

Why do French youngsters have lower levels of attainment than young people in other countries at age 15 ?

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Summary : French pupils performed only averagely in the international PISA study. We try here to understand why by looking at different factors associated with the conditions for effective learning and comparing France with countries which out-performed it. France seems to compare fairly favourably with these countries as regards the organisation of its education system and family and pupil attitudes but rather unfavourably regarding the attitudes of teachers to their pupils. We then try to see if the French system compensates for this only average level of effectiveness by a relatively high degree of equity. The answer is that it largely does not.

Key words : Effectiveness/ Equity/Skills/PISA/ International Comparisons

The position of France in international comparisons of pupil attainment matters, not for the competitive aspects but because what these are comparing is each country's capacity to transmit to its children the skills which are necessary for them to go on learning, to be in charge of their own lives and their participation in society.

PISA (Programme for International Student Assessment, cf. annex 1) the international evaluation undertaken under the aegis of the OECD, in 2000 measured the attainment of 15 year old pupils in reading literacy, maths and science across 32 countries. These attainments are skills but also the capacity to apply them to diverse situations in life or learning. They relate, for example, to knowing how far pupils are capable of "functional use of maths knowledge rather than just their mastery in the framework of academic curricula" or again "the capacity to understand, to use, written texts and to reflect on these such as to attain one's aims, to develop one's competences and potential and to take part in society¹".

In sum, that "France" does less well than "the UK" is not serious in itself, but that French pupils are, in competence terms, somewhat less well equipped for life than pupils in that country is more so and ought to concern us. It is not a matter of

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competing but, surely, of copying. If even a single country has reached a higher level of attainment than us, that means that the social and educational conditions made it possible. It is useful then to try to understand why, at least if we are claiming to want the best for our country's children.

The delegations sent for this purpose to the top-performing countries often hear the response: "we don't know". Indeed it does seem wiser for this purpose to deploy what we know of the factors which relate to the effectiveness of teaching and the data available in PISA itself on the operation of educational systems. That is what we want to do in this article.

We are going to compare the situation of France to that of countries whose pupils, on average, do significantly better than French pupils in at least two of the three subjects covered in PISA: reading literacy, maths, science².

Three groups of countries are considered. Two Scandinavian countries (Finland and Sweden), two Asian countries (Japan and Korea) and four British Commonwealth countries (Australia, Canada, New Zealand and the UK itself). In addition, we will look at the case of the USA, a country which we out-perform in maths and whose results are close to ours in reading and science but which France usually likes to compare itself with³.

We will show the differences in pupil scores, then the factors on which we propose to account for these differences, then a comparison with the above-mentioned countries on these factors and finally we will compare the pupil results in terms of equity to see if countries "pay" for their better attainment by greater inequity in their education systems.

Differences in average pupil performance

French pupils are average in PISA. In science and reading literacy they are not significantly different from the international average. In maths, they are above. Of the 32 countries which took part in this study — 28 OECD members plus Brazil, Russia, Latvia and Liechtenstein — 31 were ranked and France comes 14th in reading literacy (more precisely: between 11th and 16th place, taking account of sampling error), 10th in maths, 12th in science.

This ranking was no surprise in science. It was more so for maths and reading literacy where previous international comparisons, devised by the IEA — Reading Literacy, for reading (1991), SIMS (1984) for maths and TIMSS (1995) for maths and science — had accustomed us to better rankings.

That does not prove that the relative ranking, still less the absolute level, of French pupils has fallen. Previous evaluations measured mastery of that part of knowledge that was common to the curriculum of the different countries⁴; furthermore, — and probably the main explanation — they related to pupils educated to a given grade (usually the penultimate year of lower secondary) and not to pupils of a given age, which favours France relative to countries which do not use year repeating. It is necessary therefore to look to later rounds of PISA to compare the relative change in attainment across countries.

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So, how did France do relative to these countries in 2000 across the skills tested in PISA 2000 ?

Table 1: Average pupil scores in reading literacy, maths and science

Country	Reading literacy	Maths	Science
France	505 (2.7)	517 (2.7)	500 (3.2)
Australia	528 (3.5)	533 (3.5)	528 (3.5)
Canada	534 (1.6)	533 (1,4)	529 (1.6)
New Zealand	529 (2.8)	537 (3.1)	528 (1.4)
UK ⁵	523 (2.6)	529 (2.5)	532 (2.7)
Sweden	516 (2.2)	510 (2.5)	512 (2.5)
Finland	546 (2.6)	536 (2.1)	532 (2.5)
USA	504 (7.0)	493 (7.6)	499 (7.3)
Japan	522 (5.2)	557 (5.5)	550 (5.5)
Korea	525 (2.4)	547 (2.8)	552 (2.7)
International average	500	500	500

Source: OECD,2001a.

Note: These “scores” have been standardised so that the international average pupil score is 500 and the standard deviation 100. The score of the median Finnish pupil is thus half a standard deviation higher than that of the median pupil across the 31 countries, which means that the performance of that pupil is higher than that of 70% of the pupils in these countries. Since the scores are derived from a sample of pupils they are subject to margins of error. The standard errors are shown in brackets. France’s in reading literacy is 2.7 which means that the “true” average score of French pupils is, at 95% probability, between 502.3 and 507.7. For the performance of a country to be significantly above that of France the difference between the averages must be more than twice the square root of the sum of the squares of the standard errors. Scores significantly above those of France are in bold.

In fact, pupils in these countries have, on average, significantly higher scores than those of France in the three subjects, with the full exception of the US, and also Sweden which does better than France in reading literacy and science but less well in maths.

Do these differences really matter? Let us consider where the reading scores are highest in PISA (see annexes 1 and 2 on the reliability of the PISA results). The largest difference — 41 points for Finland — is 8% of the average French score. The smallest gap — 11 points for Sweden — is 2%. Another way of assessing the size of these differences is as follows : On average, across OECD countries, 81 points separate the average score of pupils at the upper and lower quartiles of the social class scale; 67 points separate the average score of pupils whose mother undertook higher education and those whose mother completed her education before the end of upper-secondary education⁶.

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The average gap between us and those countries which out-perform us is between one-third and one-quarter of those differences. These therefore are differences which are neither negligible nor, let us say, beyond remedy.

A first explanation for these differences might be that social conditions are more favourable in these countries. Just as the average score at the *bac* for the lycée has to be adjusted for the age and social background of their pupils in order to deduce a measure of the effectiveness of teaching in that lycée, similarly it might seem fair, in judging the effectiveness of a country's education system, to weight its average actual score, as in Table 1, by factors such as the proportion of one-parent families in the country, of recent immigrants or, on the other hand, children of parents who have high levels of education.

The PISA report also shows for each country the average performance in reading literacy it would get if its value on a group of social factors were at the international average, taking account of the net effect of each of these factors in the country⁷.

A comparison with the above countries on this basis is as follows.

Table 2: Adjusted reading literacy scores

Country	Adjusted average	Standard error
France	505	2.1
Australia	518	3.0
Canada	523	1.6
New Zealand	531	2.0
UK	523	1.9
Sweden	511	2.2
Finland	543	2.4
USA	512	4.0
Japan	534	6.0
Korea	525	2.5

Source: OECD, 2001a; table 8.2.

Note: The factors used for the adjustment are: the index of parental socio-economic status (ISEI), the number of years parents have spent in education, the % of pupils from single-parent families, number of brothers and sisters, the % of pupils born abroad, access to educational resources in the home (a quiet place to study, a desk for study, a dictionary, textbooks and a calculator) in the home, access to cultural resources (literary books, poetry, works of art) in the home.

Measuring average performance in this way does not affect France's own score. It reduces the gap between its score and that of a number of countries (Australia, Canada, Sweden), but it increases it with Japan and it is worth noting that the US score, after adjustment, is not significantly above France.

However, this type of adjustment itself suffers from its own uncertainty. First, it is never certain that all relevant external factors have been taken into account. Next, it assumes that the effect of the variables used for the adjustment is exogenous. Yet this is not always the case. If, for example, an education system brigades all its immigrant pupils in very low-performing schools, the variable “pupil born abroad” will in this system have a markedly negative effect and the above calculation will over-estimate its effectiveness because it will attribute to the fact of being born abroad what should be attributed to the low-performing schools which the foreign pupils attend. Similarly, if social segregation is marked in an education system and the more “advantaged” pupils choose the most most effective schools, the adjusted score will be very different from the raw score, but partly unjustifiably so.

For the above reasons this type of measure does not remove all the interest in raw measures. In fact, what we can say with a fair degree of certainty is that the difference between the effectiveness of the education systems of two countries lies between what the raw scores and the adjusted scores show. As has just been seen, the list of countries which out-perform us, at least for reading literacy, is the same in both cases.

How can we explain these differences ?

The attainments measured by PISA are good at describing the effectiveness of learning in each country since there is no reason to think that there are significant differences between countries as regards children’s initial capabilities or levels of general intelligence. On the other hand, the effectiveness of learning can be related to school factors but also to social ones.

To explain these differences in effectiveness the standard procedure is to construct a multilevel model explaining pupil scores by their individual characteristics on the one hand, those of their class or school on the other and, finally, those of the country’s educational system. This is what Chapter 8 of OECD 2001 did. But, contrary to these standard approaches to effectiveness, PISA only has a single measure of pupil attainment. Because of this, the PISA results, like those of previous international assessments, do not allow the identification of the characteristics of schools and classes in which pupils make most progress *given the same starting level*, even if they can reduce this limitation by taking account of other external predictors like social background. They only allow the identification of the characteristics of schools which, after correcting for various social factors, produce the best attaining pupils. This is why, for example, the OECD’s 2001 analysis does not show the effect of factors which are however known to positively affect pupil attainment, such as academic press or support from teachers. For these variables, this analysis shows that they are more important for low-attaining pupils than for high-attainers but it cannot show that, for the same initial level of attainment, they have a positive effect on pupil progress. The reason for this is the “suppressive effect” which stems precisely from their being used for the pupils who have the greatest need. This is why we will use a much more homespun statistical method, one that is thus more intuitive than the precision of the ideal method.

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We will focus on the variables which previous empirical research has shown contribute to explaining the performance of pupils relative to their initial level of attainment, that is, to put it less rigorously, that they define the conditions for effective teaching and, to put it more technically, that their net effect, that is their effect after controlling for other factors that might be thought to affect learning, is significantly positive.

If the value of one of these variables is significantly more favourable in a given country than in France, we will judge that there is a probability that it is part of the explanation for why pupils in that country do better than those in France.

We will use four types of factors to try to explain the differences in performance :

- The organisational features of the *educational system*, in particular the degree of centralisation of the main decision areas
- The expectations, academic press, support received from the *family* and the immediate social environment
- The effectiveness of the teaching which takes place in each *class*.
- The school climate, the orderliness in class which are evidence of the level of *pupil* engagement.

The influence of *organisational features* has been demonstrated by Wößmann (2001) by means of a multilevel model applied to the results from the recent IEA study of attainment in maths and science (TIMSS, 1995). According to this analysis, pupils score more highly, both in maths and science, when the content of curricula and exams is decided centrally, when management of staff (teacher hiring, for example) is decided at the school level and when choice of textbooks and determining how lessons are taught is up to the teachers. The organisational features that we will use here are as follows:

- are exams centralised? (EXAMNAT)
- are curricula decided at the national level (PROGRNAT) ?
- are schools autonomous regarding staff management?(PERSETAB)
- do teachers have the final say in the choice of textbooks?(MANUEENS)

The influence of the support and encouragement received from the *family environment* has been demonstrated by experimental studies (cf. Bloom, 1986), but also by studies which have used this to explain differences in performance between certain countries: the greater demands of parents regarding their children's schoolwork can explain part of the superiority of Korea and Japan over the USA (Holloway et al., 1990). Finally, Grisay (1997) has shown that the quality of the family educational environment (expectations, interest, importance given to study) had a positive effect in France on the learning of lower-secondary pupils in maths and French. The family characteristics we will use here are :

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- Do parents have frequent discussions with their children about cultural issues?
- Intensity of academic support the pupil receives from their family
- Time spent on schoolwork at home
- Level of educational resources available in the home

The influence of the next two categories of factors has been established by research on the effectiveness of primary and secondary schools (cf. an international synthesis in Bosker and Scheerens, 1997 and, for French lower secondary schools, Grisay, 1997). By using multilevel models which make possible the appropriate treatment of effects in the class and at the school level, these researches go beyond the “school effect” and allow the separate identification of factors which apply at the levels of the pupil, the class (and hence also the teacher) and the school.

The following table shows the match between the factors in these two categories which we are going to use in the comparisons and the variables associated with the effectiveness of French lower-secondary schools, based on Grisay (1997), a match which is obviously essential for the approach used here.

Table 3: Match between the PISA variables on the effectiveness of teaching in given subjects and the equivalent variables associated with effectiveness in French lower-secondary schools at the beginning of the 1990's⁸.

PISA Variables	Grisay, 1997
Effectiveness of classroom teaching	
Academic press	During the lesson the pupils work without stopping ; During lessons you must study hard to succeed ; if I give in a badly completed piece of work, I know that the teachers will not put up with it.
Support from teachers	The teachers are committed to the success of all the pupils; you can speak to the teachers after the lesson; the teachers are concerned if pupils do badly; they help us to do our best; they are keen to help us with our work.
Quality of pupil-teacher relations	Pupils feel that they are treated with fairness and consideration; my teachers listen to what I say.
Classroom climate and level of pupil behaviour	
Quality of pupil behaviour and degree of commitment by pupils.	No time is wasted in class; teachers are respected; the lesson starts right away; the pupils pay attention to what the teacher says.

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A comparison with the eight countries that out-perform France plus the USA

The table below compares France and each of the countries being considered in this study on those factors positively associated with pupil academic success⁹:

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**Table 4: Factors positively associated with pupil academic success
Comparison of France with countries whose pupils have a higher average score**

	France	Australia	Canada	New Zealand	UK	Sweden	Finland	USA	Korea	Japan
Organisational features										
EXAMNAT ¹⁰	Yes	No	No	Yes	Yes	No	?	No	No	No
PROGRNAT ¹¹	Yes	No	No	Yes	Yes	Yes	?	No	Yes	Yes
PERETAB ¹²	No	?	?	Yes	Yes	Yes	No	No	No	?
MANUENS ¹³	Yes	?	?	Yes	Yes	Yes	Yes	No	Yes	?
Support and encouragement from the family										
Cultural discussions with parents		+	+	+	+	+	+	=	+	+
Family support		-	+	-	-	-	=	+	+	+
Work at home		+	=	+	-	+	+	+	+	+
Educational resources in the home		+	+	+	+	+	+	+	+	+
Effectiveness of classroom teaching										
Academic press		-	--	--	--	-	-	--	-	+
Support from teachers		--	--	--	--	-	-	--	-	=
Quality of teacher-pupil relations		-	-	-	-	-	=	-	+	+
Pupil behaviour and commitment										
Pupil behaviour (pupil responses)		=	+	+	-	+	+	-	-	-
Pupil behaviour (head teacher respn.)		=	+	+	+	+	++	+	--	--

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Source: Calculated from the PISA database except where marked to the contrary.

Note: Yes or no show if, in the country, the decisions in question are or are not taken at the level most favourable to effective education

? means that the data are not available

In the lower part of the table the + and – mean as follows: + means that the replies in France are significantly more favourable to teaching effectiveness than in this country, ++ similarly but the difference is more than half a standard-deviation; - means the replies for France are significantly less favourable to teaching effectiveness than in this country; -- : similarly but the difference is more than half a standard-deviation.

In order to make the table readable the values of the indices are not shown. These composite indices are calculated from answers to the questions set out in the annex. Their definition is based on theoretical considerations and previous empirical research which had shown them to be relevant. That they “make sense”, that is, that the full set of replies to the questions form a valid latent variable which behaves in the expected way, was verified using a structural equation model (an example of which, often used in France, is LISREL). Their values were calculated using the Rasch model and the Warm estimator, this latter chosen in particular because it offers a good fit to the extremes of the scale. These values were standardised to give an international mean of 0 and a standard deviation of 1. For “cultural discussions with parents”, for example, the composite index has a value of 0.27 for France (with a standard error of 0.019) and 0.06 for the UK (standard error 0.017). As the difference $0.27 - 0.06$ is more than twice the square root of $(0.019^2 + 0.017^2)$ this index is significantly more favourable in France than in the UK to the effective learning, hence the + in the column for the UK. The questions making up each variable are shown in Annex 3.

The *organisation of education* seems more favourable in the UK and New Zealand than in France but this is not the case for the other countries. It is clear, for example, from this analysis, that Australia and Canada ought to envy us for our baccalauréat and the existence of national curricula.

It further seems that French youngsters benefit from a *family environment* that is generally more favourable than that experienced by pupils in these countries: Parents and their children are more likely to have discussions about films or books, about political and social matters; pupils have readier access at home to dictionaries, calculators, a desk, a quiet place to work; in only one country (UK) is the time spent working at home longer; finally it seems that we occupy a middle position as regards the support that pupils say they get from their parents. This support is, however, much greater in the UK, Sweden, Australia and New Zealand than in France and that probably contributes to the explanation of the better scores in these countries.

Effective *teachers* help their pupils to succeed, they are on good terms with them, at the same time they make high demands. This is the picture which two French research studies have presented: Felouzis (1996) on the first year of the lycée and Grisay (1997) for lower secondary. These three factors correspond to the three constructs in our table. It is important to note that this type of teacher is far from being absent in France, however they are less common than in Commonwealth and Scandinavian countries in our comparison group. French pupils are less likely than elsewhere to see *their teachers as having high standards* (they would not accept a piece of work that was badly done, they give us a lot of work), but also to encourage them (tell them that they

could do better, spend a lot of their time helping the pupils), support them (being interested in the progress of every pupil, helping pupils with their work, carrying on explaining until they have understood, giving supplementary help to pupils who need it) and maintaining good relations with them (giving pupils the opportunity to express an opinion, listening to what pupils have to say, being concerned with their welfare, treating them fairly).

This is all based on statements from pupils, *which might not reflect* the same “reality” from one country to another. But, in this case, it might be thought that the standard used by the pupils is correlated with the culture of the teachers and hence that, if there is a divergence from reality, reflecting national contextual factors, the true difference between two countries is *more likely* minimised by the pupil replies than exaggerated. In brief, this suggests that the teachers who are more concerned with the contents they are transmitting than the process of transmitting the contents, and for whom the emphasis is more on the intellectual level of the lesson than on the level of work expected of the pupils, are more common in France than in these countries.

Pupils are more likely to reckon that the level of classroom discipline is satisfactory (you can hear the teacher speak, the lesson starts on time, there is no noise and disorder in class, ...) in France than in Canada, New Zealand, Sweden and Finland. On the other hand, young Japanese and Koreans, like British youngsters, are more likely than French pupils to feel that the level of order in the class favours academic work. French school heads are less likely than their equivalents in the comparator countries to complain that pupils lack respect for teachers, that they disrupt the lessons, that they drink or smoke illegal substances, that they skip lessons, that they miss school, that they bully other pupils, with the exception of school heads in the two Asian countries, according to whom these behaviours are uncommon in their countries. If, therefore, better pupil behaviour seems able to help explain the better performance of young Japanese and Koreans, it does not seem that this can be called in aid in the case of the Commonwealth and Scandinavian countries: on the contrary, pupils seem more commonly there than in France to experience behaviour that is unfavourable to learning.

In sum, what our comparisons suggest is that compared to high-performing Commonwealth and Scandinavian countries¹⁴, based on the factors examined here, the poorer scores of French pupils are probably less to do with the organisation of the education system or pupil behaviour or even lack of interest by parents than that teachers demand less work from their pupils while at the same time giving them less help to make progress, are less concerned about their welfare, listen to them less, treat them less fairly — or put another way, in France, fewer pupils see their teachers behaving in these ways.

These results must, however, be put in perspective based on the following considerations.

On the one hand, our model does not cover all the variables which affect pupil attainment. One such is length of time for which pupils are taught (cf. Delhaxe, 1997, for a review of research on this factor). Again, with an even more direct effect, is year repeating. In the French sample, 55% of pupils tested are in the first or second year of the lycée, 37% are in the final year of lower-secondary and 7% are in the second to last

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year of lower-secondary. According to empirical studies on the effect of year repeating, the main effect this has is to mean pupils lose a year without gaining any benefit in terms of attainment (cf. Crahay, 1996, for a review of the literature on this topic): a pupil who repeats the first year of primary is, five years later, at only the same level of attainment as one who has been allowed to go on the second year but, of course, does so a year later. If these results, which are mainly derived from primary schooling, are extrapolated to lower-secondary school, the use of year repeating on its own would explain a good deal of our poorer performance compared to these countries. All the more so as it is possible to hypothesise that the fact that year repeating does not exist or virtually does not, in the Scandinavian and Commonwealth countries encourages teachers in the type of attitudes and practices that our model links with effectiveness: there is more need to make the effort of raising everyone's level when there is no institutional arrangement available to relegate pupils in difficulty.

In brief, it seems possible to say that, among the variables in our model, those which describe teacher attitudes in relation to their pupils are the ones which best explain the difference with these countries and France. However, on the one hand, they can depend in turn on other factors where it would be more useful to act, and on the other hand, factors which do not feature in the model can also contribute to the explanation of the differences.

There is another limitation to this study. Our approach rests on the idea that variables relating to the operation of the system experienced by 15 year old pupils describe a state, a culture, ways of working, applicable across the entirety of the education system of their country, or at least for the entirety of secondary schooling and not just for the types of schools where 15 year old pupils are educated.

This is an hypothesis and, maybe also, an hypothesis that is more or less plausible depending on the country. For example, it is more likely to be true in Sweden, where 15 year old pupils are in the final year of the "Grundskolan" which they attend from the age of 7, than in France where a large minority of pupils is still in lower secondary and the majority in the first year of the academic or vocational *lycée* which they have only attended from the start of the year¹⁵, and whose culture and practices might be different from those of the lower-secondary school.

However it seems that, while indicating a degree of caution in analysing these results, this hypothesis is reasonable. We know, on the one hand that the culture of French teachers differs markedly from that of teachers from countries within the English cultural sphere (cf. Broadfoot and Osborne, 1993, for a comparison of English and French primary teachers, for example¹⁶), on the other hand there is quite a strong uniformity in the attitudes, values and practices of French teachers across all levels of secondary (Dubet et Martucelli, 1996, for example). We can therefore make a judgment, it is suggested here, on French secondary teaching based on these analyses.

Effectiveness and equity

If French pupils on average score below those of pupils in these countries is this because our education system sacrifices the majority on the altar of elitism? The

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answer is no — or else this elitism is very ineffective — since our best pupils also do less well than theirs.

It can be seen in Table 5 that, with a few small exceptions — Japan and Korea for reading literacy, Sweden for science — the scores of the top 10 % of pupils in France are significantly lower than those in the countries where the average pupil scores are better than ours.

Table 5: Performance of the academic elite (90th percentile of the score distribution)

	France	Australia	Canada	New Zealand	UK	Sweden	Finland	USA
Reading literacy	619	656	652	661	651	630	654	636
Maths	629	647	640	659	646	626	637	620
Science	631	646	641	653	656	630	645	628

	Korea	Japan	International average
Reading literacy	608	625	622
Maths	650	662	628
Science	652	659	631

Source: OECD, 2001a, tables 2.3a, 3.1, 3.3.

Note: As for Table 1.

In reading literacy the difference in performance for these pupils between France and most of these countries is greater than the difference in the averages shown in Table 1. The exceptions are Sweden, Japan and Korea where the distribution of scores is less unequal than in these other countries. In contrast, the best pupils in the USA, where the distribution is very unequal (cf. Table 6), do better than the best French pupils.

In maths, the difference between the “top groups” (Table 5) is of the same order of size as the difference in the average scores (Table 1) — with the exception of Korea and Japan where it is a little less. It can also be seen that, in science, the difference between the top performers is generally smaller than the difference between the averages.

If, therefore, we do not seem to have sacrificed the average performance of our pupils on the altar of elitism is this because, on the contrary, our education system has perhaps sacrificed them on the altar of equity? In fact, this question is misguided. Analysis of the TIMSS results (Vandenberghe et Zacchary, 2001), like those of PISA (OECD, 2001a) shows that in fact there is no “trade-off” between effectiveness (average score) and equity, in the sense that a significant number of countries

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simultaneously succeed (or, on the contrary, fail) on these two dimensions. It is therefore better to enquire if we make up, in some sense, for our lower effectiveness than these countries by a greater equity than theirs.

The question is all the more relevant as France has, for twenty years, shown a strong concern for vulnerable pupils or those in disadvantaged areas, the Scandinavian countries have a high reputation for equity (no pupil segregation, equality of opportunity ...) whereas the Commonwealth countries but also Sweden have adopted policies over the last 15 years, which in France are seen as "liberal" and which are suspected of increasing pupil inequalities.

Based on an approach suggested in Meuret (2001, 2002), we will judge the equity of education systems by considering that one is more equitable than another if three types of inequality are less marked: the difference in attainment between the best and the worst attaining pupils, all the more important here as PISA assesses attainment towards the end of compulsory schooling; the proportion of pupils falling below a threshold level of performance that can be seen as the minimum necessary to function with dignity in society; the relationship between attainment and the pupils' family and social circumstances.

Table 6 presents various measures of these inequalities

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Table 6: Inequalities in pupil attainment in selected countries

	France	Australia	Canada	New Zealand	UK	Sweden	Finland	USA	Korea	Japan
Pupil score dispersion (standard deviation, standard error in brackets)										
Reading literacy	92 (1.7)	102 (1.6)	95 (1.1)	108 (2.0)	100 (1.5)	92 (1.2)	89 (2.6)	105 (2.7)	70 (1.6)	86 (3.0)
Maths	89 (1.9)	90 (1.6)	85 (1.1)	99 (1.9)	92 (1.6)	93 (2.5)	80 (1.4)	98 (2.4)	84 (2.0)	87 (3.1)
Science	102 (2.0)	94 (1.6)	89 (1.1)	101 (2.3)	98 (2.0)	93 (1.4)	86 (1.2)	101 (2.9)	81 (2.7)	90 (3.0)
Performance of the lowest-attaining pupils (% of pupils whose score ...)										
< 400 points in maths	10 %	16	6	7	9	12	5	18	8	5
At or below Level 1 in reading literacy ¹⁷	15 %	12	10	14	13	13	7	18	6	10
Proportion of the variance in score in reading literacy explained by family and social environment										
ISEI	13 %	10	7	10	15	9	6	11	4	1
IESCS	22 %	17	11	16	19	11	9	22	9	6
Change in reading literacy score per unit change in the ESCS index of social background										
IESCS	47	46	37	45	49	36	30	48	21	21

Definitions

ISEI: This index, which is used in international studies of social mobility, shows the socio-economic status of the parents and is measured on a continuous scale. It refers to which ever parent has the higher status.

IESCS: Index of economic, social and cultural status. This index consists of the parents' socio-economic status (ISEI), the education level of whichever parent has the higher, family wealth (based on possession of certain items), amount of resources linked to education in the home, amount of resources linked to classical culture in the home. The calculation relates to reading literacy.

Source and notes: see next page.

Source: OECD, 2002a. tables 2.3a, 3.1, 3.3, 5.2b, 8.1 and author's calculations; fig.2.3.

Note: The standard-deviation of the distribution of scores in reading literacy in France is 92 points and hence slightly below the level of 100 which, as a scaling convention, is the level for the international distribution. Australia's scores are significantly more dispersed since the difference $102 - 92 = 10$ is more than twice the square root of the sum of the squares of the standard errors (1.7 and 1.6); hence they are in bold. Some 10% of French pupils scored below 400 on the scale used in Tables 1 and 2 where the average is 500. Some 15% of French pupils did no better than the first level of reading literacy, the lowest on a scale of 5. Finally, family characteristics explain 22% of the variance in performance of pupils in reading literacy: performance in this area is thus more dependent on family circumstances than in Canada where it only explains 11%. Another way of measuring the impact of the pupils' social environment is to calculate how a pupil's score changes when the ESCS index changes by a given amount, namely, when the parents are at a higher level in the social scale. This change in France (47) is not significantly different from that of the USA (48), since on this scale, a difference has to be around 5 points to be significant.

The comparison of score *dispersions* ranks France differently according to the subjects: in maths and reading literacy, the dispersion is rather lower than in the British Commonwealth countries and the USA, is comparable with the Scandinavian dispersions and is higher than in the Asian countries. In science, on the other hand, the dispersion is somewhat larger than in the Commonwealth countries, as high as in the USA and higher than in the Scandinavian and Asian countries. If we weight each of these three subjects equally the difference between the low and high attainers would thus be, in France, somewhat less than in the Commonwealth countries and the USA, rather higher than in our two Scandinavian and our two Asian countries.

The comparison of the proportion of *very low-attaining pupils* in maths puts France ahead of the USA, on a par with the Commonwealth and only Finland and Japan do markedly better than us here. If we take as the criterion the proportion of pupils whose performance in reading literacy is at or below Level 1, we now do better than the USA ; Finland and Japan now do better than us but Korea, Australia and Canada also do as well as us. It is thus only in relation to the USA that we do significantly better in the two subjects as regards the ability to ensure that all pupils have a minimum level of competence.

The effect of the *family and social environment* on reading score, whichever index it is measured by, is as strong in France as in the USA and the Commonwealth countries with the exception of Canada which is more equitable than us on this aspect along with Korea, Japan and the two Scandinavian countries. That is as true using "IESCS" which takes account of all factors external to the school which might influence academic attainment as it is using "ISEI" which is concerned solely with parental social status. If this situation is confirmed with the succeeding rounds of PISA, this will mean that inequality of opportunity is as high in our country as in countries where we tend to think that their decentralised nature (USA) or "liberal" approach (New Zealand, UK) makes them inegalitarian. Comparisons in TIMSS with the USA, UK, New Zealand, Australia were more favourable (Vandenberghé et Zacchary, 2001): the influence of social origin was lower or the same in France; in PISA (with a different subject and a different way of measuring this effect by measuring social status) it is the same or higher. It is therefore

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necessary to be cautious in reaching a judgment even though the quality of the measures, both of social origin and pupil attainment, is probably higher in PISA than in TIMSS.

It therefore seems that on three dimensions of equity, only on one — the score difference between the lowest and highest-attaining pupils — can we find any satisfaction from this comparison. As regards equity, the position of France compared to these countries is less systematically unfavourable than for attainment but some countries (Canada, Finland, Japan and Korea) out-do us on both dimensions.

Conclusion

In two empirical research studies addressing different issues Grisay (1997) and Felouzis (1997) presented two relatively similar depictions of effective education (cf. Meuret, 2000) in French secondary schools: one which is concerned with enabling all pupils to learn and to progress rather than with the intended intellectual “level” of the lesson; one which is competent, demanding, where the lesson is structured and which holds the attention of the pupils while welcoming their questions and giving them consideration, concern and not contempt and detachment. What the PISA findings add to that is that this type of teaching is less common in France than in the British Commonwealth countries, in Sweden and Finland, even though, as regards other factors relating to effective learning — the organisation of the education system, parental support, pupil behaviour — our position is rather better than theirs. It is therefore probable that French teachers’ attitudes in relation to learning and to their pupils is part of the explanation of the latter’s lower level of attainment relative to the countries we have just listed. Furthermore, the degree of equity in the French system is not such that we can claim that this makes up for shortcomings in its effectiveness.

Admittedly, teacher attitudes are not, and could not be, the only factor which determines the learning of their pupils; some countries where these attitudes are more favourable to effectiveness than in France are, however, no more effective than it is — this is the case in the USA — and some countries where these attitudes are no more favourable than in France — as is the case for Japan and Korea — are, however, more effective. It remains the case that, if we are looking within international comparisons for ways of improving our education system, this is one which is most clearly indicated to us. It seems that some of the directions currently being recommended — reinforcing the teacher’s authority by making punishments harder, addressing academic weakness in lower secondary by setting up “special” tracks — run counter to this.

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Notes :

¹ See the “PISA sample tasks” booklet available from OECD or at www.pisa.oecd.org for a selection of test questions and an explanation for how they match the different aspects of this definition.

² The skills tested in science draw on concepts borrowed from physics, chemistry, biology and earth science.

³ “This modernisation along American lines will certainly mean plaudits for its sponsors but, in addition, will also mean record numbers of illiterates coming out of the secondary schools ~ as in the USA” (Debray, R., An open letter to the Minister of Education, (Claude Allègre) Le Monde, 3 March 1998)

⁴ In order to compare the attainment of countries whose curricula are not exactly the same there are two possibilities, compare attainment in what is common to all countries — the solution used by IEA — or assess general skills drawing on broad concepts or approaches that all countries teach — the solution adopted in PISA.

⁵ The UK consists of three slightly different education systems: England and Wales, Scotland and Northern Ireland. PISA is based on the UK as a whole.

⁶ These comparisons are taken from OECD, 2002a, p. 57.

⁷ Here is an example to illustrate this: as the proportion of adults who have undertaken higher education is much higher in the UK than in France, and the level of parents’ education is positively associated with their children’s attainment in all countries, it is possible that the better performance of the UK is partly explained by that, and not by the higher quality of its education system. It is necessary therefore, in order to assess education systems, not to compare the raw scores of the UK and France, as in Table 1, but the “adjusted” scores. For that, we calculate the score for France (the UK) if the pupils’ parents had had a length of education at the international average, to take account of the effect in France (in the UK) of parents’ length of schooling on their children’s attainment.

⁸ The make-up of the PISA composites is seen more clearly by referring to the detail in Annex 3.

⁹ The data used here are from the PISA pupil questionnaire apart from the description of the organisation of the education system which is taken from OECD “Education at a Glance” (1998) and from the IEA-TIMSS report.

¹⁰ TIMSS report, p. 19, position in 1994-95

¹¹ TIMSS report, p. 17, position in 1994-95

¹² Education at a Glance, 1998, OECD

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¹³ Education at a Glance, 1998, OECD. The answer does not distinguish between whether the decision is taken by each teacher individually or collectively by the teachers in a school.

¹⁴ The performance of Japanese and Korean pupils is more difficult to explain by the factors used here, apart from their higher levels of pupil good behaviour. Added to this is the fact that, as is known and as PISA confirms, they receive many hours of lessons out of school. However, pupils in other countries, such as Greece, also get lots of out-of-school teaching without drawing as much advantage. Whatever the case, the factors on the effectiveness of education in class are no more favourable in Japan than in France and, in Korea, only two of the three are more favourable than in France. In the two countries, based on what the pupils say, the quality of pupil-teacher relations is worse than that in France.

¹⁵ The pupil survey was in the second term of the academic year.

¹⁶ An example: 65% of French primary teachers mention basic skills (reading, writing, arithmetic) as one of the aims of their teaching in contrast to just 29% of English teachers (p. 89).

¹⁷ Only in reading literacy does PISA offer an additional basis of comparison by means of five normative levels, of which Level 1 is the lowest: pupils at but no higher than this Level are able to “retrieve simple pieces of information, identify the main subject of a text or to make a simple link with everyday knowledge” (OECD, 2002a, p. 48) but have no higher skills.

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OECD, 2001b, *Choice of assessment tasks and the relative standing of countries in PISA 2000, a first analysis*, Document pour la treizième réunion du conseil des pays participants, Paris., 10 p.,

What is PISA?

1. A sample of pupils aged 15 was tested in 2000 in 32 countries on three subjects: reading literacy, maths and natural science. The survey organisation was undertaken by the OECD and the main decisions were taken by a committee made up of representatives of the education ministry in each country; the scientific and technical aspects were managed by a consortium of a number of research organisations, overseen by an Australian research institute.
2. Rather than assessing the acquisition of specific subject knowledge PISA assesses the ability to undertake tasks based on real-life situations and which draw on fundamental concepts.
3. The main assessment was in “reading literacy”. The written texts used in the tests were varied (several types of continuous text but also charts) and a number of dimensions of understanding were tested: retrieving information, understanding the overall sense, interpreting, reflecting on the contents.
4. Half the tests called for answers based on multiple-choice and half required written “constructed” response. (Eg: *“Which of these two texts — which take contrary views — do you find more convincing? Explain your answer, in your own words, on the basis of the two pieces of text”*).
5. The test items were suggested by the countries themselves and then were reviewed by subject specialists and experts in testing and finally were returned to the countries to approve. For each country the tests were translated from two source-versions, one in English and one in French and these translations were revised until they matched.
6. In addition, the pupils were give a thirty-minute questionnaire on their family and school circumstances.
7. There will be further studies of 15 year olds in 2003 and 2006, with maths as the focus in 2003 and science in 2006.

The question of cultural bias in PISA

A country can be “favoured” in an international assessment by a variety of factors, some of which are considered in the main text: year repeating where the sample population is defined by education level and not by age, the definition of the eligible population, the sampling, the extent to which educationally disadvantaged pupils are covered (including handicapped pupils for example), the treatment of pupils missing on the day of the tests, etc.

However, it is “cultural biases” that have caused the greatest flow of ink, especially here in France. These can relate to the general culture of a country or to what can be seen as its academic culture, that is the contents or the “ethos” of its curriculum (the intended curriculum) and what teachers actually teach in the class (the implemented curriculum). It is generally accepted that the design and implementation of PISA reduced these biases to the maximum extent that the current techniques allow in this area.

But are the cultural biases that remain such as to mislead in the interpretation of the score differences between countries, such as those used in this article? In our view the answer seems to be no. Here are some facts which, while not proof of this, are food for thought : the “high-scoring” countries come from very different cultural landscapes, countries with the same culture perform markedly differently (for example, the USA and the British Commonwealth, German-Swiss and German Germans); countries speaking the same language perform differently (Quebec pupils do much better than the French, English pupils do better than Americans).

Furthermore, a study undertaken as part of PISA points in the same direction. In order to test for the size of these cultural biases in reading literacy, countries were asked to rate the tests (items) on a scale from 0 (“this item is not appropriate for assessing pupils in our country”) to 4 (“this item is particularly appropriate for assessing pupils in our country”). Eighteen countries took part in this study including France. Next, the average score for the countries was calculated by the PISA experts by taking account of not the total of the items but only those which the experts in each country had ranked as “4” (OECD, 2001b). When the countries are ranked by the average percentage of items correct, France comes 14th out of 32 on the basis of the full set of PISA items and 12th if each country’s score is estimated only on the scores obtained by its pupils on items rated “4” by France. So there is a bias — if we really want to see as “bias” the difference there is between the ranking which results from the items chosen by collaboration between the experts of all the countries and that which results from imposing our own criteria on all other countries — but it is insignificant.

In addition, that these biases are of cultural original seems questionable: by using items rated as “4” by “Anglo-Saxon culture” countries, France’s ranking lies between 11th, using the items highly-rated by New Zealand, and 15th using the items highlighted by Australia. Using the items rated “4” by the Latin countries, it swings between 11th (Greece) and 16th (Italy). To which we might add that, by using the “French” items rather than all the items, to rank the USA and the UK, the USA ranking is unchanged and we gain one place on the UK. It can thus be seen that France’s ranking, like that of

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other countries, is barely affected by the cultural landscape of the whichever country is used as the reference point.

PISA questionnaire variables associated with the effectiveness of learning

Support and encouragement from the family

Cultural discussions with the parents

How often do you :

- talk to your parents about political or social issues ?
- talk about books, films or TV programmes
- listen to classical music with them

Family support

How often do the people below help you with your school work at home:
mother, father, brothers or sisters, grandparents, other acquaintances, friends of your
parents ?

Time spent working at home

On average, how much time do you spend each week working or studying French ?
maths ? science ?

Education resources in the home

At home do you have :

- A dictionary
- A quiet place for study
- A table for use to study
- Textbooks
- A calculator

Teaching effectiveness

Encouragement (academic press)

During your French lessons, the teacher :
Expects pupils to work hard
Tells pupils that they can achieve more
Is dissatisfied when pupils hand in poor work
The pupils have a lot of studying

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Teacher support

During your French lessons, the teacher :

is concerned with the progress of every pupil
gives pupils the opportunity to express their opinion
helps pupils with their learning
carries on explaining until the pupils have understood
puts a lot of effort into helping the pupils
helps the pupils with their work

(Good) relations between pupils and teachers

In my school :

The pupils pay attention to the teacher
The teachers are concerned with the welfare of their pupils
Care about what I have to say
If I need extra help, my teachers give me this
My teachers treat me fairly

Pupil Behaviour and commitment

(Bad) disciplinary climate (pupils' responses)

In my French lessons,

The teacher has to wait a long time before the pupils settle down
There is noise and disturbance
The pupils are unable to work properly
The pupils do not listen to what the teacher says
It takes a long time after the start of the lesson for the pupils to start work
More than five minutes are wasted at the start of the lesson

This measure was inverted to give measure of the quality of class discipline

(Bad) disciplinary climate (headteachers' responses)

Pupil learning is hindered by pupil absenteeism
Pupils disrupt the lessons
Pupils skip lessons
Pupils do not respect the teachers
Pupils drink alcohol and take drugs
Pupils harass and bully other pupils

This measure was inverted to give measure of the quality of class discipline