elements were worked on with the children, regardless of the results obtained in the initial assessment.

For statistical analysis, the normality of the data was verified using the Shapiro-Wilk test. The comparison of variables between the groups, at the pre- and post-intervention

moments, was performed using the t-test for independent samples, followed by the application of Tukey's post hoc test. The analyses were conducted using SPSS software, version 23.0, adopting a significance level of α = 0.05.

## 3 RESULTS

The results demonstrated a **significant evolution** in the psychomotor development of students in the intervention group (IG) when compared to the control group (CG). The table below summarizes the data collected at the two moments of the research.

**Table 1**

| Psychomotor Element | Group | Moment 1 (Delay/Expected) | Moment 2 (Significant Advance) | p-value |
|---|---|---|---|---|
| Motor Coordination and Balance | IG | 42.1% at expected level | 88.2% at superior stages | 0.007 |
| | CG | 40.9% at expected level | 73.6% at superior stages | 0.002 |
| Body Schema | IG | 31.6% in delay | Only 5.3% in delay | 0.001 |
| | CG | 18.2% in delay | 5.3% in delay | 0.097 |
| Laterality | IG | 15.8% in delay | 76.5% at superior stages | 0.003 |
| | CG | 9.1% in delay | No significant evolution | 0.457 |
| Spatial Notion | IG | 31.6% in delay | 70.5% at superior stages | 0.001 |
| | CG | 13.6% in delay | 68.4% at superior stages | 0.14 |
| Temporal Perception | IG | 21.1% in delay | 76.5% at superior stages | 0.001 |
| | CG | 22.7% in delay | No significant evolution | 0.58 |

Source: Author's own work

The data reveal that, although both groups showed some natural (maturational) evolution, the intervention group achieved **statistically more significant and consistent gains** in almost all domains, especially in **body schema, laterality**, and **temporal perception,** in which the control group showed no significant changes.

## 4 DISCUSSION

The results of this study confirm the growing body of scientific evidence that establishes **psychomotor development** as a fundamental pillar for **academic readiness**

and success in the literacy process. The significant improvement observed in the intervention group, particularly in the domains of body schema, laterality, and spatial-temporal organization, is consistent with recent literature that emphasizes the connection between motor skills and higher cognitive functions [2,3,6]. The data suggest that, despite both groups having shown some natural (maturational) evolution, the intervention group achieved statistically more significant and consistent gains in almost all domains, particularly in the areas of body image, laterality, and temporal perception, where the control group showed no significant change.

### 4.1 PSYCHOMOTRICITY AS THE FOUNDATION OF LITERACY: CURRENT EVIDENCE

The intrinsic relationship between psychomotor development and the acquisition of reading and writing, which was once a theoretical hypothesis, is now firmly supported by empirical studies. Magalhães and Espírito Santo[2] conducted a systematic review and concluded that psychomotor skills not consolidated in early childhood education are predictors of difficulties in writing, reading, graphic direction, and sentence organization. In fact, the act of writing is a complex motor action that requires the coordinated mobilization of various parts of the body and socio-cognitive functions [2].

In this context, the findings of Vieira et al. [3] reinforce the notion that psychomotricity integrates the cognitive, emotional, and motor dimensions, making it essential for the **holistic development** of children. The research, which analyzed publications from 2020 to 2024, revealed that psychomotor practices not only improve academic performance but also promote the comprehensive development and inclusion of the child [3]. The present study provides quantitative data that concretize this contribution by demonstrating that **86.4%** of the children in the intervention group reached the expected levels for their age.

Amorim, Marques, and Santos [6] demonstrated that psychomotor skills serve as the basis for early literacy, as children spend most of the school day engaged in reading, writing, and math activities that require well-developed motor skills.

### 4.2 THE NEUROCOGNITIVE BASES OF PSYCHOMOTRICITY

The study of neuroscience has provided valuable insights into the mechanisms that connect the body and mind during the learning process. The 6 to 8 age range, the focus of this study, is a period of intense **brain plasticity** where structured motor experiences can shape neural networks that will support future academic skills. Gonçalves[5] assesses that neurosciences confirm the benefits of physical exercise on cognition and learning, increasing concentration, memory, and learning skills.

A particularly relevant finding is that of Preston et al. [9], as they demonstrated that the **executive function** of preschool-aged children, particularly their working memory, can be immediately impacted by just 12 minutes of cognitively engaging physical activity. This reinforces the importance of psychomotor interventions, even if brief, but structured and intentional.

Specific psychomotor components, such as **body image** and **laterality,** are fundamental. Raimo et al.[10] indicate that the body schema is still developing in school-aged children, and its maturation is essential for learning. Barbosa and Assunção [4] emphasize that school Physical Education plays a fundamental role in psychomotor development, addressing elements such as body schema and laterality. Laterality, or the ability to distinguish between right and left, is closely linked to **phonemic discrimination** and the prevention of mirror writing, a frequent challenge in the initial phase of literacy [2].

**Spatial-temporal organization,** another domain in which the intervention group showed advanced progress, is a prerequisite for understanding the structure of written language. Medina, Rosa, and Marques [11], in their study, showed that children with learning difficulties frequently present deficits in spatial organization.

**Fine motor coordination,** essential for graphomotricity, is directly influenced by psychomotor interventions. Suggate et al. [12] found that fine motor skills are fundamental for reading development, and that manual writing has a different impact than typing on the developing brain. Silva and Souza [13] state that fine motor coordination, laterality, spatial perception, and sustained attention are essential for the assimilation of the writing system.

## 4.3 THEORETICAL FOUNDATION: THE CONTRIBUTIONS OF LE BOULCH AND FONSECA

The present study is anchored in the fundamental theoretical contributions of **Jean Le Boulch** and **Vitor da Fonseca,** pioneers of psychomotor education. According to Le Boulch [8], psychomotor education during the school years should be an active and lived experience that prepares the child for life, based on his **psychokinetic theory.** Rossi [14], analyzing Le Boulch's work, emphasizes that development progresses from the general to the specific, and that psychomotor education is the fundamental basis for the child's intellectual and learning process.

In contrast, Fonseca[1] offers a **multidisciplinary perspective** on psychomotricity, incorporating contributions from neuroscience, psychology, and education. His approach underlines the fact that cognitive development is inextricably linked to psychomotor development and that structured interventions can improve both processes.

### 4.4 IMPLICATIONS FOR PEDAGOGICAL PRACTICE AND IMPLEMENTATION CHALLENGES

Despite the solidity of the evidence, the implementation of structured psychomotor programs in the school environment still faces obstacles, such as curriculum overload and engaging teacher training [4,3]. However, the effectiveness of interventions, even brief ones, has been consistently evidenced [15,16,17].

Viana-Cardoso and Lima [18], in their integrative review, conclude that intervention with psychomotricity is well-established and scientifically founded, and that elementary education should incorporate physical and psychomotor activities. Braga, Pereira, and Simões [19] report that the "Psychomotricity in School" program presented substantial improvements and inclusion of behavioral problems.

The present study, by being carried out in the real context of a municipal school and during regular Physical Education class hours, offers a practical and viable model of curricular integration. The positive results in the intervention group, in contrast to the more modest evolution of the control group, show the importance of **pedagogical intentionality[20,21].** It is not enough just to "play"; activities must be planned and mediated with clear psychomotor objectives, as proposed by theorists such as Le Boulch [8] and Fonseca[1].

Future studies could investigate the **longitudinal impact** of these interventions, following the students for a longer period to evaluate the sustainability of the gains and their direct correlation with performance in standardized reading and writing assessments. Furthermore, the replication of this model in different socio-cultural contexts could strengthen the generalization of the findings.

## 5 CONCLUSION

This study found a **positive and significant influence** of a psychomotricity program on the development of 1st-grade elementary school students. After six months of pedagogical intervention, the students in the experimental group not only overcame their initial delays but also advanced to superior developmental stages in all psychomotor components evaluated, with emphasis on **body schema**, **laterality**, and **temporal perception**.

The comparison with the control group shows that, although natural maturation plays a role in development, **intentional and structured psychomotor intervention**, applied in the context of Physical Education classes, accelerates and potentiates this process significantly. The findings reinforce psychomotricity as an **indispensable pedagogical tool,**

which underpins the neural, motor, and cognitive bases for learning, especially for the complex process of literacy.

It is suggested, therefore, that psychomotor practices be incorporated and valued in the curricula of early childhood education and the first years of elementary school, not as an indicator, but as a **central and strategic component** of the comprehensive development and academic success of children. The continuation of research in this area is essential for the expansion and consolidation of knowledge about the irreplaceable value of psychomotricity in the educational process.

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