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# CREATIVITY AND EXECUTIVE FUNCTIONS IN YOUNG CHILDREN WITH AUTISM SPECTRUM DISORDERS

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**Abstract:** Creativity is a key skill in child development, whether we are referring to socio-emotional, communication, or academic skills. Children with Autism Spectrum Disorder (ASD) exhibit an atypical creativity profile, with a series of deficits in cognitive flexibility and fluency, while attention to detail, for example, is highly developed. The relationship between creativity and executive functions that could impact how children with ASD express their creativity has been little explored. In our study, which is based on eight case studies, we set out to investigate the types of creativity (verbal/figural) and examine the extent to which they are affected: rapid naming, understanding instructions, drawing fluency, and visual attention in children with autism aged 4-7 years. We also sought to identify the extent to which there is a relationship between components in the visual attention, drawing fluency and figural creativity, and between components in rapid naming, understanding instructions and verbal creativity. The results showed a distinctive profile of creativity and executive functions across participants. However, our study showed better figural creativity compared to verbal creativity and a link between visual attention, drawing fluency, and figural creativity, as well as between understanding complex instructions and verbal creativity in most participants.

**Key words:** creativity, executive functions, autism spectrum disorders

## 1. Introduction

Creativity consists in generating ideas or products that are useful, appropriate, and add value in specific situations or contexts (Hennessey & Amabile, 2009). Achieving creative outcomes depends not only on individual abilities but also on how experts and society evaluate creativity, highlighting the crucial influence of the surrounding environment. Kaufman and Glăveanu (2021) capture the complexity of defining creativity and highlight a consensus among researchers in the field of creativity on defining the concept, seeing it as a process that involves novelty and originality on the one hand, and on the other hand having the characteristic of being appropriate to the task.

From a developmental perspective, creativity is viewed as a dynamic construct that evolves alongside cognitive, emotional, and social maturation, leading to observable changes in students' creative potential over time (Claxton et al., 2005). Their longitudinal research has examined how creativity changes across developmental stages, exploring whether it tends to increase, decrease, or stabilize as children mature. Evidence points to a possible stabilization or moderate growth during adolescence, with different components of creativity, such as fluency, flexibility, and creative attitude, showing distinct patterns of evolution. While divergent thinking factors (flexibility, originality, fluency) remained relatively stable from 4th to 9th grade, scores on "divergent feelings" tests showed a significant increase, with older students having a more open attitude toward novelty and being more creative. The study emphasizes the dynamic nature of creativity, the influence of developmental stages, and the importance of the educational environment in developing children's creative potential. Other studies investigate the potential role of cognitive flexibility in learning. For instance, Stad et al. (2018) found a positive correlation between cognitive flexibility and the performance of children aged 6 to 7, emphasizing cognitive flexibility as a key skill influencing young children's learning potential.

Research on children with autism spectrum disorder (ASD) often examines two main forms of creativity: verbal and figural. Findings suggest that while children with ASD may experience certain deficits in creative performance, they tend to display an atypical creative profile characterized by

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reduced fluency and flexibility, alongside heightened originality and attention to detail (Pennisi et al., 2020). Studies show that children with ASD focus more on concrete and realistic aspects, demonstrating an ability to generate innovative modifications related to the functionality of objects, while facing challenges in producing imaginary or metaphorical ideas (Craig & Baron-Cohen, 1999; Kasirer et al., 2020).

Several studies suggest that children with ASD have a creative potential. In a study comparing children with ASD to typically developing peers, Hetzroni et al. (2019) examined both general and mathematical creativity, finding evidence of creativity in both domains among children with ASD. Language and communication represent another domain in which creativity has been explored. Kasirer and Marshal (2019) reported that children with ASD produced a higher number of creative metaphors, suggesting enhanced verbal creativity. Moreover, stronger language abilities appear to be associated with better creative performance (Pennisi et al., 2020).

The ability to generate new metaphors, for example, involves a series of higher-order cognitive resources, with an emphasis on the impact of executive functions (Beaty & Silvia, 2012). Executive functions are an umbrella term that encompasses inhibition, working memory, and cognitive flexibility, through which it is possible to mentally manipulate ideas, think before acting, resist certain temptations that may arise in the environment, and maintain concentration (Diamond, 2012).

Closely related to these executive processes are various forms of attention, which play a fundamental role in supporting goal-directed thinking and creative performance. Attention refers to the ability to maintain focus on a specific task, while attentional control refers to the capacity to select relevant information and disregard distractions. Children with ASD may experience challenges in sustaining attention during learning tasks, particularly when these tasks fall outside their sphere of interest. Within this framework, selective attention becomes especially important, as it enables individuals to focus by filtering out competing stimuli (Rabi et al., 2019). Similarly, visual attention involves sustaining focus on meaningful visual cues while suppressing irrelevant ones (Goldstein, 2025). Building on this connection, rapid naming tasks represent a point of convergence between executive functions, such as attention and working memory, and linguistic abilities, including lexical access. Difficulties in these integrative processes are often observed in children with ASD, who may produce more errors and require longer response times during rapid naming tasks. Such lower performance has been linked to challenges in social communication and adaptive language use (Nayar et al., 2018).

The relationship between creativity and executive functions has been little explored in children with ASD. Most studies involve typically developing adults. Pasarín-Lavín et al. (2023) mention cognitive flexibility, inhibition, working memory, and planning as executive functions involved in the creative process. Existing studies suggest a complex relationship between creativity and executive functions based on both deficits and a unique profile. Thus, the evidence suggests an essential role for executive functions, with cognitive flexibility, for example, being positively correlated with creativity (Pasarín-Lavín et al., 2023).

Armitage et al. (2023) conducted a study examining the developmental trajectory of cognitive flexibility in children. The research followed participants aged 3 to 8, assessing their ability to spontaneously generate and apply external strategies across contexts in an experimental task where they learned to locate a hidden reward using an external cue (marking the spot). The results indicated that three-year-old children tended to replicate the demonstrated strategy without showing the flexibility needed to adapt to a new task. From the age of four, however, flexibility began to increase, and by ages six to eight, children exhibited both cognitive flexibility, reflected in their capacity to modify strategies in response to changing contexts, and creativity, demonstrated through the generation of novel solutions to atypical problems. These findings suggest that as cognitive flexibility develops, children become increasingly capable of producing new and original responses.

Education represents another key domain in which numerous implications of creativity have been identified. Creativity is recognized as an essential skill for the century we live in and it impacts academic skills, whether we are talking about reading, comprehension, or written tasks (Tzachrista et al., 2023b, Suyuti, 2024; Barus, 2024).), as well as socio-emotional skills such as empathy, which is closely linked to creative performance (Smees et al., 2024). In the study published by Tzachrista et al.

(2023), improving problem-solving skills, strengthening memory, communication, and expression are some of the skills mentioned that may be influenced by creativity. This study addresses how creativity can impact academic performance through executive functions, and based on the results, a significant positive relationship between creativity and educational competence was highlighted. This relationship was found mainly in reading, comprehension, and writing tasks (Tzachrista et al., 2023).

Previous studies on creativity in ASD have tended to examine verbal and figural creativity separately or have focused on global creative performance, offering limited insight into the specific profiles of verbal versus figural creativity in young children with ASD. Moreover, the relationship between distinct executive components, such as rapid naming, understanding instructions, drawing fluency, and visual attention, and creativity has rarely been investigated within the same sample, making it difficult to clarify how these processes jointly shape creative outcomes in ASD. Existing work has also seldom addressed fine-grained links between particular executive functions and corresponding creativity domains (e.g., rapid naming with verbal creativity, drawing fluency or visual attention with figural creativity), resulting in a fragmented understanding of these associations. In addition, most studies rely on school-aged children or adults, leaving a gap regarding early developmental profiles in younger children and the potential educational implications of these specific EF–creativity links.

## 2. Methodology

### 2. 1. Objectives and research questions

The **overall objective** of the study was to investigate the link between creativity and executive functions.

To this end, the following **specific objectives** were formulated:

1. Investigating types of creativity (verbal creativity, figural creativity) in children with ASD aged 4-7 years.
2. To examine executive functions (rapid naming, understanding instructions, drawing fluency, visual attention) in children with autism.
3. To investigate the impact of executive functions (rapid naming, understanding instructions, drawing fluency, visual attention) on the two types of creativity (verbal, figural) in children with autism.
4. To identify the relationship between understanding instructions/rapid naming and verbal creativity.
5. To identify the relationship between drawing fluency/visual attention and figural creativity.

To achieve these objectives, the research was guided by the following **questions**:

- What are the particularities of creativity (verbal/figural) in ASD?
- What are the particularities of executive functions (rapid naming, understanding instructions, drawing fluency, and visual attention) in ASD?
- To what extent is there a relationship between visual attention and figural creativity?
- To what extent is there a relationship between drawing fluency and figural creativity?
- To what extent is there a relationship between rapid naming and verbal creativity?
- To what extent is there a relationship between understanding instructions and verbal creativity?

### 2. 2. Instruments and working procedure

To assess verbal creativity, figural creativity, and executive functions, a series of instruments were used that were considered appropriate for the purpose of the research. Some tasks required translation from English into Romanian. To assess **verbal creativity**, we adapted and then applied the items from the work conducted by Levorato and Cacciari in 2002. These items were designed to study children's ability to create new expressions defining common actions and common emotions. We gave the children a list of nine common actions and nine common emotions. The original wording of the evaluator was *"Please create and write a new expression that is understood more within the group of*

*colleagues than outside it"* (Levorato & Cacciari, 2002), but the level of difficulty was too high given the particularities, age, and the fact that all participants included in the study had not yet fully acquired the ability to write. As a result, we made a series of adjustments to the task. We asked them to tell us what they understood by the actions and emotions listed, asking them several helpful questions depending on the level of each participant (for example: *"How would you say it? What does it mean to be...?"*). In this way, we tried to study the ability of children (aged 4 and 7) to create new expressions that indicate common actions and emotions. In the task, we observed whether the participants used a literal or figurative expression, or whether they produced a new expression, or to paraphrase and create simple expressions. When analyzing the responses, the evaluator had to classify the responses either as literal or figurative expressions and then classify them into subcategories. The literal expressions category included paraphrases, examples, causes/consequences, while the figurative expressions category included synecdoche/metonymy, transparent metaphors, opaque metaphors, and conventional idioms.

To assess **figural creativity**, we adapted and applied the Non-Existent Object Drawing Test (Kasirer et al., 2020). In the first phase, we asked the children to draw a house, then asked them to turn the sheet over and draw a house that does not exist. Many of the evaluated children had difficulties in understanding the concept of an imaginary house, so we decided to adapt the task to ensure that each participant understood it. Examples of questions and adaptations of the task: *"Now please draw a strange house/a house you don't see on the street/a funny house/a house you've only seen in cartoons"*, etc. The evaluator analyzed the drawings and interpreted them as being more or less creative depending on the changes the participants made to the drawings. Changes in shape, size, deletion of components, or changes to the entire shape were considered simple changes, while those that included the insertion of new elements, or changes in the way certain elements were positioned or oriented, as well as insertions between certain categories, were considered complex because they involve higher executive functions (Kasirer et al., 2020).

To assess **executive functions**, we used a series of subtests from the NEPSY neuropsychological assessment battery (Korkman et al., 2007). The NEPSY battery is a complex clinical tool that allows the investigation of cognitive functions in children aged between 3 and 12 years. It comprises five testing areas: attention/executive functions, memory and learning, language, sensorimotor functioning, and visuospatial processing. The subtests we applied were: Visual Attention, Drawing Fluency (Domain: Attention/Executive Functions) and Understanding Instructions, Rapid Naming (Domain: Language).

### 2. 3. Description of subtests

The **Understanding Instructions** subtest measures the child's ability to understand and respond quickly to increasingly complex verbal instructions. During the task, the child must listen carefully to instructions that increase in difficulty progressively, process them sequentially, and then successfully carry them out correctly.

The **Visual Attention** subtest measures the speed and accuracy with which the child can direct and maintain attention on visual targets within a defined area. During the task, the child receives a board containing several symbols, and their task is to identify only certain specific visual targets. The subtest involves the child's ability to quickly scan the board and select only the relevant targets, ignoring a series of distractors present on it.

The **Drawing Fluency** subtest assesses the child's ability to generate as many unique patterns as possible by connecting a maximum of 5 points within two areas: one structured and one unstructured. In the study, we only applied the template for the structured area. The subtest assesses the child's ability to quickly produce varied patterns, avoiding repetition of previous patterns.

The **Rapid Naming** subtest assesses the ability to quickly identify and name things (shapes, colors, sizes). During the task, the child must provide correct answers in the shortest possible time, requiring rapid lexical access and processing speed.

## 2. 4. Procedure

The study was run in conformity with the ethical standards required by the Ethical Committee of Babeș-Bolyai University. Participation in the study was voluntary, and prior to the start of the sessions, the consent of each child's parent was requested. The assessment was carried out in two individual sessions for each participant. In the first session, we attended and actively participated in the children's therapy sessions (behavioral therapy, physical therapy, art therapy, etc.): we got involved in activities, played with the children to create a friendly and safe environment, and to help the children get used to our presence. In the second session, the tests and tasks mentioned above were actually administered. The total administration time for tests and tasks was approximately 60 minutes for each participant. All assessments were conducted using paper-and-pencil materials. For seven of the participants, the subtests were administered at the private center they attend, in the therapy rooms, in the presence of a psychopedagogue/psychologist/physical therapist. For one of the children, the tests were administered at home, in the presence of the mother. The subtests and tasks were administered in the form of a game, in an atmosphere that did not constrain or cause discomfort to the child, and where necessary, breaks were taken so as not to overburden the child.

## 2. 5. Participants

Ethical standards and personal data processing rules in accordance with the GDPR were observed in the preparation of their case studies. Eight children were included in the study based on the following criteria: they had to be diagnosed with ASD, age between 4 and 7 years (mean age=5.8 years), and in terms of their verbal skills, children were supposed to have the minimal abilities to form simple sentences at least two words. All participants were enrolled in mainstream education. Two participants are in grade 0 at school, and the other 6 are in kindergarten in the older group.

## 2. 6. Description of case studies

Children present a wide range of developmental profiles characteristic of ASD, highlighting a series of abilities and deficits. From a social point of view, it is noteworthy that many of the participants are cheerful and sociable, showing interest in socializing with their peers by greeting them and asking questions, while other children need support to initiate interaction or to maintain eye contact. A number of skills are currently being developed, such as voluntarily sharing objects, understanding social cues and rules, and waiting their turn, while difficulties in maintaining friendships and managing emotions or frustration are also evident.

In terms of language skills, some children show impressive improvements in vocabulary and conversation skills, while others show deficits in grammar, difficulties in connecting words, or deficits in coherence and fluency of expression. Some children manage to communicate functionally, communicating clearly and asking questions, while others exhibit echolalia and use gestures to attract the attention of their interlocutors. The children's receptive language level allows them to follow simple instructions, but when it comes to tasks and activities involving complex instructions, they need support in the form of either repetition of the instructions or additional explanations.

Regarding cognitive development, children show curiosity and perseverance, and improvements in attention and memory skills are noticeable. Children know numbers, letters, and everyday objects, and at the centers they attend, they actively participate in tasks involving sorting, classifying, and problem solving. For some of them, maintaining concentration during tasks remains one of the challenges they experience. Motivation fluctuates, with improvements being observed based on systematic support and encouragement, emphasizing the need for activities that are personalized, engaging for each child, and lead to the unlocking and manifestation of creative thinking.

Self-care and motor skills (gross and fine) show varying levels of development. Most children manage to perform basic daily routines (eating, dressing) with varying degrees of support. They have good abilities in fine motor skills such as writing, coloring, and manipulating objects, as well as in tasks involving gross motor skills such as jumping and balancing. These motor skills can be a component that facilitates physical involvement in creative tasks or games. Viewed as a whole, this diversity in development can highlight the complexity of creativity in children with ASD. The abilities of the

children described above, based on curiosity in communication, the manifestation of a desire for social interaction (in certain cases), or improved motor skills, are manifested alongside elements within the same areas of development in which there are a number of deficits that require personalized support, which may suggest the need for an approach based on both abilities and deficits, on the particularities of each child, as well as on those common patterns in development when stimulating creativity is targeted.

## 3. Results

### 3. 1. Nepsy subtests

#### 3. 1. 1. Rapid naming

Participants' scores ranged from 44 to 60 points, with most demonstrating good or very good rapid naming skills within a time range of 1:11 to 3:00 minutes. Most participants completed the task with no errors or with a minimal number of errors. Through observation, a series of behaviors were noted, such as hand movements, body movements, and fluctuations in voice volume. The results highlight good skills in naming things quickly.

#### 3. 1. 2. Understanding instructions

Based on the scores, very good results were highlighted in terms of simple instructions (items 1-13), with participants scoring close to the maximum value. When it came to understanding complex instructions (items 14-28), participants encountered a number of difficulties, with performance declining significantly (see Figure 1). P1, for example, scored 7/15 points, and P4 failed to answer any of the complex items correctly. The number of requests to repeat the instructions varied, with some participants requesting multiple repetitions. Qualitative observations included body movements and movements of the board. Figure 2 illustrates the overall results of participants' understanding of instructions (total: simple and complex).

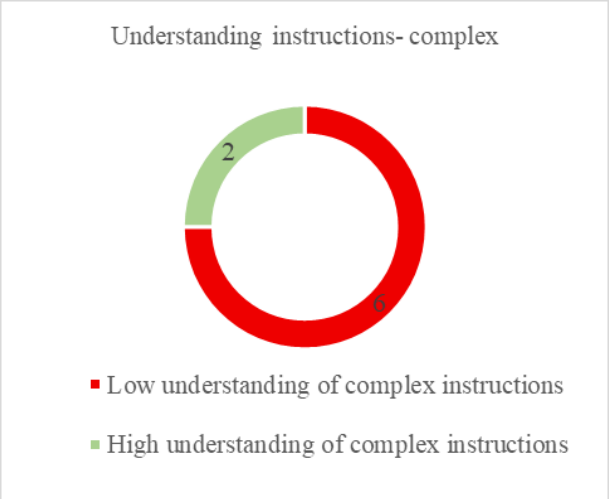



**Figure 1.** *Children's performance in understanding complex instructions*

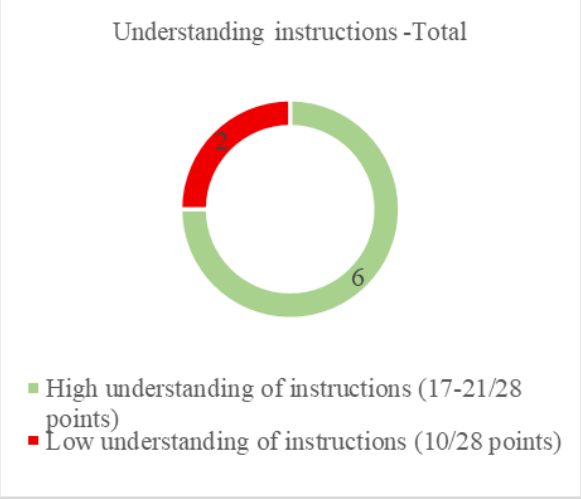



**Figure 2.** *Children's performance in understanding instructions- Total (Simple/Complex)*

#### 3. 1. 3. Drawing fluency

In terms of drawing fluency in the test administered, a number of difficulties were highlighted in generating unique patterns, with participants' scores ranging from 3 to 10 unique patterns out of a maximum of 35. Based on the scores, limitations were noted in the ability to produce varied visual patterns marked by novelty and uniqueness.

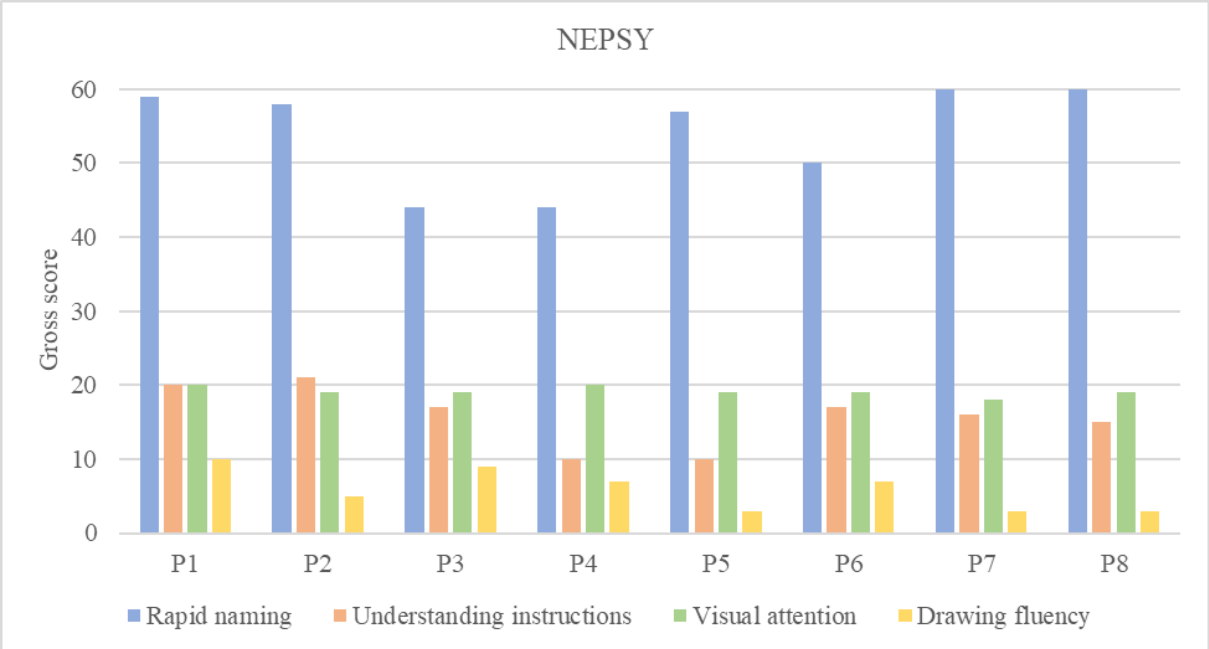
### 3. 1. 4. Visual attention

In the test focusing on visual attention, a high degree of uniformity was noted in the participants' performance, with most of them managing to accurately identify the visual targets (cats) within the structured area (18-20 cats out of a total of 20). There were variations in the time it took participants to complete the task, but no significant errors or difficulties were noted, indicating effective selective attention and sustained concentration among the study participants.

Tabel 1 and Figure 3 summarises the scores in executive functions abilities of all participants.

**Table no. 1** *NEPSY results of participants*

| Participant | Rapid naming (score/ time) | Understanding instructions (simple/ complex/ total) | Drawing fluency (unique/ total) | Visual attention (score/ time) |
|---|---|---|---|---|
| P1 | 59/60 (2:22) | 13/13, 7/15 (20/28) | 10/35 | 20/20 (1:00) |
| P2 | 58/60 (1:26) | 13/13, 8/15 (21/28) | 5/35 | 19/20 (2:33) |
| P3 | 44/60 (2:13) | 13/13, 4/15 (17/28) | 9/35 | 19/20 |
| P4 | 44/60 (2:36) | 10/13, 0/15 (10/28) | 7/35 | 20/20 |
| P5 | 57/60 (1:17) | 8/13, 2/15 (10/28) | 3/35 | 19/20 (2:02) |
| P6 | 50/60 (3:00) | 9/13, 8/15 (17/28) | 7/35 | 19/20 (1:39) |
| P7 | 60/60 (2:35) | 12/13, 4/15 (16/28) | 3/35 | 18/20 (3:00) |
| P8 | 60/60 (1:11) | 10/13, 5/15 (15/28) | 5/35 | 19/20 (1:40) |




The highest score possible: Rapid naming= 60, Understanding instructions=28, Visual attention, Drawing fluency= 25)

**Figure 3.** *Results of all participants in the NEPSY subtests*

## 3. 2. Creativity tasks

### 3. 2. 1. Figural creativity

In the case of figural creativity, there were notable variations in the participants' performance (see Figure4). P1 and P2 showed a high level of creativity based on the complex changes made to the drawing. In the case of P1, these modifications consisted of changing the shapes of the windows, inserting new elements (a smaller door), each window was drawn with a different shape, dots were added to the roof, and in the case of P2, changes in the shape of the house, changes in orientation (a sloping house), and overlapping windows on the roof were highlighted.

On the other hand, the changes made by P3 and P4 were considered simple changes based on repeating the original drawing, which indicates a low level of figural creativity. P5 and P6 made significant changes to the drawings. When first asked to draw a house, P5 drew a house with specific elements, a brown roof and brown windows, grass around the house, and two flowers on the grass. When asked to draw a house that did not exist, compared to the first house, he only drew the outline, changed its size, did not add windows, changed the size and shape of the door, and added a zigzag line symbolizing stairs. Taking into account the changes made to the first drawing, we can deduce that P5's level of figural creativity is quite high. P6 initially drew a simple house with typical elements and a sun above it, and in the actual drawing phase of the non-existent house, he drew a house of a different size, with lots of windows, added a road and a little man, as well as a chimney with some elements. These changes are considered complex. When the participant was asked to verbalize why such a house does not exist, he specified that it is a school-type house and therefore such a house would not exist. While the modifications marked by P5 AND P6 were classified as complex modifications demonstrating a high level of figural creativity, the modifications made by P7 and P8 were marked by simplicity, reflecting a lower level of figural creativity.

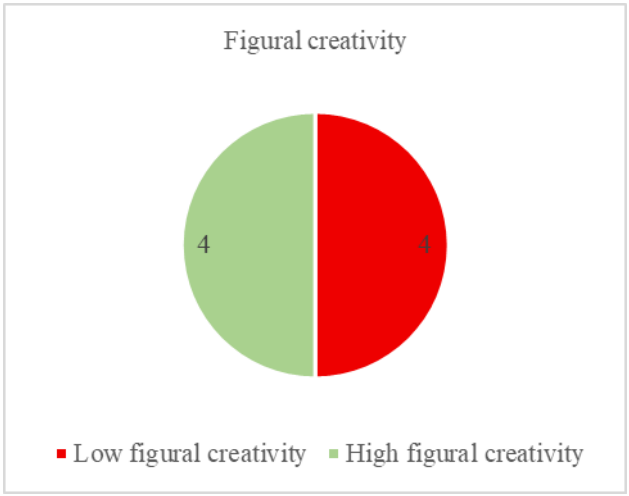



**Figure 4.** *Figural creativity levels among participants*

### 3. 2. 2. Verbal creativity

In the verbal creativity test, almost all participants demonstrated a low level of verbal creativity (see Figure 5), their responses falling into the category of literal expressions (paraphrases, examples, causes/consequences). P3 and P4 encountered great difficulties in this task, failing to produce any expressions that indicated increased verbal creativity. Both in the items that focused on actions and those that focused on emotions, the tendency was to reproduce the evaluator's question.

Also, in the case of P1 and P5, the answers given were of the paraphrasing type (Common action: Disturbing friends - P5: "Disturbing the child"), cause/consequence (Common emotion: Being angry - P1: "Because they don't leave you alone and laugh at you," or examples (Common action: Making a mistake - P1: "I accidentally hit someone while playing"). Only in the case of P2 was there a tendency

to produce new expressions rather than repeat the same answers, which indicates a good ability to generate original responses. Even though at the beginning of the test, P2 was concerned with the moral evaluation of actions (e.g., Telling a lie - "That's not good") and there were moments of task avoidance, the level of verbal creativity seems to be quite high, based on the tendency to produce varied expressions.

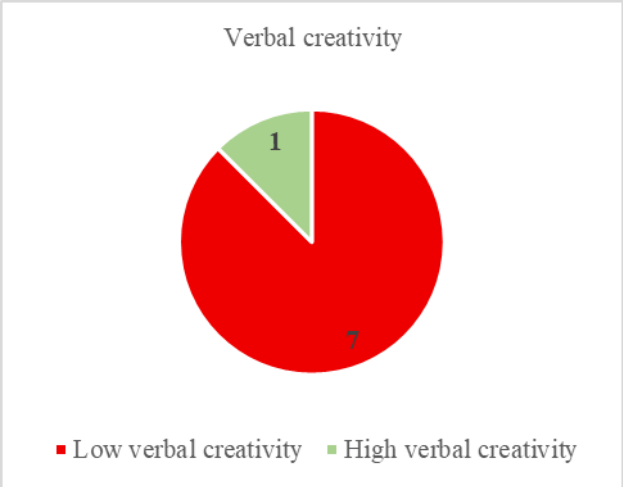



**Figure 5.** *Verbal creativity levels among participants*

### 3. 3. Correlational observations

In the case of P2, higher scores on the *rapid naming* subtest were associated with an increased level of *verbal creativity*, suggesting that the ability to name terms quickly could influence to some extent the generation of new ideas and expressions marked by creativity. At the same time, the results suggest a possible link between the scores obtained by participants in the *visual attention* subtest and the level of *figural creativity* (e.g., P1, P2, P5, P6), suggesting that attentional abilities may facilitate the production of original figures and the selection of innovative and complex variants. Similarly, deficits in *understanding complex instructions* appear to be associated with lower levels of *verbal creativity*. In the case of 5 participants, a relationship was observed between *drawing fluency* and *figural creativity*. The reduced ability to produce unique patterns was reflected in the level of figural creativity by repeating the same drawing with minor modifications to the drawing containing the non-existent house.

**Table no. 2** *Creativity levels by Task*

| Participant | Figural Creativity | Verbal Creativity |
|---|---|---|
| P1 | High | Average |
| P2 | High | High |
| P3 | Low | Very low |
| P4 | Low | Very low |
| P5 | High | Poor |
| P6 | High | Very low |
| P7 | Low | Low |
| P8 | Low | Low |

## 4. Discussions

In our study, we identified a distinct profile of creativity, with participants demonstrating both weaknesses and strengths. Previous studies highlighted that children with ASD have a mixed profile of creativity showing strenghts on verbal creativity, and the fact that the two types of creativity (verbal/figural) involve relatively different cognitive abilities (Kasirer et al., 2020;

Hetzroni et al., 2019). In contrast to what was found in the study by Kasirer et al. (2020), in terms of verbal creativity, the results of our study highlighted difficulties in the participants' ability to produce creative expressions. Zabelina et al. (2019) highlighted in their study the idea that executive functions can play an important role and influence creativity, which is supported by the data obtained in our research.

The present study aimed to *investigate the creativity of children diagnosed with autism aged between 4 and 7 years*. The first research question focused on the extent to which creativity (verbal/figural) is developed in children with autism. The results indicate that 4 of the participants (50%) show a high level of figural creativity, while the other half have a low level of this type of creativity. Verbal creativity is low in most participants, with only one participant producing expressions that would lead to an assessment of high verbal creativity, which indicates difficulties in producing responses and verbal expressions marked by novelty and originality.

The second research question examined the extent *the particularities of rapid naming, understanding instructions, drawing fluency, and visual attention in children with autism*. In our small sample, participants performed well on the rapid naming test, which may suggest that this function was not significantly affected, but further studies with larger samples are needed. In terms of understanding instructions, 6 of the participants demonstrated a good understanding of instructions in general, but most participants had difficulties understanding complex instructions. It was also found that drawing fluency may be a weekness of children evaluated of our study, with all participants scoring low (between 3-10/35 points), indicating a number of deficits in the ability to generate unique patterns. In contrast, in the Visual Attention subtest, participants achieved scores of 18-20/20 points, suggesting a good ability to selectively focus and maintain attention on specific visual targets.

The results suggest possible links between certain executive functions and the two types of creativity, such as visual attention and figural creativity, and rapid naming and verbal creativity, respectively. At the same time, difficulties in understanding complex instructions and low scores in drawing fluency are reflected in levels of verbal and figural creativity, suggesting that these deficits may impact how children with autism express creativity. These associations point to valuable directions for future research.

We identified a number of limitations in our research, one of which is the relatively small number of participants, which limits the generalizability of the data. Future research with a larger sample size could increase the possibility of generalizing the data. Another limitation of this research is related to the assessment of the two types of creativity (verbal/figural): for these types, tasks were used for which no standardized scores were used, but rather a qualitative interpretation of the expressions/drawings produced by a single evaluator, which may include a certain degree of subjectivity.

## 5. Conclusions

In conclusion, we identified unique pattern in creativity and executive functions in the participants of our study showing better figural creativity compared to verbal creativity, and a link between between visual attention, drawing fluency, and figural creativity, as well as between understanding complex instructions and verbal creativity in most participants. Children with ASD have a unique creativity profile, but there is still a gap in the literature regarding the specificity of creativity in this disorder. Future studies should investigate more closely how creativity works, which executive functions impact it and how, so that individualized interventions can be developed to train executive functions and provide the conditions conducive to the development of creativity in children with ASD.

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