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PSYCHOMOTOR EDUCATION, RHYTHM, AND PLAY: FACTORS ENHANCING SOCIO-EMOTIONAL DEVELOPMENT IN PRESCHOOL EDUCATION

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Abstract:
Socio-emotional development in preschool is a fundamental factor for school adjustment, psychological well-being, and the quality of interpersonal relationships. Contemporary pedagogical and developmental approaches recognize the importance of psychomotor education, rhythm, and play as key mechanisms through which children regulate emotion, behavior, and their social functioning. **Purpose:** To investigate the impact of a structured psychomotor and rhythmic intervention, embedded in a theatrical and play-based framework, on the socio-emotional development of preschool children, with an emphasis on intrapersonal and interpersonal adjustment as well as the reduction of maladaptive behaviors. **Methodology:** The research was based on an experimental design with an intervention group and a control group, using repeated measurements before and after the implementation of the program. Children in the intervention group participated in a structured psychomotor activity program combining rhythm, movement, and theatrical play, while indicators of socio-emotional adjustment and maladaptive behavior were assessed. **Results:** The results showed statistically significant Group × Time interactions and medium to large effect sizes in favor of the intervention group. A significant increase in intrapersonal and interpersonal adjustment was observed, along with a significant reduction in aggression, delinquent behavior, and emotional difficulties. **Conclusions:** The findings suggest that psychomotor education, when systematically incorporating rhythm and dramatic play, is a powerful pedagogical tool for enhancing socio-emotional development in preschool education. The inclusion of such programs in the kindergarten curriculum can contribute substantially to the creation of emotionally safe and socially supportive learning environments).

Keywords: psychomotor education, rhythm, theatrical play, socio-emotional development, preschool education

1. Introduction

Preschool age is one of the most crucial periods for the formation of a child's personality, emotional stability, and social adaptation. During the first six years of life, the brain is characterized by intense neuroplasticity, and the systems related to self-regulation, emotional control, and social understanding are in the phase of rapid organization.The skills developed at this stage affect not only school readiness, but also subsequent academic progress, interpersonal relationships, and mental health. Contemporary pedagogy and developmental psychology recognize that socio-emotional development is not a secondary educational goal, but a central pillar of the child's holistic development (Slot *et al.*, 2017).

Socio-emotional development includes a set of skills that allow a child to understand and regulate their emotions, develop empathy, cooperate with peers, and respond flexibly to the demands of the social environment. These skills are directly linked

to self-regulation, which includes both cognitive and emotional dimensions, such as the ability to focus attention, control impulses, and regulate emotional responses. Self-regulation is now recognized as a critical indicator of school readiness and a predictor of future social and academic adjustment (Montroy *et al.*, 2016; Williams, 2018; Korucu *et al.*, 2022).

Within this context, physical and motor experiences acquire particular importance. Psychomotor education is based on the principle that movement is not simply a biological function, but a fundamental way through which the child experiences, understands, and organizes himself and the world. The interaction between motor, emotional, and cognitive processes creates a unified field of development, in which movement functions as a means of expression, regulation, and social interaction (Luo *et al.*, 2022; Hosokawa & Katsura, 2024). Psychomotor approaches to preschool education have shown that physical activity when organized pedagogically, can enhance children's emotional awareness, self-confidence, and social participation (Gil-Moreno & Rico-González, 2023).

Particular emphasis is placed on the dynamic psychomotor approach, which is not limited to standardized exercises but utilizes creative movement, exploration, and symbolic action. Through such experiences, children are confronted with emotional situations, learn to manage frustration, coordinate with others, and express emotions through the body. Research shows that such interventions can significantly enhance emotional intelligence and social responsibility in preschool, especially when implemented systematically and in a playful context (Gil-Moreno & Rico-González, 2023).

Rhythm and musical motor experiences play a central role in this context. Rhythm is a fundamental element of human functioning, as it is linked to the neurological organization of movement, attention, and emotional regulation. Synchronized movement with musical stimuli activates common neural networks related to auditory processing, motor control, and executive functions, creating a strong foundation for the development of self-regulation (Lu *et al.*, 2025). Rhythmic activities offer children the opportunity to organize their behavior, harmonize with the group, and cultivate attention and impulse control (Rabinowitch & Meltzoff, 2017; Williams, 2018).

The importance of these mechanisms has also been confirmed in intervention programs, where the systematic application of rhythmic and motor activities led to improvements in the emotional, cognitive, and behavioral self-regulation of preschool children. The results are particularly evident in children from socially vulnerable environments, for whom the strengthening of self-regulation acts as a protective factor against future adjustment difficulties. Rhythmic interventions seem to create a safe, structured, and at the same time playful environment in which children can practice emotional and cognitive control in a natural and enjoyable way (Williams & Berthelsen, 2019; Williams *et al.*, 2020).

Alongside the psychomotor and musical-motor dimensions, play and in particular, symbolic and dramatic play are recognised as key mechanisms for socio-emotional development. Play allows the child to experiment with roles, negotiate rules, express emotions, and develop social strategies within a low-risk context. The quality of symbolic play, i.e. the degree of symbolism, roles and cooperation, is directly linked to the development of cognitive and emotional self-regulation, even when children's individual executive functions are taken into account (Slot *et al.*, 2017).

Sociodramatic play allows children to practice impulse control, perspective shifting, and emotion management within shared narratives (Goldstein & Lerner, 2018). The symbolic complexity of play, i.e., the child's ability to maintain roles, scenarios, and rules is associated with higher levels of attention and inhibition, key elements of self-regulation. Through this process, children learn to delay immediate reactions, take into account the needs of others, and manage conflict (Khomais *et al.*, 2019; Özcan & İvrendi, 2024).

The therapeutic and pedagogical value of play is particularly evident in children who present behavioral difficulties or increased aggression. Studies in preschool populations show that group play therapy significantly reduces aggressive, reactive, and impulsive behaviors, while enhancing emotional control and creativity. Within the playful context, the child can express internal conflicts and learn alternative ways to manage tension and frustration (Jafari *et al.*, 2011; Jarareh *et al.*, 2016).

Overall, the literature converges on the fact that socioemotional development in preschool is substantially enhanced when education incorporates movement, rhythm, and play as key pedagogical axes. Psychomotor education provides the physical and experiential background, rhythm organizes neurological and emotional functioning, and play offers the social and symbolic context within which these skills are transformed into meaningful learning. The combination of these elements creates a strong developmental environment that can promote children's self-regulation, cooperation, and emotional well-being, laying the foundation for a healthy learning and social integration path (Slot *et al.*, 2017; Williams, 2018; Gil-Moreno & Rico-González, 2023).

Based on the contemporary literature, which highlights the role of psychomotor education, rhythm, and a playful context as fundamental mechanisms for the development of self-regulation and socio-emotional functioning, it becomes clear that physically structured interventions, along with music and movement interventions, can be powerful pedagogical tools in preschool education. However, despite the increasing international research activity in the field of music-motor education, dramatic play, and psychomotor education, there is limited data that examines these factors in combination in organized interventions within the natural school context, especially heterogeneous populations of preschool children.

In this context, the purpose of this study was to investigate the effect of a structured psychomotor and rhythmic intervention, integrated into a theatrical playful context, on the socio-emotional development of preschool children. The intervention was

designed to utilize synchronized movement, rhythm, and symbolic play as means of enhancing self-regulation, emotional expression, and social interaction, elements that the international literature recognizes as key mechanisms for the development of emotional and interpersonal competence (Williams, 2018; Özcan & İvrendi, 2024). In particular, the study aimed to examine whether children's participation in such an intervention can lead to improvements in intrapersonal and interpersonal adjustment, as well as to a reduction in manifestations of maladaptive or aggressive behavior, as reflected in everyday school life.

2. Material and Methods

2.1 Research sample and groups

A total of 63 preschool children from six kindergartens who came from three different populations participated in the study. More specifically, 13 children with deafness from two kindergartens, 41 children from the general population from two kindergartens, and 9 children attending inclusion classes, also from two kindergartens, participated. In each population category, through a random sampling process, one class was designated as an intervention group and one as a control group, following an experimental design, with measurements before and after an intervention.

2.2 Design of the intervention

The intervention group attended a psychomotor education program characterized by strong elements of rhythm and moving around a theatrical and playful framework, which was based on physical expression, symboli**c** play, group interaction, and emotional involvement of the children.The intervention was implemented in structured sessions and had as its main goal the enhancement of intrapersonal and interpersonal adaptation, theregulation of behavior, but also the improvement of the emotional expression and social cooperation of the children, all through rhythmic, motor and theatrical activities.

2.3 Assessment tools

The initial and final assessment of the children was carried out using three weighted tools:

1) **Bruininks-Oseretsky Test of Motor Proficiency – Short Form (BOTMP-SF)** for the assessment of motor competence and motor coordination.
2) **ATHENA Test** for the assessment of cognitive and visual-motor functions.
3) **Interpersonal and Intrapersonal Adjustment Questionnaire (IIAQ)** for measuring indicators of social adjustment, emotional regulation, aggression, delinquency and general psychosocial functioning. The IIAQ scales key variables for investigating children's socioemotional development, as they provided distinct measurements of intrapersonal and interpersonal adjustment, but also behavioral indicators (e.g., aggression, delinquency, mental difficulties).

3. Results and Discussion

3.1 Results

Data analysis was performed using a 2×2 experimental design, with factors of group (intervention/control) and measurement time (before/after). 2×2 ANOVA analyses of variance, as well as 2×2 MANOVA multivariate analyses, were used to examine the interaction of intervention with time on indicators of social and emotional adjustment, as well as on global motor functioning.

Table 1 presents the means and standard deviations for the intrapersonal and interpersonal adjustment indices, as well as for the unclassified ones. For intrapersonal adjustment, a statistically significant Group × Time interaction was found, ($F(1, 39) = 13.780$, $p = .001$, $\eta^2 = .261$), where it was seen that the intervention group showed a decrease in difficulties from the initial ($M = 0.24$, $SD = 0.14$) to the final measurement ($M = 0.16$, $SD = 0.13$), while the control group had a very limited change from ($M = 0.14$, $SD = 0.15$) to ($M = 0.13$, $SD = 0.14$). Correspondingly, for interpersonal adjustment the interaction was also statistically significant, ($F(1, 39) = 17.232$, $p < .001$, $\eta^2 = .306$), with the intervention group showing a clear improvement from the first ($M = 0.28$, $SD = 0.13$) to the second measurement ($M = 0.17$, $SD = 0.12$),while the control group again maintained almost constant levels (from $M = 0.04$, $SD = 0.10$ to $M = 0.05$, $SD = 0.10$). Regarding unclassified items, a strong Group × Time interaction was also recorded, ($F(1, 39) = 23.445$, $p < .001$, $\eta^2 = .375$), as in the intervention group a decrease was observed from $M = 0.28$ ($SD = 0.19$) to $M = 0.17$ ($SD = 0.16$), while the control group an increase was recorded from $M = 0.80$ ($SD = 0.10$) to $M = 0.90$ ($SD = 0.10$).

Table 1: Intrapersonal and Interpersonal Adjustment (IIAQ) in the pre- and post-measurements for the Intervention Group and the Control Group (general population)

Variable	Time	IG M (SD)	CG M (SD)	F	p	η^2
Intrapersonal adjustment	Before	0.24 (0.14)	0.14 (0.15)	13.780	.001	.261
	After	0.16 (0.13)	0.13 (0.14)			
Interpersonal adjustment	Before	0.28 (0.13)	0.04 (0.10)	17.232	< .001	.306
	After	0.17 (0.12)	0.05 (0.10)			
Unclassified	Before	0.28 (0.19)	0.80 (0.10)	23.445	< .001	.375
	After	0.17 (0.16)	0.90 (0.10)			

Regarding the indicators of problematic behavior (Table 2), the analysis revealed a statistically significant Group × Time interaction for aggression, $F(1, 39) = 11.908$, $p = .001$, $\eta^2 = .234$, with a decrease in values in the intervention group from $M = 0.36$ ($SD = 0.18$) at the initial measurement to $M = 0.23$ ($SD = 0.16$) at the final one. An even stronger effect was recorded for delinquency, $F(1, 39) = 20.992$, $p < .001$, $\eta^2 = .350$, with the intervention group showing a clear decrease from $M = 0.18$ ($SD = 0.09$) to $M = 0.10$ ($SD = 0.09$), while the control group remained essentially unchanged. Furthermore, for the total mental disorders index the interaction was also statistically significant $F(1, 39) = 5.792$, $p = .035$,

η^2 = .345,which highlights a reduction in psycho-emotional difficulties in children who participated in the program.

Table 2: Indicators of Problematic Behavior (IIAQ)
in the measurements before and after (general population)

Variable	Time	IG M(SD)	CG M(SD)	F	p	η^2
Aggressiveness	Before	0.36 (0.18)	0.06 (0.13)	11.908	.001	.234
	After	0.23 (0.16)	0.06 (0.13)			
Delinquency	Before	0.18 (0.09)	0.02 (0.09)	20.992	< .001	.350
	After	0.10 (0.09)	0.03 (0.09)			
Mental disorders	Total	–	–	5.792	.035	.129

The summary of the interaction effects (Table 3) and effect sizes (Table 4) indicated that all η^2 values ranged from .129 to .375, values that correspond to medium to large effects. These results indicate that psychomotor education in combination with rhythmic and playful-theatrical activities can have a strong effect on both improving socio-emotional adjustment and reducing maladaptive behaviors in preschool age.

Table 3: Interaction of Group × Time on indicators
of socioemotional development (2×2 ANOVA)

Variable	F	p	η^2
Intrapersonal adjustment	13.780	.001	.261
Interpersonal adjustment	17.232	< .001	.306
Aggressiveness	11.908	.001	.234
Delinquency	20.992	< .001	.350
Mental disorders	5.792	.035	.129
Unclassified	23.445	< .001	.375

Table 4: Effect measures (η^2) on indicators of socioemotional intervention

Variable	η^2	Size effect
Unclassified	.375	Large
Delinquency	.350	Large
Mental disorders	.129	Medium
Interpersonal adjustment	.306	Large
Intrapersonal adjustment	.261	Large
Aggressiveness	.234	Large

3.2 Discussion

The present study showed that psychomotor education, when systematically incorporating rhythm and a playful-theatrical context, can be an effective pedagogical intervention that enhances the socio-emotional development of preschool children.The analyses revealed statistically significant interaction of Group × Time and medium to large effect sizes across both in the indices of intrapersonal and interpersonal adjustment, as well in the indices of aggression, delinquency and mental difficulties. This shows that

the observed changes were directly related to participation in the program and cannot be attributed to general developmental factors.

More specifically, the significant improvement in interpersonal adjustment and the simultaneous reduction in maladaptive behaviors, indicate that the framework of rhythmic movement and theatrical play substantially enhances the social interaction, cooperation, and emotional regulation capacity of preschool children. Furthermore, it was shown that rhythm functions as an organizational mechanism of movement and emotion, while play and physical expression provide a safe symbolic environment in which children can process experiences, express tensions, and develop functional forms of communication.

Based on the above, it appears that the inclusion of programs that combine rhythm, movement, and theatrical play in the kindergarten curriculum can contribute substantially to the creation of supportive learning environments that promote emotional security, social inclusion, and positive adjustment of all children. These findings are in the line consistent with the modern theory of psychomotor education, according to which movement is a key mechanism through which the child organizes both his cognitive and emotional functioning. The dynamic psychomotor approach, which is based on experiential exploration, interaction, and symbolic movement, has been found to enhance emotional intelligence, social responsibility, and positive adjustment in preschool. The large effect sizes recorded in this study support the view that such interventions do not simply function as a complement but can substantially influence the way in which children regulate their emotions and behavior in the school context (Gil-Moreno & Rico-González, 2023).

The particularly strong effect of rhythm recorded in the study data can be interpreted in light of the neurodevelopmental function of synchronized movement. Rhythmic movement activates common neural networks involved in auditory processing, motor control, and executive functions, thus supporting the development of self-regulation. When children are asked to synchronize their movements with musical or rhythmic stimuli, they practice impulse inhibition, sustained attention, and behavioral flexibility, skills that lie at the core of emotional and social adaptation (Williams, 2018).

This research is also consistent with intervention studies that have shown that rhythmic movement programs in preschool settings lead to improvements in both emotional and cognitive and behavioral self-regulation. Of particular importance is the fact that such interventions appear to be effective even in populations at increased risk of maladjustment, which reinforces the importance of their integration into the daily education program. The findings of the present study, with the large effect sizes recorded, confirm that rhythm and coordinated movement can function as powerful levers for the development of emotional regulation and social competence (Williams & Berthelsen, 2019).

The contribution of theatrical and symbolic play incorporated into the program is also a critical factor in interpreting the results. Qualitative symbolic play allows children

to negotiate roles, regulate emotions, and control their behavior within a common framework of rules and meanings. It has been shown that its complexity is directly linked to the development of both cognitive and emotional self-regulation, regardless of the general level of executive functions of the children. The improvement in interpersonal adjustment recorded in the present study can be interpreted as a result of this very process of social and emotional practice within theplay (Slot *et al.*, 2017).

At the same time, the reduction in aggression, delinquency and mental difficulties is consistent with research data showing that group and therapeutic play provides children with safe channels for the expression of tension, anxiety, and frustration. Through the body, imagination, and dramatization, children can process internal conflicts and develop more functional ways of social interaction. The findings of the present study confirm that such frameworks not only reduce problematic behaviors, but also enhance children's adaptability and emotional stability (Jafari *et al.*, 2011; Jarareh *et al.*, 2016).)

4. Conclusion

Overall, the present research reinforces the theoretical and empirical argument that psychomotor education, when combined with rhythm and dramatic play, can function as a comprehensive developmental framework that simultaneously supports the physical, emotional, and social development of preschool children. The results show that such interventions do not simply have short-term pedagogical benefit, but can influence deeper structures of self-regulation and social adaptation, offering a strong basis for their inclusion in the core curriculum of preschool education.

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References

Gil-Moreno, J., & Rico-Gonzalez, M. (2023). The effects of physical education on preschoolers' emotional intelligence: A systematic review. *Sustainability, 15*(13). https://doi.org/10.3390/su151310632

Goldstein, T. R., & Lerner, M. D. (2018). Dramatic pretend play games uniquely improve emotional control in young children. *Developmental Science, 21*(4). https://doi.org/10.1111/desc.12603

Hosokawa, R., Matsumoto, Y., Nishida, C., Funato, K., & Mitani, A. (2024). Enhancing social-emotional skills in early childhood: intervention study on the effectiveness of social and emotional learning. *BMC psychology, 12*(1), 761. https://doi.org/10.1186/s40359-024-02280-w

Jafari, N., Mohammadi, M. R., Khanbani, M., Farid, S., & Chiti, P. (2011). Effect of play therapy on behavioral problems of maladjusted preschool children. *Iranian journal of psychiatry, 6*(1), 37. Retrieved from https://pmc.ncbi.nlm.nih.gov/articles/PMC3395936/

Jarareh, J., Mohammadi, A., Nader, M., &Moosavian, S. A. (2016). The impact of group play therapy on creativity and control of aggression in preschool children. *Cogent Psychology, 3*(1). https://doi.org/10.1080/23311908.2016.1264655

Khomais, S., Al-Khalidi, N., & Alotaibi, D. (2019). Dramatic Play in Relation to Self-Regulation in Preschool Age. *Contemporary Issues in Education Research, 12*(4), 103-112. Retrieved from https://files.eric.ed.gov/fulltext/EJ1267575.pdf

Korucu, I., Ayturk, E., Finders, J. K., Schnur, G., Bailey, C. S., Tominey, S. L., & Schmitt, S. A. (2022). Self-regulation in preschool: Examining its factor structure and associations with pre-academic skills and social-emotional competence. *Frontiers in Psychology, 12*. https://doi.org/10.3389/fpsyg.2021.717317

Lu, Y., Shi, L., &Musib, A. F. (2025). Effects of music training on executive functions in preschool children aged 3–6 years: Systematic review and meta-analysis. *Frontiers in Psychology, 15*. https://doi.org/10.3389/fpsyg.2024.1522962

Luo, L., Reichow, B., Snyder, P., Harrington, J., & Polignano, J. (2022). Systematic review and meta-analysis of classroom-wide social–emotional interventions for preschool children. *Topics in Early Childhood Special Education, 42*(1), 4-19. https://doi.org/10.1177/0271121420935579

Montroy, J. J., Bowles, R. P., Skibbe, L. E., McClelland, M. M., & Morrison, F. J. (2016). The development of self-regulation across early childhood. *Developmental Psychology, 52*(11), 1744–1762. https://doi.org/10.1037/dev0000159

Özcan, Ö., &İvrendi, A. (2024). Relationship between socio-dramatic play and self-regulation skills in early childhood. *Kastamonu Education Journal, 32*(1), 38-50. https://doi.org/10.24106/kefdergi.1426465

Rabinowitch, T. C., & Meltzoff, A. N. (2017). Joint rhythmic movement increases 4-year-old children's prosocial sharing and fairness toward peers. *Frontiers in psychology, 8*. https://doi.org/10.3389/fpsyg.2017.01050

Sarris, D. (2025). Therapeutic Approaches Through Play and Drama for Children and Adolescents with Psychosocial Problems: A Systematic Review. *European Journal of Special Education Research, 11*(4). http://dx.doi.org/10.46827/ejse.v11i4.6063

Sarris, D., Charmpatsis, C., Katsarou, V., Mavropalias, T., Efthymiou, E., Travlos, K., Papantoniou, G., & Papadimitropoulou, P. (2024). Developmental Coordination Disorder and Social Competence in Preschool Children. *European Journal of Special Education Research, 10*(6). http://dx.doi.org/10.46827/ejse.v10i6.5504

Sarris, D., Kiriakos, T., Travlos, K., Siafaka, V., Skordilis, E., Christopoulou, F., Papadimitropoulou, P., Mavropalias, T., & Thanou, E. (2024). Factors influencingthe social-emotional behavior of children with autism: the influence of psychomotor clumsiness. *European Journal of Special Education Research, 10*(7). http://dx.doi.org/10.46827/ejse.v10i7.5639

Slot, P. L., Mulder, H., Verhagen, J., & Leseman, P. P. (2017). Preschoolers' cognitive and emotional self-regulation in pretend play: Relations with executive functions and quality of play. *Infant and child development, 26*(6). https://doi.org/10.1002/icd.2038

Williams, K. E. (2018). Moving to the beat: Using music, rhythm, and movement to enhance self-regulation in early childhood classrooms. *International Journal of Early Childhood, 50*(1), 85-100. https://doi.org/10.1007/s13158-018-0215-y

Williams, K. E., & Berthelsen, D. (2019). Implementation of a rhythm and movement intervention to support self-regulation skills of preschool-aged children in

disadvantaged communities. *Psychology of Music, 47*(6), 800-820. https://doi.org/10.1177/0305735619861433

Williams, K. E., Savage, S., & Eager, R. (2020). Rhythm and Movement for Self-Regulation (RAMSR) intervention for preschool self-regulation development in disadvantaged communities: a clustered randomised controlled trial study protocol. *BMJ Open, 10*(9). https://doi.org/10.1136/bmjopen-2019-036392

Zakopoulou, V., Christodoulides, P., Koutsobina, V., Anagnostou, N., Vergou, M., Sarris, D. (2022). Psychomotor development disorders in the early diagnosis and intervention in specific learning disorder. a case study. *The American Journal of Social Science and Education Innovations, 4*(3), 19–32. https://doi.org/10.37547/tajssei/Volume04Issue03-03

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