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ORIGINAL RESEARCH

Imagination vs Marketing. Empirical Evidence on What a Child Chooses to Play?

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Abstract

The lack of data on the impact of preferred toys on play per se and children's developmental outcomes can be noted in the field of play studies. At the same time, this impact is expected since the characteristics of a toy, as a tool for creating an imaginary situation, can both support and limit a child's playful initiatives. The present study aimed to identify the most and least preferred toy depending on open-endedness degree and the possible impact of these preferences on children's imagination. The study involved 203 children from 4 to 7 years old. All children individually underwent an assessment of imagination and participated in a procedure on toy preference in the experimental settings using the forced-choice method. The study's findings confirmed that preference for open-ended toys is associated with imagination, namely with the number of details the toys have, and the originality of the images children create. This result confirms that blocks, being a raw play material, provide the child with an opportunity to develop, and embody their ideas in play through symbolization, which contributes to the development of imagination. At the same time, blocks were found to be the least preferred toy among other, as most children find them boring and do not want to put effort into creating play structures or do not know how to do so. The study's findings may be useful in selecting toys and developing recommendations on adult participation in play to engage children in using open-ended play material and developing the ability to symbolize.

Keywords Child development · Imagination · Early childhood education · Toy preference · Forced-choice method

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Resumen
La falta de datos sobre el impacto de los juguetes preferidos en el juego en sí y en los resultados del desarrollo infantil se puede observar en el campo de los estudios sobre el juego. Al mismo tiempo, se espera que este impacto exista, ya que las características de un juguete, como herramienta para crear una situación imaginaria, pueden tanto apoyar como limitar las iniciativas lúdicas de un niño. El presente estudio tuvo como objetivo identificar el juguete más y menos preferido según el grado de apertura y el posible impacto de estas preferencias en la imaginación de los niños. El estudio involucró a 203 niños de 4 a 7 años. Todos los niños fueron evaluados individualmente en cuanto a su imaginación y participaron en un procedimiento sobre la preferencia de juguetes en un entorno experimental utilizando el método de elección forzada. Los hallazgos del estudio confirmaron que la preferencia por juguetes abiertos está asociada con la imaginación, específicamente con el número de detalles que tienen los juguetes y la originalidad de las imágenes que los niños crean. Este resultado confirma que los bloques, al ser un material de juego básico, brindan al niño la oportunidad de desarrollar y materializar sus ideas en el juego a través de la simbolización, lo que contribuye al desarrollo de la imaginación. Al mismo tiempo, se encontró que los bloques eran el juguete menos preferido entre otros, ya que la mayoría de los niños los consideran aburridos y no desean esforzarse en crear estructuras de juego o no saben cómo hacerlo. Los hallazgos del estudio pueden ser útiles en la selección de juguetes y en el desarrollo de recomendaciones sobre la participación de los adultos en el juego para involucrar a los niños en el uso de materiales de juego abiertos y desarrollar la capacidad de simbolizar.

Résumé
Le manque de données sur l'impact des jouets préférés sur le jeu en tant que tel et sur les résultats développementaux des enfants peut être constaté dans le domaine des études sur le jeu. En même temps, cet impact est attendu, car les caractéristiques d'un jouet, en tant qu'outil de création d'une situation imaginaire, peuvent à la fois soutenir et limiter les initiatives ludiques d'un enfant. La présente étude visait à identifier les jouets les plus et les moins préférés en fonction du degré d'ouverture et de l'impact possible de ces préférences sur l'imagination des enfants. L'étude a impliqué 203 enfants âgés de 4 à 7 ans. Tous les enfants ont passé individuellement une évaluation de leur imagination et ont participé à une procédure de préférence de jouets dans des conditions expérimentales en utilisant la méthode du choix forcé. Les résultats de l'étude ont confirmé que la préférence pour les jouets ouverts est associée à l'imagination, notamment au nombre de détails que les jouets possèdent et à l'originalité des images que les enfants créent. Ce résultat confirme que les blocs, en tant que matériau de jeu brut, offrent à l'enfant l'opportunité de développer et d'incarner ses idées dans le jeu à travers la symbolisation, ce qui contribue au développement de l'imagination. En même temps, il a été constaté que les blocs étaient le jouet le moins préféré parmi d'autres, car la plupart des enfants les trouvent ennuyeux et ne souhaitent pas fournir d'efforts pour créer des structures de jeu ou ne savent pas comment procéder. Les résultats de l'étude peuvent être utiles dans la sélection de jouets et dans l'élaboration de recommandations concernant la

participation des adultes au jeu afin d'inciter les enfants à utiliser des matériaux de jeu ouverts et à développer leur capacité à symboliser.

Introduction

Imagination

Imagination is understood as a universal creative ability to make new images and solutions (Harris, 2000). This ability is a synthesis of cognitive and emotional processes, which leads to the problem of operationalizing this ability in studies (Beck & Riggs, 2014; Garcia & Mukhopadhyay, 2019; Wang et al., 2021). There are several main approaches to understanding imagination (Dyachenko, 2008; Harris, 2021). In Gestalt psychology, imagination is the confrontation of an innate ability to perceive the structures of the phenomenal field with real objects (Arnheim, 1966; Wertheimer 1959). Psychoanalysis views imagination as a tool for creating imaginary constructions that relieve inner tension by transfiguration or substitution of painful memories (Freud, 2018). In the theory of cognitive development, Piaget defines imagination as anticipating and forecasting the dynamics of a situation or the behavior of objects (Piaget, 2013). In the cultural–historical approach, Vygotsky proposed to consider imagination as the ability to reflect reality through sign activity and symbolic forms (speech, writing, play, and drawing), which develops when a child learns culture (Hedegaard, 2016). Vygotsky notes that imagination works most productively when there is a "unity of affect and intellect", referring to when all personal experience (intellectual, emotional, and behavioral) is involved (Vygotsky, 1998; Hedegaard, 2016). A more modern understanding of imagination proposed by Harris (2021) draws heavily on Vygotsky's ideas and defines imagination as going beyond memory and direct perception to create a new representation of an event or phenomenon.

Imagination is largely resistant to formal learning (McKernan, 2007). This presents a significant challenge when it comes to studying this ability, particularly due to the difficulty of explicitly defining it. In adulthood, attempts to "learn to be creative" often yield only modest results (Claxton et al., 2016). Research into mental development suggests that imagination is most actively fostered during childhood (Wertheimer, 1959; Piaget, 2013). Therefore, it is essential to create and investigate conditions that can support and stimulate the development of this ability during the early years of life (Fleer, 2022; Tinio et al., 2020; McKernan, 2007).

During childhood, imagination is integrated into nearly all activities, including drawing, reading, socializing, and, most notably, play, where it is expressed most fully (Harris, 2021). According to Vygotsky, play externalizes imagination, allowing it to find direct expression in playful actions and the creation of imaginary scenarios (Vygotsky, 2016). Additionally, play can be an effective means of developing imagination, especially with some adult involvement (Hoffmann & Russ, 2016; Moore & Russ, 2008). However, prolonged and engaging play is more often found among peers or siblings than with parents (Harris, 2000; Howe & Bruno, 2010).

It is important to note that imagination is always grounded in reality, as indicated by Vygotsky (2016), Piaget (2013), and Harris (2021). A child's social and material environment provides crucial information and inspiration that significantly influences imaginative activity, including play. Despite this, the impact of toys on imaginative play remains underexplored, even though toys are critical for creating imaginary situations.

How Toys Influence the Play Experiences and Imagination

A toy is understood as a tool for creating play situations that are connected to the context and experience of the child and supports their playful initiatives, allowing, among other things, to change its meaning in play (Legaard & Skovbjerg, 2024; Levinovitz, 2017). A toy can be either a commercial product specifically designed for use in play and with specific affordances embedded in it (De Almeida, 2018; Marsh, 2017), or any object such as a bar, pebble, piece of cloth or wool that can become anything in a play. Open-ended toys are toys whose meaning can be changed in play, which is necessary for the child to develop a variety of play stories (Chookah et al., 2024). In mature play, the child reconstructs many different realistic or fantasy-oriented situations, and too detailed toys with a specific closed purpose (e.g., too stereotyped characters, utensils, furniture) might limit the child's freedom (Dasgupta, 2023). When the prescription of possible actions with a toy constrains the player too much, it is fair to call it a false toy (Dasgupta, 2023; Legaard & Skovbjerg, 2024). Whereas toys capable of changing their purpose (blocks, ribbons, and fabrics) allow the child to use them as they need: they become something, then disintegrate to become something else because of the dynamic interaction between subject, object, and context (Aksoy & Belgin Aksoy, 2022; Levinovitz, 2017).

It follows from the above that play can be driven by toys or children's motives and imagination. Certainly, open-ended toys are more useful in terms of the developmental potential of play, because, using them, the child can give himself/herself a task in playing (Gadamer, 2004) and more intensively use cognitive processes, including imagination, to fulfill this task (Ryabkova, 2023). Giving meaning to play material as intended by the child is one of the central points in Vygotsky's conceptualization of the relationship between play and imagination (Vygotsky, 2016; Møller 2015). Vygotsky believes that imagination is externalized in the child creating an imaginary situation and endowing play materials with personal meaning (Vygotsky, 2016). However, the relationship between imagination and reality in his concept is not limited to the assignment of meaning to play objects at the cognitive level. He sees it primarily as an act of symbolization, which is caused by the child's affective urge to fulfill in play what is unrealistic in reality. Consequently, the child's emotional attitude is an integral component of symbolization and the creation of an imaginary situation. Therefore, according to Vygotsky, the meaning of a play object is not just another denotation/name but is filled with personal meanings and experiences.

Blocks are one of the toys that allow children to endow themselves with their meanings and can be used in different ways in play, supporting children's

playful initiatives and freedom of imagination (Aksoy & Belgin Aksoy, 2022; Levinovitz, 2017; Sarama & Clements, 2009). Froebel was the first to highlight the benefits of block play (Fröbel & Hoffmann, 1994; Froebel in Lilley, 1967). Within his educational framework of learning through play, he considered block play an effective method for fostering creative thinking, imagination, spatial perception, social skills, and fine motor skills through the construction of various structures and forms. Wooden blocks, along with other open-ended materials such as geometric shapes and mosaics, were integral components of his educational sets, known as Froebel's Gifts. Froebel noted the advantages of cubes in that they are both simple and multiform, as well as easily disassembled and put together (Froebel in Lilley, 1967). Blocks are not a finished product, but a raw material suitable for the fulfillment of ideas. The simplest wooden blocks do not carry any rules, inbuilt goals, or algorithms according to which the child should act, leaving the initiative to the child. Therefore, according to Barthes, they are the best toys: "Then, the child does not in any way create meaningful objects, it matters little to him whether they have an adult name…" (Barthes, 1972, 53). Blocks can also be viewed as a form of symbolic language that facilitates children's interaction and creativity. This idea was suggested by Cohen (2007), who examines block play through the lens of Bakhtin's Dialogic Concept, emphasizing the interactions that occur during the play process. Block play provides children with the opportunity to exchange ideas and construct shared meanings, thereby functioning as a space for both individual and collaborative creativity.

Legaard (2022) notes that by constructing, a child creates something new by transforming the elements at hand. Later, because of studying the influence of building materials on children's play experiences, Legaard and Skovbjerg (2024) suggested that toys have instant and latent affordances, the two types of opportunities they offer. Instant affordances of a toy immediately evoke ideas, whereas latent affordances require active manipulation by the player to become available for discovery. Analyses of play sessions in this study showed that "prescriptive" toys with instant affordances shift the focus of the child's attention to correctly assembling the construction according to the instant affordances, leaving no room for independent exploration, imagination, or play. This supports the idea that toys with no clear identity as understood by Levinovitz (2017) leave it up to the child to use their ability of imagination in determining the purpose and story of play.

Today, digital games present analogies to traditional block play, including open-world games and construction simulators. In these games, players can create and modify their environments using modular game elements, which resembles the process of constructing with blocks. Some of these digital games support multiplayer modes, allowing players to exchange ideas and collaboratively build objects or worlds. Such digital games might serve as an equivalent to traditional block play, enabling players to express their creativity and experiment with forms and structures (Arnott et al., 2019; Cheng, 2021).

Attractiveness of Toys for a Child

Intense marketing and commercialization of the children's market has led to a huge variety of toys vying for a child's attention (Johnson & Christie, 2009; Marsh, 2017). In this vivid variety, a toy that promotes symbolization and complexity of play may lose its appeal to the child. Because, on the one hand, children expect a toy to be able to surprise and delight (Trawick-Smith et al., 2015). On the other hand, the content of play is increasingly taken up by the reproduction of the plots of popular animated films and video games (Gavrilova et al., 2023; Johnson & Christie, 2009), and owning a toy of a popular animated character can be transformed into social capital among peers (Patico, 2011). The described trends refer to factors of external influence on children's evaluation of toy attractiveness. They can lead to a preference for toys that limit the ability to construct a story independently and fill the play with the child's motives and experiences.

The child's own characteristics can also be the reason for the reduced attractiveness of toys that give him or her the right to play. For example, the hidden potential of toys is not actualized if the child's ability to symbolize is not sufficiently developed (Mertala et al., 2016). Thus, if a toy does not serve as a clue for play or does not itself create a play situation, a child with poor symbolization ability may experience frustration instead of delight and joy.

Present Study

The current study adopts a threefold objective. First, to examine children's preferences in toy choice depending on toy open-endedness degree. Second, to explore the impact of the most preferred toy open-endedness degree on imagination while controlling for gender, age, and number of siblings, since these variables can impact a child's experience of play (Harris, 2000; Howe, Bruno, 2010). Third, in addition to the experimental data, collect information about children's favorite toys in real life and evaluate their potential usefulness for imagination development considering the results of the present study.

Method

Participants

This study was conducted with the participation of 4 to 7 years-old children from Moscow (Russia) recruited via public kindergartens in Spring 2024. The initial number of children included in the study was 215. Upon application of the inclusion criteria (born full-term, birth weight over 2500 g, no reported visual, auditory, or cognitive impairments, and for teachers—having worked with a child

for at least 6 months) 12 observations were removed from the analysis. The final sample consistent of 203 (108 boys; 95 girls; M = 51.8 months, SD = 4.12).

Procedure

The empirical part of the study was conducted in three stages. The first stage involved collecting written informed consent from parents for their children's participation in the study and collecting sociodemographic information about the families. The second stage involved an individual assessment of children's imagination. In the third stage, individual sessions were conducted on toy preference in the experimental settings. The studies involving human participants were reviewed and approved by the Ethics Committee of Faculty of Psychology at Lomonosov Moscow State University (the approval no: 2024/21). Written informed consent to participate in this study was provided by the participants' legal guardian/next of kin.

Measures

Complete the Drawing test (Dyachenko, 2008) was used to assess the imagination. This is a drawing test that is designed to assess the child's ability to create original, detailed images and to use the proposed conditions flexibly. The test is conducted individually and includes 10 trials, each of which asks the child to complete one abstract graphic element on white paper (A6 format). The cards are given to the child one at a time. The drawing is done in pencil without using an eraser. There is no time limit on the completion of the test. The assessment of children's drawings included four indicators. Image details, which is the average number of details based on all drawings, reflect the elaboration of ideas and the child's ability to fulfill them. Image creation strategy, as the total number of inclusions of the original graphic element in the drawing as a secondary element (e.g., when a circle becomes a clock on a building) instead of using it as the main element (e.g., turning a circle into a sun) of the Fig. (0–10 points). Flexibility, as the total number of drawings unique in content and creation strategy (0–10 points). Originality is several drawings created by a child that differ from the drawings of other children when completing the same graphical element. The last indicator is the only one that is calculated not individually, but about drawings of other children.

Experimental Session on Toy Preference

Individual sessions in a forced-choice experimental settings were conducted to identify the most and least preferred toy depending on open-endedness degree. In the experimental session, each child was presented with a black-and-white image of three toys that varied according to toy open-endedness degree: a ready-made wooden toy house, a wooden toy house construction kit, and wooden blocks (see Fig. 1). The images were shown on the screen of a digital tablet (12.4"/1752 × 2800).

(a) (b) (c)

Fig. 1 Image of the toys presented in the experiment: **a** ready-made wooden toy house, **b** wooden toy house construction kit, and **c** wooden blocks

The experimenter verbally gave the instructions to each child on the script: "Look, there is a ready-made house that already has furniture and a TV set, but it cannot be disassembled (points to Fig. 1a). There is a house that can be assembled and disassembled (points to Fig. 1b). And there are blocks that can be anything in the play: you can use them to build a house, make furniture or even imagine that it is someone alive (points to Fig. 1c). With your finger, which toy would you like to play with the most? Why? With your finger, which toy would you like to play with the least? Why? Thank you!". The duration of the experiment was seven minutes on average.

Data Analysis Strategy

Jamovi software, version 2.6.17 (The jamovi project, Sydney, Australia), was used for all analyses in the current study. First, descriptive statistics and frequency distribution on toy preferences was considered to identify the most and least preferred toy depending on open-endedness degree. Second, preliminary analyses were conducted using Pearson's r correlation and analyses of variance (ANOVA) to control the main and interaction effects of potential confounding variables on toy preferences and imagination. Third, the main analysis was based on general linear models. General linear models were built to assess the impact of the most preferred toy open-endedness degree on imagination controlling for age in months and gender. An alpha level of 0.05 was used for all statistical tests. Partial eta square (partial $\eta 2$) was reported to estimate effect size. According to the rules given by Cohen for the eta-squared effect, size interprets as follows: $\eta 2 \leq 0.01$ as small, $\eta 2 \geq 0.06$ as a medium, and $\eta 2 \geq 0.14$ as large effect sizes. Additionally, information about children's favorite toys in real life and evaluate their potential usefulness for imagination development considering the results of the present study.

Results

Frequency Distribution on Toy Preferences and Preliminary Analyses

In preliminary analyses, frequencies for the most and least preferred toys were considered. Most children (59.1%) chose a ready-made wooden toy house as the toy they would like to play with the most. The most frequent explanations of this choice were the possibility to use such a toy immediately (e.g., '*it is a house, I will play in the house'*, '*it is already ready-made'*). With less frequency, the choice was explained by the stability of the toy and preservation of its properties (e.g., '*it cannot be disassembled'*, '*there is no way to disassemble it'*, '*I do not like it when I play and my brother comes and breaks everything*', '*I have blocks like this (showed wooden blocks), but I build castles and they fall down*'). The second most popular choice (26.6%) was wooden toy house construction kit. The most frequent explanation for this choice was the ability to re-assemble and disassemble the house (e.g., '*it disassembles and re-assembles'*, '*I like to assemble and then disassemble'*) or only wanting to take it apart (e.g., '*I would like to take it apart'*, '*it can be broken'*). Wooden blocks received the lowest number of choices (14.3%). Argumentation in favor of this choice in most cases was reduced to the possibilities embedded in the blocks for implementing one's ideas (e.g., '*you can still play on the road'*, '*you can build a lot of things from them'*, '*you can make a lot of houses'*, '*you can build a tower but not a house'*). It is noteworthy that all answers of this group started with the word 'can'. In other cases, children reported their positive experience of playing with blocks (e.g., *'I always play with them'*, '*I like them very much'*, '*blocks are fun to play with'*, '*I like blocks'*).

To get more information about the characteristics of the toy that are important for children, they were also asked to choose the least preferred toy. In most cases (41.5%), the least preferred toy was wooden blocks. Arguing their choice children reported that they would least like to play with wooden blocks because the unsuccessful previous experience (for example, '*I have already thrown away blocks at home, I don't like them'*, '*I don't like blocks'*, '*I have such blocks, I don't want to play with them'*). Some children shared their feelings that blocks do not bring joy and are very monotonous (e.g. '*they are not colored'*, '*they are not fun*', '*they are hard and wooden*', '*they are not exciting*', '*they have no other parts*', '*there is no furniture*', '*they are just squares and nothing else*'). And quite a lot of children noted that they do not know how to play with blocks or it is given with demotivating efforts (e.g. '*I don't know how to build a house with blocks*', '*It is difficult to build something with them'*, '*you have to build them yourself'*, '*I don't know what to build'*, '*they have to be assembled'*).

Gender and Age Effects on Toy Preferences and Imagination

Then analyses of variance (ANOVA) were used to assess children's toy preferences and imagination regarding their age and gender. Results showed a significant main

Table 1 Descriptive statistics and Pearson's r correlation for study variables

	M	SD	Range	1	2	3	4	5	6	7	8
1.Toy open-endedness degree	1.55	0.73	1–3	–							
2. Image detailedness	22.30	11.48	10–69	0.302**	–						
3. Image creation strategy	0.19	0.46	0–2	0.056	0.311**	–					
4. Flexibility	8.82	1.68	1–10	0.227	0.191	0.185	–				
5. Originality	4.95	2.26	0–9	0.261*	0.374**	0.239*	0.473***	–			
6. Number of siblings	2.19	0.92	1–6	0.102	0.003	-0.048	0.129	0.132	–		
7. Mother education level	5.87	0.98	3–8	−0.246	−0.196	0.326*	−0.225	−0.304	−0.079	–	
8. Family's financial well-being	2.22	0.44	1–3	0.040	0.145	0.253	0.198	−0.163	−0.045	0.279**	–

Controlling for 'Gender' and 'Age in months'; * Correlation is significant at the 0.05 level (2-tailed); ** Correlation is significant at the 0.01 level (2-tailed); *** Correlation is significant at the 0.001 level (2-tailed)

effect of gender, F(1, 201) = 7.94, $p = 0.005$, $\eta^2 = 0.038$, on children's toy preferences, but no effect of age, nor interaction effect. Regardless of age, boys chose more open-ended toys (M = 1.69, SD = 0.75) than girls (M = 1.40, SD = 0.67). No significant main effects of gender or age were found, nor interaction effects for any of the indicators of imagination (Flexibility, Image detailedness, Image creation strategy, and Originality). Table 1 shows Spearman's rank correlation for all study variables controlling for children's gender.

Controlling for age and gender results indicated that there was a significant positive association between the most preferred toy open-endedness degree and such imagination indicators as image detailedness (*r = 0.302, p < 0.01*), and originality (*r = 0.261, p < 0.05*), but not with image creation strategy, flexibility, number of siblings, maternal education, nor family's financial well-being. Image creation strategy was significantly positively associated with mother education level (*r = .326, p < 0.05*). Because of these preliminary results, only image detailedness and originality were included as dependent variables in subsequent analyses (GLM), aimed to analyze more specifically the impact of the most preferred toy open-endedness degree on imagination.

Impact of the Toy Open-Endedness Degree on Imagination

GLM (Image detailedness ~ 1 + `Toy open-endedness degree` + Gender + `Age in months` + `Toy open-endedness degree': Gender`) was performed to explore how the toy open-endedness degree impacts such imagination indicator as image detailedness, when controlling for age and gender. An ANOVA Omnibus test: $F(6) = 1.52$, $p < 0.184$, $\eta^2 p = 0.12$. There was a significant main effect of the most preferred toy open-endedness degree $F(2) = 3.84$, $p < 0.026$, $\eta^2 p = 0.10$, but no significant effects of age, gender, nor interaction effects ($p > 0.1$) (see Fig. 2a).

Next GLM was built with the same as above factors and covariates to explore the impact of the toy open-endedness degree on such imagination indicator as originality. An ANOVA Omnibus test: $F(6) = 1.53$, $p < 0.184$, $\eta^2 p = 0.12$. There was a significant main effect of the most preferred toy open-endedness degree F

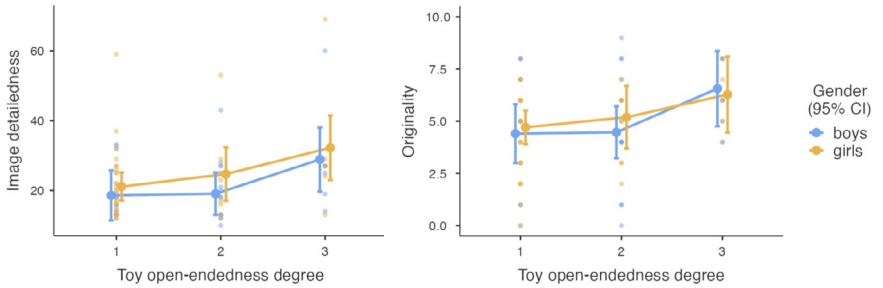

Fig. 2 The most preferred toy open-endedness degree effect on imagination among 4 to 7-year-old children controlling for age in months and gender: **a** image detailedness, **c** originality

(2) = 3.05, $p < 0.046$, $\eta^2 p = 0.08$ and age F (1) = 4.04, $p < 0.049$, $\eta^2 p = 0.06$, while no significant effect of gender or interaction effects ($p > 0.1$) (see Fig. 2b).

Categorical Analysis of Children's Favorite Toys

In addition to the experimental data, children's responses to the question of which of their favorite toys they liked the most were examined. Qualitative analyses of children's responses were made to assess the potential usefulness for imagination of those toys outside the laboratory through reference to children's direct experience. The responses received were evaluated on criteria such as open-endedness and realism of the toy. The theoretical impact of these toy characteristics on children's imagination is discussed in detail in the Introduction.

As a result of the categorization of children's responses, they were divided into four categories formed at the intersection of open-endedness and realistic toys (See Fig. 3). The first group: was not open-ended unrealistic toys. This group of toys supports the child's initiative and imagination to a lesser extent, as it does not allow the child to independently build a plot and reconstruct events and experiences from real life. However, this category of toys turned out to be the most popular among

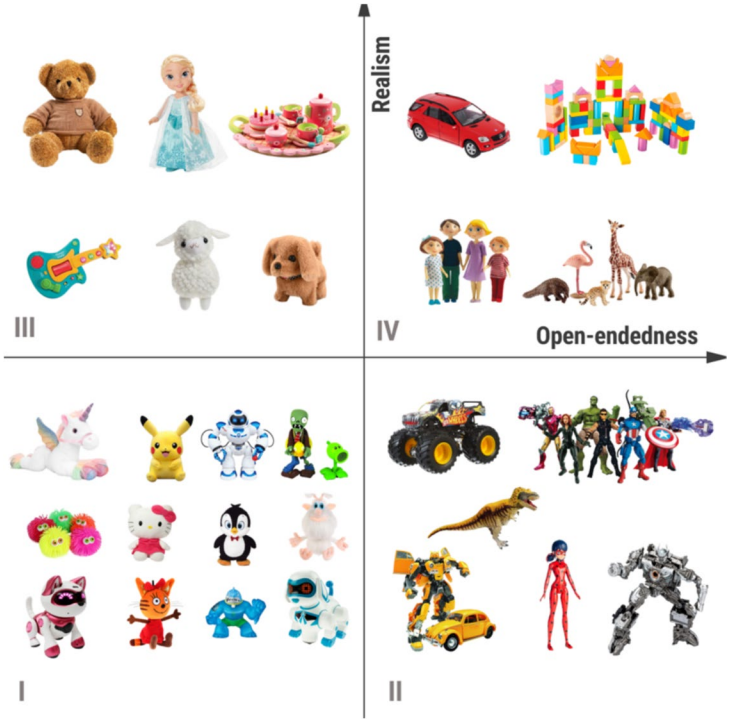

Fig. 3 Favorite toys of 4–7-year-old children, categorized into four groups at the intersection of open-endedness and toy realism: *(I)* not open-endedned unrealistic toys; *(II)* open-endedned unrealistic toys; (III) not open-endedned realistic toys; (IV) open-endedned realistic toys

the favorite toys named by children (46%). These included robot toys with limited pre-defined functionality (robot cat and robot puppy); unrealistic soft toys; tactile toys (stretchy, sticky, and anti-stress); and fantasy characters with the same behavior (zombies, destroyers). The second group: open-ended unrealistic toys. This group turned out to be the second most popular (34%) and mainly consisted of characters from popular animated films video games and transformer toys. The third group: not open-ended realistic toys. Toys in this category were also frequently mentioned by children as their favorite (14%). This category includes toys that have a realistic appearance and have a direct relation to reality, but which cannot change their meaning in play. The fourth group: is open-ended realistic toys. Toys of this category were least frequently mentioned in children's responses about their favorite toy (6%). It includes toys that allow a child to independently determine the plot and reconstruct necessary for this purpose, changing the meaning of toys in the play by the tasks that the child sets for himself in the play.

Discussion

Despite the richness and depth of theoretical and empirical studies of play, today, we can note a lack of data on the impact of preferred toys on children's development. Such impact may be caused by the fact that not all toys are capable of being a tool for a child to create an imaginary situation (Legaard & Skovbjerg, 2024; Levinovitz, 2017). Supporting playful initiatives of the child requires open-ended toys, whose meaning can change as the story develops, providing the child with the opportunity to fulfill any ideas, engaging the imagination and other cognitive processes. But, there are such toys of interest to children in the face of active marketing of toys that can constrain the scope of the child's creative play narratives and own experiences (Kline, 2023). The present study had three aims, including identifying the most and least preferred toy depending on open-endedness degree, exploring the possible impact of these preferences on children's imagination, and considering children's favorite toys in real life. The main empirical findings for each of the study objectives are discussed below.

The first aim of the study was to identify the most and least preferred toy depending on open-endedness degree. The frequency distribution of toy choices by children showed that blocks as an open-ended toy were the least interesting for children to play with. The verbal reasoning of children who did not want to play with blocks at all was that they are boring and monotonous (*'they are not colored'*, '*they are not fun*'), playing with them requires effort (*'it is difficult to build something with them'*, *'you have to build them yourself'*) and coming up with ideas on their own (*'I don't know what to build'*). This result supports concerns that today's children are more likely to expect delight and enjoyment from toys, rather than seeing them as material for fulfilling their ideas (Dasgupta, 2023; Legaard & Skovbjerg, 2024; Levinovitz, 2017). This can be contrasted with the motives of a small proportion of children (14.3%) who did choose blocks as the toy they would most like to play with: *'You can still play on the road'*, *'You can build lots of things with them'*, *'You can make lots of houses'*, *'You can build a tower but not a house'*. Such explanations

contained an indication of the possibility of fulfilling one's ideas and using them in different ways. It is also important that in contrast to the reasoning for choosing other toys in this case children used the word *'can'* very often. On the one hand, this suggests that children go beyond memory and direct perception when assessing what can be done with this toy. And it is this ability that is the modern definition of imagination (Harris, 2021). On the other hand, according to Vygotsky, the meaning of a play object is not just another denotation/name but is filled with the child's meanings and experiences. When a child chooses blocks as the most desirable toy for the opportunity to fulfill his or her ideas with it, play will be more filled with his or her meanings and motivations than if the child relies on the possibilities of a ready-made toy. These theoretical considerations, supported by children's verbal comments, were the origin of the idea of the possible impact of children's preferred toys on the development of imagination.

The second aim of the study was to explore the impact of the most preferred toy open-endedness degree on children's imagination. Using GLM, a significant positive impact of children's preference for the toy with the highest open-endedness degree on imagination was identified. It was found that the images created by children who preferred blocks to less open-ended toys had the greatest degree of detail and originality. This effect remained significant when controlling for child gender and age. Potential cofounder variables such as the number of siblings, maternal education, and family's financial well-being were also considered, which may have influenced both toy choice and imagination (Harris, 2000; Howe, Bruno, 2010). This finding supports the assumption that blocks, being a raw material and providing the child with the opportunity to develop and fulfill their own ideas in play, contribute to the development of imagination (Froebel in Lilley, 1967; Aksoy & Belgin Aksoy, 2022). Children who chose blocks in the experimental conditions reported playing with them a lot in their normal lives. This indicates that these children's play is probably more mature and their ability to symbolize and use the symbolic language in constructing blocks should be higher than that of peers who prefer less open-ended toys (Cohen, 2007).

The third aim of the study was exploratory in nature and aimed at considering children's favorite toys in real life in terms of their potential usefulness for imagination development considering the results of the present study. A model of categorization of toys into four types based on the intersection of such characteristics as open-endedness and realism was proposed: not open-ended unrealistic toys; open-ended unrealistic toys; not open-ended realistic toys; open-ended realistic toys (See Fig. 2). Toys of the first type are least able to support the child's initiative and imagination, as they are detached from reality and have limited pre-defined functionality due to their design or exclusive attachment to animated cartoons and games. We suggest that play with the latter type of toys has the greatest developmental potential, promoting symbolization (Mertala, 2016; Hedegaard, 2016) and engaging imagination and other cognitive processes. A toy's open-endedness helps to bring any idea into play by becoming something and then disintegrating to become something else (Chookah et al., 2024; Levinovitz, 2017); and its realism encourages symbolization (i.e., the fulfillment of desires and ideas on a symbolic level) (Vygotsky, 2016). A realistic toy helps to develop meaningful play

with a complex engaging story, which has been shown to promote working memory development (Vidal Carulla et al., 2021).

In the context of low demand for open-endedness toys among children, digital games, such as open-world games and building simulators, may serve as a more appealing alternative. Furthermore, there is evidence suggesting that such digital games positively influence imaginative capabilities (Arnott et al., 2019; Cheng, 2021). However, for preschool and early elementary-aged children, this form of play may be suboptimal due to the developmental characteristics of spatial thinking and perception, the need for sensory experiences, and the recommendations from pediatric associations regarding the reduction of screen time.

Limitations

This study has several limitations that must be considered when interpreting its findings. Firstly, the data are cross-sectional, which does not allow us to conclude causal relationships. Secondly, there is a lack of information regarding the relationship between toy preferences observed in laboratory settings and the toys children play in their everyday life. Thirdly, children's preferences for digital games and their potential impact on imagination were not addressed in this study. It is noteworthy that certain digital games may offer a more engaging alternative for children compared to traditional block play. Fourthly, the positive impact of children's preference for the toy with the highest open-endedness degree on imagination found in the study should be viewed with caution, as children reported playing a lot with blocks in ordinary life. The prevalence of block play reported by children in their daily lives may be supportive of the study's finding; however, it may also indicate the influence of adult involvement in children's play, potentially affecting both the selection of play materials and the imagination development.

Conclusion

Findings from the study confirmed that a preference for open-ended toys is associated with a child's imagination. The imaginative products created by children who chose simple wooden blocks as the toy they would most like to play with had the greatest degree of detail and originality. This effect remained significant when controlling for child gender and age, as well as other potential cofounder variables. This finding supports the assumption that blocks, being a raw material, provide the child with the opportunity to develop and implement their ideas in play through symbolization, which encourages the development of imagination. Information about the identified patterns may be useful when parents and teachers select toys for children and assess their developmental potential for imagination. Additionally, results indicating children's reluctance to play with blocks may indicate the need for joint play with children, in which an adult would engage the child in such play and teach the ability to symbolize (Utami et al., 2023).

As a result of this study, we can identify several research questions that we believe would be promising to pursue to further explore the impact of toys on children's play and development. Due to the usefulness of block play not only for imagination but also for other cognitive processes, it is important to find out what kind of targeted interventions can arouse children's interest in this activity. Given the flooding of the market with hero toys, it would be important to see whether the associated animated film and game plots limit children's play and freedom to create stories. Finally, evaluating the effectiveness of digital games that can be regarded as analogues to traditional block play—such as open-world games and construction simulators—may represent a promising avenue for fostering the imaginative development of children and adolescents.

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Declarations

Conflict of interest The authors have no relevant financial or non-financial interests to disclose.

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