French nursery schools and German kindergartens: effects of individual and contextual variables on early learning

Youssef Tazouti, Caroline Viriot-Goeldel, Cornélie Matter, Anemone Geiger-Jaillet, Rita Carol, Dominique Deviterne

French nursery schools and German kindergartens: effects of individual and contextual variables on early learning

Youssef Tazouti, Caroline Viriot-Goeldel, Cornélie Matter, Anemone Geiger-Jaillet, Rita Carol, Dominique Deviterne

French nursery schools and German kindergartens: effects of individual and contextual variables on early learning

**Youssef Tazouti · Caroline Viriot-Goeldel ·
Cornélie Matter · Anémone Geiger-Jaillet · Rita Carol ·
Dominique Deviterne**

Abstract The present article investigates the effects of individual and contextual variables on children's early learning in French nursery schools and German kindergartens. Our study of 552 children at preschools in France (299 children from French nursery schools) and Germany (253 children from German kindergartens) measured skills that facilitate the learning of reading, writing and arithmetic at primary school. We also evaluated educational family practices and parents' expectations of their children's pre-school education. In order to take into account the hierarchical structure of our data, multilevel models were used in the analysis, which was carried out using MLwiN software version 2.02 (Rasbash et al. 2005). Although French nursery schools emphasise academic learning, we did not find any significant differences in overall performances between the French and German samples. However, significant differences were obtained for some subscale results. In addition, our results indicate that individual and contextual variables have an impact on the differences observed between children from the two countries.

Resume Cette recherche étudie les effets des variables individuelles et contextuelles sur les apprentissages premiers des enfants à l'issue de l'école maternelle française et du

Y. Tazouti (✉)
IUFM de Lorraine/Université Henri Poincaré, Nancy, France
e-mail: Youssef.Tazouti@univ-nancy2.fr

C. Viriot-Goeldel
Université de Paris Est Créteil, Paris, France

C. Matter
IUFM d'Alsace, Strasbourg, France

A. Geiger-Jaillet · R. Carol
IUFM d'Alsace/Université de Strasbourg, Strasbourg, France

D. Deviterne
IUFM de Lorraine/Université Henri Poincaré, Nancy, France

Kindergarten allemand. L'étude porte sur 299 enfants scolarisés en grande section de maternelle en France et 253 enfants scolarisés en dernière année de *Kindergarten* en Allemagne. Les compétences facilitant les apprentissages fondamentaux des élèves à l'école élémentaire en lecture, en écriture et en calcul ont été mesurées. De même les pratiques éducatives familiales ainsi que des attentes des parents vis-à-vis des institutions qui accueillent leurs enfants ont été évaluées. Les données ont été traitées à l'aide des modèles multiniveaux afin que soit respectée leur structure hiérarchisée. Nous avons utilisé le logiciel MLwiN version 2.02 (Rasbash, Charlton, Browne, Healy, & Cameron, 2005). Bien que les écoles maternelles françaises privilégient les apprentissages scolaires, nous n'avons pas trouvé des différences significatives entre les performances globales des enfants français et allemands. Toutefois, des différences significatives ont été obtenues pour quelques sous-épreuves. Enfin, les résultats indiquent un impact des variables individuelles et contextuelles sur les différences constatées entre les enfants des deux pays.

Introduction

In its review of early childhood education and care across the world, the OECD (2006) distinguished two dominant currents: the "pre-primary" approach, which is widely used in many southern European and English-speaking countries, and the "social pedagogy" tradition that predominates in northern and central Europe. As their names suggest, the French nursery school (*école maternelle*) and German kindergarten systems epitomise these two approaches. France's decision to adopt a "pre-school" model and thus favour a scholarly approach to early learning was made over a century ago. Several other European countries, including Spain and Belgium, made similar choices (HCE: Haut Conseil de l'Evaluation de l'Ecole 2003). Conversely, many other countries, including Germany, chose to emphasise the all-round growth of their youngest citizens, adopting a system based on the horticultural metaphor of the "children's garden". Substantial differences remain between French nursery schools, with their school status and focus on learning, and German kindergartens, which put the accent on socialisation through "social pedagogy" (*Sozialpädagogik*), an idea that arose in Germany in the nineteenth century (OECD 2004b).

The two approaches differ in terms of both teaching methods and teaching content. French nursery schools favour preparatory learning through structured and progressive teaching situations, whereas German kindergartens exploit teaching situations that arise naturally when children interact (*Situationsansatz*) and make wide of learning through play. In general, the methods used by kindergartens are child centred and focus on socialisation and developing personality. Preparing children for entry into primary school is only a marginal concern for kindergartens and purely academic learning is often "peripheral". Thus, in contrast to what happens in France, German children do not start formally learning the alphabet, numbers and how to write until they go to primary school (Brougère 2002; Faust-Siehl 2001). These two approaches to early childhood education also differ in the ways the schools operate, the length of the school day and the qualifications held by the teaching staff.

Consequently, it would seem reasonable to ask how these two approaches affect the ways in which young children acquire skills. The growing impact of international surveys has led countries to question the effectiveness and suitability of their chosen pre-school system. In Germany, the poor mean performances of German schoolchildren on the

OECD's PISA survey[1] (OECD 2001, 2004a) produced an unprecedented media outcry that was quickly followed by proposals for reforms at all levels. Fingers were pointed at several aspects of the system, including the role of pre-school education, and Germany's different states are now investigating a variety of solutions (Buhlmann 2002; Hohlmeier and Stevens 2003). In today's world, with its emphasis on performance and early learning, and given the results of the PISA survey, is there still a place for a model that even Germany is starting to doubt? Is the approach adopted by French nursery schools, which are traditionally considered to be a strong point of the country's education system, more suitable and more effective? In France, the difficulties experienced by a non-negligible number of children when they enter primary school have led the latest report from the *HCE: Haut Conseil de l'Evaluation de l'Ecole* (2007) to pose a number of questions about the nursery school system. Success at school is strongly linked to a child's skills on entering primary school. At a time when both countries are currently concerned about the limits of their respective models, an answer has yet to be found to the question of whether the basic skills needed for later stages in a child's education are best acquired at an institution in which children play and act freely or at a school in which they follow a structured syllabus and a regular schedule of morning and afternoon lessons for 3 or 4 years.

Despite the differences in learning environments offered by the two systems, they refer to both the Piagetian perspective and the Vygotskyian approach of development and learning. According to Piaget, human intelligence is a particular case of biological adaptation through a process involving the assimilation and accommodation of new experiences that must be suited to the child's level of development. In this orthogenetic vision, educators can only further a child's intellectual development if their awareness of the child's abilities is sufficient for them to be able to offer the right experiences at the right time. According to the Vygotskyian view, development is essentially epigenetic, and educators influence the proximal zone of development. This allows parents to anticipate and accelerate the child's development. In other words, educators can offer their children development opportunities.

Thus, most preschool programmes have a positive impact on later learning (Goldring and Presbrey 1986; Hattie 2009). However, the most effective are those most structured and managed by well-trained staff (Innocenti and White 1993). Similarly, Fusaro (1997) found that children attending full-day kindergarten showed significantly greater achievement than those attending half-day.

Surprisingly, and despite the innumerable international surveys that have been carried out at all levels of elementary and secondary education, this question has not been widely addressed. Several studies describe how French nursery schools and German kindergartens function (e.g. Brougère 1995, 1997, 2002; Vaniscotte 1996, 2001) and their effects on skills acquisition by children (e.g. Bressoux et al. 1999; Cèbe and Paour 2001; Leroy-Audouin 1993; Suchaut 1996); however, we have not found any research that systematically compares the two approaches. Consequently, we decided to investigate how the French and German approaches to early learning affect the development of abilities that facilitate the acquisition of basic pre-school skills, notably in the fields of reading, writing and arithmetic.

We hypothesised that there would be differences between the cognitive acquisitions of French and German children at the end of nursery school or kindergarten. Three groups of variables were examined to explain any differences between French and German children.

---

[1] It should also be noted that there are substantial differences between Germany's different states (*Länder*). For example, Bavaria and Baden-Wurttemberg obtained good results.

First, the nature of the educational establishment (nursery school vs. kindergarten) might influence skills acquisition. Second, as shown in many studies (Hattie 2009; Hyde 2005), individual variables (social class, gender, etc.) can affect a pupil's performance. Finally, family characteristics may also explain the differences between French and German children; therefore, we measured parents' expectations of pre-school education and modelled possible repercussions of these expectations on their child's performance. We also looked at the effect of the family educational practices, which could difer between French and German countries in regard of the historical and philosophical backgrounds that forged French nursery schools and German kindergartens. In this respect, Prêteur and Louvet-Schmauss (1991, 1994) showed that family educational practices concerning reading, writing and arithmetic contribute to variations between pupils. For example, the correlation with improved performance is higher for a variety of less formal practices parents commonly use to help their children learn to read (reading children's books, going to libraries and use of writing in everyday situations) than it is with other more traditional and formal practices, such as teaching sound-spelling patterns.

Methodology

Participants

We had the opportunity to recruit participants in two French regions (Alsace and Lorraine) and in two German regions (Baden-Württemberg and Sar). We chose to retain only the two most representative of the two systems of preschool (Kindergarten and Ecole Maternelle). Thus, Alsace and Sar were excluded because of their historical and cultural proximity.

Our study was based on 552 children. The French sample contained 299 children (166 girls and 133 boys) who were in their final year of preschool at 12 nursery schools in Lorraine. The German sample contained 253 children (121 girls and 132 boys) who were in their final year of preschool at 10 kindergartens in the state of Baden-Wurttemberg.[2] Approximately 10% of parents in the French sample and about 20% of parents in the German sample were of foreign nationality. The mean ages of the children tested were 5 years 9 months for the French sample and 6 years 2 months for the German sample. This age difference is mostly due to differences in the school calendar between the two countries.

Measures

Evaluation scale for first learning abilities

For the purposes of the present study, first learning abilities are considered to be the abilities children need in order to assimilate the fundamental skills they will be taught when they enter primary school. Our evaluation scale is based on tools used to measure the skills involved in learning how to read, write and do basic arithmetic: NBA1-T scales (Ravard and Rabreau 2005) and "Grande Section de Maternelle" (final year of nursery school) national evaluation scales (MEN 2003). We measured children's performances in nine fields relating to arithmetic (spatial organisation, counting, rhythms), reading-writing (visual discrimination, auditory discrimination, sound-spelling patterns), and transversal learning

---

[2] Germany is a federal country composed of 16 states (*Länder*). Education is the responsibility of the individual states.

(handwriting, visual memory, auditory memory). These tests do not claim to measure all the skills acquired by children at the end of nursery school; their aim was to examine some of the most important skills for the child's future school career.

The French and German versions of the scale were drawn up at the same time by members of our Franco–German research team. Our objective was to take into account the curricula used in the two countries and to ensure the French and German items were strictly identical, while respecting the cultural specificities of the two countries. Nevertheless, before undertaking a comparison of children from the two countries, we checked that the scale was not subject to Differential Item Functioning (DIF) effects. In other words, we checked that the items did not favour one group of participants over the other. In order to do this, we used the Mantel–Haenszel statistic (Mantel and Haenszel 1959), which was used to study DIF by Holland and Thayer (1986). The procedure reveals the presence of DIF by testing whether or not two samples with the same skill level have different probabilities of success for an item. DIF occurs when the probabilities of success for an item are different for the two samples. From an inferential point of view, Mantel–Haenszel's chi squared statistic is used to test the null hypothesis that the success rates of two populations with similar levels of skill are homogenous. From a descriptive point of view, we calculated a Mantel–Haenszel delta statistic, which indicates the direction and size of the DIF.

Large DIFs were found for four items, which were consequently removed from the scale. As a result, our scale of first learning abilities contained 41 items (see Table 1) that presented a satisfactory internal consistency coefficient (Cronbach's alpha=.84). A principal components analysis of the scores for the nine tests allowed us to retain a single component that strongly saturated the nine scales and that explained 38% of the variance.

Measure of the families' social class

The social class of the children's families was measured by calculating a socioeconomic index combining three indicators: (1) the mother's level of education; (2) the father's level of education; (3) the size of the home, that is to say, the number of rooms in the home divided by the number of people living there. The relatively high correlations between the three indicators (they vary between .25 and .55 and are all significant at $p < .01$) justify their combination. Our socioeconomic index showed a high degree of variability (mean=2.25, standard deviation=.68).

Table 1 Analysis of the items of the nine tests included in the first learning evaluation scale

	Number of items	Cronbach's alpha
Handwriting	4	.50
Spatial organisation	4	.52
Rhythm	3	.59
Visual discrimination	3	.55
Auditory discrimination	4	.51
Visual memory	6	.61
Auditory memory	9	.56
Sound-spelling patterns	4	.48
Counting	4	.43
Whole scale	41	.84

Questionnaire measuring educational practices within families and parents' expectations for their child's pre-school education

This questionnaire for parents was based on existing questionnaires (Prêteur and Louvet-Schmauss 1991, 1994; Tazouti 2003; Tazouti et al. 2005). It first asked parents about their educational practices with respect to reading, writing and arithmetic. Then, it asked them about their expectations for their child's pre-school education. A principal components analysis of the items relating to the families' educational practices with respect to reading, writing and arithmetic allowed us to retain two components (Table 2). The first saturates items 1 to 4 and refers to "activities related to formal teaching of reading and arithmetic". The second saturates items 5 to 9 and corresponds to "book-related activities". These two components explain 25% and 18% of the total variance, respectively. The internal consistency coefficients (Cronbach's alpha) of the items composing each of these two sub-scales were .72 and .52, respectively.

A principal components analysis for the items relating to parental expectations of pre-school education also allowed us to retain two components (Table 3): one that saturates the items related to socialisation expectations (items 1 to 9) and one that saturates the items relating to cognitive learning expectations (items 10 to 15). These two components explain 34% and 15% of the total variance, respectively. The internal consistency coefficients (Cronbach's alpha) of the items composing each of these two sub-scales were satisfactory (.87 and .73, respectively).

Results

Descriptive statistics

Table 4 gives descriptive statistics of different variables of the study. Results show that French parents have higher scores than German parents regarding educational practices 'activities related to formal teaching of reading and arithmetic' and 'book-related activities'.

Table 2 Principal components analysis of the items relating to family educational practices with respect to reading, writing and arithmetic

	Component	
	1	2
Do you (or a member of your family) try to teach your child to read?	.83	−.02
Do you (or a member of your family) try to teach your child to write?	.83	−.20
Do you use materials other than books to teach your child to read?	.68	.25
Do you (or a member of your family) try to teach your child to count?	.55	−.02
Does your child have books at home?	−.15	.64
Do you (or a member of your family) read books to your child?	.01	.61
Does your child subscribe to a magazine?	.14	.54
Do you take your child to the library?	−.15	.54
Do you buy your child books?	.06	.36
Eigenvalue	2.23	1.58
Percentage of variance explained (%)	25	18
Cronbach's alpha	.72	.52

Table 3 Principal components analysis for the items relating to parents' expectations with respect to pre-school education

	Component	
	1	2
Teach children to put things away	.85	.04
Teach children to be polite	.79	.09
Teach children to respect adults	.76	.15
Teach children to be self-sufficient (dress themselves, choose their activities, etc.)	.75	−.01
Teach children to accept differences	.69	.12
Allow children to express their needs and wishes	.67	.11
Introduce children to the world about them	.60	.17
Teach children to respect other children	.51	.28
Enable children to meet other children	.38	.17
Prepare children for primary school	.04	.79
Teach children the basics of reading and writing	−.12	.74
Teach children to count	.13	.73
Help children become pupils (discipline, follow instructions, etc.)	.23	.66
Stimulate the desire to learn	.35	.52
Teach children to obey rules (of the school, of the group, etc.)	.35	.48
Eigenvalue	5.17	2.19
Percentage of variance explained (%)	34	15
Cronbach's alpha	.87	.73

Regarding expectations for the preschool, the French parents have high scores for 'learning expectations' while German parents get high scores on "socialisation expectations". Concerning the tests of the first learning scale, Table 4 shows little difference between scores of children in France and Germany in two tests: 'handwriting' and 'auditory discrimination'. Children in France have higher scores in three tests: 'spatial organisation', 'rhythms' and 'visual discrimination'. In contrast German children have the best performance in four tests: 'visual memory'; 'auditory memory', 'sound-spelling patterns' and 'counting'. Do these differences between the two countries persist when individual and contextual variables are controlled for using multi-level regression models?

Multi-level analyses

Our research aimed to investigate the relationship between individual and family characteristics and the characteristics of the pre-school context. Our analyses incorporate statistical units that belong to different, stacked levels (pupils and establishments). Given the hierarchical structure of the data, it was necessary to apply multi-level regression models. Detailed descriptions of these models are provided by Bressoux (2008) and by Snijders and Bosker (1999). An advantage of multi-level regression models is that they allow explanatory variables to be treated in a way that takes into account the hierarchical level they refer to. Thus, in our study, we were able to differentiate between level 1 variables that were measured for each pupil (e.g., socioeconomic index, sex) and level 2 variables that were measured for the class (e.g., country of residence, average socioeconomic index of the establishment). In the present study, the analyses were carried out using MLwiN version 2.02 software (Rasbash et al. 2005).

Table 4 Descriptive statistics from the study variables

Variables	French (N=299)			Germany (N=253)		
	Mean	SD	SE	Mean	SD	SE
Family educational practices						
With respect to formal teaching of reading	0.67	0.33	0.02	0.56	0.34	0.02
With respect to books	0.65	0.25	0.02	0.62	0.22	0.02
Expectations for pre-school education						
Cognitive learning expectations	2.90	0.21	0.01	2.69	0.35	0.02
Socialisation expectations	2.70	0.38	0.02	2.84	0.25	0.02
Tests of the first learning scale						
Handwriting	2.14	1.24	0.07	2.18	1.19	0.07
Spatial organisation	2.97	1.07	0.06	2.62	1.21	0.08
Rhythm	2.03	1.02	0.06	1.64	1.05	0.07
Visual discrimination	2.50	.83	0.05	2.31	.88	0.06
Auditory discrimination	1.98	1.30	0.08	2.07	1.20	0.08
Visual memory	5.17	1.16	0.07	5.64	.83	0.05
Auditory memory	7.31	1.50	0.09	8.36	1.12	0.07
Sound-spelling patterns	2.67	1.12	0.06	3.00	.96	0.06
Counting	3.22	.94	0.05	3.58	.70	0.04
Whole scale	29.99	6.45	0.37	31.40	5.53	0.35

Impact of individual and contextual variables on the pupils' total scores

Several multi-level regression models were drawn up (see Table 5) in order to investigate the effects of the different individual and contextual characteristics on the variability of the children's performances. Multi-level modelling often begins with the construction of an "empty model" that does not contain any explanatory variables. This initial model is used to break down the total variance of the dependent variable into two parts[3]: the variance between the level 2 units (intergroup variance), and the variance between the level 1 units (intragroup variance). The values given by the empty model serve as a reference point for the rest of the analysis and allow us to evaluate the impact of the explanatory variables introduced into subsequent models. Later models include the individual and contextual variables. Our goal was to explore the variability in the pupils' performance scores in the form of a mathematical relation between these scores and all the variables we chose to introduce into the analysis. We took into account nine level 1 explanatory variables: sex, nationality, marital status of the parents, age of the child, socioeconomic index of the family, family educational practices and parental expectations with respect to education. The use of multi-level modelling allowed us to measure the specific effect of "target variables" independently of other factors, that is to say, "all other things being equal". In this type of equation, the dichotomous variables are introduced into the analysis by fixing a reference modality and an active modality. For example, for the sex variable, the reference modality is "boy" and the active modality is "girl". Our study also included two level 2 variables: the country in which the pupil was

---

[3] This is true in the case of a two-level model, but not for a model with three or more levels (Snijders and Bosker 1999).

Table 5 Multi-level models measuring the impact of the individual and contextual variables on the total scores obtained by French and German children

Parameters	Model 1 (empty)	Model 2
Constant	−.01 (.10)	−.27 (.11)
Level 1 variables		
Sex of the child (boy=0; girl=1)		.34 (.08) **
Nationality (native=0; foreign=1)		−.20 (.11)
Matrimonial situation (single parent=0; couple=1)		.20 (.09) *
Age		.20 (.05) **
Socioeconomic index		.23 (.05) **
FEP with respect to formal teaching of reading		.01 (.04)
FEP with respect to books		.12 (.05) **
Cognitive learning expectations for pre-school education		−.08 (.05)
Socialisation expectations for pre-school education		.01 (.05)
Level 2 variables		
Country (Germany)		.20 (.12)
Mean socioeconomic index of the establishment		.17 (.05) **
Variance		
Intergroup	.19 (.07)	.01 (.01)
Intragroup	.82 (.05)	.64 (.05)
−2 log L	1,500	959

N=552

FEP family educational practices

*p<.05; **p<.01

educated (France or Germany) and the average socioeconomic index of the establishment. All the continuous variables were standardised (m=0, sd=1). Such standardisation facilitates the interpretation of the regression coefficients and the decomposition of the total variance.

The contribution of the raw intergroup variance was 19% (Table 5, Model 1: the empty model). The largest contribution to the differences in children's performances was between children within establishments. Model 2, which included the individual and contextual variables, provides a significantly better adjustment of the data than the empty model (−2 log L decrement=541 for 11 df; p<.01). Introducing these variables allowed us to explain 95% of the intergroup variance (i.e., (.19−.01)/.19), and 22% of the intragroup variance (i.e., (.82−.64)/.82).

Focusing on the effects of individual and family variables[4] (level 1) on the children's performances showed that:

– Girls performed better than boys.
– Children of parents living together performed better than children from single-parent families
– Older children performed better than younger children

---

[4] The significance of the regression coefficients was tested using Z tests for the level 1 variables, where N was equal to 552. For the level 2 variables, we used a t test with 19° of freedom. The number of degrees of freedom was calculated using the formula described by Snijders and Bosker (1999): df=N−q−1 where N=the number of units at level 2 and q=the number of explanatory variables at level 2.

– Children from families with a high socioeconomic index performed better than children from families with a lower socioeconomic index
– The only family educational variable to have a significant effect on a child's performance was family educational practices related to books

The impact of the contextual variables (level 2) on the children's performances can be summarised as follows:

– The "country" variable did not have a significant effect on the children's overall performances.
– Conversely, the "mean socioeconomic index of the class" had a significant positive effect on the children's overall performances.

Impact of the individual and contextual variables on the scores for the nine tests

Multi-level analyses were carried out for each test (see Table 6). The largest differences in the children's performances were found within the establishments, although there were also significant differences between establishments. Models incorporating individual and contextual variables adjusted the data significantly better than the empty models (the –2 log L decrement was always significant). The introduction of these variables explained part of the intergroup variance (between 42% and 96%) and part of the intragroup variance (between 4% and 18%).

Focusing on the effects of certain individual and family variables (level 1) on the children's performances showed that:

– Girls performed significantly better than boys on four tests: rhythm, sound-spelling patterns, handwriting and visual memory.
– Older children performed significantly better than younger children on six of the nine tests.
– Children from families with a high socioeconomic index performed significantly better on all the tests, except the handwriting and visual memory test.

The impact of the contextual variables (level 2) on the children's performances can be summarised as follows:

– French children obtained better results on the spatial organisation and rhythm tests, whereas German children performed better on the visual memory, auditory memory, sound-spelling pattern and counting tests.
– The "mean social level of the establishment" variable had a significant positive effect on the children's performances on the auditory discrimination and auditory memory tests.

Discussion and conclusion

Performances on the different tests

All other things being equal, the mean performances of the 552 children for all the tests did not reveal any significant difference between the French children and the German children. Thus, the kindergarten approach, with its emphasis on socialisation and play, enabled the children in the German sample to attain similar overall performances to the nursery school approach, with its focus on formal teaching and work.

This apparent equality in overall performances between France and Germany is confirmed in some fields tested, but masks significant differences in other fields. Thus, in

Table 6 Multi-level models measuring the impact of the individual and contextual variables on the scores for the nine tests obtained by French and German children

Parameters	Spatial organisation	Counting	Rhythms	Visual discrimination	Auditory discrimination	Sound-spelling patterns	Handwriting	Visual memory	Auditory memory
Empty models	Model 3a	Model 4a	Model 5a	Model 6a	Model 7a	Model 8a	Model 9a	Model 10a	Model 11a
Variance									
Intergroup	.07 (.03)	.11 (.05)	.12 (.05)	.08 (.04)	.12 (.05)	.10 (.04)	.12 (.05)	.08 (.04)	.23 (.08)
Intragroup	.93 (.06)	.89 (.06)	.88 (.05)	.91 (.06)	.89 (.05)	.91 (.06)	.87 (.05)	.93 (.06)	.80 (.05)
−2 log L (1)	1547	1535	1526	1541	1532	1543	1521	1553	1487
	Model 3b	Model 4b	Model 5b	Model 6b	Model 7b	Model 8b	Model 9b	Model 10b	Model 11b
Level 1 variables									
Sex of the child (boy=0; girl=1)	.08 (.09)	.12 (.09)	.36 (.09) **	.07 (.09)	.12 (.09)	.28 (.09) **	.46 (.09) **	.23 (.10) *	.14 (.09)
Nationality (native=0; foreign=1)	−.14 (.12)	−.20 (.12)	−.04 (.12)	−.07 (.12)	.12 (.12)	−.03 (.12)	−.08 (.12)	−.22 (.13)	−.38 (.12) **
Matrimonial situation (single parent=0; couple=1)	.13 (.10)	.34 (.10) **	.12 (.10)	.15 (.10)	.07 (.11)	.17 (.10)	.07 (.10)	.09 (.11)	.04 (.10)
Age	.23 (.05) **	.10 (.05) *	.11 (.05) *	.07 (.05)	.02 (.05)	.14 (.05) **	.22 (.05) **	.11 (.06)	.10 (.05) *
Socioeconomic index	.19 (.06) **	.24 (.06) **	.13 (.06) *	.12 (.06) *	.18 (.06) **	.18 (.06) **	.06 (.06)	.04 (.06)	.14 (.06) *
FEP with respect to formal teaching of reading	−.01 (.05)	.01 (.05)	.05 (.05)	−.03 (.05)	.04 (.05)	−.06 (.05)	−.02 (.05)	.02 (.05)	.04 (.05)
FEP with respect to books	.06 (.05)	.02 (.05)	.16 (.05) **	.02 (.05)	.13 (.05) **	.13 (.05) *	.11 (.05) *	.01 (.06)	.01 (.05)
Cognitive learning expectations	−.08 (.06)	−.12 (.05) *	−.03 (.06)	−.02 (.06)	−.11 (.06) *	−.02 (.06)	.03 (.06)	−.12 (.06) *	.02 (.05)
Socialisation expectations	−.02 (.05)	.05 (.05)	−.01 (.05)	.01 (.05)	.03 (.05)	−.04 (.05)	.05 (.05)	.03 (.06)	−.06 (.05)
Level 2 variables									
Country (Germany)	−.46 (.12) **	.32 (.13) **	−.32 (.12) **	−.24 (.14)	.16 (.16)	.30 (.12) **	−.06 (.17)	.29 (.13) **	.87 (.12) **
Mean socioeconomic index of the establishment	.03 (.05)	.02 (.06)	.10 (.05)	.06 (.07)	.20 (.07)*	.05 (.05)	.16 (.08)	.10 (.06)	.15 (.05)**
Variance									
Intergroup	.00 (.00)	.02 (.02)	.00 (.00)	.03 (.02)	.05 (.03)	.00 (.00)	.07 (.03)	.01 (.02)	.01 (.01)
Intragroup	.76 (.05)	.71 (.05)	.81 (.06)	.75 (.06)	.79 (.06)	.76 (.05)	.79 (.06)	.89 (.07)	.74 (.05)
−2 log L (2)	1017	998	1045	1027	1050	1022	1054	1087	1011
−2 log L (1)−−2 log L (2)	530 **	537 **	481 **	514 **	482 **	521 **	467 **	466 **	476 **

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

some fields such as handwriting and auditory discrimination, we did not find any significant differences between the performances of French and German children. This result is not surprising for the following reasons: (1) Handwriting is taught in both types of establishment, even if the teaching is less formal in kindergartens than in nursery schools, and the items proposed did not target a standardised style of handwriting. At this ability level, it is easy to imagine that kindergarten and nursery school activities can produce similar levels of performance. (2) The auditory discrimination tests asked the children to identify syllables, rhymes, onsets and phonemes. Although some French teachers use formal exercises, the most commonly used ways of encouraging children to recognise different sounds are nursery rhymes, songs and other language games: methods that are also widely used in Germany. However, the French children obtained better results than the German children on the rhythm, visual discrimination and spatial organisation tests. These are activities that are frequently and systematically practised in French nursery schools.

Counting, which is an important element in the syllabuses of French nursery schools, is another key skill. Although French nursery school children are frequently asked to carry out counting exercises, this training does not seem to be particularly effective, as the German children performed significantly better in this domain. This result supports the findings of Flieller (cited by Bocéréan et al. 2003), who showed that German children obtain significantly better results than French children on the arithmetic tests of the K-ABC test. A similar observation can be made for the sound-spelling pattern tests. Reading picture books is part of the programme in both kindergartens and nursery schools, and German parents appear to read to their children at least as much, if not more, than French parents. Nevertheless, the emphasis placed on written language at French nursery schools, where children are taught to recognise the letters of their name and their sounds, to copy words and sentences, to build up a vocabulary of words they recognise (first names, days of the week, etc.) and even to do dictation, should allow French children to build up a better conception of the written language than their German counterparts. Manifestly, this is not the case: a surprising result that calls into question the teaching methods used in French nursery schools. German children also performed better on the visual memory and auditory memory tests, which raises the question of whether these skills may develop more quickly in the play situations that characterise kindergartens. Such a hypothesis is supported by other studies that show that some fundamental skills are learned better in spontaneous situations containing a large element of play (Deviterne et al. 2002, 2005).

However, other explanations are also possible. For example, results can be affected by the importance given to evaluation in each of the two early learning systems and by the way the children perceive the evaluation situation and the tests they are asked to complete. In Germany, evaluations tend to be presented in a spontaneous, informal and formative way; in France, evaluations are generally formative, but official guidelines tend to mean that they are programmed and summative. This may explain the differences in the ways the children perceived the evaluation situation and the tests they were asked to complete. We observed that most of the French children found the taking of the tests stressful, whereas most of the German children seemed more relaxed. In addition, the fact that some of the tests were new was seen to be unsettling for the French children but motivating for the German children. These interpretations, based on informal observations by the researchers, need to be confirmed by empirical studies.

Influence of individual characteristics on performances

Within our study sample we observed a significant difference between the performances of the boys and the girls. Hence, this already widely documented phenomenon appears to occur before primary school and in both countries. The girls obtained better performances than the boys.

The effect of socioeconomic index on the children's performances could also be observed at this stage in their school careers. This effect was almost two times greater in our French sample than in our German sample. These results may at first appear surprising, as the PISA survey showed that Germany is one of the countries in which social class has the greatest effect on the performances of 15-year-old children. However, the PISA survey also revealed substantial differences between Germany's different states, and, although there are large social inequalities in Germany, these inequalities are smaller in Bavaria and Baden-Wurttemberg than in the other states of the west of the country (Deutsches Pisa-Konsortium 2002). Nor must it be forgotten that the inequalities in Germany tend to be amplified at the end of primary school, when pupils have to choose the orientation of their studies (Artelt et al. 2003).

Do the results of the present study allow us to conclude that French nursery schools amplify social inequalities and that German kindergartens do not? We believe that it would be premature to draw such a conclusion, as our study did not measure spoken language skills, despite the importance of this factor and its dependence on socio-cultural variables for German children (Artelt et al. 2003). It should also be noted that 100% of French children attend nursery school at the age of 3 years (MEN. 2004), whereas fewer than 89% of German children attend kindergarten at the same age (EURYDICE 2004). In addition, kindergarten attendance depends on social class, as attendance rates are much lower than average among children from disadvantaged or immigrant families (OECD 2006).

Influence of family characteristics on performances

The French families were characterised by higher expectations with respect to cognitive learning, whereas the German families were characterised by higher expectations with respect to socialisation. This difference between the expectations of parents in the two countries is perfectly coherent with the priorities each country gives to its pre-school education system. Neither of these types of expectation had a significant effect on the mean performances of the children on the first learning evaluation tests.

The only family educational practices that had a significant positive effect on the mean performances of the children on the first learning evaluation tests were "book-based practices". This effect was noted for both countries, although it was slightly stronger in Germany.

To the best of our knowledge, most of the results of the present study are new. Our research also shows the value of multi-level models, as they enable us to analyse complex relations between variables while respecting the hierarchical structure of the data. Nevertheless, our work can only be considered an exploratory and heuristic study that has suggested new research directions that may be followed by other researchers.

References

Artelt, C., Baumert, J., Julius-McElvany, N., & Peschar, J. (2003). PISA 2000: Die Studie im Überblick. Grundlagen, Methoden, Ergebnisse. [On line]. http://pisa.bildung-rp.de/informationen-zu-pisa-und-co/pisa-2000.html (2008). Page consulted on 27th February.

Bocéréan, C., Fischer, J. P., & Flieller, A. (2003). Long-term comparison (1921–2001) of numerical knowledge in three to five-and-a-half year-old children. *European Journal of Psychology of Education, 18*, 405–424.

Bressoux, P. (2008). *Modélisation statistique appliquée aux sciences sociales*. Brussels: De Boeck.

Bressoux, P., Bru, M., Altet, M., & Leconte-Lambert, D. (1999). Diversité des pratiques à l'école élémentaire. *Revue Française de Pédagogie, 126*, 97–110.

Brougère, G. (1995). *Jeu et éducation*. Paris: L'Harmattan.

Brougère, G. (1997). Jeu et objectifs pédagogiques: une approche comparative de l'éducation préscolaire. *Revue Française de Pédagogie, 119*, 47–56.

Brougère, G. (2002). L'exception française: l'école maternelle face à la diversité des formes préscolaires. *Les Dossiers des Sciences de I'Education, 7*, 9–19.

Buhlmann, E. (2002). PISA: Les conséquences pour l'Allemagne. *L'Observateur OCDE, 21*, 33.

Cèbe, S. & Paour, J. L. (2001). Education cognitive à l'école maternelle et apprentissage de la lecture en primaire. *Psychologie de l'Éducation, 3*, 86–111.

Deviterne, D., et al. (2005). Intégration et accompagnement des enfants en difficulté à l'école maternelle par une prise en charge collégiale et diversifiée de tous les élèves. Rapport de recherche du Programme Académique de Recherche et d'Innovation. [On line]. http://www3.ac-nancy-metz.fr/pasi/IMG/54EHerbiniereLa Plaine2005.pdf. (Page consulted on 27th February 2008).

Deviterne, D., Hogard, J., & Dobson, C. (2002). Une recherche accompagnée pour "bâtir l'école du XXIe siècle".: à propos d'un exemple sur les pratiques collégiales à l'école maternelle. CR colloque inter-IUFM "Apprendre/enseigner à l'école primaire". Dijon, June 2002.

EURYDICE. (2004). *Les chiffres clés de l'éducation en Europe*. Luxembourg: Office des publications officielles des Communautés Européennes.

Faust-Siehl, G. (2001). Konzept und Qualität im Kindergarten. In G. Faust-Siehl & A. Speck-Hadman (Eds.), *Schulanfang ohne Umwege. Mehr Flexibilität im Bildungswesen. Beiträge zur Reform der Grundschule* (pp. 53–79). Frankfurt: Grundschulverband.

Fusaro, J. A. (1997). The effect of full-day kindergarten on student achievement: A meta-analysis. *Child Study Journal, 27*(4), 269–277.

Goldring, E. B. & Presbrey, L. S. (1986). Evaluating preschool programs: A meta-analytic approach. *Educational Evaluation and Policy Analysis, 8*, 179–188.

Hattie, J. (2009). *Visible learning: a synthesis of over 800 meta-analyses relating to achievement*. London: Routledge.

HCE: Haut Conseil de l'Evaluation de l'Ecole. (2003). *Eléments pour un diagnostic sur l'Ecole. Document général préparatoire au débat national sur l'avenir sur l'école. Avis du Hcéé n° 9*. Paris: Hcéé.

HCE: Haut Conseil de l'Evaluation de l'Ecole. (2007). *Bilan des résultats de l'école: L'école primaire*. Paris: Ministère de l'Education Nationale.

Hohlmeier, M. & Stevens, C. (2003). PISA, IGLU und die Folgen—Die Notwendigkeit einer kindgerechten frühen Förderung, insbesondere im Kindergarten. *Politische Studien. Sonderheft, 3*, 56–69.

Holland, P. W. & Thayer, D. T. (1986). *Differential item performance and the Mantel–Haenszel procedure (Technical Report No. 86–69)*. Princeton: Educational Testing Service.

Hyde, J. S. (2005). The gender similarities hypothesis. *The American Psychologist, 60*, 581–592.

Innocenti, M. S. & White, K. R. (1993). Are more intensive early intervention programs more effective? A review of the literature. *Exceptionality, 4*, 31–50.

Leroy-Audouin, C. (1993). L'école maternelle entre la diversité des élèves et la continuité éducative: du passage anticipé au cours préparatoire au cycle des apprentissages fondamentaux. Thèse de doctorat en Sciences de l'Education non publiée, Université de Bourgogne.

Mantel, N. & Haenszel, W. (1959). Statistical aspects of the analysis of data from retrospective studies of disease. *Journal of the National Cancer Institut, 22*, 719–748.

MEN. (2003). *Evaluations nationales Grande Section de Maternelle*. Paris: Ministère de l'Education Nationale, de l'Enseignement Supérieur et de la Recherche.

MEN. (2004). *L'état de l'école*. Paris: Ministère de l'Education Nationale, de l'Enseignement Supérieur et de la Recherche.

OECD. (2001). *Connaissances et compétences: des atouts pour la vie*. Rapport PISA 2000. [On line]. http://www.oecd.org/dataoecd/44/30/33691604.pdf. (Page consulted on 27th February 2008).

OECD. (2004a). *Apprendre aujourd'hui, réussir demain. Premiers résultats de PISA 2003*. Paris: OECD.

OECD. (2004b). *OECD Country note. Early childhood education and care policy in the Federal Republic of Germany*. [On line]. http://www.oecd.org/dataoecd/42/1/33978768.pdf. (Page consulted on 27th February 2008).

OECD. (2006). *Starting Strong II: Early Childhood Education and Care*. Organisation de coopération et de développement économiques. [On line]. http://www.oecd.org/document/63/0,2340,en_2649_34819_37416703_1_1_1_1,00.html (Page consulted on 27th February 2008).

Pisa-Konsortium, D. (ed). (2002). *PISA 2000—Die Länder der Bundesrepublik Deutschland im Vergleich*. Opladen: Leske & Budrich.

Prêteur, Y. & Louvet-Schmauss, E. (1991). Conception éducatives parentales vis-à-vis de l'apprentissage de la lecture chez l'enfant d'âge préscolaire: Etude comparative selon deux systèmes socioculturels et politiques (RFA et France). *Enfance, 45*, 83–97.

Prêteur, Y. & Louvet-Schmauss, E. (1994). Education familiale et acquisition de l'écrit chez des enfants de 5 à 7 ans, une approche comparative franco-allemande. In M. Deleau & A. Weil-Barais (Eds.), *Le développement de l'enfant: approches comparatives* (pp. 244–254). Paris: PUF.

Rasbash, J., Charlton, C., Browne, W. J., Healy, M., & Cameron, B. (2005). *MLwiN Version 202: Centre for Multilevel Modelling*. Bristol: University of Bristol.

Ravard, J. C., & Rabreau, J. (2005). *NBA1-T: Echelle d'évaluation des préalables pour les CP et Batterie analytique de lecture/orthographe*. Paris: Edition ECPA.

Snijders, T. & Bosker, R. (1999). *Multilevel Analysis: an introduction to basic and advanced multilevel modeling*. London: Sage.

Suchaut, B. (1996). La gestion du temps à l'école primaire: diversité des pratiques et effets sur les acquisitions des élèves. *L'Année de la Recherche en Éducation, 1*, 123–153.

Tazouti, Y. (2003). Education familiale et performances scolaires des enfants de milieu populaire. *Revue Européenne de Psychologie Appliquée, 53*, 97–106.

Tazouti, Y., Flieller, A., & Vrignaud, P. (2005). Comparaison des relations entre l'éducation parentale et les performances scolaires dans deux milieux socio-culturels contrastés (populaire et non populaire). *Revue Française de Pédagogie, 151*, 29–46.

Vaniscotte, F. (1996). *Les Ecoles de l'Europe: systèmes éducatifs et dimension européenne*. Paris: INRP.

Vaniscotte, F. (2001). Une comparaison européenne des structures et des contenus. In J. C. Ruano-Borbalan (Ed.), *Eduquer et former: Les connaissances et les débats en éducation et en formation* (p. 403409). Paris: Editions Sciences Humaines.

Youssef Tazouti. Maître de conférences en Psychologie de l'Education. IUFM de Lorraine/Université Henri Poincaré.IUFM de Lorraine, 5, rue Paul Richard. C03—Maxéville. 54528 Laxou Cedex. E-mail: tazouti@univ-nancy2.fr

Current themes of research:

Family Education, intellectual performance and academic achievement. Comparative Education.

Most relevant publications in the field of Psychology of Education:

Tazouti, Y., Malardé, A., & Michéa, A. (2010). Parental beliefs concerning development and education, family educational practices and children's intellectual performances and academic achievement. *European Journal of Psychology of Education, 1, 19–35.*

Viriot-Goeldel, C., Tazouti, Y., Matter, C., Geiger-Jaillet, A., Carol, R., & Deviterne, D. (2009). Comparaison des effets des variables individuelles et contextuelles sur les performances scolaires des élèves en France et en Allemagne à la fin des deux premières années de scolarisation. *Recherches & Educations, 2, 233–253.*

Tazouti, Y., Constant, M., & Prévot, E. (2009). Evaluation de l'environnement familial par la version française du HOME préscolaire. *Enfance, 2, 223–239.*

Caroline Viriot-Goeldel. Maître de conférences en sciences de l'Education à l'université de Paris Est Créteil

Cornélie Matter. Doctorante en Sociologie de l'éducation. Maitre formateur à l'IUFM d'Alsace

Anémone Geiger-Jaillet. Professeur des Universités en Sciences du Langage à l'IUFM d'Alsace/Université de Strasbourg

Rita Carol. Maître de conférences en Sciences du Langage à l'IUFM d'Alsace. Université de Strasbourg E-mail: rita.carol@alsace.iufm.fr

Dominique Deviterne. Maître de conférences en Psychologie de l'Education. IUFM de Lorraine/Université Henri Poincaré