

## ARTYKUŁY

[*Articles*]

### SCHOOL READINESS OF PRE-SCHOOL CHILDREN: ARE SIX-YEAR-OLD CHILDREN READY FOR A SCHOOL EDUCATION?

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**Summary.** The article constitutes a report from own research on the issue of school readiness for six-year-old children. In the first step, the level of school competences of six-year-olds measured by Intelligence and Development Scales (IDS) was analyzed. The second stage involved checking how the competences corresponding to the dimensions of the IDS\_SR subscales are evaluated by the mothers of the examined children using the Child's School Readiness Questionnaire by Parents (KGSD-R) and to what extent these assessments correlate with the results of the IDS scale. The studies included 68 mothers and 68 children. The criterion of including the child in the sample was age, i.e. age of six years (6; 0-6; 11). The selection for the test was carried out using the "snowball" method. Based on the results obtained, it can be concluded that the examined children present an average level of school readiness, sufficient to take up school education. In addition, in general, the older children are, the higher scores they obtain in IDS\_SR subscales. Subjective assessments of mothers moderately correlate with the results of objective measurement, and the tool used requires further improvement.

**Key words:** school readiness, parents' assessments, six-year-old children

### Introduction

The introduction in Poland of a school duty in 2014 for six-year-olds led to the protest of a large part of parents. In 2017, the previous regulation was restored according to which children start school again at the age of 7<sup>1</sup>. In connection with these changes, there were numerous statements of specialists and parents in the public space about the benefits and threats of sending a child to school earlier.

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It pointed out that parents who were against the lowering of the age limit for compulsory education indicated mainly the dangers of “shortening childhood”, the lack of appropriate school conditions for early childhood education and fears that the 6-year-old child is not sufficiently “mature” to cope with the requirements of school education. Parents who were negative about the education reform did not want their children to become “the subject of the experiment” because they were afraid of lack of preparation of the teaching staff and the school’s inability to accommodate six-year-olds. Parents who took advantage of the statutory option of prolonging their children’s stay in kindergarten were worried whether they did not limit their developmental possibilities in this way.

It is true that psychological development is individual in character, that – according to many teachers – among six-year-olds we find children not ready to take up school education, mainly due to the lack of appropriate socio-emotional competences (see Rimm-Kaufman, Pianta, Cox, 2000; McBryde, Ziviani, Cuskelly, 2004). It is worth noting that studies of parents of Polish six-year-olds indicate that one of the factors that is important in determining a child’s school readiness is the ability to establish relationships with adults and children, not the level of cognitive development (Czub, Matejczuk, 2014)<sup>2</sup>. However, it is also true that pre-school education programs probably do not meet the cognitive needs of many children, if only because of the accelerated cognitive development of subsequent cohorts/children’s year groups (see e.g. Flynn, 1984; Raven, 2000). In addition, the following voices were hardly audible in this discussion: (a) indicating that in the vast majority of European countries, the obligation of school education includes six-year-olds, and in four countries even four-year-olds<sup>3</sup>; (b) information that the Polish education system has the right conditions, well-educated staff and adapted to the competences of even the youngest pre-school children, original and tried-and-tested teaching methods (see Rocławski, 2001; Gruszczyk-Kolczyńska, Zielińska, 2003 et al.); moreover,

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<sup>1</sup> The Act on Education Law of 14th of December 2016, Chapter 2, art. 35.2. “The child’s school duty begins at the beginning of the school year in the calendar year in which the child turns 7, and continues until the completion of primary school, but no longer than until the age of 18”. Art. 36. 1. “At the request of parents, primary school education may also be started by a child who turns six in a given calendar year”.

<sup>2</sup> Based on research conducted by the Educational Research Institute in 2014 with the participation of 195 parents, four main elements important for parents in determining their child’s school readiness were defined: cognitive curiosity (interest in school and science), self-regulation (self-reliance and ability to cope with difficult situations), level of social development (ability to establish and build relationships with adults and children), child’s health (body build, disease resistance and endurance).

<sup>3</sup> European Commission/EACEA/Eurydice, 2015. Compulsory education in Europe – 2015/2016. Eurydice Facts and Figures. Luxembourg: Publications Office of the European Union.

(c) data that the restoration of the 7-year border in school education may increase the educational distance of current generations of Polish children in relation to their European peers (see Winięcka, Borowik, 2015). Perhaps the reason for parents' fears in discussing the age of school children in Poland is poor information. However, it cannot be ruled out that parents have a good understanding of the competences and development opportunities of their children.

**School readiness.** The concept of school readiness has been thoroughly discussed, also in Polish literature of the subject (see, for example, Wilgocka-Okoń, 2003; Brzezińska, Appelt, Ziółkowska, 2008; Kołodziejczyk, 2012; Smykowski, 2015 et al.). This discussion shows that historical controversy has led to a reconciliation that in assessing student's readiness or maturity, not only their level of intellectual development is important (so-called Leipzig school: Penning, Winkler) but also social-emotional or personality (so-called Viennese school: Bühler, Schenk).

With time, it was noticed that the assessment of school readiness should go beyond the individual characteristics of the child, considering the environment, including the requirements of the school in which the student has to adopt. Taking an interactive perspective shaped the view that the child is ready to take up school education when s/he has reached the level of physical, social and mental development, thanks to which it is susceptible to schooling and is able to cope alone or with the support of others with requirements related to starting school (see e.g. Brzezińska, 2000; Kołodziejczyk, 2012), or more generally speaking, is able to use individual and environmental resources in assimilating new principles of intellectual functioning and acting according to them in interaction with the environment (Smykowski, 2015). It is worth mentioning that, from a systematic point of view, not only a child but also a social environment, including school and family, must be ready for a school start (see e.g. Wilgocka-Okoń, 2003; Brzezińska, Czub, 2015 et al.).

The above considerations make people aware of problems with the measurement of school readiness (see Jaworowska, 2017). They are related to the complexity of the system of factors forming the conditions of early education, which can potentially affect the course of school career and the successful development of children. First of all, it is difficult to put them together in one research procedure. Secondly, even focusing on the individual diagnosis of the pupil's school readiness (its properties or competences) in practice, we are condemned to choose from many, a specific way of evaluating them, based on specific assumptions about the requirements for a child crossing the school threshold.

**Conditions for school readiness.** Research on factors positively correlating with the results of various types of school readiness measurements showed the susceptibility of pre-school children to educational interactions. For example, in experimental studies, it has been proved that relatively short-term executive function trainings are effective in this age: they improve, for example, attention, working memory or inhibition, and sometimes even transfer of distant effects of this training to fluid intelligence (see Rueda, Posner, Rothbark, 2005; Garon, Bryson, Smith, 2008; Röthlis-

berger et al., 2012; Deja, Trempała, Leszko, 2016; Peng, Miller, 2016). Longitudinal studies of the effects of pre-school education as part of the Head Start programs showed that despite the disappearance of some short-term profits in development and learning, e.g. reading (so-called fade-out effects, after: Cicirelli, 1969) in people participating in these programs, more positive results were observed at different times and in different areas of development, revealed in lower probability of repeating a grade, transfer to a special school, engaging in anti-social activity, and higher probability to graduate from higher school and keep a job (see Hyson, Copple, Jones, 2006; Lee et al., 2014). We can therefore adopt an optimistic assumption that early education is associated with achieving positive effects in the development of children.

Environmental correlates of school readiness of children were also examined. Due to the purpose of this study, we have focused on the elements of the family environment that support school readiness and achievement in early childhood. Although the results of these studies are not always consistent or unambiguous, most of them show the importance of various family factors in shaping school readiness, most often such as parental relationships with the child, parent education or socio-economic status (SES) of families (Hill, 2001; Fantuzzo, McWayne, 2002; Umek et al., 2008; Razza, Martin, Brooks-Gunn, 2010; Winsler et al., 2012; Jeon, Buettner, Hur, 2014; Lombardi, Coley, 2014; Bernier, Perrier, McMahon, 2017). These results also correspond to the research of Polish six-year-old children who obligatorily attend school (see Kaczan, Rycielski, 2017). For example, the results of the research program *First-grader 2014*, which was carried out by the Educational Research Institute in the school year 2014/2015, showed that the family's situation affects the competences of the child more strongly than the age. Children from families poorer in economic resources achieved worse results than children from families characterized by a higher level of these resources.

The least is known about the role of parents' knowledge and judgments about school readiness in the process of moving a child from kindergarten to school. Relatively few research results on this topic suggest that the parental concept of school readiness and judgments about the child's competences required by the school, mediating the impact of early education on educational achievement and development (see Diamond, Reagan, Bandyk, 2000; McBryde, Ziviani, Cuskelly, 2004; Barbarin et al., 2008). The results of longitudinal studies also show long-term positive effects, such as parents' beliefs that their child will cope with school situations and engagement in his/her educational start (see Puccioni, 2015). Bernier et al. (2017) in the sequential analysis of data collected in five waves from infancy to the school-leaving period, found that maternal mind-mindedness about the need to support cognitive development from the infancy of the child, result in acquiring basic skills in a cascading way during the pre-school period (i.e. expressive vocabulary, effective control), which are mediators of achieving school readiness and further development.

In the light of the above considerations on the issue of school readiness, we became interested in asking if parents expressing fears that their children would not be

up to the earlier school duty are right. Aiming to answer this question, in the presented study we want to present the results of research on the correlation between the results of standard measurement of school competences with Intelligence and Development Scales (IDS) in the group of 6-year-olds and subjective assessment of their developmental abilities by mothers in dimensions corresponding to these scales, useful in the assessment of school readiness (see Jaworowska, Matczak, Fecenec, 2012; Jaworowska, 2017) using the KGSD-R questionnaire constructed by us<sup>4</sup>.

**Research questions.** The review of research published in the literature allows to notice a gap in knowledge about the subjective assessments of children's school competences by parents, mainly about the correlations of these assessments with the psychological tests indicators measuring school readiness. Aiming at answering the question whether the subjective assessments of children's school competences made by their mothers are consistent with the standard assessment, we presented three basic questions in the report: (a) What is the level of school readiness of six-year-olds measured by Intelligence and Development Scales (IDS) in subscales related to school readiness (IDS\_SR); (b) what is the level of school readiness of the examined children in the subjective assessment of their mothers measured using the specially constructed School Readiness Questionnaire (KGSD-R) in the dimensions corresponding to IDS\_SR subscales; and (c) to what extent mother assessments correlate with the results of IDS\_SR school readiness subscales?

## Method

**Sample.** The research included 68 mothers and their children. The criterion of including the child in the sample was age – completed six years (6; 0-6; 11), lack of delay in mental functioning and completion of the study with the IDS test (in two cases, the child did not complete the study). The group of children ( $M = 6.04$ ,  $SD = .03$ ) consisted of 33 girls and 35 boys. The mothers' group consisted of 47 women with higher education (69%), 13 – with secondary education (19%) and 8 – with vocational education (11%) (mothers were not monitored). 35 children lived in a city with more than 100 000 inhabitants, 26 – a city with less than 100 000 inhabitants while 7 – villages. All subjects came from the Kujawsko-Pomorskie and Wielkopolskie voivodships. Selection for the sample was carried out using the "snowball" method, with mothers willing to take part in the study (expressing their written consent to participate in the study). The research was carried out from May to September 2017, in kindergartens where children attended. The mothers of the examined children were given verbal information about the purpose and method of examination, and

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<sup>4</sup> A detailed description of the subscales can be found in the "Method" part of the article. Abbreviation "KGSR-D" means in Polish: "Kwestionariusz Gotowości Szkolnej Dziecka w Ocenie Rodziców".

written information was also available. During the examination children were provided with quiet, isolated rooms, no interference from third parties, and the possibility of leaving the room where the examination took place. The average time of the child's examination was 70 minutes.

**Measurement and procedure.** To measure the school readiness, the Intelligence and Development Scales IDS for Children aged 5-10 were used by A. Grob, Ch.S. Meyer and P. Hagmann-von Arx in the Polish adaptation of A. Jaworowska, A. Matczak and D. Fecenec (2012). The test consists of two scales (intelligence and development), which are formed on the basis of 19 subscales, investigating seven different areas of the child's functioning, i.e. cognitive abilities (visual perception, selective attention, phonological working memory, spatial working memory, spatial reasoning, conceptual thinking, auditory long-term memory) and diagnosing five competences (psychomotor skills, socio-emotional competences, mathematics, language, motivation of achievements). The subscales consist of tests performed by the child. 11 of 19 subscales are used to diagnose school readiness. The authors of the Polish adaptation of IDS Scales recommend that the following variables be included in the diagnosis of school readiness:

- (1) emotional maturity – the ability to regulate negative emotions (index: score in the Emotion regulation subscale) and knowledge of the rules of behaviour in various types of difficult social situations (index: score in the Social strategies subscale);
- (2) mathematical competence – the ability to use the ability of logical thinking to perform tasks based on quantitative and spatial relations (index: score in the Logical-mathematical reasoning subscale);
- (3) language competences – communicative ability that allows a child to understand what other people say to him (index: score in the Passive speech subscale) and correct constructing of statements that self-directed to (index: score in the Speech subscale);
- (4) ability for visual analysis and graphomotor efficiency, which are necessary to master literacy skills (index: score in Visual-motor coordination subscale);
- (5) any memory involved in storing phonological information (index: score in the Phonological memory subscale) and long-term memory which is a prerequisite for effective learning at school (index: score in the Auditory memory subscale);
- (6) motivation to learn – willingness to learn and learn about the world (index: score in the Satisfaction with achievements subscale);
- (7) task motivation and focus on the task – the ability to perform imposed tasks, readiness to overcome obstacles in their implementation and postpone the prize (index: score in the Perseverance subscale) and focusing their attention on the essential elements of the tasks (index: score in the Selective attention subscale).

The IDS scales are characterized by high indicators of reliability and accuracy and are now increasingly used by psychologists involved in the diagnosis of children in early school age (see Jaworowska, Matczak, Fecenec, 2012). The results of the sur-

vey conducted among IDS users showed that until now the IDS subscales were most often used in assessing the maturity of children starting school duty and are recommended by specialists to diagnose school readiness in practice (Fecenec, Matczak, 2017; Jaworowska, 2017). First of all, the Logical-mathematical reasoning and Auditory memory subscales correlate with school achievements of children to the greatest extent.

The *Questionnaire of Subjective School Readiness Assessment by Parents* (KGSD-R), the author of which is M. Kowynia, was used to measure the school readiness assessment by the parent. The parent's task is to address in a nominal scale: YES / NO / I DO NOT KNOW the 28 statements in the dimensions corresponding to the school readiness indicators included in the IDS Scales. The reliability of KGSD-R measurements was determined on the basis of the half-integrity index (*rtt*), which amounted to 0.82 for the first and second half of the statements, while the reliability calculated for every second statement was 0.93. Demographic data have been collected in the questionnaire.

## Results

Statistica version 12 from StatSoft was used to analyze the results. In the first step, aimed at determining the level of competence of six-year-olds, the results obtained by the examined children in individual IDS\_SR subscales, used to assess school readiness (see table 1) were analyzed.

Table 1. Results characteristics for particular IDS\_SR subscales – raw results (*M*, *SD*), standardized results (*Z*), average score for subscales based on norms for the Polish population and the number of respondents with low, medium and high scores in given subscales

IDS_SR subscales	<i>M</i>	<i>SD</i>	<i>Z</i>	<i>M</i> calculated			
				for the subscale according to the standards	<i>N</i> (%) low results	<i>N</i> (%) average results	<i>N</i> (%) high results
1. Auditory memory	24.65	6.34	569.35	11	0 (0)	54 (79)	14 (21)
2. Selective attention	30.88	13.07	356.69	8	18 (26)	46 (68)	4 (6)
3. Phonological memory	5.54	1.97	426.9	12	8 (12)	42 (62)	18 (26)
4. Visual and motor coordination	8.29	2.92	478.99	11	6 (9)	42 (62)	20 (31)

cont. table 1

5. Emotions regulation	8.38	2.78	553.24	8	11 (16)	57 (84)	0 (0)
6. Social strategies	7.6	2.02	585.43	10	4 (6)	61 (90)	3 (4)
7. Logical-mathematical reasoning	5.85	2.11	540.81	10	11 (16)	38 (56)	19 (28)
8. Active speech	6.71	2.25	563.29	12	3 (4)	48 (71)	17 (25)
9. Passive speech	7.16	2.69	551.46	11	4 (6)	43 (63)	21 (31)
10. Perseverance	10.85	2.94	626.76	9	17 (25)	49 (72)	2 (3)
11. Satisfaction with achievements	10.37	2.88	598.73	8	18 (26)	49 (72)	1 (2)
Average:					9 (13)	48 (71)	11 (16)

Source: own work.

Graphs convergent with normal distribution were obtained (the exception was logical-mathematical reasoning; K-S:  $p < .01$ ; Lilliefors:  $p < .01$ ), in case of subscale 2. Selective attention (due to the spread of results 1-80). In order to compare the results of individual subscales with each other, they were converted (standardized), reducing the results for individual variables to a common scale (a common denominator was adopted, i.e. maximum measurement: 924) (see table 1 – Z values). Friedman's ANOVA test showed statistically significant differences between the results of individual tests ( $\chi^2 = 142.48$ ;  $p < .001$ ). The differences between the subsequent three highest scores (10. Perseverance, 11. Satisfaction with achievements and 6. Social strategies) turned out to be statistically insignificant (a significant difference only between 10. Perseverance and 1. Auditory memory –  $t = -2.1$ ;  $p = .04$ ), and the two lowest results – in the scope of 2. Selective attention and 3. Phonological memory – were significantly lower than the next low score – in the range 4. Visual-motor coordination (respectively  $\chi^2 = 7.33$ ;  $p = .007$ ;  $d$  Cohen = .76 and  $\chi^2 = 5.55$ ;  $p = .02$ ;  $d$  Cohen = .32).

Then the results of the IDS\_SR subscales obtained for the group of examined children were referred to standardized norms for 6-year-olds (see table 1). After recalculation on a 19-point scale for individual IDS tests, collective results with a confidence interval of 95% were presented in figure 1. The examined children obtained average recalculated results – in the range of 8-12 points (on a scale of 0-19; 7-13 is the average score) for individual IDS subscales. Most of the respondents obtained a general result (average score for all 11 subscales) on the average level ( $\chi^2 = 19.6$ ;



$p < .001$ ;  $\phi^2 = .1$  – compared to the group of children with a low score;  $\chi^2 = 16.79$ ;  $p < .001$ ;  $\phi^2 = .09$  compared to the group of children with a high score).

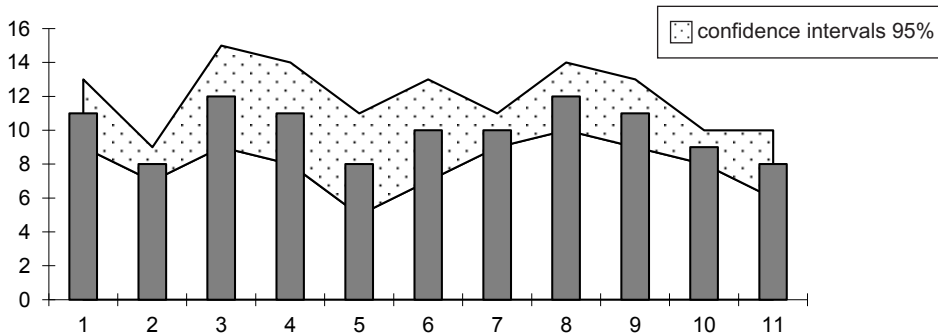


Figure 1. Results of IDS\_SR subscales for the studied children with regard to the standards for Polish population of 6-year-olds (result given with confidence intervals 95%)

Source: own work.

We also tested the importance of age and gender for the converted average score of all IDS\_SR subscales using the ANOVA variance analysis. In this case, only age was relevant *dzieci* ( $F = 47.59$ ;  $p < .001$ ;  $\eta^2 = .43$ ) – older children received higher scores than younger children, gender was not relevant ( $F = .39$ ;  $p = .53$ ) nor its interaction with age ( $F = .36$ ;  $p = .55$ ).

Continuing the analysis, the focus was put on the importance of the age of the examined children – they were divided into two parallel groups (34 people each): 6; 0-6; 4 and 6; 5-6; 11 years. Table 2 presents the differences in the raw results of the IDS\_SR subscales. Glass *delta* was used to estimate the magnitude of the effect due to different standard deviations of the compared groups.

Table 2. Comparison of results for younger (6; 0-6; 4) and older (6; 5-6; 11) groups of children in the IDS\_SR subscale

IDS_SR subscales	Younger children		Older children		<i>t</i> Student	$\Delta$ Glass
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>		
1. Auditory memory	22.06	5.19	27.24	6.4	-3.66***	1
2. Selective attention	28.62	9.62	33.15	15.61	-1.44	.47
3. Phonological memory	4.82	1.73	6.26	1.94	-3.23**	.83
4. Visual and motor coordination	6.82	2.17	9.76	2.86	-4.78***	1.35

cont. table 2

5. Emotions regulation	7.85	2.76	8.91	2.72	-1.59	.38
6. Social strategies	6.82	2.01	8.38	1.72	-3.44***	.78
7. Logical-mathematical reasoning	4.97	1.8	6.74	2.05	-3.77***	9.83
8. Active speech	5.7	1.73	7.71	2.29	-4.06***	4.13
9. Passive speech	5.63	2.05	8.69	2.38	-5.68***	1.49
10. Perseverance	10.44	2.73	11.26	3.13	-1.15	.3
11. Satisfaction with achievements	10.32	2.84	10.41	2.96	-.13	.03

\*  $p < .05$ ; \*\*  $p < .01$ ; \*\*\*  $p < .001$ .

Source: own work.

Differences between the results of the group of younger and older children were observed in seven of eleven IDS\_SR subscales – older children achieved higher scores than younger ones. In subscale 6. Social strategies, the differences were moderate (< .8), while in the others – large (> .8) (see table 2).

The next step in the analysis concerned the subjective assessment of children's skills – the analysis covered the results for individual KGSD-R items. First, the number of individual answers of mothers of children was compared (see table 3).

Table 3. Subjective assessment of school readiness of children, made by mothers – results for individual items

KGSD-R item	Answers "yes" $n$ (%)	Answers "no" $n$ (%)	$\chi^2$	$\phi^2$	Answers "I do not know" $n$ (%)
1. My child can talk about a previously heard story without help.	44 (64.7)	24 (35.3)	3.01	.06	0 (0)
2. My child can talk about a previously heard story with help.	65 (95.6)	2 (2.9)	38.15***	.28	1 (1.5)
3. My child can find out from among different blocks exactly the ones I ask for – both in terms of color and size.	65 (95.6)	1 (1.5)	40.8***	.3	2 (2.9)
4. My child can repeat a string of numbers or letters that do not overlap any words or a string of digits known to him (e.g. phone number).	37 (54.4)	25 (36.8)	1.23	.009	6 (8.8)

cont. table 3

5. My child is able to accurately and evenly redraw the layout of the basic geometric figures.	48 (70.6)	17 (25)	7.99**	.06	3 (4.4)
6. My child can tell how to deal with anger.	59 (86.8)	6 (8.8)	26.27***	.2	3 (4.4)
7. My child can tell how to deal with fear.	58 (85.3)	5 (7.35)	27.67***	.21	5 (7.35)
8. My child can tell how to deal with sadness.	60 (88.24)	2 (2.94)	35.43***	.27	6 (8.82)
9. My child can find the right solution in different social situations when dealing with peers.	57 (88.8)	8 (11.8)	21.85***	.16	3 (4.4)
10. My child can count to 5.	68 (100)	0 (0)	–	–	0 (0)
11. My child knows the meaning of the words first, second, third, fourth and fifth.	64 (94.1)	1 (1.5)	40.25***	.3	3 (4.4)
12. My child, seeing three different objects, knows what is their number and after changing their position, s/he still knows that their quantity does not change.	48 (70.6)	15 (22)	9.58**	.07	5 (7.4)
13. My child, seeing four different objects, knows what is their number and after changing their position, s/he still knows that their quantity does not change.	51 (75)	16 (23.5)	9.87**	.07	1 (1.5)
14. My child knows the number 3.	68 (100)	0 (0)	–	–	0 (0)
15. My child knows that when in two rows – one under the other – I have the same number of items and in one of them I put them together, making bigger breaks between them, their number does not change.	32 (47.05%)	24 (35.3%)	0.63	.005	12 (17.65)

16. My child knows that when in two rows – one next to the other – I have the same number of items and in one of them I will move part of the beads one way, increasing the gap between them and the other beads, their number does not change.	34 (50)	23 (33.82)	1.16	.009	11 (16.18)
17. My child can add in the range to 100.	16 (23.5)	48 (70.6)	8.76**	.07	4 (5.9)
18. My child can add in the range to 1000.	6 (8.8)	55 (80.9)	24.25***	.19	7 (10.3)
19. My child understands the importance of individuals and tens.	11 (16.2)	48 (70.6)	13.58***	.11	9 (13.2)
20. When multiplication occurs in the task, my child knows that it can be done by dividing into small groups and by doing the addition, s/he can also justify it.	4 (5.9)	58 (85.3)	29.73***	.23	6 (8.8)
21. My child can add large numbers in memory (above 1000).	2 (2.9)	65 (95.6)	38.15***	.28	1 (1.5)
22. My child is able to count all the blocks in a three-dimensional figure made of them, where all the elements are not visible because the child only looks at it from one perspective.	4 (5.9)	52 (76.5)	26.54***	.21	12 (17.6)
23. My child is able to complete the task: $56800 = 8 * \underline{\quad} + 4 * \underline{\quad}$ (where * means multiplication).	2 (2.94)	63 (92.65)	37.07***	.28	3 (4.41)
24. My child is able to name the object shown in the drawing and make a sentence with it.	47 (69.1)	17 (25)	7.64**	.06	4 (5.9)
25. My child is able to name the objects shown in the drawing and make one sentence with them.	40 (58.8)	23 (33.8)	2.42	.02	5 (7.4)

cont. table 3

26. My child, while playing with various objects, carries out my instructions regarding these items.	62 (91.2)	2 (2.9)	36.52***	.28	4 (5.9)
27. Even if my child fails or some difficulties arise – s/he persistently completes the task.	38 (55.9)	26 (38.2)	1.17	.009	4 (5.9)
28. My child is willing to take on new and difficult tasks and their solution gives him satisfaction.	41 (60.3)	25 (36.8)	2	.01	2 (2.9)
The average number of responses for items 1-28:	40 (59.4)	23 (34.2)	2.42	.02	4 (6.4)

\*  $p < .05$ ; \*\*  $p < .01$ ; \*\*\*  $p < .001$ .

Source: own work.

The examined mothers provided all possible answers to all items of the questionnaire apart from statements concerning self-storytelling (item 1) (no answer “I do not know”), counting to five (item 10) (only “yes”) and knowledge of number three (item 14) (only “yes” statements). In seven cases, maternal denials dominated (for the 21st and 26th items the differences were on the border of average and large –  $\phi^2 = .28$  in both cases), in twelve – confirmation of childrens skills (also in two – 2nd and 8th – the differences were on the border of average –  $\phi^2 = .28$  and  $\phi^2 = .27$ ), in seven – the number of confirmations and denials did not differ significantly. The average number of answers “yes” and “no” did not differ statistically, while the average number of answers “yes” ( $\chi^2 = 19.94$ ;  $p < .001$ ;  $\phi^2 = .18$ ) and “no” ( $\chi^2 = 9.97$ ;  $p = .002$ ;  $\phi^2 = .1$ ) was higher than the answer “I do not know”.

In the next step of the analysis, a subjective assessment of children’s competences for objective measurement was made, comparing the IDS\_SR results of the mothers of children declaring the possession of a given competence by the child (answers “yes”) and lacking it (answers “no”). Each of the KGSD-R items was referenced to the corresponding IDS\_SR subscale. The non-parametric U Mann-Whitney test was used for comparison. The result of the test was supplemented by the effect measure in the form of a range two-part correlation, which allowed to determine the covarius of the dichotomous variable (individual KGSD-R items) and ordinal (individual IDS\_SR subscales). The results were presented in table 4.

Table 4. Differences in IDS\_SR results of children of mothers declaring a given skill in a child and lack thereof (Z) and correlations of subjective and objective assessments of school readiness of children (R)

KGSD-R item	IDS_SR subscales	Z	R
1. My child can talk about a previously heard story without help.	1. Auditory memory	4.14*** YES > NO	.39
2. My child can talk about a previously heard story with help.		.55	–
3. My child can find out from among different blocks exactly the ones I ask for – both in terms of colour and size.	2. Selective attention	.43	–
4. My child can repeat a string of numbers or letters that do not overlap any words or a string of digits known to him (e.g. phone number).	3. Phonological memory	4.39*** YES > NO	.34
5. My child is able to accurately and evenly redraw the layout of the basic geometric figures.	4. Visual and motor coordination	2.78** YES > NO	.54
6. My child can tell how to deal with anger.	5. Emotions regulation	1.64	–
7. My child can tell how to deal with fear.		1.2	–
8. My child can tell how to deal with sadness.		.82	–
9. My child can find the right solution in different social situations when dealing with peers.	6. Social strategies	1.45	–
10. My child can count to 5.	7. Logical and mathematical reasoning	no variability KGSD-R	–
11. My child knows the meaning of the words first, second, third, fourth and fifth.		1.42	–
12. My child, seeing three different objects, knows what is their number and after changing their position, s/he still knows that their quantity does not change.	7. Logical and mathematical reasoning	3.37*** YES > NO	.41
13. My child, seeing four different objects, knows what is their number and after changing their position, s/he still knows that their quantity does not change.		3.57*** YES > NO	.4
14. My child knows the number 3.		no variability KGSD-R	–

cont. table 4

15. My child knows that when in two rows – one under the other – I have the same number of items and in one of them I put them together, making bigger breaks between them, their number does not change.		4.13*** YES > NO	.35
16. My child knows that when in two rows – one next to the other – I have the same number of items and in one of them I will move part of the beads one way, increasing the gap between them and the other beads, their number does not change.		4.17*** YES > NO	.34
17. My child can add in the range to 100.		2.3* YES > NO	.61
18. My child can add in the range to 1000.		2.64** YES > NO	.33
19. My child understands the importance of individuals and tens.		3.32*** YES > NO	.35
20. When multiplication occurs in the task, my child knows that it can be done by dividing into small groups and by doing the addition, s/he can also justify it.		2.94** YES > NO	.11
21. My child can add large numbers in memory (above 1000).		2.08* YES > NO	.12
22. My child is able to count all the blocks in a three-dimensional figure made of them, where all the elements are not visible because the child only looks at it from one perspective.		2.26* YES > NO	.31
23. My child is able to complete the task: $56800 = 8 * \underline{\quad} + 4 * \underline{\quad}$ (where * means multiplication).		.77	–
24. My child is able to name the object shown in the drawing and make a sentence with it.	8. Active speech	1.41	–
25. My child is able to name the objects shown in the drawing and make one sentence with them.		3.31*** YES > NO	.49
26. My child, while playing with various objects, carries out my instructions regarding these items.	9. Passive speech	.08	–

27. Even if my child fails or some difficulties arise – s/he persistently completes the task.	10. Perseverance	3.34*** YES > NO	.5
28. My child is willing to take on new and difficult tasks and their solution gives him satisfaction.	11. Satisfaction with achievements	2.98** YES > NO	.56

\*  $p < .05$ ; \*\*  $p < .01$ ; \*\*\*  $p < .001$ .

Source: own work.

The analysis showed that mothers' responses in 16 from the 28 items of KGSD-R significantly differentiated their children's scores in the IDS\_SR subtests measuring school readiness (see table 4). In these 16 items, the subjective assessment of child's readiness by mothers (KGSD-R) correlated with the assessment of their child in the IDS\_SR subscales: (a) in ten they were low correlations (below  $R = .4$ ), (b) in five – moderate ( $R = .4-.6$ ), (c) and only in one – high (above  $R = .6$ ). In all cases, children whose mothers declared the occurrence of a given competence, obtained higher scores in the IDS subscales corresponding to the KGSD-R item than children whose mothers denied the mastery of a given competence (see table 4, YES > NO markings). The overall correlation between the standardized average score for all 11 IDS\_SR subscales (measuring school readiness) and the average number of mothers' responses confirming the child's mastery of a given competence (KGSD-R) was  $R = .59$  ( $p < .001$ ;  $R^2 = .35$ ). The correlation between the proportion of "yes" and "no" answers (yes/no) to KGSD-R items and the standardized average score for all 11 IDS\_SR subscales was also calculated. A moderate positive correlation was obtained  $R = .48$  ( $p < .001$ ;  $R^2 = .23$ ).

Next, a generalized hierarchical regression analysis was performed (stepwise approach method), taking as an independent variable a general, standardized result for all IDS\_SR subscales, and predictors the general proportion of "yes" to "no" to KGSD-R and controlled side variables: child's age in years (including finite months on the day of the study), the sex of the child, place of residence (village, small and large city) and mother's education (basic, secondary, basic vocational, higher). The regression analysis was completed on the fourth step, taking into account the following variables: age of the child ( $\beta = .71$ ;  $p < .001$ ), proportion of yes/no answers of mothers ( $\beta = .14$ ;  $p = .06$ ), place of residence ( $\beta = -.14$ ;  $p = .08$ ) and mother's education ( $\beta = .1$ ;  $p = .16$ ). The obtained model was characterized by moderate match ( $R^2 = .73$ ) – predictors explained 73% of the variability of the general results of the standardized IDS\_SR.

The final step of the analysis consisted in conducting additionally a regression analysis, the aim of which was to determine the relation between KGSD-R results and the results for IDS\_SR subscales. This time, the reverse direction of the relationship was adopted, assuming that the objective competences of children, expressed in their behaviour, are the basis for subjective judgments of children's competences.



The dependent variable was the proportion of “yes” to “no” to all KGSD-R items, the results of individual IDS\_SR subscales were independent. Hierarchical regression analysis of the step-by-step method was performed. Predictors of mother assessments were the results obtained by children in four out of eleven subscales IDS\_SR: 7. Logical-mathematical reasoning ( $\beta = .22$ ;  $p = .08$ ), 2. Selective attention ( $\beta = .34$ ;  $p < .001$ ), 4. Visual and motor coordination ( $\beta = .25$ ;  $p = .04$ ) and 8. Active speech ( $\beta = .15$ ;  $p = .25$ ). The obtained model was characterized by low match ( $R^2 = .39$ ) – predictors explained 39% of the variability of the general results of the standardized IDS\_SR.

## Discussion

Analysis of the presented research results leads to three key statements. Firstly, the average levels of achievements of the examined six-year-olds in the IDS\_SR subscales, measuring their school readiness, are within the limits of standards observed in the Polish pre-school children’s population. Secondly, in spite of the relatively large variation, in mothers’ assessments generally prevailed the opinions confirming the achievement by their six-year-old children of the competences required in school education. Third, subjective assessments of school competences of children by their mothers correlate with their measurement of IDS\_SR subscales, while the relationship between these variables is moderate.

A detailed analysis of the results obtained in terms of the level of school readiness allows us to state that the relatively high results of the six-year-olds surveyed in terms of such competences as perseverance, satisfaction with achievements<sup>5</sup> and social strategies, while lower – in terms of selective attention and phonological memory. Generally speaking, this means that the examined children are primarily characterized by a high motivation to learn and solve tasks, as well as the ability to effectively cope with social situations, including not only knowledge of the rules of conduct, but also the ability to apply them in action. It is worth noting that in the light of the norms for Polish 6-year-olds, the results of the examined children in terms of perseverance approached the lower limit of averages (similarly as in the case of selective attention and the ability to regulate emotions), while the upper results were similar in terms of phonological memory and active speech. Thus, the children’s ability to store phonological information in short-term memory, although it is a relatively less controlled competence than others (except the ability to intentionally direct attention), was moderately and even higher than part of the other

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<sup>5</sup> In the light of the deliberations presented in the discussion, it should be noted that the scale of Perseverance and Satisfaction with achievements are the estimated scales completed by the researcher based on the observation of the behavior of the child in the course of execution of the IDS test tasks.

competences. The obtained results indicate that the pre-school children in question are ready to take up school education in terms of motivation and society, despite the fact that they obtain relatively lower results in subscales measuring cognitive readiness. This result stands in contrast to the results of previous research on the beliefs of parents or teachers pointing to the lack of appropriate socio-emotional competence of children starting school education (compare Rimm-Kaufman, Pianta, Cox, 2000; Czub, Matejczuk, 2014).

The analysis of controls variables allowed us to assume that in general, age is important for the results – older children achieved higher scores than younger ones, which corresponds with the current research results (see Kaczan, Rycielski, 2017). Significant differences were observed in seven of eleven subscales: Auditory and phonological memory, Visual and motor coordination, Social strategies, Logical-mathematical reasoning and Active and passive speech. It can be assumed that children with age develop competences that allow them to enter a class group, i.e. knowledge of social rules and language competences. At the same time, they improve their competences ensuring the mastery of reading and writing skills and the use of logical thinking skills to perform tasks based on quantitative and spatial relations, which are used to solve tasks appearing at school (see Kołodziejczyk, 2012). An interesting result was that the age of the examined children did not matter to their ability to regulate emotions, which – in relation to standards – are at the lower end of average results. This may result from the fact that the surveyed children, despite good coping in social situations, have some difficulties with the active impact on their emotional states, that is, taking independent remedial actions that reduce the tension associated with the feeling of anger, fear and sadness.

The analysis of the subjective assessment of children's competences, carried out by mothers, revealed that mothers generally have knowledge about their children's abilities. The number of answers "I do not know" was relatively lower than the others. In three cases, they accounted for 16-17% of all responses, but these were specific logical-mathematical tasks regarding the constancy of the number and the ability to decentrate when adopting different spatial perspectives. It is worth noting, however, that only in one case the item on which mothers gave differentiated answers (regarding the ability to tell a story to a child without any auxiliary questions) was never given the answer "I do not know". It can be assumed that the mothers' knowledge of the competences of their children was to some extent limited or some of the items could be difficult for mothers to assess and cause uncertainty when providing an unambiguous answer.

The examined mothers almost twice more often confirmed than denied that the child possesses the competence described in the KGSD-R item (negations related only to relatively difficult mathematical competences). In addition, in cases of the ability to independently tell the story, repeating a string of digits/letters, understanding the constancy of the number, arranging a sentence with names of objects in the figure, perseverance in action and motivating the achievements of the group of mothers

confirming and denying the child's competence were leveled. Children's knowledge of the number three and the ability to count up to five was confirmed by all examined mothers.

The last of the research questions raised concerned the relationship between the IDS\_SR results and the subjective assessments of the school readiness of the six-year-olds, made by their mothers. The results of this analysis are not unambiguous.

First, the research revealed a moderate general correlation between these variables and a limited range of partial correlations: only slightly more than half of the responses in the subsequent KGSD-R items correlated positively with the results of the respective IDS\_SR subscales. Most of these correlations were low and moderate. These results suggest that the examined mothers did not have a good orientation in the development of their children's school competences. It also draws attention to the fact that they had a better orientation in the scope of cognitive developmental abilities and clearly overestimated the social and emotional competences of their children.

Secondly, the results of the regression analysis showed that the variability of the general level of school readiness measured by six-year-olds measured by appropriate IDS\_SR subscales, is best explained by the system of five factors, namely: age of children, mothers' assessment, place of residence and education, but only one of them is significant: age of the examined children. These analyzes prove that mothers' judgments about the competences of their children have low accuracy in predicting the results of school readiness measurements by IDS\_SR subscales.

Thirdly, despite the fact that subjective assessments of mothers turned out to be weak predictors of school readiness measurement with IDS\_SR subscales, we were interested in what areas of school competence mothers accurately assess the development opportunities of their children. The applied regression analysis showed that the variability of the general level of school readiness in the assessment of mothers of examined six-year-olds (KGSD-R) best explains the results in four IDS\_SR subscales, respectively: selective attention, visual-motor coordination, logical-mathematical reasoning and active speech, however only two are important: selective attention and visual-motor coordination. These results suggest that the subjective assessment of school readiness expressed by mothers is mainly influenced by the cognitive skills of their children.

When discussing these results, it should be noted that the first two conclusions are related to each other. On the one hand, not the best orientation of mothers in the development opportunities of their children (e.g. due to the lack of appropriate experience/observation of the child's behaviour or attitudes in their perception) is probably the reason for low relevance of the expressed assessments in the prediction of IDS\_SR tests measuring school readiness. On the other hand, however, we must realize that subjective assessments of mothers (or teachers) and performance tests in the measurement of children's school competences are a source of data that has a different nature, organization and functional distribution over time (see Trempała,

Olejniki, 2011; Trempała, in preparation). It seems, therefore, that the direct comparison of these measures found in the literature or the frequent use of multi-component school readiness indicators mentioned in the Introduction (combining the results of standard tests with parents' or teachers' judgments) is not always justified.

The third conclusion, which concerns the significant impact of cognitive competences on school readiness assessment, seems inconsistent with the assumption adopted in the study that parents (and teachers) attach particular importance to the social and emotional competences required in school (see McBryde, Ziviani, Cuskelly, 2004; Czub, Matejczuk, 2014). Unfortunately, the presented analyzes do not allow to resolve unequivocally the question about the role of the child's social and emotional competence in shaping the assessment of mothers about their child's school readiness. On the one hand, the vast majority of mothers confirmed their child's mastery of socio-emotional competences (see table 3: emotion regulation, social strategies). On the other hand, the small diversity of mothers' judgments on the subject caused their lack of correlation with more varied IDS\_SR results (see table 4). As a result, it turned out that the IDS subscales measuring social and emotional competences do not explain maternal judgments about school readiness of their children. In our opinion, the mentioned problem of small differences in mothers' assessments is probably related to the limitations of the questionnaire we used (KGSD-R) and requires separate research. We believe that, in order to improve it, we should replace the dichotomous scale of the answer (yes/no) with a more multi-valued scale and increase the match (content and structural) of the KGSD-R item in comparison with the corresponding IDS tasks.

In conclusion, the analysis of the presented research results allows to answer the question asked in the title: six-year-old children are ready to start school education. It should be stressed, however, that the assessment of school readiness is relative: it depends on the way it is measured. It seems that from the point of view of standard school readiness measurement tools, maternal judgments about this subject are of low relevance and should be treated with caution.

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#### GOTOWOŚĆ SZKOLNA DZIECI PRZEDSZKOLNYCH: CZY SZEŚCIOLETNIE DZIECI SĄ DOJRZAŁE DO PODJĘCIA NAUKI SZKOLNEJ?

**Streszczenie.** Artykuł stanowi raport z badań własnych dotyczących problematyki gotowości szkolnej dzieci sześciolatków. W pierwszym kroku analizowano, jaki jest poziom kompetencji szkolnych sześciolatków mierzonych Skalami Inteligencji i Rozwoju (IDS). Drugi etap obejmował sprawdzenie, jak kompetencje odpowiadające wymiarom podskal IDS\_SR oceniają matki badanych dzieci przy zastosowaniu Kwestionariusza Gotowości Szkolnej Dziecka przez Rodziców (KGSD-R) i w jakim stopniu oceny te korelują z wynikami pomiaru skalą IDS. Badania objęły 68 matek i 68 ich dzieci. Kryterium włączenia dziecka do próby stanowił wiek, tj. ukończone

sześć lat (6; 0-6; 11). Dobór do próby odbywał się przy użyciu metody „kuli śnieżnej”. Na podstawie uzyskanych rezultatów można wnioskować, że badane dzieci prezentują przeciętny poziom gotowości szkolnej, wystarczający do podjęcia nauki szkolnej. Ponadto generalnie im dzieci są starsze, tym wyższe wyniki uzyskują w podskalach IDS\_SR. Subiektywne oceny matek w umiarkowanym stopniu korelują z wynikami pomiaru obiektywnego, a zastosowane narzędzie natomiast wymaga dalszego doskonalenia.

**Słowa kluczowe:** gotowość szkolna, oceny rodziców, dzieci sześciolatnie

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