

# EDUCAZIONE ALLA TEATRALITÀ: APPROCCIO SPERIMENTALE E ANALISI DEI DATI

## LEARNING THROUGH THEATRICALITY: EXPERIMENTAL APPROACH AND DATA ANALYSIS

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### Abstract

This research has focused on the latest discoveries in the field of neuroscience and Embodied Cognition and a didactic based on theatre which, as several studies confirm, is able to implement the cognitive-affective-relational development of the person, and specifically, of the child (Troiano, 2018; Immordino, 2017).

It was applied an experiential didactic based on the "Education to Theatricality" of prof. Gaetano Oliva, whose main objective is to accompany the subject to form himself through personal experience, the discovery of himself, his possibilities and his limitations, in order to express himself, to relate and then to communicate (Oliva, 2017).

The sample, composed of children from 3 to 6 years old, experienced a dramatic play, a formative and educational activity. The aim was to stimulate the child in several ways, to help him develop his social, emotional and cognitive skills. The NEPSY-II and AEPS tests used for the assessment were administered before the start of the activity and at the end of the meeting session.

Questa ricerca si è focalizzata sull'unire le ultime scoperte nel campo delle neuroscienze e dell'Embodied Cognition e una didattica basata sul teatro che, come confermano diversi studi, è in grado di implementare lo sviluppo cognitivo-affettivo-relazionale della persona, e nello specifico, del bambino (Troiano, 2018; Immordino, 2017).

È stata applicata una didattica esperienziale basata sulla «Educazione alla Teatralità» del prof. Gaetano Oliva, il cui obiettivo principale è quello di accompagnare il soggetto a formarsi attraverso l'esperienza personale, la scoperta di sé stesso, delle sue possibilità e dei suoi limiti, per esprimersi, relazionarsi e dunque comunicare (Oliva, 2017). Il campione, composto da bambini dai 3 ai 6 anni, ha sperimentato il gioco drammatico, un'attività formativa ed educativa. L'obiettivo è stato quello di stimolare il bambino sotto più aspetti, per aiutarlo nello sviluppo delle proprie competenze in ambito sociale, emotivo e cognitivo.

I test della NEPSY-II e l'AEPS utilizzati per la valutazione sono stati somministrati prima dell'inizio dell'attività e alla fine della sessione di incontri.

### Keywords

Theatre; Early childhood; Emotional Intelligence; TOM; experiential didactic  
Teatro; Infanzia; Intelligenza Emotiva; ToM: didattica esperienziale

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## Introduction

This quasi-experimental study examines whether participation in a preschool theatrical education program can develop language production, TOM theory of mind, and imaginative development. This research combines quantitative assessments of children's understanding and narrative production (vocabulary and content), understanding of false beliefs and imaginative skills. Several international researches in this area have demonstrated the development of individual skills and how education in theatricality in kindergartens, and subsequent educational paths, supports school education.

The idea of the project starts from the studies of *language grounding* or *symbol grounding*, that is, those processes through which words and expressions of the language are linked to reality through action-driven schemes. The development of motor sense and that of language are anchored and constitute the set of actions to be performed in relation to perceptual inputs (Borghi et al, 2005). To understand that human cognition is linked to perception through action. Countless stimuli prompt action in such a way that the body is ready for the relationship with the environment.

Our brain is experience-dependent and knowledge, therefore, derives from learning through the body. The body, experiencing reality circumstances, builds its own space and places it as a reference for the perception and knowledge of the external one. The brain continually creates and modifies visual-spatial and motor maps, abstract domains that can be used in any problem solving situation (Peluso Cassese. Morsanuto, 2020).

A study by Mercy College (Mages, 2018) has developed a similar survey, but the limited time of the educational-theatrical offer has not yielded the expected results; despite this, however, based on the analysis of the data, the author concludes that the inclusion of high-quality theatre art curricula in early childhood education can provide young children with a fun and engaging preschool acting experience, while providing academic support commensurate with that of more traditional early childhood programs.

Another study (Rathje S., Hackel L., Zaki J., 2021), has shown how theatre or even just theatrical entertainment, can lead to tangible increases in empathy and pro-social behaviour. Topaloglu (2015) demonstrates how, through the theatre, the body becomes a physical reflection of the soul, space accompanies it and the body is the means to transfer feelings and thoughts and at the same time to learn through the environment and events. Through the environment, therefore, activities are carried out which develop thought, i.e. the cognitive substrate of mental operations.

### 1. Experiential learning and Embodied Cognition

The Embodied Cognition is new perspective based on the awareness that the body influences cognition, as it is the body itself that is an active part of the cognitive process. Damasio, a neuroscientist specialized in the study of the neural basis of cognition, stated that "our minds would not be what they are if it were not for the reciprocal action between body and brain"; therefore, it is precisely through the body that the subject comes into contact with the surrounding world and, through this, explores and learns.

All these assumptions make us understand how there is a close connection between action and thought and how we must consider it in teaching. In fact, every behaviour is composed of actions but "every action is knowledge and all knowledge are action." (Maturana H., Varela F., 1984)

The basis of this theory is the awareness that the subject is a whole and it must be considered in its entirety, and in the same way the brain, which organizes and processes information in a modular and distributed way, is not separated and divided, but it is composed of numerous areas that are closely connected and interdependent with one another.

For example, during the development of the child, the brain relies on the tactile and motor experience to implement the sensory and motor areas, which will be the starting point for the formation of cortical areas, especially linguistic ones. This highlights how there is a close relationship between these cortical areas and how motor skills play a fundamental role in the con-

struction of the mind and the cognitive faculties: “every type of activity that includes movement is efficient for cognition” (Cinti F., Troiano G., Valentini M., 2018).

A demonstration is given by the connection between the tactile experience and the hippocampus, a very important centre for memory and learning, where precisely the tactile experience increases its activity: in fact, many students report that if they perform some manipulation activity during the study it increases the capacity of concentration and learning (Morsanuto, Cipollone, Peluso, 2019).

All these assumptions underline how it is necessary to stimulate the student in many aspects, the emotional, the motor, the perceptive, the cognitive, which is why “a sensorially enriched environment is undoubtedly important for learning” (Meraviglia M.VV., 2012).

From this point of view, the best methodology becomes experiential education, therefore learning through action, since “it corresponds to the most natural aspect of training: it is the action itself that must be used as a fundamental means of training itself, through the central role of doing in learning experiences” (Lo Presti F., 2016).

So, through experience, it involves fully the subject, with all his senses, emotions and motor skills and with respect to the actual events that happen; furthermore exploring, past experiences are consolidated thanks to the fact that they come back to mind, activating memory processes. In all this, words play a fundamental role in organizing thoughts and giving meaning to feelings, but they cannot replace “the strength and life of real experience” (Meraviglia M.VV., 2012).

So the aim of this project is to investigate how important a multilateral and transversal didactic path since in the preschool age could be, to enhance the potential of the child in function of a practical access to primary school, being able to reach the goal of realizing appropriate didactic paths for the qualification, the strengthening and enhancement of the child's abilities through experiential and bodily training in teaching processes. In fact, some research proved that “defining the importance of a multilateral and transversal educational path since pre-school age, is useful to enhance the potential of the child in function of an early and / or functional access to primary school” (Bonfiglio, Melchiori et al., 2018).

Through play, the favourite channel of children, behaviours belonging to the macro category of non-verbal communication are acted out and cognitive processes, such as memory and language, are enhanced. The results, (derived from studies that compare structured teaching with unstructured one), point out that the interconnections between perception, action, emotion and cognition, produce molecular changes with a relative improvement in the learning process, finding that experiential learning and the neuro – didactics move on different but heterogeneous aspects and lead us to consider the body as a mediator of the acquisition and development of individual and pro-social skills (Morsanuto, Cipollone, Peluso, 2019).

## **2. Education to Theatricality in the kindergarten: laboratory of body expressivity and dramatic game**

### **2.1 The Learning through Theatricality workshop**

Studies and research have demonstrated that the arts are an effective means to develop and enhance the expressive, communicative and creative potential of the person. This is possible by the presence of a plurality of languages, by the playful and active mode, by the coexistence of the individual dimension with that of a group (Oliva, 2017). It is possible and necessary to approach the person to the expressive arts from an early age. Through specific educational activities, that refer to the expressive arts, it is possible to develop children's creative skills. In particular the theatrical experience is an important tool for the discovery of oneself and one's own personal creativity and for cooperative interaction with others. All this is possible within the scope of the Theatre Education workshop (Miglionico, 2019), organized according to a project that takes into account the specific characteristics of a particular evolutionary age. The starting point of this activity is to put the child at the centre and create a favourable environment

for each individual, characterized by their own individuality, to accept the stimuli and to be active, learning appropriate strategies and useful tools to know, acquire knowledge and express themselves, interacting with others and the world, increasing self-esteem (Oliva, 2010).

Based on these theoretical assumptions, the activities of this research project involved the collaboration of some professionals who, as external experts or appropriately trained teachers and with different methods of application depending on the context and their personality, shared the same aims and the same tool, namely the Theatre Education Laboratory.

Within the studies related to this science, for the theoretical and practical aspects concerning in particular the relationship with childhood, reference is made to the existing literature on this specific subject and in particular to the text by Gaetano Oliva, "Learning through Theatricality: the dramatic game (2010)". The professor writes: "The theatrical education workshop has as its goal the conquest of the fullness of the subject's resources, the awareness of them and the ability to know how to manage them consciously and to act through them in a critical way on reality. It is possible to identify a pedagogical path through which to reach the discovery and awareness of the body, as a child's favourite instrument, to its use in a scenic sense." (Oliva, 2010)

## **2.2 Express themselves with the body**

The workshops of Theatre Education in kindergarten are based on the link between the "dramatic game", that is the inherent activity of the human being to represent situations by acting together with others in a conscious way, and the artistic body language, which sees in the body the first instrument through which man expresses himself. Body language is the means of expression used to bring out ideas and emotions. "The main goal is to provide a first body literacy, which gives rise to a liberated body, competent and aware of its communicative possibilities". (Salati, Zappa, 2011). Through bodily expression, it is realized a discovery of the expressive gestural potential of the person and also of the child, going beyond the concrete of aesthetically beautiful, stereotyped forms.

During and especially after the experimentation, we try to get to the awareness of the work done, to know how to evaluate if the gesture or movement made is effective to represent what we wanted to communicate. In the school the working path of childhood is based on improvisation, a method that allows children to express themselves as they can and as they know, without fear of being judged on the merits. Playful improvisation is an ideal tool to release the energies and meanings hidden in the body and stimulate the imagination; play, because of its spontaneous nature, allows the child to experiment with pleasure and joy (Oliva, 2010). In every meeting of the workshop, the preparatory moment is given by the body game that use of the language of mime: the latter is very important in the development of the child for the knowledge of himself and the world.

Educators should therefore accustom children to experimenting with short mimic scenes; this means expressing and reproducing something through body language, gestures and facial expressions, without the use of the voice (Oliva, 2010).

Simple exercises must be performed through dramatization to make them more enjoyable, for example by suggesting to the child a precise image to represent with a position, with a shape of the body. It has already been mentioned how bodily communication is charged with emotional values: the gesture, the look and the muscular tone express feelings, fears, desires, conflicts. In this way, through physical education, an emotional education is also promoted. A starting point can be the reading or telling of a story, from which emerge the characters and situations. These become the guidelines for the work of children who, starting from a specific text, elaborate the types and their related actions (Oliva, Pilotto 1999).

## **2.3 The children in relationship**

Oliva writes: "Once is reached the purpose of the individual exercise, the focus of attention is shifted from the self to the other, so from the encounter with the other, born the relationship and, through it, the sense of self in relation to existing differences." (Oliva, 2010). The group work is

fundamental because it allows the comparison between the different creative potentials, it urges the spirit of collaboration, criticism, self-criticism, necessary in the relationship with the other.

The first exercises, as explained, are all based only on the use of one's own body: the child focuses more on his gesture, having nothing to manipulate. Then the work on the body can be integrated with the use of the sound produced by the child himself and with the music, in order to achieve a total harmonization of the sources of expression (Oliva, 2010). Gradually can be introduced some objects that begin to assume a precise role, used in stage actions. Their knowledge is acquired through manipulation and the relationship with the object built through the body. Experienced the object, its shape, dimensions, weight, it can then be acted in absence that is evoking it through the body and the rules of mime (G. Oliva, 2010).

In the laboratory the ability to transform with imagination and imagination the material, according to one's needs and intentions, is another of the very important activities related to the "dramatic game" because it orients the creative work of the child.

#### **2.4 The dramatic game: characteristics and rules**

The "dramatic game" has been mentioned several times. But what this expression means? Gaetano Oliva writes: "Dramatic play, the tool par excellence of drama education in the relationship with children of kindergarten and primary school, a valid tool to facilitate the relationship with oneself and with others, acquires an expressive pedagogical value, a value and an educational task. This educational system takes its cue from the theatrical pedagogical system which was originally intended for the training of actors: it began in the early years of the twentieth century thanks to some figures such as Jacques Copeau and Léon Chancerel. The theatrical pedagogy of these great innovators puts the person actor at the centre, re-evaluating the global and original value of the human person, seen in its most engaging artistic sense" (G. Oliva, 2010).

Play and dramatic play are two different things. In the early years of kindergarten spontaneous play is individual creation, in most cases. Dramatic play remains an individual creation, but at the same time it is also a group activity, discovered through the present adult who assumes a specific role. This game is characterised by precise rules, the most important of which is to accept the participation of others and the cooperation of the various members of the group. People are not free as in spontaneous play, because only what it is included in the common project can be done and it is important to keep the chosen role for the entire duration of the scenic game. It is also established that not all children can act at the same time and sometimes they need to watch, knowing that the next shift will be their own, although it is possible to give suggestions or intervene if a seat becomes available. The adult who leads the workshop intervenes when his presence is needed to enforce the rules, asking for explanations about the children's actions in order to continue the game effectively.

According to Gaetano Oliva: "Dramatic play or conscious play within educational activities is an opportunity for important experiences of socialization, experimentation of roles, expansion of knowledge and refinement of aesthetic taste. The activity of dramatic play engages all the physical, mental and creative faculties towards more complex forms with which children take control of reality." (Oliva 2010)

In the dramatic game, in fact, the child does not limit himself to imitating reality but is active to invent it, design it and give it life in a group work (Oliva, 2001). To achieve this, it is important for children to experience the laboratory dimension as a moment of serenity, confidence and opportunity to play. It is essential for the conductor to create a well-defined situation through a ritual that delimits time and space. In fact, it is central for children to recognize that at that moment they encounter fun and pleasant stimuli, but in a reassuring and gradually recognized atmosphere. Each meeting takes place according to a well-defined scheme that helps even the most insecure children to let go and experiment. Including the activity of dramatic play within a project does not mean forgetting that the main objective is to develop a free activity in the child, but thinking about education in terms of planning, stimulating and educating an active attitude towards reality (Oliva, 2010).

### **3. Laboratory experience in the context of the school of the children**

The laboratory path of this research takes into account the current school situation. The social scenario of the school was outlined in 2006 with the *Recommendation of the European Parliament and the Council of the European Union*, which presented the eight key competences for lifelong learning, which were taken up in the *National Indications for the Curriculum of the Kindergarten of 2012*. On 22 February 2018, in the document *National Indications and New Scenarios*<sup>1</sup>, supranational institutions such as the UN, the EU and the Council of Europe called on schools to make a greater effort to develop and build a deeper sense of European and global citizenship. In nursery schools, in particular, there is a need to develop in pupils a sense of identity, autonomy, competence and citizenship.

Expressive languages, developed in a Learning Through Theatricality, respond to supranational demands because they are the tools that help children to give meaning to the variety of their experiences, to become aware of their actions while maintaining a bidirectional gaze: inside and outside; succeeding in establishing a dialogue between the specificity of each individual and the environment and society in which he lives. The workshop also develops listening, dialogue and attention to the point of view of others, skills necessary to train a citizen of the world. With reference to the eight key competences for lifelong learning, the competency to which drama refers and consequently our research project is *Cultural Awareness and Expression*<sup>2</sup>; this competence presupposes that the individual works on his own consciousness by looking at the arts and other cultural forms as tools for interpreting and shaping the world. Key competences are a dynamic combination of knowledge, skills and attitudes that develop from early childhood onwards; in fact, within the fields of experience, are outlined the goals of competences which are then divided into knowledge and skills in the design.

The activity of dramatic play, which makes use of expressive languages, involves all fields of experience since: verbal language develops the field of experience *Speech and Words and Self and Other*; the non-verbal language and the manipulation of materials is part of *Images, sounds, colours and the body and movement*; the language of space in the field *Knowledge of the World*.

The proposed path, which focuses on the expressive possibilities of the body, has mainly taken into account the field of experience *Images, sounds and colours*, since in the *Targets for the development of competence* presented in the *2012 National Indications* it is noted that: “the child communicates, expresses emotions, tells the story using the various possibilities that body language allows” and of the field of experience *The body and movement*, in which, again in the *Goal* it is said that “The child perceives the communicative and expressive potential of his or her own corporeality, feels pleasure in movement, controls the execution of the gesture in expressive communication” (*National Indications for the Curriculum of the Kindergarten and the First Cycle of Education*, 2012).

The learning unit, designed in the different research contexts, has been integrated into the annual planning of the plexus in order to create a continuity between the experiences of the pupils within the school. In the workshop, a guide character or a narrative was used to connect topics and build new knowledge and skills, giving children the opportunity to experiment with the theme chosen by the teachers, also through expressive languages. Below is a summary table of the knowledge, skills and specific learning objectives that have been developed.

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1 The document was prepared by the National Scientific Committee for National Indications for the Curriculum of the Kindergarten and First Cycle and delivered to the MIUR

2 Competence in cultural awareness and expression involves understanding and respecting how ideas and meanings are creatively expressed and communicated in different cultures and through a variety of arts and other cultural forms. It requires a commitment to understand, develop and express one's ideas and sense of one's function or role in society in a variety of ways and contexts (COUNCIL RECOMMENDATION of 22 May 2018 on Key Competences for Lifelong Learning).

<p>The key competency for lifelong learning: <i>Cultural Awareness and Expression</i></p> <p>Field of experience: “<i>Images, sounds and colours</i>” and “<i>The body and movement</i>”</p>			
<p>Competence target:</p> <p>“<i>The child communicates, expresses emotions, tells the story using the various possibilities that body language allows</i>”</p>	KNOWLEDGES	SKILLS	SPECIFIC LEARNING OBJECTIVES
	COGNITIVE AREA		
	Essential elements for the construction of scenic actions and the interpretation of an expressive movement;	Exercising the sensory, cognitive, relational, rhythmic and expressive potentialities of the body;	Promoting the knowledge of the expressive capacities of the body through the experimentation of expressive languages;
	COMMUNICATION/LINGUISTICS AREA		
	Promoting management and comprehension of simple oral communications;	Promoting using of the various possibilities that body language allows (verbal and non-verbal);	Promoting democratic debate; Discovering and developing creative and socialising potential;
	SOCIAL AREA		
	Promoting elements of Proximaemia.	Developing listening; Explore personal and interpersonal space	Fostering a greater awareness of one's own ideas, emotions, thoughts and help to understand those of others.
<p>The levels of mastery of the skills are constantly checked, through the systematic observation and the proposal of increasingly complex tasks that allow to identify changes in the individual and in the relationship with the group, the degree of interest and participation in relation to the contents of the theatrical path.</p>			

Table 1

As already mentioned in this article, the attitude of the adult inside the laboratory was open and never judgmental in order to stimulate a sense of freedom and security where each child could live their learning time with peace. Using a design for skills, identified and estimated the time, it was also necessary to identify the resources, the tools needed for the development of the path and finally, outlined the methodology, an observational grid to verify and evaluate the progress of the project and the learning of the students.

In the first part of the workshop, non-verbal language and space language were presented as games/exercises within a narrative framework, which allowed us to observe the children's ability to mentally create a fantastic environment in which to act with their peers, sharing their space; to listen and develop physically the educator's deliveries to get to build the dramatic game, within which they have learned to choose how to use their body and a simple gesture, to shape a thought, an emotion.

The assessment of learning was divided into three phases: at an early stage where previous skills and knowledge have been observed; intermediate where it was analysed whether and how the child responded to stimuli and whether the laboratory met his needs; and final where the student is involved in a creative project.

This project, as will be explained below, used some tools to observe in the initial and final stages, if and how much, this working method had succeeded in improving children's emotional, cognitive and relational skills.

## 4. Research<sup>3</sup>

### 4.1 Research contexts

The research was carried out in the S. G. Bosco nursery school of the "Aldo Moro" Comprehensive Institute of Saronno (Va) and in the nursery schools of Azzio and Cittiglio belonging to the "Curti" Comprehensive Institute of Gemonio (Va), in the 2018-2019 school year.

In the Section of Saronno's nursery school, the theatrical educator, who led the workshop, also had an internal teaching role. The research project was presented by the professor to the Institute Council where it was approved; families were then informed about the data collection resulting from the observation and completion of the questionnaires. The group, composed of ten four-year-old children, took part in ten workshops where they went to develop spatial language, non-verbal and verbal.

In the nursery schools of Azzio and Cittiglio, on the other hand, the Theatre-Educator acted as an external expert in close collaboration with the teachers, within the framework of a PON project. In the school of Azzio all the children of the only heterogeneous section were involved, for a total of 23 children of which five were 3 years old, 10 were 4 years old and 10 were 5 years old. In the school of Cittiglio, on the other hand, the children were involved who attended the last year, for a total of 29 children belonging to the 4 heterogeneous sections, organized in two groups to improve individual participation.

### 4.2 Tools

As a method of evaluating subjects, we administered two tools at the beginning and end of the project, the NEPSY-II and the AEPS®:

1. NEPSY-II is a battery of tests that provides a neuropsychological evaluation of the cognitive abilities of subjects from 3 to 16 years of age, in relation to specific cognitive domains; in particular, it allows to carry out both a global assessment and an investigation aimed at one or more domains, and it is able to ascertain cognitive abilities or typical disorders that can generally be diagnosed for the first time in childhood.

Specifically, we selected three tests in this project, in order to investigate the skills of memory, ToM and emotional recognition.

- The M6 test evaluates the narrative memory in three conditions, on the basis of free, guided re-enactment and on the condition of recognition: a story will be told to the child and asked to repeat it and after which questions will be asked about what he has not remembered.
- The S01 test evaluates the ToM, that is the ability to understand mental constructs such as beliefs, intentions, deceptions, emotions, fantasy, fiction as well as the ability to understand that others have their thoughts, ideas and feelings that may be different from ours: the adult read to the child various scenarios or shown figures, then ask questions that require understanding the other's point of view.
- The S02 test consists of four tests that evaluate the ability to recognize emotional states from photos of children's faces: in the first test, the child declares whether two faces in two different photos represent faces with the same emotion; in the second test the child chooses two photos with faces that express the same expression between three or four faces; in the third test we show to the child a page with five faces and the child has to choose between four faces which represents the same emotion as the face placed at the top; finally in the fourth test we show briefly to the child a face and by heart he has to choose two photos representing the same emotion of the face presented previously.

2. AEPS® is a complete observation sheet, which aims to counteract practices that generate

<sup>3</sup> The research has been developed through the cooperation of the Laboratory of Educational Neuroscience **Heracle** of the University Niccolò Cusano - Rome - which took care of the scientific and analytical part and the **CRT** - Center for Theatre Research - Fagnano Olona - Varese - which developed the laboratory and methodological part.

scores or results which are:

- Not valid for young children;
- Inappropriate for use with young children with disabilities;
- Difficult to use for the development of significant objectives and intervention contents.

Among the various domains that allows to investigate, the area of social communication and the social area were analysed.

## 5. Data analysis

### 5.1 M6 spontaneous re-enactment

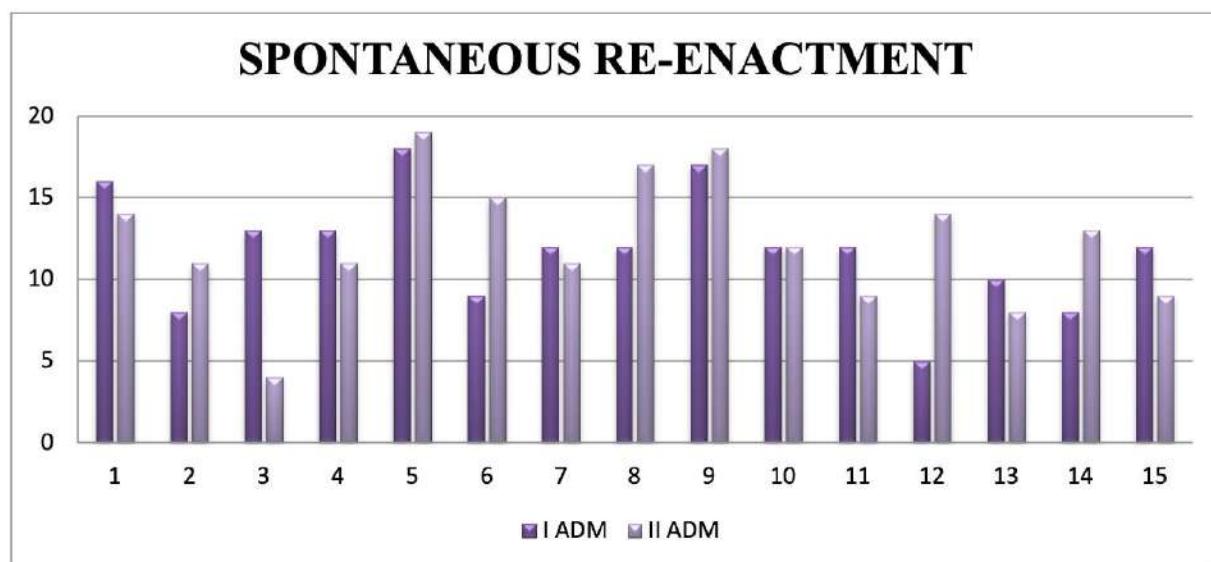


Figure 1 Spontaneous re-enactment

Figure 1 shows the data obtained from the administration of the M6 test, specifically in the “spontaneous re-enactment” section, where the researcher asks to verbally report a story immediately after it has been told. The graph shows how 46% of the children performed better in the second administration, but it also shows how the same percentage of children showed a worse performance in the second administration: these data should be read in light of the time available and the environments where this test was administered, as it requires a high degree of concentration of the child which can be easily altered by external conditions.

### 5.2 M6 guided re-enactment

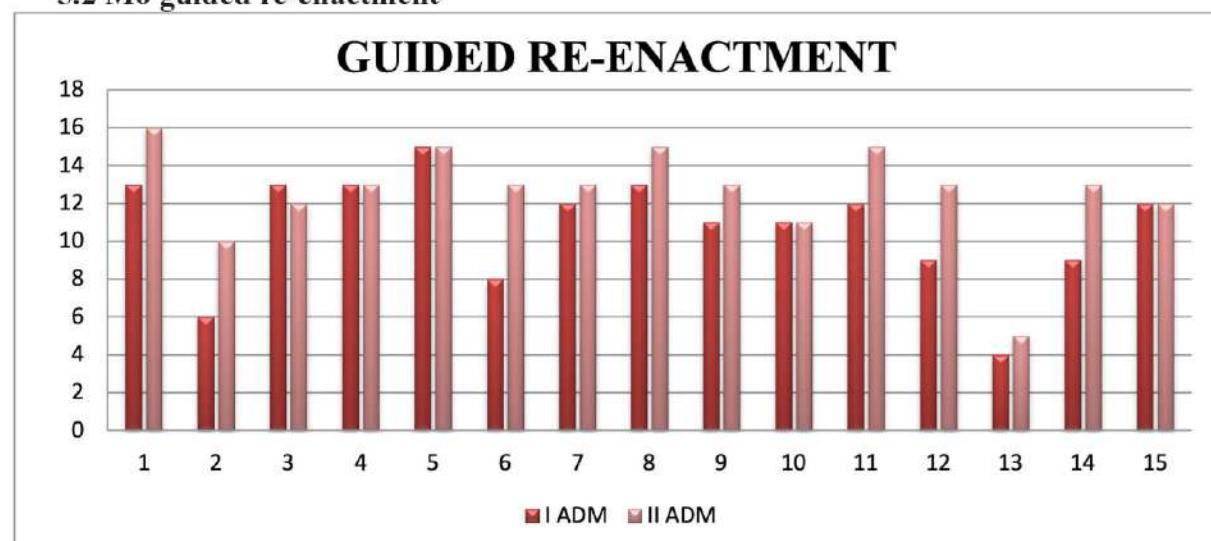


Figure 2 Guided re-enactment

Figure 2 instead reports the results obtained by the children at the administration of the “guided re-enactment” section of the M6 test, where the children were asked questions about the story that had been told to them. The pink lines of the graph show how 80% of the children showed an evident improvement in the performance of the second administration.

### 5.3 S01 Theory of Mind

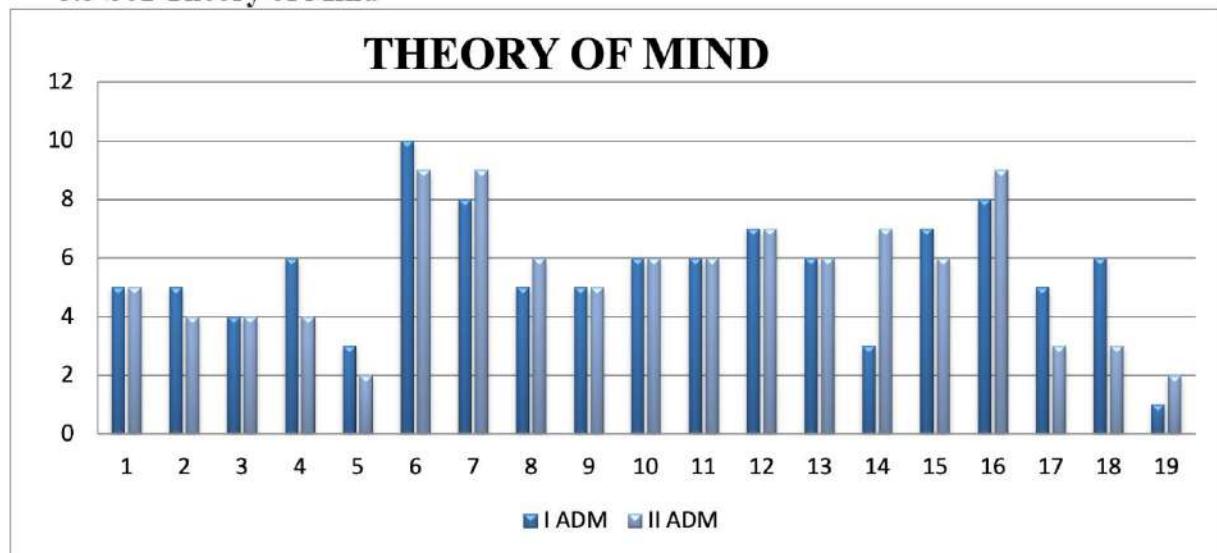


Figure 3 Theory of mind

Figure 3 shows the data of the administrations of the S01 test, which evaluates the ToM, where the researcher shows various scenarios or figures to the child, then ask questions that require an understanding of the other's point of view. The graph reveals that only 26% of the children showed a marked improvement in the second administration, however a good percentage of 36.8% maintained a constant score. Although this test primarily evaluates the TOM, it is necessary to underline how the alteration or the poor performance of functions such as attention rather than visual-perceptual difficulties in the coding of facial features, can make the result obtained in this test not totally reliable.

### 5.4 S02 Recognition of emotions

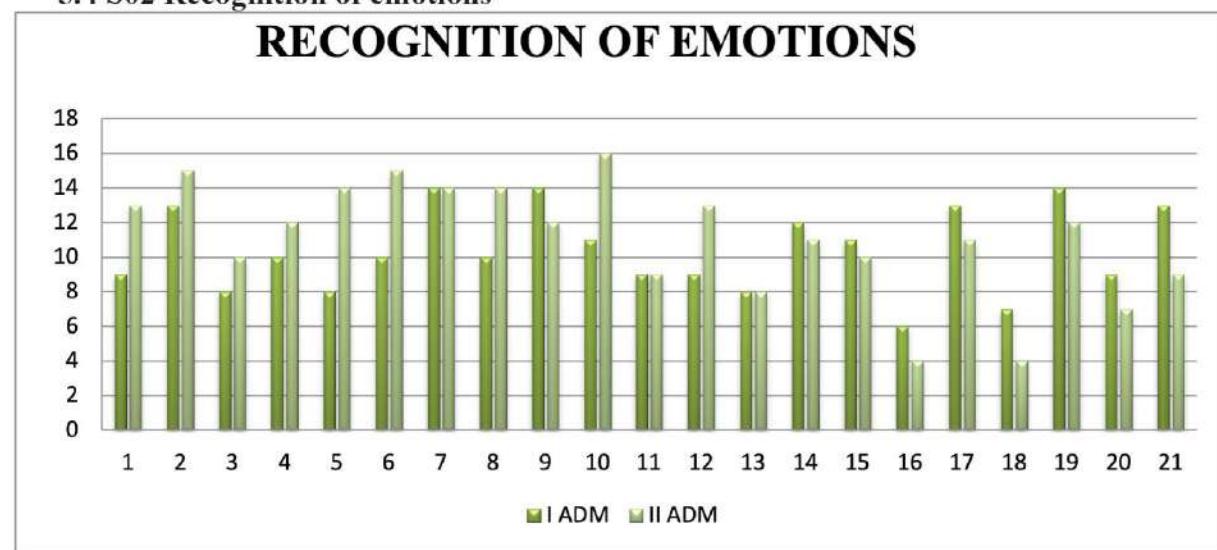


Figure 4 Recognition of emotions

Figure 4 shows the scores obtained in the S02 test which assesses the ability to recognize emotional states from photos of children's faces. This test consists of 4 subtests that measure the child's

ability to read and decode the expressions of others, a fundamental element in relational skills. The graph reports that 42.8% of the children showed an improvement in the second administration, but the same percentage instead showed a worsening. It should be stressed that this is a rather complex test that not only affects visual and relational skills, but involves a whole series of cognitive functions, such as attention or working memory, which if not properly checked can alter the test result.

It should be noted that the results of these administrations could be altered by difficulties or poor performance of children in other cognitive functions, which have not been investigated, or by external elements such as distracting factors or little time available for administrations.

### 5.5 Social communication

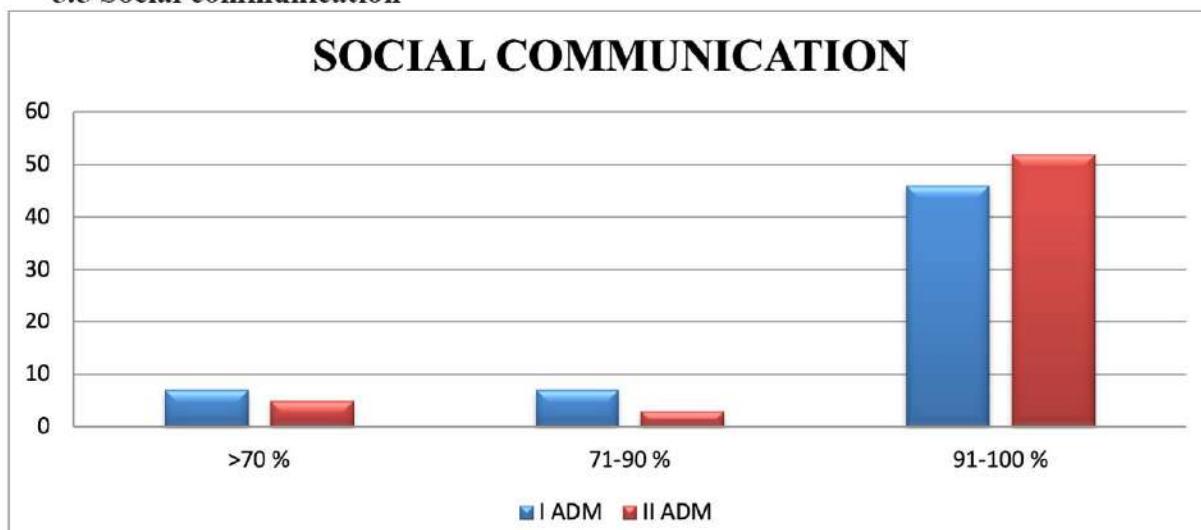


Figure 5 Social communication

Figure 5 reports the results obtained by the children in the first and second administration of the “Social Communication” section of the AEPS, which investigates how the child expresses himself in social relationships. For the number of subjects, it was necessary to divide the scores into 3 categories:

- scores less than 70% of the total score;
- scores between 71% and 90%;
- scores above 91%

By observing the graph, it can see how the children showed a marked improvement in the second administration of the test, so much so that 86% of the sample falls within the highest range.

### 5.6 Social section

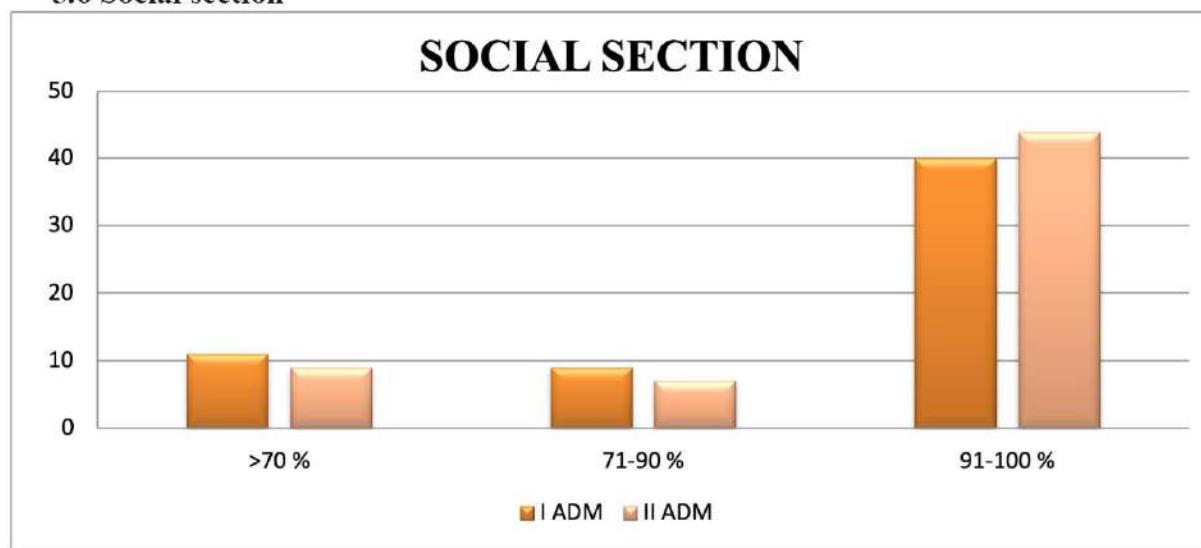


Figure 6 Social section

Figure 6 shows the results obtained by the children in the “social” section of the AEPS, which analyses social behaviour: here it is used the same subdivision used in figure 5. The graph shows that here too there has been a marked improvement, where 73.3% of the children scored over 91% and specifically 66.6% of the children scored 100%.

## 6. Discussion

As can be concluded from the graphs, there has been a marked improvement in all areas investigated, as expected by the research hypothesis. It should be noted that the assessment tool, in this case, influenced the results, as the NEPSY tests are very demanding, require a setting without strong stimuli and involve the use of many other cognitive functions besides the one investigated. So, it's important to read the data in the light of these interferences.

For example, the difference in scores between the two subtests of M6 could be given by the complexity of cognitive functions involved in spontaneous recall, which are less involved in guided recall; the clear improvement in the performance M6 test “Guided recall” therefore allows to see that there has been a real improvement in the mental abilities, as this test investigate more precisely the variable of our interest.

The variability of the scores obtained in the second administration of the S01 and S02 tests is due to the extreme complexity of the test, which turns out to be long and articulated and is greatly affected by moments of distraction of the child. Despite these premises, the subjects showed improvements in memory performance, ToM and recognition of emotions, highlighting a positive effect of the teaching implemented.

For the assessment of the social components, it was possible to use a different tool, the AEPS, which could examine more accurately specific variables. In this case, for the survey of the social components, it was chosen to use the social communication section and the social section, in order to have a more complete picture. The clear improvement observed allows to affirm the great positive impact of applied teaching in the social area, a fundamental element in the proper development of the child.

The main limitation of this research is therefore related to the assessment tools used, which proved to be too influenced by variables external to the ones investigated. Despite this, the research hypothesis has been largely confirmed, highlighting how this experiential teaching has actually been able to improve emotional, cognitive and social skills. For this reason, it was decided to propose the same research project again, devising an ad hoc assessment tool that would be able to investigate more accurately the variables under consideration. This questionnaire will be based on the fundamental concepts of neurodevelopment and Theatre Education and will not require the involvement of the child, but will be structured like the AEPS, an observation grid that allows examining the child during the course of the activities. This will limit the influence of non-core cognitive variables in the survey and inhibit the interference of the surrounding environment.

## Conclusions

This research project focuses on combining the latest discoveries in the field of neuroscience and Embodied Cognition with theatre-based teaching, which is able to stimulate the person at a cognitive-affective-relational level.

The research hypothesis envisaged the application of an experiential didactics that would involve the whole individual, both in the cognitive, bodily, emotional and sensory components, in order to implement their development in early childhood. Therefore, it was applied a didactics based on the principles of Theatrical Education, theorized by prof. Gaetano Oliva, whose main objective is to accompany the subject to form through personal experience, using basic elements of the theatre; has therefore been concretized in the insertion, in the normal teaching, of the dramatic game whose objective is to bring the child to develop of his creativity, through the use of imagination but, at the same time, it also allows him to favour his integration into the group, the knowledge of himself and of the others and building one's own way of seeing reality.

The application of this teaching method has had a positive effect on the development of cognitive, social and emotional abilities, resulting in a marked improvement in the performance of the children. The main limitation was the assessment tools used, which were highly influenced by external factors. Therefore, starting from these limitations, it was decided to propose the same didactics, devising an ad hoc tool for the evaluation of variables, based on the fundamental concepts of neurodevelopment and theatre education.

At the moment the research has been discontinued due to the health emergency period, it is expected to start again from the school year 2021-2022. In addition, it was thought to extend the project to elementary and middle school children, adapting the teaching to their respective age groups.

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