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ABOVE-AVERAGE BLOCK-BUILDING SKILLS AMONG PRE-SCHOOL CHILDREN ON THE EARLY SIGNS OF TECHNICAL GIFTEDNESS*

Introduction: The preschool period is a time when children's construction skills develop. Some children, even at this early stage, reveal above-average abilities in building blocks. Identifying these children is an essential element of the process of supporting child development.
Research Aim: The aim of the study was to estimate the number of preschool children who exhibit above-average block-building skills. Based on the evaluation of several completed construction tasks, conclusions were drawn regarding above-average skills, and consequently, the potential for technical giftedness.
Method: To determine above-average block-building skills, a specific tool was developed: a teacher's diagnosis of technical giftedness potential in preschool children. It consisted of six construction tasks performed in groups by children (n=397) aged 3 to 6. The construction designs were based on patterns by Popiel (1955/1957), which have been contemporary validated.
Results: The study showed that among three-year-old children, there are those who perform construction tasks using non-interlocking blocks at the same level as six-year-olds. The study found no significant differences in solving construction tasks between children from urban and rural areas. Boys were found to recreate more complex block structures better than girls.
Conclusions: The presence of children whose above-average construction skills significantly deviate from the building abilities of their peers proves the necessity of supporting children's construction skills. This necessitates a shift in how preschool teachers approach construction play, treating it as a very serious developmental challenge.

Keywords: preschool children, block building, abilities, diagnosis

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INTRODUCTION

Indicators of giftedness are commonly understood to include engagement, creativity, and above-average abilities (Gardner, 2009; Limont, 2012; Nęcka, 2000; Nosal, 1990; Renzulli, 2016; Szewczuk, 1983; Szmidt, 2007). Although all these features may be observed in block-building activities, the literature rarely discusses technical abilities among pre-school children. However, analyses of differences in building styles and construction creations demonstrate that some children's constructions differ substantially from those of their peers (Casey et al., 2008; Jelinek, 2023; Nartowska, 1980), which may constitute evidence of early signs of technical giftedness (cf. Gruszczyk-Kolczyńska, 2012).

The pre-school period represents a golden age for the development of construction skills. The development of this ability begins during the second year of life; however, its most intensive growth occurs during the pre-school years. Through experimentation with blocks, children discover numerous ways of combining and arranging construction blocks. They learn to build arches, tunnels, fences, and enclosed circular walls. Toward the end of the pre-school period, children are already capable of completing their structures with roofs (Casey et al., 2008; Goodson, 1982; Gura, 1992; Reifel & Greenfield, 1982; Żebrowska, 1982).

Despite the developmental importance of construction play, this form of activity is often treated as secondary within pre-school education (Gruszczyk-Kolczyńska & Zielińska, 2008, pp. 203-208). Some teachers regard construction activities merely as a way of filling time between completed educational tasks and, for example, waiting for lunch. Consequently, children are required, within a very limited period, to devise a construction theme, locate appropriate building blocks and workspace, and simultaneously protect their structures from being destroyed by other children. A child constrained by limited time, a restricted number of blocks, building conditions, and the necessity of destroying completed constructions, has limited opportunities to develop their constructive potential.

Despite such unfavourable conditions, some pre-school children manifest strong interests in construction activities. Within the same pre-school group, there are children who build richly decorated, symmetrical, and highly developed constructions, as well as children who pay little attention to detail and construct chaotically and without reflection (Nartowska, 1980). In some cases, block-building skills are so advanced that they clearly distinguish children from their peers. These above-average abilities may constitute elements of early manifestations of signs of technical giftedness, and children who manifest them require appropriate developmental conditions to cultivate these capacities. Otherwise, they may never fully realise their potential (cf. Gruszczyk-Kolczyńska, 2012; Nęcka, 2000).

An original study was conducted to estimate the number of pre-school children who exhibit above-average block-building skills. The literature indicates that block-based tasks have frequently been employed in intelligence testing. Standardised tests include the *Block Design* test from the Wechsler Scale (1967) and the *block copying* subtest from the Stanford-Binet (2003). Due to the requirement of psychological certification for the use of these tests, the decision was made to develop an original evaluation tool. This resulted in the teacher diagnosis of signs of technical giftedness in pre-school children, intended to identify pre-school children demonstrating above-average construction skills to support their development consciously and systematically (cf. Gruszczyk-Kolczyńska, 2012).

RESEARCH PROBLEM AND AIM

The purpose of the study was to determine how many pre-school children, particularly younger pre-schoolers, exhibit signs of technical giftedness. When constructing a tool enabling the evaluation of above-average construction abilities, it was assumed that, under identical conditions, a child who creates a construction substantially different from the creations of the majority of children of the same age may be regarded as exhibiting signs of technical giftedness (cf. Limont, 2012; Okoń, 2003; Pietrasiński, 1969; Szewczuk, 1983). However, confirmation of such an evaluation requires the assumption that a child will exhibit above-average abilities not in a single task but across several construction tasks. The completion of multiple appropriately designed tasks increases the likelihood of accurately identifying signs of technical giftedness.

MATERIALS AND METHODS

The study employed an original diagnostic tool designed in the form of a diagnostic experiment to identify signs of technical giftedness. The tool consisted of a series of six construction tasks. The first and second tasks involved reproducing constructions according to a model. The third and fourth tasks required reproducing constructions from a set of blocks containing additional unnecessary pieces. The fifth and sixth tasks involved reproducing construction models from memory. All construction models were adopted from (and in certain cases modified from) the studies conducted by Popiel. These studies, replicated in contemporary research (Jelinek, 2023), demonstrate children's competencies in constructing with non-interlocking blocks. These studies were used because they provide a basis for evaluating task difficulty across age groups.

The study involved 397 children. Among the participants, 192 were boys and 205 were girls; 203 children came from urban areas and 194 from rural areas. Ninety-two children were three years old (aged 3.0-3.11), 101 were four years old (aged 4.0-4.11), 103 were five years old (aged 5.0-5.11), and 101 were six years old (aged 6.0-6.11). The children came from two Polish voivodeships – Mazovian and Lubusz – and were selected purposively. Participant selection was associated with the implementation of the Lubusz Technical Education Project. Prior to participation, parents and legal guardians were informed about the purpose of the study and provided consent for the child's participation. The study records included only the child's first name, last name initial, sex, as well as month and year of birth. Upon completion of the study, each pre-school received the results obtained by every participating child in that facility. These results could supplement existing information about participating children and provide a basis for supporting their development. The study was conducted in September and October 2025, and in January and February 2026.

DATA ANALYSIS

During the organisation of the diagnostic evaluation, the researcher prepared six boxes containing construction materials, one for each task. Each box contained 11 sets of blocks grouped in plastic bags. These were identical block sets distributed to children during the evaluation. The study was conducted in a separate room in which the researcher prepared ten workstations on the floor. These consisted of A3 sheets of paper arranged in a semicircle, behind which the children sat during the evaluation. Children were brought by pre-school teachers and either seated freely within the semicircle or assigned places by teachers according to a previously prepared list. The researcher addressed the children by asking whether they liked constructing and whether they would like to build using the blocks provided. The researcher showed the children the bags and explained that each contained blocks intended for constructing one structure. "I will build a structure here" (gesture toward the sheet in the middle of the carpet), "and you will reproduce it on your own sheets. You will build exactly the same structure as I do." When children – particularly three-year-olds – stated that they were unable to build such constructions, the researcher encouraged them to try to reproduce the structure as accurately as possible.

At the beginning, the researcher removed the blocks from the first bag and arranged them into a model construction – *the Castle* (Figure 1). The children were encouraged to observe the structure carefully. The researcher then distributed bags containing blocks to the children's workstations and instructed them not to touch the blocks until all children had received their bags.

During construction, the researcher evaluated the children's creations using a three-point scale:

- 1 point – the child undertook the act of building;

- 2 points – the completed construction was partially similar to the model but contained simplifications or transformations in relation to the original model;
- 3 points – the reproduced construction was identical to the model.

After the children completed the construction, they were instructed to place the blocks back into the bag, and the researcher proceeded to construct the second model – *the Tower* (Figure 2).

Figures 1 and 2

Construction models reproduced by the children in Tasks 1 and 2

Note. Task 1: *The castle* construction (13 blocks)

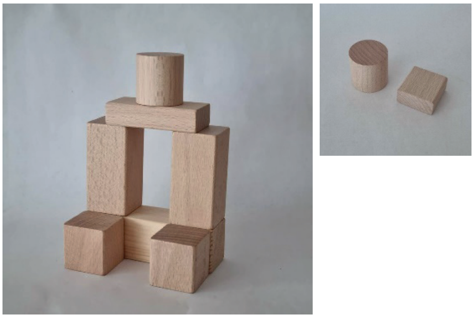
Note. Task 2: *The tower* construction (10 blocks)

Note. Author's own study.

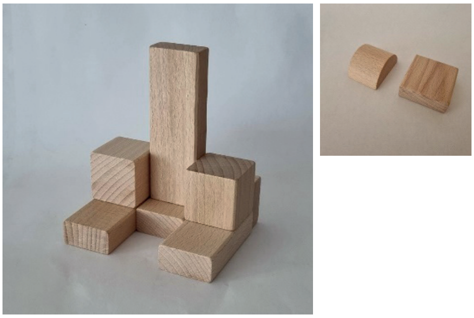
Each subsequent task followed the same procedure as the first task. The differences introduced in the next two construction tasks (Figures 3 and 4) concerned building using a set containing additional blocks. It was assumed that pre-school children generally prefer using the entire set of available blocks; therefore, the researchers examined whether, when instructed to reproduce an identical construction model, children would nevertheless decide to incorporate the two unnecessary blocks. When children asked what should be done with the two extra blocks, the researcher repeated the instructions to build exactly the same structure.

Figures 3 and 4

Construction models reproduced by the children in Tasks 3 and 4



Note. Task 3: *The window* construction (7 + 2 blocks)



Note. Task 4: *The monument* construction (7 + 2 blocks)

Note. Author's own study.

The final two construction tasks (Figures 5 and 6) involved memory-based construction. Initially, the researcher set a simple structure consisting of three blocks to draw the children's attention to the difference between this task and the previous ones. After presenting *the Stairs* structure, all the children smiled and stated that it was very easy. The researcher would then add: "In that case, we will change the rules. I will hide these blocks (gesture), and you will build this structure from memory. Now you need to remember it carefully." The researcher then re-built the blocks and allowed the children to observe the structure before hiding it and distributing blocks to the children for construction. Each time, the researcher reminded the children that they could touch the blocks only after all children had received their bags of blocks. After this task, the researcher proceeded to an analogous task involving *the Gate* structure (Figure 6). During these tasks, the researcher recorded both the accuracy of the reconstructed structure and the degree of independent construction (checking which children waited to build their structures by copying the constructions made by other children).

After reconstructing the sixth structure, the study was concluded. The researcher thanked the children for their participation, and the teacher, who had remained present in the room throughout the session, escorted the children back to their classroom.

Figures 5 and 6

Construction models reproduced by the children in Tasks 5 and 6

Note. Task 5: *The stairs* structure (3 blocks)

Note. Task 6: *The gate* structure (6 blocks)

Note. Author's own study.

RESULTS

In Task 1, which involved reconstructing the most difficult structure (*the Castle*), 18% of all participants reproduced it correctly. Among them were 3.3% of all three-year-olds, 1.0% of four-year-olds, 25.1% of five-year-olds, and 43.1% of six-year-olds. Furthermore, 2.2% of the three-year-olds did not attempt to build the structure at all and instead observed the other children during the task. Structures similar to the model were built by 48.1% of all children, including 33.7% of the three-year-olds, 45.5% of the four-year-olds, 59.2% of the five-year-olds, and 52.5% of the six-year-olds.

Figure 7 presents examples of constructions made by three-year-old children who attempted to reproduce the most difficult structure, *the Castle*. The photographs show varying degrees of similarity to the model. Some constructions resembled the model more closely (6A), while others were less similar (6B). The similarity of construction A concerned the walls, gate, and towers, whereas construction B resembled the model primarily in terms of the walls and towers. Both constructions were evaluated as similar to the model (their creators received 2 points).

Figure 7

The Castle model and two example constructions (A and B) made by three-year-old children

(model) A B

Note. Author's own study.

In Task 2, the children were asked to reconstruct *the Tower* structure – see Figure 8 below. Many children reproduce this structure with only minor errors (7a and 7b); nevertheless, they received 2 points for their constructions.

Figure 8.

The Tower model and two example constructions

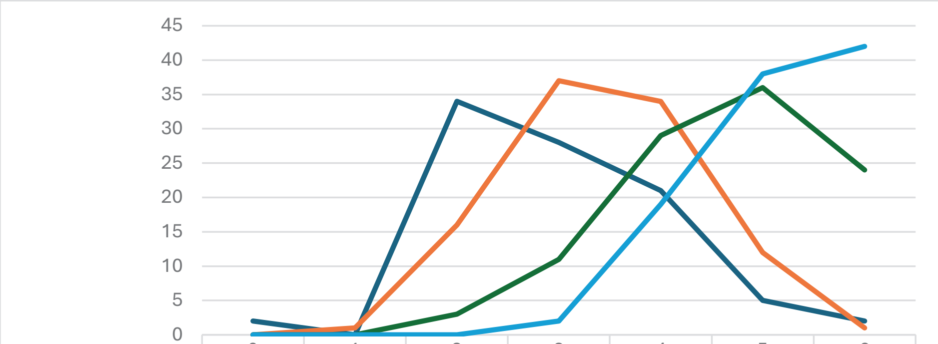
(model) (a) (b)

Note. Author's own study.

In the first two tasks, which involved reproducing structures from a model, children could obtain a total of 0-6 points. The mean score achieved by all participants across these two tasks was 4.09 points. The average scores by age group were as follows: three-year-olds: 2.97 points, four-year-olds: 3.43 points, five-year-olds: 4.65 points, six-year-olds: 5.19 points. The difference between the mean scores of the younger pre-school children (three- and four-year-olds) was 0.46 points, while the difference between the older pre-school children (five- and six-year-olds) was 0.54 points. In contrast, the difference between four-year-olds and five-year-olds was as high as 1.22 points. These differences indicate similarities within the younger pre-school group (three- and four-year-olds) and within the older pre-school group (five- and six-year-olds). However, there is a substantial difference between younger and older pre-schoolers, demonstrating significant progress in construction skills. Detailed information on the distribution of scores obtained by children in the four age groups is presented in Figure 1 below. Distribution curves can be observed for each age group. The curves shift progressively toward more accurately reproduced constructions with increasing age. This indicates the development of construction skills.

Figure 9

Number of points obtained by all participating children in the four age groups in tasks 1 and 2



	0	1	2	3	4	5	6
3-year-olds	2	0	34	28	21	5	2
4-year-olds	0	1	16	37	34	12	1
5-year-olds	0	0	3	11	29	36	24
6-year-olds	0	0	0	2	19	38	42

Note. Author's own study.

The study demonstrated that some three-year-old children were able, under the same construction conditions, to reproduce structures that were just as complex as those reproduced by six-year-old children who were twice their age. Among the three-year-olds were Mikołaj and Hania (names changed for personal data protection purposes). Their ability to construct such complex structures suggests a high potential in the area of constructional abilities.

The next two tasks (Tasks 3 and 4) involved reproducing structures using a set of blocks containing additional, unnecessary pieces. The purpose of these tasks was to determine whether children would use all available blocks or, in accordance with the instructions, use only those blocks necessary to build the structure while leaving the remaining blocks aside. In each task, children could receive from 0 to 3 points. Children who used additional, unnecessary blocks received 2 points.

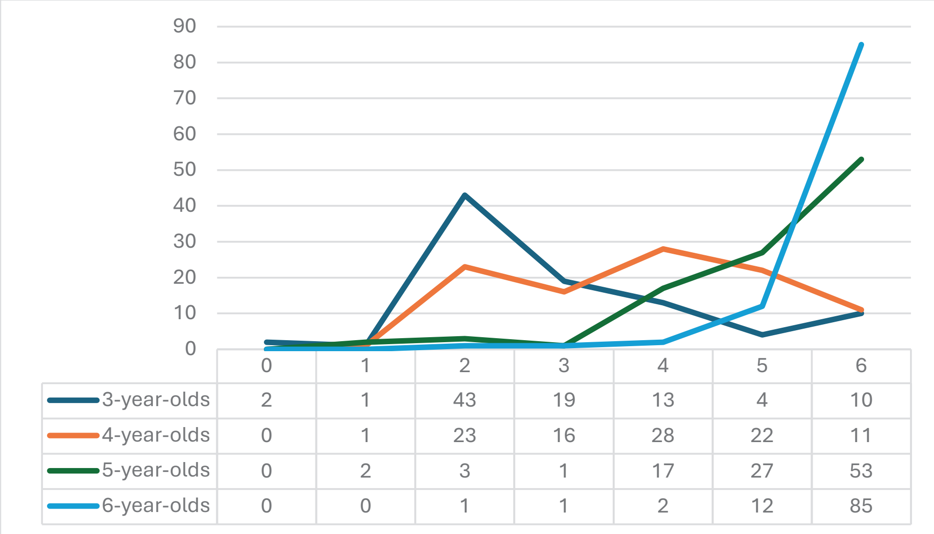
In Task 3, the children reproduced *the Window* structure (see Figure 3 above). This structure was reproduced correctly by 56% of all participants. Among them were 19.6% of all three-year-olds, 31.7% of four-year-olds, 74.8% of five-year-olds, and 95.0% of six-year-olds. Structures similar to the model were built by 22.2% of all children. This group included 26.1% of all three-year-olds, 40.6% of four-year-olds, 18.4% of five-year-olds, and 4.0% of six-year-olds.

In Task 4, the children reproduced *the Monument* structure (see Figure 4 above). This structure was reproduced correctly by 44.6% of all participants. Among them were 13.0% of the three-year-olds, 17.8% of the four-year-olds, 59.2% of the five-year-olds, and 85.1% of the six-year-olds. Many children in tasks 3 and 4 used unnecessary blocks to enrich their constructions with additional blocks, thereby creating structures similar to *the Monument* model. Such constructions were produced by 26.0% of all children, including 14.1% of the three-year-olds, 42.6% of the four-year-olds, 32.0% of the five-year-olds, and 12.9% of the six-year-olds.

The total number of points that could be obtained in Tasks 3 and 4 ranged from 0 to 6. The mean score achieved by all participants across these two tasks was 4.43 points. The average scores by age group were as follows: three-year-olds: 3.00 points, four-year-olds: 3.79 points, five-year-olds: 5.17 points, six-year-olds: 5.77 points. The difference between the mean scores of the younger pre-school children (three- and four-year-olds) was 0.79 points, while the difference between the older pre-school children (five- and six-year-olds) was 0.60 points. By contrast, the difference between younger and older pre-schoolers amounted to as much as 1.38 points. A similar pattern was observed in Tasks 1 and 2. This provides further evidence of substantial differences in abilities between successive age groups of children. Moreover, a considerable qualitative change in block-construction performance can be observed between younger and older pre-schoolers. Detailed information on the total scores obtained in Tasks 3 and 4 is presented in Figure 9 below.

Figure 10

Number of points obtained by all participating children in the four age groups in Tasks 3 and 4



	0	1	2	3	4	5	6
3-year-olds	2	1	43	19	13	4	10
4-year-olds	0	1	23	16	28	22	11
5-year-olds	0	2	3	1	17	27	53
6-year-olds	0	0	1	1	2	12	85

Note. Author's own study.

Among the three-year-olds who achieved the highest possible scores in Tasks 3 and 4, there were as many as 10 children. This group included Mikołaj and Hania – the same children who had obtained the highest scores in tasks 1 and 2.

The final two tasks (tasks 5 and 6) involved reproducing structures from memory. The first task served as a preparatory exercise; therefore, *the Stairs* structure was relatively simple. Due to its greater level of difficulty, the second task was more diagnostic in nature; nevertheless, both tasks were included in the study. In each task, children could receive from 0 to 3 points.

In task 5, children were asked to reproduce from memory the three-block *Stairs* structure. Because the task was very easy for most children, they completed it with little effort. Correct reproductions were achieved by 72.8% of three-year-olds, 84.2% of four-year-olds, 95.1% of five-year-olds, and 98.0% of six-year-olds. Similar constructions were produced by 14.1% of three-year-olds, 7.9% of four-year-olds, 3.9% of five-year-olds, and 2.0% of six-year-olds. Children who failed to reproduce the structure correctly were typically inattentive and preoccupied with playing with the blocks they had received. These children were predominantly younger preschoolers (1.1% of three-year-olds and 2.0% of four-year-olds).

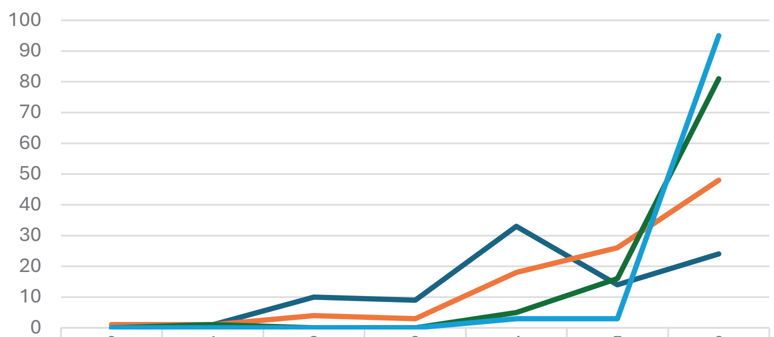
Following the introductory task 5, the children were given the more difficult task 6, which required them to reproduce *the Gate* structure from memory. This task was completed correctly by 64.7% of all participants. Among them were 26.1% of the three-year-olds, 53.5% of the four-year-olds, 79.6% of the five-year-olds, and 96.0% of the six-year-olds. Children who produced a structure similar to the model accounted for 15.9%. This group included 20.7% of all three-year-olds, 22.8% of four-year-olds, 17.5% of five-year-olds, and 3.0% of six-year-olds.

It should be added that during the study it was observed that many children, when confronted with this new type of task (memory-based reproduction), eagerly undertook the challenge. Interestingly, some children who had previously shown less enthusiasm for reproducing constructions became noticeably more interested when presented with the memory task.

The mean score obtained by all children in tasks 5 and 6 was 5.23 points. In the more demanding task 6 alone (where a maximum of 3 points could be earned), the mean scores ranged from 1.70 points among three-year-olds, to 2.29 among four-year-olds, 2.76 among five-year-olds, and 2.95 among six-year-olds. Figure 10 presents detailed information regarding all scores obtained by the four age groups in the memory-based construction tasks.

Figure 11

Number of points obtained by all participating children in the four age groups in tasks 5 and 6



	0	1	2	3	4	5	6
3-year-olds	1	1	10	9	33	14	24
4-year-olds	1	1	4	3	18	26	48
5-year-olds	0	1	0	0	5	16	81
6-year-olds	0	0	0	0	3	3	95

Note. Author's own study.

In the final two tasks (Tasks 5 and 6), as many as 24 three-year-old children correctly completed the memory-reproduction tasks. Among them was Mikołaj (previously mentioned in Tasks 1-4), who achieved the maximum total score of 18 points. This indicates that among the participants there were three-year-old children who achieved the highest possible scores across all tasks. When slightly lower scores are also considered, the number of highly capable three-year-olds increases. Specifically, four three-year-olds achieved 17 points, three achieved 16 points, and an additional four achieved 15 points.

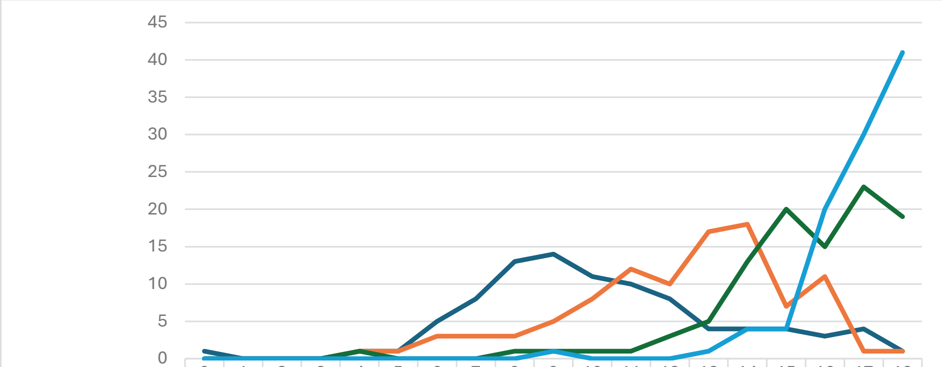
Age-Related Differences. The study demonstrated that construction skills (both model reproduction and memory-based building) improve with age. Across all tasks (1-6), the number of correctly reproduced structures increased with age. The older the children were, the more structures they reproduced accurately.

Clear differences were also observed between younger and older pre-school children. Differences in mean scores for correctly reproduced structures across all tasks indicate that the competencies of younger children (three- and four-year-olds) were sometimes only half those demonstrated by older children. This is particularly evident in Tasks 1 and 2, involving reproduction from a model, where the difference between younger and older pre-schoolers amounted to 1.22 points. In Tasks 3 and 4, the difference was even greater, reaching 1.38 points. Such substantial differences on a six-point scale indicate that a marked acceleration in block-building development occurs between the ages of four and five years. Thus, in addition to the gradual age-related increase in competence, the findings reveal a doubling – and in some cases even a tripling (based on average scores) – of constructional competence during this developmental period.

Children Showing Signs of Technical Giftedness. In accordance with the initial research assumption, signs of technical giftedness were evaluated by comparing construction-reproduction performance across all age groups. Since children could receive between 0 and 3 points for each task, the total score across all six tasks ranged from 0 to 18 points. The mean score for all tasks across all participants was 14 points. A summary of total scores is presented in Figure 11 below.

Figure 12

Total scores obtained by all participating children in the four age groups across tasks 1-6



	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
3-year-olds	1	0	0	0	1	1	5	8	13	14	11	10	8	4	4	4	3	4	1
4-year-olds	0	0	0	0	1	1	3	3	3	5	8	12	10	17	18	7	11	1	1
5-year-olds	0	0	0	0	1	0	0	0	1	1	1	1	3	5	13	20	15	23	19
6-year-olds	0	0	0	0	0	0	0	0	0	1	0	0	0	1	4	4	20	30	41

Note. Author's own study.

To evaluate signs of technical giftedness, the highest-scoring three-year-olds were compared with six-year-olds, who were twice their age. The study revealed that some three-year-olds achieved the maximum possible score across all tasks. One such child was Mikołaj.

Mikołaj attends a rural pre-school in one of the towns near Warsaw. Teachers interested in his development and construction abilities closely observed his behaviour during the study. After the study was completed, they confirmed to the researcher that the boy had already been regarded within the pre-school as potentially technically gifted.

If a broader score range were adopted as the cut-off criterion, rather than restricting it to the maximum score of 18 points (as in Mikołaj's case), the number of children identified as gifted would increase. If technical giftedness were defined as obtaining either 17 or 18 points (the two highest score categories), five children would meet this evaluation. This group would also include Hania.

Hania attends the same rural pre-school as Mikołaj. However, in her case, teachers had not been certain about her abilities. The diagnosis of signs of technical giftedness made teachers aware of the need to pay closer attention to other children as well.

If the score range were expanded further, and children obtaining between 15 and 18 points (four score categories) were included, then among the youngest participants there would be 12 three-year-old children. Using this criterion, it can be concluded that among the 92 three-year-old children studied, approximately 13% were capable of performing construction tasks under the same conditions and at the same level as children twice their age – namely six-year-olds.

Gender Differences. The study also examined differences between boys and girls in solving construction tasks. Detailed results regarding the number of children obtaining maximum scores in each task are presented in Table 1 below. The findings showed that performance levels were similar for boys and girls in the memory tasks (Tasks 5 and 6) and in the tasks involving unnecessary blocks (Tasks 3 and 4). Differences emerged, however, in the reproduction of more complex structures in Tasks 1 and 2. When reproducing *the Castle* structure, 17% more boys than girls built the structure correctly. Similarly, in reproducing *the Tower* structure, 14% more boys than girls built the structure correctly.

Table 1

Number of boys and girls obtaining the maximum score in each task

	Task 1	Task 2	Task 3	Task 4	Task 5	Task 6
Boys (n=192)	51 27%	95 49%	106 55%	93 48%	166 86%	132 69%
Girls (n=205)	21 10%	71 35%	117 57%	84 41%	182 89%	125 61%

Note. Author's own study.

Environmental Differences. The analysis also compared the number of correctly reproduced structures among children living in urban and rural environments. The study has shown that children from these two environments demonstrate a similar level of ability when solving construction tasks. The detailed results of the study, broken down by environment, are presented in Table 2 below.

Table 2

Number of urban and rural children obtaining the maximum score in each task

	Task 1	Task 2	Task 3	Task 4	Task 5	Task 6
Urban children (n=203)	39 19%	84 41%	117 58%	91 45%	182 90%	139 68%
Rural children (n=194)	33 17%	82 42%	106 55%	86 44%	166 86%	118 61%

Note. Author's own study.

CONCLUSIONS

The study demonstrated a similar level of construction-model reproduction among pre-school children from rural and urban environments. However, with respect to gender, boys proved more successful than girls in reproducing more complex block constructions. Among the three-year-olds, the study identified children who correctly performed the same construction tasks under the same conditions as six-year-old children. Importantly, these children had only half the life experience of the older pre-schoolers, yet were capable of completing construction tasks at the same level. The presence of children with such constructional potential provides evidence for the existence of early signs of technical giftedness in pre-school settings.

Such substantial constructional potential should not be neglected. The pre-school period is the only stage of education that can provide optimal conditions for the development of block-building skills. These children require carefully organised opportunities in which they can develop their technical abilities. They need an appropriately prepared environment: a large variety of blocks, sufficient space for construction, secure storage for completed structures, opportunities to return to their constructions to modify and improve them. Children also need time to build things without worrying that they'll have to tidy the blocks away straight away. In addition to suitable conditions, children also require experiences that stimulate construction skills, such as reproducing structures from models and experimenting with constructional designs (cf. Jelinek, 2023; Paramonow, 1976).

LIMITATIONS

The evaluation of signs of technical giftedness concerned children who demonstrated above-average abilities under the conditions created for the study. However, it should be remembered that task performance may have been influenced by internal factors (e.g., poor well-being) or external events (e.g., accidents). Such factors could significantly limit a child's ability to perform at their full potential. Therefore, it is possible that a larger number of children may exhibit signs of technical giftedness than were identified in this study.

Three criteria were used to evaluate signs of technical giftedness. Reproduction of constructions from a model (Tasks 1 and 2), reproduction using an unnecessary set of blocks (Tasks 3 and 4), reproduction from memory (Tasks 5 and 6). However, technical giftedness may also involve other abilities (e.g., technical reasoning). Consequently, the diagnosis of signs of technical giftedness in this study was limited to only several construction-related situations involving blocks. Further, more in-depth study is therefore required.

The study was conducted on a relatively small sample, and participants were not selected randomly. As a result, generalising the findings to larger populations may involve a degree of error. The study should therefore be replicated with a larger sample to determine the actual prevalence of children exhibiting exceptional construction abilities.

Another issue concerns the cut-off score used to identify signs of technical giftedness. Under the strictest evaluation – achievement of the maximum possible score – only one child (Mikołaj) would be classified as exhibiting signs of technical giftedness. Expanding the score range allows giftedness to be viewed as a continuum rather than a categorical phenomenon. If not only the highest score but also the range of the last three scores is taken to include gifted children, then the number of children rises to 12 (representing 13% of the three-year-olds studied). These findings suggest that the number of children exhibiting signs of technical giftedness may be substantial. The results highlight the need to reconsider the educational significance of construction play and the importance of supporting children through intentionally designed activities aimed at developing construction and technical skills.

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PONADPRZECIĘTNE UMIEJĘTNOŚCI BUDOWANIA Z KLOCKÓW U DZIECI PRZEDSZKOLNYCH. O WCZEŚNIE UJAWNIAJĄCYCH SIĘ ZADATKACH UZDOLNIEŃ TECHNICZNYCH

Wprowadzenie: Okres przedszkolny to czas, w którym rozwijają się umiejętności konstrukcyjne u dzieci. Niektóre dzieci, już w okresie przedszkolnym, ujawniają ponadprzeciętne umiejętności budowania z klocków. Ich rozpoznanie stanowi istotny element procesu wspierania rozwoju dzieci.

Cel badań: Celem badania było oszacowanie liczby dzieci przedszkolnych, które ujawniają ponadprzeciętne umiejętności budowania z klocków. Na podstawie oceny kilku realizowanych zadań konstrukcyjnych wnioskowano o ponadprzeciętnych umiejętnościach, a na tej podstawie o zadatkach uzdolnień technicznych.

Metoda badań: Do ustalenia ponadprzeciętnych umiejętności budowania z klocków opracowano narzędzie – nauczycielską diagnozę zadatków uzdolnień technicznych dzieci przedszkolnych. Było to sześć zadań konstrukcyjnych, które dzieci (n=397) w wieku od 3 do 6 roku życia wykonywały w grupach. Przy projektowaniu wzorów konstrukcyjnych wykorzystano wzory Popiel sprawdzone współcześnie.

Wyniki: Badania wykazały, że wśród dzieci trzyletnich, są takie, które wykonują zadania konstrukcyjne z użyciem klocków nieczepnych na takim samym poziomie co dzieci sześcioletnie.

Odnotowano zbliżony poziom rozwiązywania zadań konstrukcyjnych między dziećmi z miasta i ze wsi. Chłopcy okazali się lepiej odtwarzać bardziej skomplikowane konstrukcje z klocków względem dziewczynek.
Wnioski: Obecność dzieci, których ponadprzeciętne umiejętności konstrukcyjne znacznie odbiegają od możliwości budowania z klocków rówieśników, dowodzi konieczności wspierania u dzieci umiejętności konstrukcyjnych. Pociąga to za sobą konieczność zmiany sposobu, w jaki nauczyciele przedszkola postrzegają zabawy konstrukcyjne – z aktywności swobodnej na ważne wyzwanie rozwojowe.

Słowa kluczowe: dzieci w wieku przedszkolnym, budowanie z klocków, zdolności, diagnoza