
EVALUATION OF THE IMPACT OF SYMBOLIC PLAY STRATEGIES ON THE COGNITIVE DEVELOPMENT OF CHILDREN IN EARLY CHILDHOOD EDUCATION

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SUMMARY

Symbolic play is a fundamental tool in the cognitive development process of preschool children. This study aimed to evaluate the impact of symbolic play strategies on cognitive functions such as attention, memory, and problem-solving in early childhood children. A quasi-experimental quantitative approach was applied with a control and experimental group, using standardized psychometric instruments before and after an intervention based on symbolic play dynamics for 10 weeks. The results show significant improvements in the experimental group, especially in executive functions and language skills, which suggests that these strategies should be systematically integrated into educational programs.

Keywords: symbolic play, cognitive development, early education, executive functions, childhood

INTRODUCTION

In the early education stage, children's cognitive development is profoundly influenced by learning experiences that involve active exploration, social interaction, and creativity. One of the most powerful ways young children understand and assimilate the world around them is through play. In this context, **symbolic play** – also known as pretend play or role-play – has established itself as a fundamental strategy for stimulating abstract thinking, language, and executive functions (Pyle et al., 2022).

Symbolic play is characterized by role-playing, the transformation of objects, and the recreation of imaginary or everyday scenes. This activity, far from being trivial or merely recreational, acts as a bridge to higher mental processes such as planning, problem-solving, impulse control, and emotional self-regulation (Kangas et al., 2021). In this sense, various studies have underlined that symbolic experiences allow children to experiment with different social perspectives, which strengthens their cognitive and socio-emotional development (Edwards et al., 2021).

In recent years, research in educational neuroscience has shown that structured play, particularly symbolic play, activates brain regions related to the prefrontal cortex, linked to the development of key executive functions for learning (Baten et al., 2020). These functions—such as working memory, inhibition, and cognitive flexibility—are essential for later school success, and their early development has become a priority goal for early education programs (Lillard et al., 2022).

However, despite the theoretical recognition of the value of symbolic play, instructional approaches focused on mechanical repetition and direct instruction persist in educational practice, relegating play to a marginal role (Pyle & Danniels, 2019). This dissociation between theory and practice limits children's opportunities to develop higher-order cognitive skills through intentional play environments.

The present study aims to address this problem through the **empirical evaluation of the impact of structured symbolic play strategies on the cognitive development of children in early education**. Through a quasi-experimental design, it is analyzed how the systematic implementation of symbolic play sessions can enhance

essential cognitive skills, with the aim of providing evidence that supports their active inclusion in the pedagogical practices of the preschool level.

THEORETICAL FRAMEWORK

Cognitive development in childhood is intrinsically linked to play experiences. Among the different forms of play, **symbolic play** has stood out as a fundamental tool in the stimulation of higher mental processes. This type of play involves the mental representation of actions, roles, objects, and situations, allowing children to act "as if" they are in a real scenario, which promotes skills such as abstraction, imagination, planning, and problem-solving (Whitebread et al., 2021).

SYMBOLIC PLAY AND ITS SOCIOCULTURAL FOUNDATION

From a Vygotskian perspective, symbolic play is essential for the development of higher psychological functions, as it enables the internalization of social norms and the creation of shared meanings (Edwards et al., 2021). In this sense, play not only reflects the child's thinking, but transforms it, by creating a context where they can operate beyond their current abilities thanks to the social scaffolding.

Recent studies have shown that symbolic play environments generate a significant increase in the ability to take perspective, emotional self-regulation, and awareness of social roles (Kangas et al., 2021). In addition, it has been found that the expressive language used during symbolic play tends to be more complex and varied than in other communicative situations (Lillard et al., 2022).

SYMBOLIC PLAY AND EXECUTIVE FUNCTIONS

Executive functions are a set of cognitive skills that regulate thinking, behavior, and emotions. These include **working memory**, **inhibitory control**, and **cognitive flexibility**, all essential for academic learning and social adaptation (Diamond, 2020). The relationship between symbolic play and executive functions has been the subject of various investigations.

According to Baten et al. (2020), symbolic play acts as an ecological environment that requires the child to plan sequences, remember roles, adapt to new ideas from their peers, and maintain attention on changing goals. These activities stimulate the prefrontal cortex, a key brain region in executive development.

SYMBOLIC PLAY, LANGUAGE AND EMERGENT LITERACY

The linguistic dimension of symbolic play has also been widely documented. Pyle et al. (2022) found that children who regularly participate in structured symbolic play scenarios develop more sophisticated storytelling skills, functional vocabulary, and grammatical structures than their peers. This makes it a facilitator of oral language and emerging reading skills, preparing them for formal literacy processes.

INITIAL EDUCATION AND PEDAGOGICAL APPROACHES TO PLAY

The play-based pedagogical approach—especially symbolic play—requires intentional planning that integrates curricular objectives with meaningful simulation scenarios. However, as Pyle & Danniels (2019) point out, a dichotomous vision between "play" and "learning" still persists in many educational systems, which prevents the full use of the formative potential of play.

Table 1 summarizes the main contributions of symbolic play to cognitive development and its theoretical foundations.

Table 1. Contributions of symbolic play to cognitive development

<i>Dimension</i>	<i>Cognitive contributions</i>	<i>Theoretical foundation</i>	<i>Source</i>
<i>Executive Functions</i>	Improved inhibitory control, working memory, and flexibility	Developmental theory of the prefrontal cortex	Diamond (2020); Baten et al. (2020)
<i>Language and communication</i>	Increased vocabulary, narrative structures, and symbolic communication	Sociocultural Theory of Language	Pyle et al. (2022); Lillard et al. (2022)

<i>Emotional regulation</i>	Expression of emotions, frustration management, turn-taking	Psychology of emotional development	Kangas et al. (2021); Edwards et al. (2021)
<i>Symbolic representation</i>	Capacity for abstraction, divergent thinking and creativity	Representational game theory	Whitebread et al. (2021)

METHODOLOGY

RESEARCH APPROACH AND DESIGN

This study adopted a **quantitative approach** with a **quasi-experimental pretest-posttest design with a control and experimental group**, which allows causal relationships to be established between the independent variable (symbolic play strategies) and the dependent variable (cognitive development) without random assignment (Creswell & Creswell, 2023).

This methodological choice is relevant in real educational contexts where it is not feasible to control for all contextual variables, but it is possible to intervene through structured strategies and observe significant differences (Hernández-Sampieri et al., 2022).

PARTICIPANTS

The sample consisted of **60 children** between 4 and 5 years of age, enrolled in two public early education institutions in Bogotá, Colombia. Two groups were formed:

- **Experimental group (n = 30):** Participated in an intervention program with structured symbolic play strategies.
- **Control group (n = 30):** Continued with their regular curriculum without systematic application of these strategies.

The inclusion criteria were: age between 4 and 5 years, not presenting diagnoses of developmental disorders, and having authorization from their parents or guardians. The sampling was **intentional and non-probabilistic**, considering accessibility to educational contexts and institutional willingness to participate in the research.

VARIABLES AND INSTRUMENTS

The following table describes the study variables, dimensions evaluated, and the instruments used.

Table 2. Variables, dimensions and instruments

VARIABLE	DIMENSION	INSTRUMENT	AUTHORS/SOURCE
COGNITIVE DEVELOPMENT	Executive Functions	BRIEF-P (Behavior Rating Inventory of Executive Function – Preschool)	Gioia et al. (Spanish version, validated by León, 2020)
	Expressive language	CELF-Preschool 2 (Clinical Evaluation of Language Fundamentals)	Semel et al. (adapted by Rivas, 2021)
SYMBOLIC PLAY	Frequency and complexity of the game	Symbolic Play Observation Scale (EOJS)	Ad hoc instrument validated by expert judges (2023)

PROCEDURE

The study was carried out in three phases:

Phase 1 – Initial diagnosis (week 1): Application of pre-test instruments in both groups, under standardized conditions in their respective schools, respecting the children's rhythm and their emotional well-being.

Phase 2 – Intervention (weeks 2 to 11): A program of symbolic play strategies was **applied** to the experimental group. This program consisted of **three weekly sessions of 40 minutes for 10 weeks**, in which the children participated in activities such as dramatization of social roles (doctors, teachers, families),

recreation of stories, construction of scenarios with concrete materials and simulation games guided by trained teachers.

The sessions were designed considering principles of playful-pedagogical planning (Pyle et al., 2022) and active participation, conflict resolution in the game, and the use of symbolic language were promoted. The teachers in the experimental group previously received 8-hour training on the implementation of the program, while the control group continued their pedagogical routine without intervention.

Phase 3 – Final evaluation (week 12): The same instruments were reapplied to both groups. Conditions equivalent to those of the pre-test were guaranteed to avoid bias in data collection.

ANALYSIS TECHNIQUES

The data were processed using the SPSS v.26 statistical software. The following were applied:

- **Student's t-tests** for related samples (pretest-posttest within each group).
- **t-tests for independent samples** (post-test comparison between groups).
- **One-way analysis of variance (ANOVA)** to contrast general effects.

A statistical significance level of $p < 0.05$ was assumed as a reference value to determine the existence of significant differences between the conditions evaluated, following criteria suggested by Field (2020).

RESULTS

The evaluation of the impact of symbolic play strategies on the cognitive development of children in early childhood education was carried out through a comparative analysis between the results obtained in the measurement instruments applied in the pre-test and post-test, both in the experimental group and in the control group.

The results for each dimension evaluated are presented below: **executive functions, expressive language and complexity of symbolic play.**

EXECUTIVE FUNCTIONS (BRIEF-P)

In the **experimental group**, a **significant improvement** in global executive functions was observed. The total average score on the BRIEF-P scale decreased from 65.3 (pretest) to 54.8 (posttest), indicating a reduction in problem behaviors related to attention, inhibitory control, and cognitive flexibility ($p = 0.003$). In contrast, the **control group** showed no statistically significant changes.

Table 3. Executive Function Comparison (BRIEF-P)

Group	Pretest Media (DE)	Postest Media (DE)	Difference	P-Value
Experimental (n=30)	65.3 (6.8)	54.8 (5.9)	-10.5	0.003
Control (n=30)	64.7 (7.1)	63.9 (6.5)	-0.8	0.388

Note: Lower scores indicate better executive functioning.

These findings are consistent with recent studies that have demonstrated improvements in self-regulation and working memory as an effect of interventions based on structured symbolic play (Baten et al., 2020; Lillard et al., 2022).

EXPRESSIVE LANGUAGE (CELF-PRESCHOOL 2)

The results of the CELF-Preschool 2 instrument showed a **significant increase in the expressive language** of the experimental group, with an improvement of 12.4 points in the overall index of language skills ($p = 0.012$), compared to a non-significant change in the control group.

Table 4. Comparison in Expressive Language (CELF-Preschool)

Group	Pretest Media (DE)	Postest Media (DE)	Difference	p-value
Experimental (n=30)	82.1 (9.5)	94.5 (8.7)	+12.4	0.012
Control (n=30)	83.3 (8.2)	84.1 (9.0)	+0.8	0.541

These data reinforce the evidence that symbolic play promotes the development of narrative structures, functional vocabulary, and communication skills, by allowing children to use language in creative and social contexts (Pyle et al., 2022; Edwards et al., 2021).

COMPLEXITY OF SYMBOLIC PLAY (EOJS)

The Symbolic Play Observation Scale (EOJS) allowed us to analyze the evolution of play in terms of symbolic complexity, use of substitute objects, social interactions, and duration of play.

The experimental group showed an average increase of 4.3 points in the EOJS, indicating greater symbolic elaboration and use of more sophisticated fictitious scenarios ($p = 0.001$). The control group had minimal changes.

Table 5. Symbolic Play Level Comparison (EOJS)

<i>Group</i>	<i>Pretest Media (DE)</i>	<i>Postest Media (DE)</i>	<i>Difference</i>	<i>P-Value</i>
<i>Experimental (n=30)</i>	10.7 (2.3)	15.0 (2.6)	+4.3	0.001
<i>Control (n=30)</i>	10.5 (2.1)	11.0 (2.4)	+0.5	0.289

These results show a correlation between playful intervention and the complexity of symbolic thinking in childhood, a finding aligned with Kangas et al. (2021) and Whitebread et al. (2021).

OVERALL IMPACT ANALYSIS

Overall, the results indicate that the **experimental group significantly outperformed the control group in the three dimensions evaluated**. The ANOVA analysis showed a statistically significant interaction effect ($F(1,58) = 7.89, p < 0.01$), confirming the efficacy of structured symbolic play strategies on child cognitive development.

CONCLUSIONS

The findings of the present study allow us to conclude that the systematic implementation of **symbolic play strategies** has a significant and positive impact on the **cognitive development of preschool children**, particularly with regard to **executive functions, expressive language, and symbolic complexity of thought**. These results coincide with recent research that argues that symbolic play constitutes a fundamental platform for the development of higher mental skills (Baten et al., 2020; Lillard et al., 2022).

First, there was evidence of a substantial improvement in the **executive functions** of the children who participated in the intervention program, which reinforces the theory that structured play promotes the development of self-regulation, planning, and working memory (Diamond, 2020). These skills are key predictors of later school success, as highlighted by Kangas et al. (2021), and their early development should be a priority in educational policies and practices.

Secondly, a notable advance was found in **expressive language**, which shows that symbolic playful scenarios encourage the use of language in functional, creative and socially significant contexts. This result is aligned with the contributions of Pyle et al. (2022), who argue that symbolic play favors language acquisition through the construction of narratives, the resolution of fictitious conflicts, and the adoption of multiple communicative perspectives.

In addition, the qualitative and quantitative analysis of play behavior showed a significant increase in the **complexity of symbolic play**, both in terms of duration and role structure, suggesting that the intervention not only generated effects on measurable cognitive skills, but also on children's symbolic and representational capacity. This dimension, often relegated in school contexts, must be recovered as a central component of the children's curriculum (Edwards et al., 2021; Whitebread et al., 2021).

Overall, the results allow us to affirm that symbolic play is not a simple hobby or a complementary activity, but a **highly effective pedagogical means for integral cognitive development**, and therefore, **it should be conceived as a structuring axis of early education**. It is recommended that teachers incorporate symbolic play strategies into the pedagogical routine in a planned and conscious manner, as well as receive specific training on their design and implementation.

Finally, it is suggested that future research delves into the longitudinal impact of these strategies, as well as their application in contexts with neurodivergent children or in rural populations with limited access to play materials. Variants of symbolic play mediated by emerging digital technologies could also be explored, given their growing presence in contemporary educational environments.

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