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Development of the Checklist for Imitation, Exploration and Imagination Behaviour for Play Observation in Preschool Age

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Abstract: The purpose of this paper is to offer a new coding system to capture preschool playful behaviours based on the imitative, exploratory and imaginative aspects underlying playful behaviours (CIEIPO checklist: Imitation, Exploration, Imagination, for Play Observation). A series of focus group sessions (four in total) involving experts in the field were conducted to identify the most typical preschool play behaviours. In addition, a thorough literature review allowed for the operational definition of the items. The number of participants consisted of 280 preschool-aged children, aged 3 to 5 years ($M_{age} = 4.5$, $SD_{age} = 1.8$), 130 of whom were girls. The most frequently observed behaviours were exploratory (150 times) and imaginative (136 times), while imitative behaviours occurred 58 times. The index of agreement between raters was 0.89 (Cohen's Kappa). The results show important implications for promoting play skills in preschool children, with particular relevance to the developmental functions involved (exploratory, symbolic and imitative skills).

Keywords: play; child observation; behaviour observation; imitation; exploration; imagination

1. Introduction

The literature emphasises the fundamental role of play in important areas of development: social, emotional and cognitive [1,2]. In fact, playful activity promotes psychological adjustment and allows the child to develop and perform basic higher psychological functions [3], such as environmental exploration, the ability to manipulate and represent objects and social interaction with peers [4,5].

Through playful activity, children learn to represent themselves and their environment, but also to distance themselves from it and to experience the alternatives offered by the world of imagination.

Furthermore, play is characterised by the fact that it is an activity that is essentially adapted by the individual child in order to understand reality and transcend it at the same time [6,7]. In this respect, as mentioned above, play is associated with active exploration [8], as it allows children to learn about the different objects around them, but also to manipulate and represent them according to their wishes, overcoming the obstacles presented by objective reality.

Play is an activity that is constantly found among the spontaneous behaviours of children; because of this characteristic, it has always attracted the attention of researchers. There is a broad consensus on describing play as an all-encompassing activity in which the child is spontaneously and fully engaged, characterised by pleasantness and intrinsic, solid motivation: play represents an occupation in itself that is pleasurable and "fulfilling" [8].

Some authors [9] have looked in more detail at the emotional stimulation caused by the exploratory activities typical of play. Play offers the child a creative context in which to experiment with possible cognitive, emotional and relational adaptations to reality [10].

1.1. Evolutionary Function of Play

The first scientists to study play scientifically [11–13] emphasised its adaptive function in evolutionary terms. Originally, Spencer hypothesised that the need to dissipate excess energy underlies the activation of play behaviour. More recently, Ellis [9] defines play as a biological function that enables the child to recognise and cope with difficulties in the environment. According to this view, play is characterised as a fundamental aspect of children's behaviour, since it is through it that the first forms of adaptive mediation are realized in childhood [11,12].

1.2. Play and the Development of Cognitive Skills

There is widespread agreement in the literature on the importance of play for the development of cognitive abilities. Santrock [14] points out that playful activities effectively support the development of intellectual abilities by providing constant opportunities for exploration and manipulation.

On the other hand, the crucial role of play in the development of cognitive skills has been widely emphasised since the work of key educators of the early 1900s, such as Maria Montessori [15]. In developmental psychology, we owe to Piaget [16,17] the introduction of a new view of play in which exploratory and imaginative activities become concrete expressions of the child's cognitive development. Piaget was the first to advocate a new view of play, in which exploratory and imaginative activities become concrete expressions of the child's cognitive development: the "Piagetian" child is an active constructor of knowledge who gradually acquires new forms of representing reality through participation and direct manipulation. According to this view, play plays an important role in children's development. In fact, play is the best framework for learning and development, as children can express themselves naturally, even when they have no specific material at their disposal, and can effectively direct their development, even when they involve other people.

As early as the 1970s, several studies investigated the relationship between imaginative play and cognitive development [18] and looked at the role of this playful activity in promoting the development of mathematical, linguistic [2], cognitive and representational skills [19]. They further emphasised that the child's imaginative play can be seen as the genesis of the inner processes of daydreaming and fantasy: that is, the child absorbs experiences from the world, processes them cognitively and emotionally and expresses them in play [18].

1.3. Play from a Sociocultural Perspective

According to the sociocultural perspective [3,20,21], play has a fundamental function in socialization processes, as it provides the child (e.g., in preschool fantasy play) with a context in which to learn social roles and values typical of the culture to which he or she belongs and to practice them in interaction with peers [22–24].

As Vygotsky already pointed out, in play, it is possible to develop adequate skills of self-regulation of behaviour and symbolic representation of social reality, since the playful activity stimulates the activation of the semiotic functions of thought that allow the child to develop a personal vision of reality that is consistent with the cultural framework in which the gestures made with peers are inscribed. According to this view, play, especially pretend play, and the private language that children typically use to accompany play sessions, also play an essential role in motivational processes [3].

1.4. Play, Imitation, Exploration

Play is closely related to two other behaviours: imitation and exploration.

The relationship between play and imitation has also long been studied, primarily because of the crucial developmental function attributed to these two behaviours in early childhood. Like pure play behaviour, imitative behaviour is also emphasised for its important role in cognitive and social development [25].

Several authors [26] hypothesise that imitative behaviour is innate and activates adaptive behaviours aimed at survival in the environment. This evolutionary hypothesis is based on numerous studies on imitative behaviour in young children. A second hypothesis, on the other hand, places the emergence of imitation in the framework of dynamic relationship systems [27]. It is generally agreed that imitation plays an essential role in the acquisition of basic skills and social norms [28,29]. Imitation allows the child to learn in the context of social interactions, essentially adopting behaviours, values and social conventions that are characteristic of the culture to which it belongs [30,31].

Important confirmations for these functions also come from neuroscientific studies on social–cognitive processes [30,32], which emphasise that imitation has a central function in social cognition and promotes the connection between different individuals: imitation promotes empathy, the expression of positive relationships with others and cooperative behaviour. It was the early neuroscientific studies on imitation in animals that led to two crucial discoveries: mirror neurons [33] and automatic imitation (mimicry) [34].

Childhood play is initially characterised by functional and exploratory aspects, from which the child gradually progresses to more cognitively complex play and later experiences symbolic and pretend play [35].

In this context, a type of play known as "exploratory play" can be identified, which is particularly important because it promotes the learning of new skills and stimulates curiosity. Exploratory play in childhood is important for four factors: it i. promotes and increases learning opportunities; ii. stimulates curiosity; iii. facilitates the development and consolidation of basic skills; and iv. encourages the discovery and learning of new skills.

1.5. Pretend Play and Imagination

As outlined above, play is a fundamental experience in the developmental process, with different aspects and functions emphasised by theoretical perspectives. It is difficult to give a clear definition of play; however, it is possible to identify the most common types of play at preschool age, among which pretend play plays a major role.

Pretend play involves the use of fantasy, imagination, symbolic understanding and the expression of emotions [36,37]; it is characterised by flexibility, high intrinsic motivation and the non-literality of the meanings used. In addition, the child is emotionally involved in imaginative play, enjoys it and expresses a wide range of feelings: "acting as if" allows the child to freely explore his or her world and express wishes, fantasies and personal fears [38]. Recent literature has specifically investigated which cognitive components are most strongly associated with pretend play, focusing mainly on representational, problem-solving, linguistic and social skills, as well as on the development of academic skills; in addition, imagination is strongly stimulated by this type of activity to achieve symbolic transformation in relation to objects or actions [39].

From a neuroscientific point of view, the "cognitive theory of pretense" [40] assumes the existence of a brain area explicitly responsible for the control of the pretend game. While such a hypothesis has the advantage of emphasising the close link between pretend play and cognitive abilities, it is more likely that such activity involves the activation of different brain areas, as it typically activates emotionality, language, sensorimotor action patterns and cognitive abilities, and triggers the formation of multiple synaptic connections [6].

Pretend play is associated with various cognitive and emotional skills, such as problem-solving, coping and emotional regulation. In many studies, pretend play is associated with creativity [39,41]. In this context, Russ [40] hypothesised that the relationship between pretend play and creativity is mediated by two distinct processes: cognitive and affective. Many studies have investigated the latter by looking at divergent thinking [42,43]. Thus, on the one hand, the child would activate divergent cognitive processes in symbolic play [44], and on the other hand, the emotional component would support idea production and imagination [39,45].

Several studies have also investigated the links between pretend play and certain representational abilities, such as Theory of Mind (TOM). In this context, Lillard [36]

pointed out that fantasy play necessarily requires the negotiation of different points of view, the representation of the same object with multiple meanings (the "real" and the "pretend") and the adaptation of emotional expression to the play situations created. Long before they can correctly solve tasks based on misconceptions, children know how to manage even complex situations of pretend play.

1.6. Play: A Complex Definition

So far, it is difficult to propose a clear definition of play [46], which is characterised by a multidimensional nature; in this context, the definition of play as a "coevolutionary functional multiplex" [47] has been proposed, i.e., as a phenomenon expressed through different functional domains and influenced by different factors (emotional, social, cultural, genetic).

However, it is possible to identify some common characteristics of different play behaviours.

First, play is a complex activity that simultaneously influences three fundamental dimensions of growth: cognitive, social and emotional [1,48].

Play can also be distinguished by the simultaneous presence of five basic characteristics [49,50]: i., intrinsic motivation (play is intrinsically motivating: the pleasantness of the action spurs the child to continue); ii. positive affect (which arises from the pleasure experienced); iii. non-literacy (where the child is aware that the actions performed in the game are not real, but "as if" they were); iv. interest in the means and not in the ends (the child is more interested in the actions and sensations perceived during the game than in the results); v. flexibility (the behaviours during the game are prone to variation: they do not follow rigid or binding patterns).

Other studies, starting with the well-known play theory of Huizinga [8], define the essential characteristics of play: activity, the feeling of having an adventurous experience, communication (from the age of 2) between participants, pleasure, participation, meaningfulness, social interaction, the possibility of symbolic representation of reality, cathartic function and voluntariness. Playful activities also activate numerous and diverse behaviours, including complex behaviours.

1.7. Play as a "Self-Organizing" Mind's Need

The pleasure of play is a fundamental aspect of play: play is characterised by a strong intrinsic motivation that arises from the pleasure associated with the experience itself. This aspect stimulates the child to perform functional adaptive behaviours that are often innate, perfected and incorporated into the behavioural repertoire. Bruner [51], who proposes the concepts of playfulness and playful practice, describes that the pleasure of the playful act is not to be understood as a consequence of experience, but as a characteristic aspect of an innate playful "function".

From this perspective, it is possible to understand play more broadly as an expression of a playful ability: a mental function that is spontaneously activated by pleasurable and engaging activities for the child [52]. The pleasantness of such activities stimulates the child to constantly practice skills that produce certain behaviours that are essential from an adaptive view.

A key feature of playful activities is the natural predisposition to activate certain behaviours in the first months of life. Even the first encounters between mother and child can be considered genuine playful moments [52].

Recent studies have investigated the importance of play in parent–child interaction at an early age as a function of facilitating early forms of emotion regulation in children [53]: children of "more "playful" parents are characterised by lower levels of negativity.

The spontaneous and frequent practice of play sessions allows the child to experience a deep sense of well-being and, from an evolutionary point of view, to adaptively practice the basic patterns of action that are useful for the growth process.

The playful activity promotes the constant activation of the child's brain and stimulates the formation of new brain connections: in this respect, one can assume a "self-organizing" function of the mind [52]. According to the epigenetic developmental perspective, play has a fundamental function that enables the child to relate to the outside world in a rewarding way [54,55]. Furthermore, through the constant and varied stimuli generated by playful activity (cognitive, social, emotional, motor), play contributes to structuring an appropriate psychological environment for individual development.

Neuroscience has helped to highlight the role of the brain in the organization of neural connections, that in turn express the typical activities of conscious thought [56]. By analogy, we can state that the mind, for its part, organizes its activity by structuring sensations and the complex of behavioural patterns. From this perspective, the mind primarily represents the psychic environment in which individual development is organized. For such an environment to remain active, it must above all provide constant, pleasant and exciting stimuli. Any experience that is to be perceived as a meaningful experience must be an exciting experience [52].

If mental processes mirror the functioning of brain systems, just as the brain is a "self-organizing system" [56], the mind would also tend to self-organize. The mind can thus be viewed as a "self-conceived organization" that, through playful activity, creates an intrapsychic environment that supports the activation of innate behavioural patterns with which the child can interact with the external environment in increasingly complex ways.

1.8. Imitation, Exploration and Imagination Behaviour

This paper identifies and proposes imitation, exploration and imagination as fundamental dimensions of childhood play behaviour. Indeed, these three components have emerged from the literature review as three fundamental behaviours that are activated and supported by childhood play behaviour.

The interaction between the imitative, exploratory and imaginative components in play is multimodal [57]. For this reason, we decided to propose an account of children's play behaviour based on these three dimensions.

As mentioned above, several studies emphasise the adaptive function of imitation. The "imitative play patterns" [58] form the basic units of the behavioural repertoire that the child will develop in the future. Imitation is usually defined as a general ability to respond by imitating the behaviour of another person [59]. The experience of being imitated also influences the actions of young children, who tend to show those behaviours that can stimulate imitation in dyadic interactions and in the activation of social play sequences [60]. Two roles can be distinguished in imitative behaviour: the "model" and the "imitating" subject. The group usually chooses the role model for different reasons. Within a class group, a distinction can be made between a task-oriented leader with assertive, autonomous behaviour, who tends to assert themself in the group and avoid confrontation with peers, and a relational leader (group-oriented), whose dominance is maintained by the consensus of the group.

It is also possible to distinguish imitation according to the time interval in which it takes place [61,62]: immediate or synchronous imitation describes the imitative behaviour performed immediately after the observed behaviour, whereas delayed imitation, already described by Piaget [16,17], is based on the ability to process and mnemonically retain the mental image of the observed sequence in order to reproduce it in the absence of the model.

Another distinction concerns the type of imitated behaviour: one can distinguish between motor imitation when it refers to movements and actions, verbal imitation when it refers to vocal sounds, or verbal and motor imitation when it refers to both aspects.

In addition to imitating a sequence of actions or sounds, the child tends to select objects that are similar to those used by the model in the face-to-face play sequence, with uses sometimes very similar to those observed and reproduced.

Exploration represents one of the basic behavioural patterns activated in children from the earliest stages of development, complementing the activation of the attachment system

to the caregiver [63]; exploratory activities allow the child to experiment with different ways of interacting with objects and with their motor skills, which gradually become more sophisticated and better integrated. Several authors [6] have studied the aspects associated with emotional stimulation through exploratory activities: the discovery of new elements in the environment helps to generate a positive state of arousal in the child, which in turn can stimulate new exploratory behaviour. Logue and Harvey [64] describe some characteristics of stimuli that stimulate exploratory behaviour: novelty, ambiguity, incongruity, surprise and complexity. However, other characteristics would encourage more playful behaviour, such as familiarity with the stimulus, clarity and the simplicity of the proposed situation.

Exploratory behaviour can be described in terms of some typical aspects: in terms of the type of environment in which the exploratory activity takes place (natural or experimental); in terms of the characteristics of the stimulus (familiar, unfamiliar, simple, complex); in terms of the behavioural responses elicited (orienting responses aimed at positioning and exploring the surrounding space; locomotor responses, which focus on motor practice and exploration of one's own motor abilities; exploratory responses, which focus on manipulating the object to explore how it is used and what variations there are).

At the age of 2½ to 3 years, the child begins to develop the first representational skills. The appearance of language, delayed imitation and symbolic play are expressions of the acquisition and development of new semiotic skills: symbolic play involves the activation of imagination and symbolism. It supports the development of cognitive, linguistic, socio-emotional and social skills; it develops in an increasingly differentiated way over the course of the preschool years and integrates an increasing and varied number of action sequences. Compared to symbolic play, fantasy play (or imaginative play) develops later, around the age of 4 to 5, and involves more explicit and structured narrative sequences using stereotypical social roles.

The use of imagination is central to both symbolic play and fantasy play. "Pretending" is considered a precursor behaviour for the later development of creativity [39].

Perner [62] notes that the child is able to distinguish between reality and fantasy through secondary representations that enable them to distinguish an imaginary plot background from its analogue in the real world. Pulaski [65] points out that symbolic play is influenced by the degree of structuring of the materials offered: simpler, unstructured objects would stimulate more creative and varied imaginative play, in contrast to more structured games and materials, which would limit personal recourse to imagination and discourage free and spontaneous play.

1.9. The Aims of This Study

As can be seen from these considerations, play is a fundamental experience in the child's growth process, which promotes the development of basic cognitive, emotional and social skills and is expressed in the different contexts of life: it is, therefore, essential to have appropriate tools to study it, especially with regard to play at preschool age. The use of observation methods is beneficial for this developmental stage, when the child is still consolidating their language and communication skills and expressing many of their needs through their behaviour [5,65–67].

In this context, the literature recommends the use of observation methods aimed in particular at recording the level of interaction carried out during the play phase or the nature of the play itself. As Epstein [68] notes, observational data can be used to engage parents and teachers in discussions about a child's progress and behaviour. Sharing these observations can help create a collaborative approach to the child's development. The observational study of preschool play provides a comprehensive view of how children develop, learn and interact with each other. Belsky and Most [69] describe a coding scheme that aims to capture play behaviour in its development, from exploratory behaviour to actual symbolic play. Smilansky [70] describes the types of play according to their different cognitive complexity and distinguishes between functional, constructive, dramatic and rule-based play. One of the most widely used coding schemes is undoubtedly the one proposed

by Parten [71], which distinguishes between six categories for the different levels of social participation (unoccupied play, solitary play, spectator play, parallel play, associative play, cooperative play). Rubin and other researchers [72], for their part, propose an exciting synthesis of the procedures proposed by Smilansky and Parten, distinguishing between functional, constructive, dramatic and rule-based play. In contrast, the method developed by McCune-Nicolich [73] focuses on the manifestation of symbolic play and encodes the development of the representational capacities involved: pre-symbolic, self-symbolic patterns, decentralised symbolic play, combined symbolic play and hierarchical functional play. Further proposals then focused on the observation of play patterns implemented in the therapeutic context and in the school context [74].

Several of these approaches are characterised by distinguishing different types of play according to the content of the playful activity (e.g., distinguishing between pretend play and play with objects, etc.) and the degree of social participation. However, there are only a few coding methods in the literature that emphasise the different developmental dimensions activated in play behaviour in the sense of a multimodal approach; the preference has been to observe certain components from time to time [75].

Based on these considerations, we have set ourselves the goal of developing an observation instrument that can be used to comprehensively describe the behaviours typically activated in preschool-age play behaviour using a multimodal approach. The study aims to create a more detailed understanding of children's play behaviour with typical developmental patterns by bridging the gap between existing research methods and introducing a new data collection system. This system will allow for a more detailed and comprehensive analysis of play behaviour and provide insights that are not captured by current instruments. Secondly, it explores how this new coding system can improve the ability of teachers and researchers to observe, assess or promote children's play, thereby helping to improve pedagogical practice and research methods.

The aim of this paper is thus twofold: (a) to present a new coding system to capture playful behavioural expressions in the preschool context (whose categories represent the underlying cognitive, interactive and imitative aspects of play behaviour); (b) to observe the spontaneous play behaviour of children aged 3 to 5 years in the preschool context in order to create a list of play behaviours and to analyse the categories of imitative, exploratory and imaginative play behaviour. Although many specific skills are activated through play, this study proposes a conceptualisation of play that refers to three main functions: imitation, exploration and imagination.

2. Materials and Methods

2.1. Participants

Five public kindergartens (in northwestern Italy) were initially involved (360 pupils), but one school preferred not to give consent due to issues related to the pandemic emergency. We chose not to include children with disabilities because, as aforementioned, this research aims to describe the play behaviours of pupils with typical developmental trajectories [75].

Thus, the final sample consists of 280 pupils aged 3 to 5 years old (M_{age} = 4.5, SD_{age} = 1.8), including 130 girls (46.43%) and 150 boys (53.57%). Ten pupils had a foreign nationality. In general, the children participated in the structured pedagogical activity divided into 28 groups of 10, homogeneous by age and heterogeneous by gender: 8 groups of subjects aged 5 (total: 80 subjects) years old, 11 of subjects aged 4 years old (total: 110 subjects) and 9 groups aged 3 years old (total: 90 subjects). The large sample size also reflects the three age phases already defined and the criteria adopted from recent studies in the argument [76]. During spontaneous play, the children were able to gather in groups, always composed of 10 children, of different ages. Therefore, the free play activities observed for this study were attended by age- and gender-heterogeneous groups. Free play sessions constitute a fundamental moment within the pedagogical approach typically adopted in the Italian preschool: for this reason, it was decided to observe children's behaviour taken

in the context of a fundamental and typical experience of their everyday lives. Free play is proposed in the preschool context by setting up a learning environment characterised by the availability of spaces, materials and toys appropriately identified by the educational team. Children are given complete free rein in the activating and carrying out of the play session, under the supervision of the adult.

In this study, it was decided to observe free play sessions in an educational setting with which the children were familiar, such as the preschool setting. The choice to observe age-heterogeneous groups was, first of all, based on the typical organization of the preschool setting in the Italian context: in most schools, daily activity is organized by alternating phases of structured pedagogical activity, in which children are grouped homogeneously by age, and phases of free play as an unstructured activity, in which children are involved in age-heterogeneous groups. The literature also points out that preschool (3–6 y.) is generally characterised by homogeneous play behaviours, marked mostly by symbolic and imaginative play. Age-related differences in such a small range are not significant: significant changes are observed, but mostly in the transition from preschool to the school period [77].

The observed groups were also heterogeneously composed in terms of gender. Again, this decision was motivated by the need to observe play behaviours expressed in a familiar setting for the child. In the preschool setting, the various structured and unstructured activities are aimed at mixed groups concerning gender. Differences in play due to gender are, moreover, investigated in the literature mainly concerning the preferences expressed for gender-oriented objects and/or toys [78,79], which would be consolidated during the school period [80]. Gibson and other scholars [81] report correlations between gender and play behaviours expressed mainly about language and negotiation skills, without the involvement of the structural components of play, as already highlighted by the research of Kaugars and Russ [82].

2.2. Measurement

2.2.1. Sociodemographic Data

Data collected included gender and age. This information was used to analyse the sample's demographic composition and to control for age-related variations in play behaviour.

2.2.2. Checklist for Imitation, Exploration and Imagination Behaviour for Play Observation (CIEIPO)

Structured procedures are among the most reliable procedures for observing children's behaviour: direct observation using checklists ensures higher validity and reliability [83]. In the present study, the ad hoc construction of a checklist was chosen to capture playful behaviour. We conducted four focus groups with 5 experts in each—preschool teachers and researchers (14 females, 6 males, M_{age} = 41.7, SD_{age} = 8.5, range: 28–59).

Subsequently, the definition of the terms was made, taking into account the relevant literature.

A key challenge highlighted in the focus group discussions was the difficulty of capturing the spontaneous nature of play, with participants emphasising the importance of observing both the frequency and quality of target behaviours. To address these considerations, the study protocol called for the game to be organized in familiar settings such as preschools with minimal adult involvement to maintain ecological validity.

A variety of age-appropriate materials were provided to elicit a wide range of play behaviours, and observations were conducted in a variety of contexts to capture the full range of imitative, exploratory and imaginative actions.

Based on the focus group discussions, specific behaviours corresponding to each of the three categories of play were defined. Imitative behaviour included imitating other children's actions or vocalizations as well as acting out observed play sequences. Exploratory behaviour was characterised by a focus on cause-and-effect relationships, literal use of objects, and an emphasis on discovery and learning. Imaginative play, on the

other hand, was characterised by the symbolic transformation of objects and the inclusion of fantasy elements in the play events.

The observation methodology used in this study offers numerous advantages over other existing methods. It facilitates data collection in a natural context, reducing the influence of external factors and ensuring a more authentic observation of children's behaviour [5,6]. Direct observation is a fundamental tool for understanding the behavioural dynamics of young children and provides a comprehensive picture of their interactions and play modalities. Bergen also highlights the importance of observational methods to capture the spontaneous and authentic behaviour of children in their natural environment [1]. Observing children in familiar settings, such as preschools, provides a holistic understanding of their play experiences and the factors that influence their development [22,39].

Following the focus group discussions, the researchers examined the relevant literature and integrated the practical experiences of the expert participants to refine and expand the definitions of the key terms studied. This comprehensive review process ensured that the operational definitions captured the nuances and complexities of preschool children's observed play behaviour.

The items of imitation, exploration, and imagination behaviour for play are organized according to three dimensions related to imitative, explorative, and imaginative behaviour (Table 1).

The imitative behaviour category consists of 9 specific behaviours (e.g., "the child imitates verbal behaviour", or "the child imitates the model immediately"). The exploration behaviour category includes 7 behaviours, notable examples being "the child explores an unknown stimulus" and "the child explores the natural environment". Finally, the imagination behaviour category is the most extensive, comprising 13 behaviours (e.g., "the child uses objects as if they were something else", or "child selects objects of different types according to gender").

Each dimension is analysed using items (31 in total) that define the observable behaviours. The occurrence (presence/absence of the behaviour), the timing of occurrence of the target behaviour, the context and a narrative description are recorded.

2.3. Procedure

Behavioural coding is performed a posteriori using video recordings of spontaneous play phases of children in preschool contexts. Posterior coding of video recordings was chosen because it ensures a higher degree of objectivity and accuracy [84–86].

A discontinuous type of temporal sampling was conducted: the observation times were sampled in successive intervals of 30′ each. The observation refers to the first 15′ of each interval. In this study, a total of 150 time intervals were recorded, representing 2.250 min of observation time.

Three video cameras were strategically placed in key play areas within the preschool to capture a diverse range of interactions and play behaviours. Recordings were made post-morning reception and before structured activities commenced, ensuring that children's play was spontaneous. These recordings were later analysed by three trained researchers specialising in early childhood behaviour observation.

Table 1. CIEIPO checklist: Imitation, Exploration, Imagination, for Play Observation.

Category	Behaviour/Items	Description
Imitation behaviour	Ii1. The child is a model belongs dominant	The child is a receiving model of imitation activated by other children. One or more children preferentially imitate the behaviour of the child on whom the observation is focused and who is used as a model for the action and play sequences undertaken.
	Ii2. The child is a leader who imposes himself on others	The child is a receiving model for imitation activated by other children. The child actively expresses its willingness to direct the actions of other children according to the sequence it has made, even if it uses imposing methods. It avoids confrontation with other children.
	Ii3. The child imitates the model immediately	The child actively imitates an observed behaviour. Imitation occurs simultaneously with the action demonstrated by the model.
	Ii4. The child imitates the model after a certain time.	The child actively imitates an observed behaviour. Imitation occurs later, after a variable amount of time.
	Ii5. The child imitates verbal behaviour	The child actively imitates an observed behaviour, to verbal type.
	Ii6. The child imitates motor behaviour	The child actively imitates an observed motor behaviour.
	Ii7. The child imitates verbal and motor behaviour.	The child actively imitates an observed behaviour, simultaneously verbal and motor.
	Ii8. The child selects objects that are similar to the attendant	The child actively imitates an observed behaviour, choosing the same type of objects that the imitation model uses.
	Ii9. The child uses different objects from the attendant	The child actively imitates an observed behaviour by selecting objects different from those used by the imitation model himself.
Explorative behaviour	E1. The child explores the natural environment	The exploration activity takes place in an environment that the child finds commonplace (e.g., their own home)
	E2. The child explores in an experimental environment	The exploration activity takes place in a controlled, artificial environment created specifically for the observation activity.
	E3. The child explores in relation to a familiar stimulus	The child explores objects and environments that he or she has already come into contact with and has been able to manipulate and learn about in the past.
	E4. The child explores in relation to an unfamiliar stimulus	The child explores objects, materials, and environments that are completely new and unfamiliar.
	E5. The child explores in relation to a simple stimulus.	The child explores objects and environments characterized by low complexity (e.g., a ball).
	E6. The child explores in relation to a complex stimulus.	The child explores objects and environments characterized by high complexity (e.g., a puzzle).
	E7. The child expresses orienting responses	In the course of the exploration activity, the child exhibits behaviours aimed at positioning him/herself and exploring the surrounding space (e.g., moves toys to make room for him/herself and to reach the adult).
	E8. The child shows locomotor responses	During the course of the exploration activity, the child exhibits behaviours focused on motor practice and exploring their own motor skills (e.g.,: While trying to play with some cones, they try to throw them in the air).
	E9. The child expresses exploratory responses	In the course of the exploratory activity, the child exhibits behaviours aimed at manipulating the object to investigate its use and variations.

Table 1. *Cont.*

Category	Behaviour/Items	Description
Imagination behaviour	Ig1. The child uses objects as if they were something else	The child includes the use of objects in the play sequence, but they are treated and described as if they were something else.
	Ig2. The child uses objects with active functionality	Objects are included in the play sequence with a specific functional role in the activity, as an active interlocutor for the child (e.g., the child interacts with a puppet used during the play sequence).
	Ig3. The child uses objects with a passive function	The child incorporates objects into the play sequence that are used as tools that can add meaning to the actions he or she is performing, even if they do not become objects of interaction (e.g.,: Pretends to drive a car and uses various dolls and puppets as "passengers" but does not create a real interaction with them).
	Ig4. The child selects structured objects	The child includes objects in the play sequence that prefigure the development of the play itself and are characterized by a high degree of structuring. These include common toys.
	Ig5. The child selects unstructured objects	The child includes objects in the play sequence whose precise function of use is not determined a priori. These include toys that are characterized by a low degree of structuring and everyday objects that generally do not have playful functions.
	Ig6. The child selects objects according to gender	The child includes toys in the play sequence that are structured according to deliberately gender-differentiating characteristics.
	Ig7. The child selects objects according to age	The child includes toys and objects with varying degrees of complexity in the play sequence, preferring materials with higher complexity as the child ages.
	Ig8. Actions are performed without speech	The child plays without commenting or verbalizing.
	Ig9. The child performs actions accompanied by sound effects.	The child plays by uttering sounds that accompany the play sequence (e.g., produces the sound "brum brum" when playing with toy cars).
	Ig10. The child performs actions that are supported by dialog.	The child plays by verbally simulating dialogs that intervene in the action sequence.
	Ig11. The child performs actions that are carried out by a single child.	Only one child is involved in the play sequence.
	Ig12. The child performs actions that are performed by multiple children.	Several children are involved in the play sequence at the same time.
	Ig13. The child pretends to do something.	The child performs actions "for appearances" (e.g., pretends to park the car).

2.4. Ethical Approval

This study was approved by the ethical review board of the university. The ethical code of the Italian Association of Psychology (AIP) was followed in this study, and it received approval from the Institutional Review Board (n. 470619). When conducting research with minors, ensuring informed consent and maintaining transparency are of paramount importance [87]. To this end, the parents of all participating children were informed in detail about the aims, methods and potential risks of the study to enable a full understanding and to give them the opportunity to ask any clarifying questions before giving consent. Both parents and teachers were thoroughly informed about the objectives and procedural framework of the study, promoting full transparency and cooperation throughout the process.

To ensure data confidentiality and integrity, robust anonymization protocols were put in place, with personal identifiers deleted and unique alphanumeric codes assigned to each participant. Participants were explicitly informed that they could leave the study at any time without consequences, emphasising the voluntary nature of their participation [88]. During the observation phases, the presence of adults, including teachers and researchers, was intentionally minimal to maintain the ecological validity of the play environment, with an emphasis on non-intrusive monitoring to ensure the safety of the children while avoiding bias in the observations [89].

These ethical safeguards were carefully implemented to maintain the integrity of the research and protect the rights and welfare of the participants throughout the study.

2.5. Data Analysis

The behaviour recorded in the video recordings was coded using a CIEIPO checklist to ensure that observation data are reliable and objective. The first coding round was carried out initially by the primary researcher. Two other researchers, both experienced in observation of early childhood behaviour but not involved in the development of checklists, independently applied the CIEIPO checklist to the same set of data with a view to enhancing the robustness of this analysis. Inter-rater reliability was assessed by calculating Cohen's Kappa among the three coders' results to determine the consistency of behavioural coding across different observers. As a result, the Kappa values for imitation and imagination behaviours ranged between 0.81 and 0.96 in this process, suggesting that there is broad agreement among researchers on the correctness of the coding scheme.

To further assess the validity and reliability of the instrument, an exploratory factor analysis was conducted on a series of 31 items representing the three types of play activities: Imitation, Exploration and Imagination. The Kaiser–Meyer–Olkin measure was used to check for sampling adequacy for the analysis, and Bartlett's test for sphericity was performed to ensure that the correlations between items were sufficiently large for the exploratory factor analysis.

Following the exploratory factor analysis, Cronbach's Alpha was calculated for each of the three identified factors to assess the internal consistency and reliability of the instrument.

A cluster analysis was also conducted to examine possible groupings of children based on their behavioural frequencies. The data were standardized to ensure that all variables contributed equally to the clustering process. A hierarchical clustering method was then used to determine the optimal number of clusters, and a k-means clustering algorithm was applied based on the hierarchical clustering results to classify the children into different clusters.

3. Results

3.1. Exploratory Factor Analysis (EFA)

In the current study, an exploratory factor analysis was conducted on a set of 31 items representing these three types of play activities. The Kaiser–Meyer–Olkin measure verified the sampling adequacy for the analysis, KMO = 0.85, which is well above the acceptable

limit of 0.6. Bartlett's test of sphericity was significant ($\chi^2 = 2345.6$, *p* < 0.001), indicating that correlations between items were sufficiently large for EFA (See Table 2) [90].

Table 2. Factor loadings from exploratory factor analysis (EFA).

Behaviour/Items	Factor 1 (Imitation)	Factor 2 (Exploration)	Factor 3 (Imagination)
Ii1. The child is a model belongs dominant	0.72		
Ii2. The child is a leader who imposes himself on others	0.81		
Ii3. The child imitates the model immediately	0.69		
Ii4. The child imitates the model after a certain time.	0.63		
Ii5. The child imitates verbal behaviour	0.54		
Ii6. The child imitates motor behaviour	0.76		
Ii7. The child imitates verbal and motor behaviour.	0.61		
Ii8. The child selects objects that are similar to the attendant	0.65		
Ii9. The child uses different objects from the attendant	0.58		
E1. The child explores the natural environment		0.68	
E2. The child explores in an experimental environment		0.73	
E3. The child explores in relation to a familiar stimulus		0.75	
E4. The child explores in relation to an unfamiliar stimulus		0.72	
E5. The child explores in relation to a simple stimulus.		0.78	
E6. The child explores in relation to a complex stimulus.		0.70	
E7. The child expresses orienting responses		0.64	
E8. The child shows locomotor responses		0.67	
E9. The child expresses exploratory responses		0.80	
Ig1. The child uses objects as if they were something else			0.81
Ig2. The child uses objects with active functionality			0.77
Ig3. The child uses objects with a passive function			0.72
Ig4. The child selects structured objects			0.68
Ig5. The child selects unstructured objects			0.74
Ig6. The child selects objects according to gender			0.70
Ig7. The child selects objects according to age			0.64
Ig8. Actions are performed without speech			0.69
Ig9. The child performs actions accompanied by sound effects.			0.78
Ig10. The child performs actions that are supported by dialog.			0.73
Ig11. The child performs actions that are carried out by a single child.			0.71
Ig12. The child performs actions that are performed by multiple children.			0.68
Ig13. The child pretends to do something.			0.80

The analysis revealed a three-factor solution based on eigenvalues greater than 1 and the scree plot. These three factors correspond to the predefined dimensions of play activities: imitation, exploration, and imagination.

3.2. Reliability Analysis

To evaluate the reliability of this instrument, the researchers calculated Cronbach's Alpha for each of the three identified factors.

For the imitation behaviour factor, the Cronbach's Alpha coefficient was 0.78, indicating good internal consistency. This suggests that the items within this factor are well correlated and reliably measure the construct of imitative behaviour in children.

The exploratory behaviour factor demonstrated a Cronbach's Alpha coefficient of 0.82, which is considered to be very good. This high level of internal consistency indicates that the items grouped under this factor are strongly related and collectively measure the exploratory behaviours effectively.

Similarly, the imagination behaviour factor showed a Cronbach's Alpha coefficient of 0.80, reflecting good internal consistency. This suggests that the items associated with imaginative behaviour are well correlated and consistently measure the intended construct.

The consistency across the items within each factor supports the validity of the three-factor structure, confirming that the instrument is a reliable tool for assessing the different dimensions of children's play behaviours.

The analysis revealed a three-factor solution based on eigenvalues greater than 1 and the scree plot. These three factors correspond to the predefined dimensions of play activities: imitation, exploration, and imagination.

3.3. Frequency of Coded Behaviours

Table 3 shows the frequency of the children's behaviours studied, described according to the three types of play activities presented above: imitation, exploration, and imagination. As can be seen, exploratory behaviour is the most frequently noted behaviour type (1500 occurrences or 43.6% of the total), followed by imaginative behaviour (1360 o. or 39.5% of the total). Imitative behaviour is coded 580 times in total (16.9%).

3.4. Cluster Analysis

To explore potential groupings of children based on their behaviour frequencies, a cluster analysis was performed. The data were first standardized to ensure all variables contributed equally to the clustering process. A hierarchical clustering method was used to determine the optimal number of clusters. The dendrogram suggested that a three-cluster solution was appropriate (See Figure 1). Based on this, k-means clustering was applied to classify the children into distinct clusters.
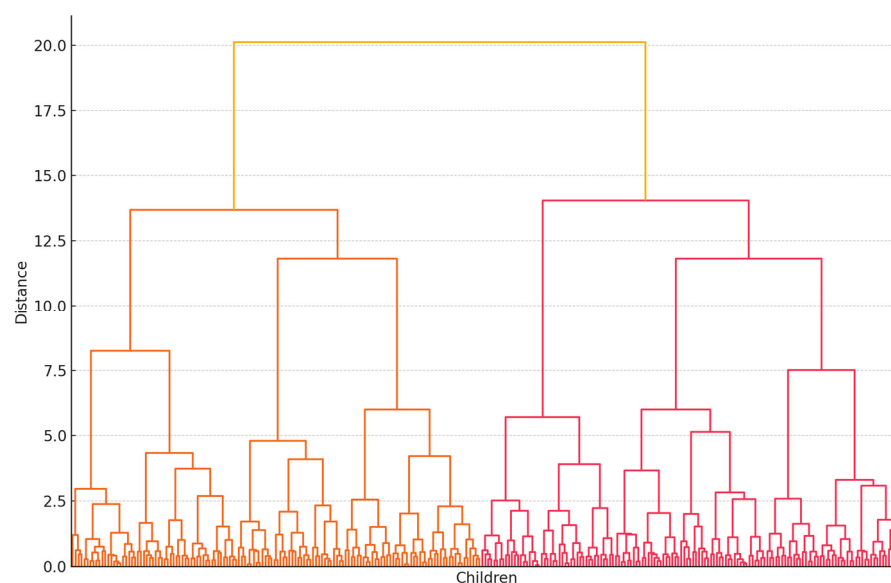

Figure 1. Dendrogram of the hierarchical clustering.

Table 3. Frequency of coded behaviours.

Category	Behaviour/Items	Occurrences (Absolute Frequencies)	Percentage Frequencies (of Total Coding Done)
Imitation behaviour	Ii1. The child is a model belongs dominant	90	2.6%
	Ii2. The child is a leader who imposes himself on others	110	3.2%
	Ii3. The child imitates the model immediately	80	2.3%
	Ii4. The child imitates the model after a certain time.	60	1.7%
	Ii5. The child imitates verbal behaviour	20	0.6%
	Ii6. The child imitates motor behaviour	110	3.2%
	Ii7. The child imitates verbal and motor behaviour.	30	0.9%
	Ii8. The child selects objects that are similar to the attendant	70	2%
	Ii9. The child uses different objects from the attendant	10	0.3%
	Total coding assigned to the Imitation Behaviour dimension	**580**	**16.9%**
Explorative behaviour	E1. The child explores the natural environment	0	0%
	E2. The child explores in an experimental environment	0	0%
	E3. The child explores in relation to a familiar stimulus	230	6.7%
	E4. The child explores in relation to an unfamiliar stimulus	160	4.6%
	E5. The child explores in relation to a simple stimulus.	150	4.4%
	E6. The child explores in relation to a complex stimulus.	190	5.5%
	E7. The child expresses orienting responses	140	4.1%
	E8. The child shows locomotor responses	190	5.5%
	E9. The child expresses exploratory responses	440	12.8%
	Total coding assigned to the Explorative behaviour dimension	**1500**	**43.6%**

Table 3. *Cont.*

Category	Behaviour/Items	Occurrences (Absolute Frequencies)	Percentage Frequencies (of Total Coding Done)
Imagination behaviour	Ig1. The child uses objects as if they were something else	220	6.4%
	Ig2. The child uses objects with active functionality	40	1.2%
	Ig3. The child uses objects with a passive function	80	2.3%
	Ig4. The child selects structured objects	-	0%
	Ig5. The child selects unstructured objects	130	3.8%
	Ig6. The child selects objects according to gender	190	5.5%
	Ig7. The child selects objects according to age	10	0.3%
	Ig8. Actions are performed without speech	0	0%
	Ig9. The child performs actions accompanied by sound effects.	90	2.6%
	Ig10. The child performs actions that are supported by dialog.	90	2.6%
	Ig11. The child performs actions that are carried out by a single child.	80	2.3%
	Ig12. The child performs actions that are performed by multiple children.	170	4.9%
	Ig13. The child pretends to do something.	260	7.5%
	Total coding assigned to the Imagination behaviour	1360	39.5%
	Total coding done	**3440**	**100%**

The clusters revealed distinct patterns of behaviour among the children. Cluster 1 consists of children with moderate imitation and high exploration and imagination scores. Cluster 2 comprises children with high imitation scores and moderate exploration and imagination scores. Cluster 3 includes children with moderate imitation and exploration scores but high imagination scores (See Table 4).

Table 4. Summary statistics of clusters.

Cluster	Number of Children	Mean Imitation Score	Mean Exploration Score	Mean Imagination Score
1	93	70.1	210.3	140.2
2	94	120.5	160.8	100.4
3	93	90.2	180.7	160.5

The most frequently used item regarding exploratory behaviour is "The child expresses exploratory responses" (440 mentions, or 12.8%). Also, compared to the total number of mentions, this item is the most frequently used.

Regarding imaginative behaviour, the most frequently used item is "Pretending to do something" (260 mentions, i.e., 7.5% of the total). In contrast, in terms of imitative behaviour, the items "The child is a leader who imposes themselves on others" and "The child imitates motor behaviour" were the most frequently used, each with 110 mentions (3.2%).

4. Discussion

The checklist is sufficiently comprehensive with regard to the behaviour in question, although imitative behaviour is represented to a lesser extent. The above differences may be attributed to the observation context because the natural nature of preschool children might lean more towards exploratory and imaginative play in the familiar school environment.

Imitative behaviour was expressed less frequently than participants expected; however, in the coded occurrences, all items in the category were used to describe the behaviour in question. The comprehensive nature of the checklist ensures that even less frequently observed behaviours are adequately captured. As can be seen, the most frequently coded items in the imitative behaviour domain concern the adoption of leadership behaviour (Ii2) and imitation of motor behaviour (Ii6); this is also consistent with the trend reported in the literature emphasising the importance of imitation of motor and social behaviour at preschool age [91,92]. In only one case was imitation observed with objects other than the accompanying person. These patterns confirm what emerges from the literature on the subject, which emphasises the role of imitation in the preschool period in learning social relationships and in understanding the attitudes underlying leadership [93]. Imitation of motor behaviour would also appear to be reinforced when the model is provided by an important influence figure [94].

With regard to exploratory behaviour, the items for coding the observation environment (E1: "In the natural environment" and E2: "In the experimental environment") were not applied, as all observations took place in the same context, namely in the everyday school environment.

As described in the literature on the importance of exploratory behaviour at preschool age [95], exploratory behaviour was the most frequently observed type of behaviour: Item E9 ("The child shows exploratory reactions"), in particular, was used most frequently (440 responses). Compared to the school environment, the children showed more exploratory behaviour aimed at discovering new ways of handling objects and materials. This behaviour is evidently a common occurrence in early childhood, thus placing it at the centre of cognitive and motor development. All items were also used for this behavioural category, with the exception of the special cases mentioned, which represents sufficient operational completeness with regard to the construct under investigation.

Imaginative behaviour also had a high number of occurrences (1360 or 39.5% of the total coded behaviours). In this case, two of the proposed items were not used: Items Ig4 ("Selection of structured objects") and Ig8 ("Actions without use of language"). As we have seen, the most frequently occurring aspect refers to "pretending to do something" (item Ig13), which refers to real symbolic play actions. This high frequency corresponds with the knowledge that symbolic play is an important aspect of a child's growth, especially in the areas of emotional and social growth [6,49].

Although there is some imbalance in the use of codes related to exploratory and imaginative behaviours, which were selected more frequently than items describing imitative behaviours, the CIEIPO checklist adequately and exhaustively represents the wide range of possible playful behaviours observed in the preschool context.

The high coding frequency of exploratory behaviours also confirms that these behaviours do not decrease with growth, but change and expand over time [96]. This finding is significant as it highlights the dynamic nature of play and its evolving complexity with age. Although the children had already been discovering and manipulating the typical materials of the visited department for several months (the surveys were conducted in the second half of the school year), the playful behaviours of the students of the different age groups were characterised by exploratory behaviours in constant but varying degrees from time to time.

Overall, the CIEIPO checklist thus presents itself as an instrument with a good degree of completeness: for all three operationalized behaviours, the proposed items were applicable in almost all cases, with the exception of two items (E1 and E2) on exploratory behaviour, which is due to the specificity of the observation context, and two items (Ig4 and Ig8) on imaginative behaviour.

However, the frequency of occurrence of exploratory and imaginative behaviour compared to imitative behaviour is an aspect to be investigated depending on the structure of the instrument, as a more even distribution of observed behaviour across the three categories was expected based on the data available in the literature [97,98].

Finally, the positive cooperation and the ability of the participants to interact and familiarise themselves with the experts should be emphasised. Hence, the successful endeavour points to the practicability of the CIEIPO checklist in educational settings.

The cluster analysis further enriched our understanding by identifying distinct patterns of play behaviour among children. Three clusters emerged from the data.

Cluster 1 consisted of children with moderate imitation and high exploration and imagination scores, exhibiting a balanced approach to play with a strong inclination towards both exploratory and imaginative activities [43]. This profile suggests that these children are well rounded in their play behaviours, actively engaging with their environment while also demonstrating high levels of creativity and symbolic play.

In contrast, Cluster 2 comprised children with high imitation scores and moderate exploration and imagination scores [47]. This pattern might be particularly beneficial in contexts where learning through observation and social interaction is emphasised, highlighting the importance of role models and peer interactions in these children's play [3].

Lastly, Cluster 3 highlighted children with moderate imitation and exploration scores but high imagination scores. These children predominantly engage in imaginative play, suggesting a rich internal world and creative expression. Such children may benefit from environments that provide ample opportunities for imaginative play, supporting their creative development and offering spaces where their rich fantasy lives can be expressed and expanded.

These findings indicate that while all three play dimensions were present across the sample, individual children may exhibit preferences or strengths in different types of play [78]. This differentiation has important implications for educational practices, as tailored approaches that cater to the dominant play behaviour of each child could enhance learning and development outcomes [38]. Incorporating diverse play experiences that

foster a range of skills and cognitive abilities may be a valuable approach to promoting holistic child development [82].

5. Limitations

The checklist has good features of completeness in relation to the behaviours of interest, especially in relation to imaginative and exploratory behaviours. This conceptualisation of play behaviour based on three main dimensions (imaginative, exploratory, imitative) is also an original proposal compared to the codifications usually proposed in the literature, which focus more on the operationalization of the symbolic and interactive components of play [70,71,98,99] or on the specific observation of imitative behaviour alone, especially in atypical developmental situations [100]. In the future, further statistical methods could be proposed to test the construct validity of the checklist.

While our study yielded valuable insights into children's play behaviours and attitudes, a key limitation was the restricted demographic data, which was limited to gender and age. Recognising the need for a more comprehensive understanding, we acknowledge that future research should incorporate additional demographic variables, such as family background, context and cultural diversity, to enrich the analysis.

Moreover, the lower representativeness of the imitative behaviour indicators should be noted: future work needs to investigate whether this is an effect related to variables such as the age of the participants by extending the study to the 0–3 age group as well, or whether it is due to aspects of the operationalization of the instrument.

Overall, the checklist is characterised by a good index of inter-rater agreement, an aspect that makes it possible to positively evaluate its use in similar study contexts.

Institutional Review Board Statement: The study was conducted in accordance with the Declaration of Helsinki, and approved by the Institutional Review Board of University of Turin (protocol code 0318535).

Informed Consent Statement: Informed consent was obtained from all subjects involved in the study.

Data Availability Statement: The data are available by contacting the corresponding author.

Conflicts of Interest: The authors declare no conflict of interest.

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