ACTUAL PROBLEMS OF PSYCHOLOGY

DOES SCHOOL ENTRANCE AGE MATTER?

Konarzewski Krzysztof
prof. zw. dr hab., Katedra Edukacji, Kultury i Historii
Wszechnica Świętokrzyska, Kielce, Polska

Polish reform of school entrance age was justified on the grounds that sending children to school one year earlier would increase, or at least would not decrease, their scholastic achievement. This article tests this conviction on the basis of international research data.

1. 1. Polish reform of school entrance age

In Poland, since the onset of the twentieth century, children have begun compulsory education in the year they turned seven. Parents of advanced children could send them to school at the age of six, but children of this age were in the minority, making up less than one per cent of the Grade 1 cohort. In 2009, the government proclaimed a change. The amendment to the Educational Act said: 'Compulsory schooling begins with the first day of the school year in the calendar year in which a child turns six'.

What were the reasons for lowering the school entrance age? Firstly, developmental psychologists asserted that six-year-old children are ready for school, and that holding them in kindergarten slows down their mental and social development. In most European Union countries children enter school at six. Why should Polish six-year-old children only be getting ready for school while their peers abroad have already started? Secondly, lowering the age of school entrance promised future benefits for the labour market, providing a supplementary age cohort. Polish society is ageing at a rapid pace; an extra workforce would certainly help to support the growing masses of pensioners.

The Ministry of Education dealt with opposition to the amendment as the reform challenged old traditions. In order to accustom people to the change, it was introduced over a three-year transitional period, during which parents of six-year-olds were encouraged but not obligated to send them to school. In the 2012/2013 school year, the remaining six-year-olds were supposed to enter school obligatorily. The reform was expected to achieve full success in the fourth year.

Alas, parents showed reluctance to the new law. As Table 1 shows, in the first year of the transition period, less than five per cent of parents sent their six-year-olds to school. For the next two years the percentages grew, but at a slow pace. It was clear that there was no chance that all six-year-olds would be in Grade 1 by September 2013. Therefore, the government postponed the deadline for two years, until 2014. This was taken as evidence of the government's indecisiveness and strengthened opposition to the reform. A social movement 'Save toddlers' came to the fore. Their message was simple: six-year-olds are not ready for school and schools are not ready to enrol them. Indeed, six-year-old enrolments in the 2013/2014 school year declined. The 'Save toddlers' movement collected almost a million signatures on a petition calling for a national referendum. The petitioners believed that the question 'Shall compulsory education begin at six?' should have been settled by society, and not by politicians or experts. The parliament refused to call the referendum and passed a new amendment. It stated that in September 2014 all seven-year-olds and the older half of the six-year-old cohort would be obliged, by law, to commence Grade 1 education. In September 2015 the obligation would rest with the remaining seven-year-olds and all the six-year-olds.

Table 1

A calendar of the unsuccessful reform (Główny Urząd Statystyczny, 2010–2015)

School year	The cohort of six-year-olds	Number of six-year-olds in Grade 1	Per cent of six-year-olds in Grade 1	Comments
2009/2010	348,169	14,812	4.3	In the transitional period percentages are small. In January 2012 legal amendment postpones the obligation for two years until 2014.
2010/2011	353,438	33,190	9.4	
2011/2012	369,872	70,349	19.0	
2012/2013	383,956	65,868	17.1	The 'do as you please' period continues.
2013/2014	404,041	62,768	15.5	Percentages decrease. In August 2013 legal amendment sustains the 2014 obligation for the older half of the six-year-old cohort.
2014/2015	431,591	193,802	44.9	The older half of the six-year-old cohort goes to school. There are 513,298 pupils in Grade 1.
2015/2016	433,638	318,375	73.4	All six-year-olds (except for 21 per cent of 'redshirting' children) go to school. There are 536,763 pupils in Grade 1.

The opposition was broken, but it came at the cost of a huge increase in Grade 1 enrolment in the two subsequent school years. In 2015/2016 the increase might have been even bigger if parents had not applied to psychological counselling services for the postponement of compulsory education for their children. The psychologists did not want to cause difficulties and granted postponements for 21 per cent of the cohort.

The government's efforts were all in vain. An oppositional Law and Justice Party (PiS) won the autumn 2015 parliamentary election. In the electoral campaign they promised to withdraw the amendment which lowered the school entry age, and indeed they did. In December 2015, the new parliament adopted a law, to come into effect in 2016, that reinstated compulsory schooling for children aged seven. Parents who wished to send their six-year-old children to school were still able to, but only with the consent of a psychological service.

Consequently, the 2016/2017 Grade 1 will comprise 74,000 six-year-olds, 91,000 seven-year-olds, and 45,000 seven-year-olds repeating Grade 1. This totals 210,000 altogether and is only 60 per cent of usual enrolment. Large urban schools will have to dismiss some teachers. In most small country schools there will be only one Grade 1 classroom, possibly with few pupils.

The landscape after the storm looks desolate. There will be two overpopulated grades and one underpopulated. It is under these abnormal conditions that these children will learn for the next 10–12 years. Overcrowded classes are certainly not conducive to scholastic achievement. Are small classes more beneficial? It may be doubted. In small classes a toxic social climate quite often develops. Cliques are formed that discriminate against outsiders. Teachers excessively direct the activity of pupils at the expense of independent learning. In addition, early grade repetition may have a negative effect on pupils' achievement at the end of primary school (Alet, 2010).

1. 2. School entrance age and scholastic achievement

In the campaign for lowering school entrance age, the government argued that pupils' calendar age has no impact on achievement. One longitudinal research (Kaczan & Rycielski, 2014) was frequently cited. A battery of basic skills in mathematics, reading, and writing were administered to random samples of six– and seven-year-olds who had just commenced Grade 1 education. The same measurement was repeated at the end of Grade 1. The results are shown in Table 2.

Table 2

Mean scores of pupils who entered Grade 1 at the age of six (*N* = 565) and seven (*N* = 599)

Skill area	Entrance age	Onset of Grade 1	End of Grade 1	Increment
Mathematics	6	102	110	8
	7	103	110	7
Reading	6	103	116	13
	7	103	115	12
Writing	6	106	115	9
	7	106	116	10

All tests were scaled to mean 100 and standard deviation 15.
Source: Kaczan & Rycielski, 2014.

It can be seen that the six– and seven-year-olds in this study did not differ from each other either in initial measurement or in increment of skills. The government concluded that six-year-olds are as ready for school as seven-year-olds and that the difference of one year is unimportant. Is it a valid conclusion? No, because in the study the sample of six-year-olds were drawn from six-year-old pupils who had entered Grade 1 in 2012 but, as Table 1 attests, they made up only 17 per cent of the six-year-old cohort. Obviously, the sample is not representative of the general population. If parents suspected that their six-year-old might have difficulties in learning they would

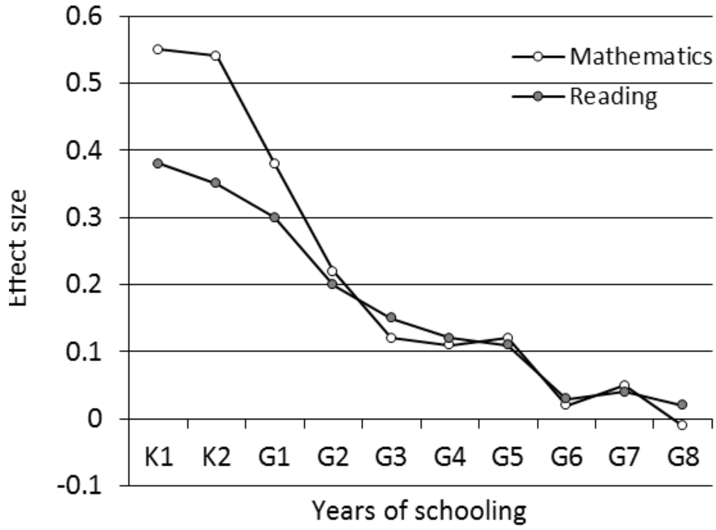

Figure 1. Differences in achievement (*d*) between older and younger pupils in kindergarten (K, two repeated measurements) and Grades 1–8. Source: Oshima & Domaleski, 2006.

have held him or her back in kindergarten for a year. In effect, only the most able children from the cohort entered Grade 1 at this time; it is little wonder that they did not receive poorer scores than the representative sample of seven-year-olds.

Other, methodologically correct, studies (see Konarzewski, 2013 for a review) show that even a one year difference in age matters. In every school system that enrols children once a year, age differences among pupils in the same grade span one year. If a school year begins September 1 and the cut-off for school entrance is December 31, then the oldest pupil in Grade 1 is six years and eight months and the youngest is five years and four months. Is this difference in birth date conducive to differences in achievement? The answer is yes.

Figure 1, derived from a study of Oshima and Domaleski (2006), shows the achievement differences of older students (born three months after the cut-off) and younger students (born three months before the cut-off). Each point in the figure presents the results of a comparison of two samples, consisting of approximately 3,000 pupils each. It can be seen that at the beginning of education the differences are middle-sized (especially in mathematics), but that these differences decrease quickly and by Grade 6 they are close to nonexistent.

Why do the differences between achievement levels of younger and older pupils decrease? Apparently, this is because schools create conditions that favour the development of younger pupils over older pupils. What does matter is not age alone, but the way in which the school treats age differences.

A satisfactory explanation of the birth date effect must refer to the interaction between pupil competence and the challenges embedded in the school environment. The current competence level of a pupil is best understood as the uppermost level of educational challenge that the pupil is able to meet without the need to learn. A theory of the birth date effect asserts that development, that is the long-term growth of subject competence, is a curved function of environmental challenge. The scale of challenge includes the optimum *c* value representing the level that efficiently promotes the development of a given person. Points to the left of *c* represent insufficient challenge and points to the right are excessive challenge. Nevertheless, even sub-optimal challenge has some developmental value, which decreases as the distance from the optimum increases. It is also assumed that challenge values which are too large or too small do not differ from each other.

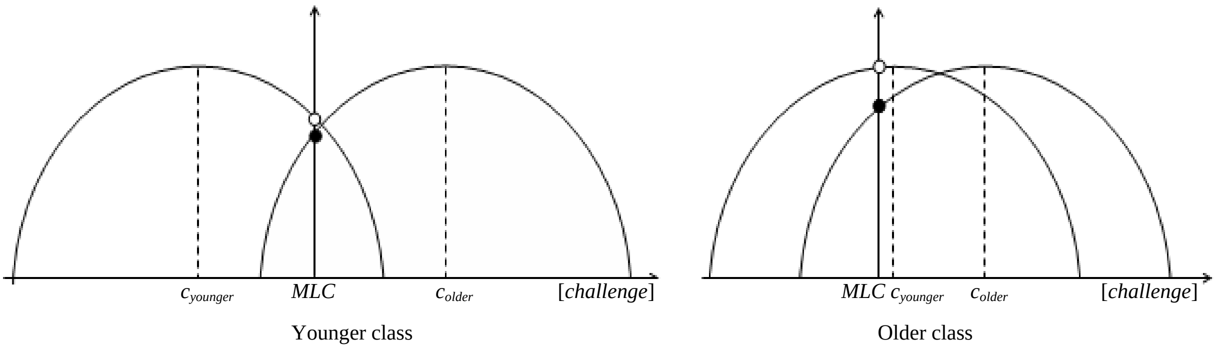

Figure 2. Two two-pupil classes

A class may be represented as a nest of individual development curves located on a common scale of challenge with an established modal level of challenge (MLC). MLC is based on a class's typical curriculum requirements, methods of transferring educational content, teaching pace, and evaluation style. Classes with high MLC get an advanced curriculum, their teachers do not dwell on the obvious, the pace of teaching is fast, and evaluation is frequent and objective. A pupil's development depends on the distance between the MLC and his or her *c*-point. The more differentiated the *c*-points within a class, the more troublesome it is for a teacher to bring the MLC closer to less advanced pupils because this will have an adverse effect on the more advanced pupils. There is evidence that in younger classes (i.e., of lower average age) differences in *c*-points or initial competence are greater than in older classes. Table 3 shows the coefficients of variation ($s/\bar{x}$) for the scores of three tests administered at the beginning of Grade 1 (Kaczan & Rycielski, 2014). Younger children were more differentiated with respect to initial competence than older children.

Table 3

Coefficients of test score variation at the beginning of Grade 1 in four quartiles of pupils' age

Skill area	Quartiles of age				Levene's test
	1 (age 6.1; *N* = 133)	2 (age 6.6; *N* = 242)	3 (age 7.0; *N* = 445)	4 (age 7.6; *N* = 292)	
Mathematics	0.13	0.13	0.12	0.11	ns.
Reading	0.14^a	0.13^a	0.12^b	0.11^b	<0.001
Writing	0.12^a	0.12^a	0.11^a	0.10^b	0.001

Coefficients with different superscripts differ significantly.
Source: Kaczan & Rycielski, 2014.

What can be expected in the younger and older classrooms after a few years of study, for example in Grade 4? The theory leads to three hypotheses:

H1. Achievement of the younger pupils in a classroom will be lower than that of the older pupils.

H2. In younger classrooms, achievement differences between younger and older pupils will be greater than in older classrooms.

H3. In younger classrooms, average achievement will be lower than in older classrooms.

These hypotheses were tested.

1. 3. Method and results

The analysis was conducted using data from the international IEA TIMSS 2011 study (Martin, Mullis, Foy & Stanco, 2012; Mullis, Martin, Foy & Arora, 2012), which aimed to determine scholastic achievement in mathematics and science of ten-year-olds in Grade 4 from 50 countries.

The database containing the data of over 600,000 pupils was reduced in three steps. Firstly, in order to reduce the number of organisational variants, all countries outside of Europe were eliminated, leaving data from 25 countries. Secondly, ‘delayed’ pupils, that is, those older than appropriate for their grade, were excluded. Thirdly, atypical classrooms with fewer than five pupils or more than 32 pupils were excluded. This accounted for 3.9 per cent of all classrooms. After these eliminations the sample comprised 101,519 pupils from 5,585 classrooms, with a mean classroom size of 18.2 pupils and a standard deviation of 5.6. The age of pupils ranged from 6.3 to 11.6 years, with a mean of 10.3 and a standard deviation of 0.51. The sample was 50.3 per cent male. The analysis was performed using the two-level hierarchical linear model (Raudenbush & Bryk, 2002). The results are presented in Table 4.

Table 4

Fixed effect estimates with robust standard errors

Effects	Mathematics			Science		
	Coefficient	Standard Error	*p*	Coefficient	Standard Error	*p*
Average achievement [γ_{00}]	518.86	1.36	<0.001	527.35	1.45	<0.001
Average pupil age in a classroom [γ_{01}]	28.78	3.14	<0.001	27.53	3.06	<0.001
SES slope [γ_{10}]	15.19	0.50	<0.001	16.13	0.55	<0.001
Gender slope [γ_{20}]	5.91	0.80	<0.001	5.29	0.94	<0.001
Average pupil age in a classroom [γ_{21}]	–6.30	2.40	0.016	–5.28	2.20	0.019
Age slope [γ_{30}]	5.97	1.22	<0.001	8.20	1.37	<0.001
Average pupil age in a classroom [γ_{31}]	–10.20	2.95	<0.001	–9.80	3.79	0.016

1. Gender and family socioeconomic status (SES) are controlled variables. The coefficients for mathematics and science are positive which means that boys and children from higher social strata gained higher scores. If the two variables were not

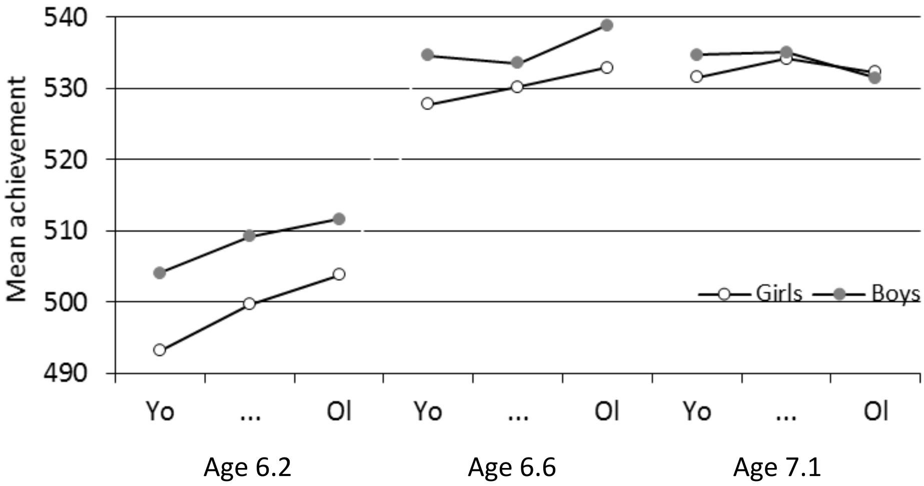

Figure 3. Mean achievement in mathematics of girls and boys of different relative age (Yo – younger, Ol – older) from classrooms differing in the age of school entry.

included in the equation, the relative age effect would be distorted as a result of random fluctuations in the classroom composition.

2. The average age of pupils in a classroom (γ_{21}) is negatively related to the difference in achievement between girls and boys. This means that the older the children in a classroom, the lower the advantage of boys over girls.

3. The intra-classroom coefficients of regression of achievement on relative age are highly varied, but their average (γ_{30}) is positive. In a typical classroom, a one year difference translates into a difference of 5.97 points in mathematics and 8.20 points in science. By dividing each difference by the standard deviation of the dependent variable, we obtain d = 0.10 for mathematics and d = 0.14 for science. This confirms the H1 hypothesis.

4. The average age of pupils in a classroom (γ_{31}) is negatively related to the relative age effect. This means that the older the children in a classroom, the lower the advantage of relatively older pupils over younger ones. This confirms the H2 hypothesis.

5. The average age of pupils in a classroom (γ_{01}) is positively related to the average achievement in the classroom. Achievement of pupils in the older classrooms is higher than in the younger classrooms, which is in line with hypothesis H3. Additional analyses show, however, that the relationship for mathematics is not linear. Pupils in medium-aged classes (i.e., those who started school at age 6.6) get higher scores than pupils in younger classes (who went to school six months earlier), but further postponement of school enrolment is without benefit: pupils in the older classes (who started school at age seven) do not achieve more than those in classes of children six months younger (Figure 3).

1. 4. Discussion and conclusions

Confirmation of H1 may seem trivial in the light of the many studies in which this effect has been shown; however, a particular feature of this study should be noted. The relative age in the sample of classes from different education systems depends, to a minor extent, on season of birth. In fact, the youngest and oldest pupils in these classes were born in all months of the year: the oldest most often in January (in 31 per cent of classes), and least often in April (4 per cent); and the youngest most often in December (30 per cent), and least often in April (5 per cent). The relative age effect is, therefore, of a particularly school-related nature and cannot be reduced to biological and weather conditions during foetal development and early infancy.

Confirmation of H2 means there is an interaction between relative and absolute school enrolment age. Postponement of school enrolment by one year cancels the relative age effect in Grade 4, probably because it reduces initial differences between pupils' competence and allows a teacher to better adapt to the challenging needs of younger pupils.

Although the H3 hypothesis has been confirmed, a question remains: Why does mathematical achievement in the older classrooms not differ from classrooms which are, on average, six months younger? If, in systems of late school enrolment, the cult of childhood is stronger, an MLC shift to the left, towards less demanding challenges, might be expected. Relatively younger children catch up more quickly with older ones, but meet them at a lower level than would be expected if requirements were higher for everyone. This only holds true in mathematics classes, since mathematics is considered to be particularly difficult.

The study also produced an unexpected effect: in the older classrooms the advantage of boys over girls is lower than in younger classrooms. The theory provides a simple explanation. Some studies suggest that at the start of schooling boys have an advantage over girls in terms of numeracy skills. In order to account for this difference, it is necessary to divide every function in Figure 2 according to gender: girls shifted slightly to the left, and boys shifted slightly to the right. It seems obvious that older classes provide more stimulation for girls than boys, while younger classes provide roughly equal amounts.

How relevant are these results to the Polish debate about school enrolment age? The findings are not directly conclusive, but they do support the claim that age is related to scholastic achievement through both biopsychology (i.e., initial aptitude differences) and schooling (i.e., teaching strategies). The earlier children start school, the more diversity a teacher faces in the classroom and the harder it is for him or her to pitch a level of challenge that will maximize pupil achievement. The question of how to reduce those initial differences is more important than defining the age at which children should start school. However, the results of this analysis suggest that differences at the beginning of Grade 1 may be reduced by adjusting the cut-off date. The estimated school enrolment age for pupils in the youngest classes is 6.2 years, in the medium-aged classes it is 6.6 years and for those in the oldest classes it is 7.1 years. These values correspond to the following cut-offs: age six, December 31, age six, June 30; age seven, December 31. The latter situation existed in Poland before the legal amendment, while the former would have applied if the amendment had come into force. The compromise – enrolling children who turn six before June 30 – would have reduced the relative age effect without subverting the intended effect of the reform. Alas, neither the old nor the new goverment pays attention to scientific research.

References:

1. Alet, E. (2010). Is grade repetition a second chance? Retrieved from http://feb.kuleuven.be/eng/ew/papers_edupol /ALET.pdf
2. Główny Urząd Statystyczny (2008–2015). Oświata i wychowanie w roku szkolnym 2009/2010–2014/2015. Warszawa: Autor.
3. Kaczan, R. & Rycielski P. (eds.). (2014). Badanie 6– i 7-latków – Rok szkolny 2012/2013. Warszawa: Instytut Badań Edukacyjnych.
4. Konarzewski, K. (2013). Wiek startu szkolnego a osiągnięcia w nauce w okresie wczesnoszkolnym. Edukacja, 4, 5–19.
5. Martin, M. O., Mullis, I. V. S., Foy, P. & Stanco, G. M. (2012). TIMSS 2011 international results in science. Chestnut Hill: Boston College.
6. Mullis, I. V. S., Martin, M. O., Foy, P. & Arora, A. (2012). TIMSS 2011 international results in mathematics. Chestnut Hill: Boston College.
7. Oshima, T. C. & Domaleski, Ch. S. (2006). Academic performance gap between summer-birthday and fall-birthday children in grades K–8. Journal of Educational Research, 99(3), 212–217.
8. Raudenbush, S. W. & Bryk, A. S. (2002). Hierarchical linear models. Applications and data analysis methods (2nd ed.). Thousand Oaks: Sage.

STRES I SYTUACJE TRUDNE W PRACY ZAWODOWEJ FUNKCJONARIUSZY ZAKŁADÓW KARNYCH

Mazur Eliza

doktor, Katedra Pedagogiki Społecznej i Resocjalizacji
Wszechnica Świętokrzyska, Kielce, Polska

Stres jest nierozerwalnie związany z pracą zawodową, a dla wielu osób praca jest jednym z największych źródeł stresu i problemów w życiu. Są zawody, w których narażenie na zdarzenie traumatyczne jest wpisane w rolę zawodów [5, s. 46]. Dotyczy to np. zawodu policjanta, strażnika więziennego, strażaka, pracowników pogotowia ratunkowego oraz członków innych zespołów ratowniczych.

Celem artykułu jest próba przybliżenia problematyki, uwarunkowań stresu i sytuacji trudnych w pracy zawodowej funkcjonariuszy służby więziennej.

Stres określany jest jako «psychologiczny i fizyczny ciężar lub też napięcie, które wywołane jest przez fizyczne, emocjonalne, społeczne, ekonomiczne czy zawodowe okoliczności, zdarzenia czy doświadczenia, z którymi trudno sobie poradzić lub które trudno wytrzymać» [1, s.710]. Wydarzenia kojarzymy negatywnie, utożsamiamy je z problemami, chorobą, sytuacjami konfliktowymi, ale