Rich schools, poor schools.

Hidden resource inequalities between primary schools.

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Structured abstract

Background

There has been relatively little analysis of school context including a large number of elements from the broader social, political and economic influences. However, primary schools in Flanders (Belgium) are supposed to consider their school context when implementing the Flemish policy on equal opportunities in education.

Purpose

In order to provide a better underpinning for a contextualized policy, a multidimensional concept of school context is used to identify the position of Flemish primary schools in the field of education and to outline their profile.

Sample

The position of these schools was analyzed with survey data from the longitudinal study ‘School careers in primary education’ (SiBO), supplemented by administrative data from the Flemish government. The sample used for this analysis contains 113 primary schools with an overrepresentation of schools receiving additional resources to implement a policy on equal opportunities in education. SiBO collected information from several stakeholders: the pupils and their parents, the teachers and the school principals.

Design and methods

The survey results were analyzed statistically. A latent class analysis (LCA) was carried out to cluster schools into more or less homogeneous groups. School context is made up of different kinds of resources. These are latent constructs that are not directly measurable. Therefore, social, cultural and economic capital are operationalized with

concrete, measurable indicators related to the school infrastructure, the catchment area and the human resources.

Results

The analysis shows that there exist clusters of schools with common contextual features.

The LCA reveals three classes: medium-resource schools, low-resource schools and high-resource schools. As a result, this study identifies hidden resource inequalities between primary schools in Flanders.

Conclusions

We conclude that the field of education is not a level playing field. Despite equality in funding rules or indeed, despite educational priority funding, school contexts and resources can differ strongly between ‘advantaged’ and ‘disadvantaged’ schools. The findings are relevant for policy makers aiming to improve equal opportunities in education and contribute to the ‘contextualisation agenda’ of educational research.

Keywords

School context; primary schools; educational policy; equal opportunities; latent class analysis

Introduction

Although the influence of school context on school processes and pupil performance has received greater attention in some disciplines of educational research, school context itself deserves more in-depth study in order to provide a better underpinning for a contextualised policy. Indeed, there has been relatively little analysis of school context including a large number of elements from the broader social, political and economic influences. For the implementation of the Equal Educational Opportunities Act (Vlaams Parlement 2002, B.S.14-9-2002), primary schools in Flanders (Belgium) are largely autonomous but are supposed to consider their school context and their related position in the field of education (Vlaams Parlement 2009, B.S. 28/08/2009). In this study, a multidimensional concept of school context is used to identify the position of schools and to outline their profile. In this way, this article aims to contribute to the ‘contextualisation agenda’ of educational research (Thrupp and Lupton 2006, 54:308-328).

This article is structured as follows: the first section describes the theoretical background highlighting the key concepts used in the study. Second, the methods section outlines the data, the sample and the variables measuring school context. Third, and more importantly, the latent class analysis reveals three latent classes of school context. Finally, the article concludes with a discussion in which the main findings are interpreted and the implications of these results for education policy and practice are addressed.

Theoretical background

This section discusses the importance of two concepts:

- the contextualisation agenda of educational research;
- the conceptualisation of school context and the position of primary schools in the field of education.

The contextualization agenda of educational research

An education policy that takes into account school context is a prerequisite for greater social justice in education. Thrupp and Lupton (2006, 54:308-328) point out the importance of school context for practice and policy and emphasise the need for research to consider school context much more. They call this the ‘contextualization agenda’ of educational research. The main motive is to develop a less ‘neutral’ and politically ‘naïve’ discourse on the performance of a school. Other arguments stem from the above: a fairer evaluation of school performance, a more equitable distribution of resources and providing appropriate advice and better support for schools in a less favourable context. All this would lead to a better response to the specific needs of disadvantaged student populations.

Since 2002, the Flemish government has been pursuing a policy of equal opportunities in education by granting additional resources to schools that have disadvantaged children among their pupils. For the implementation of this policy, schools have to take into account their specific context and input characteristics. Indeed, schools can differ strongly in terms of school population. These inequalities interact with other factors such as the location, infrastructure and equipment of schools, their history and their human resources. These are factors which are often beyond the control of the school.

Several parameters of the school context interact and position a school on a spectrum from cumulatively advantaged to cumulatively disadvantaged (Thrupp and Lupton

2011, 26:289-312). Does this mean that every school should be approached with an individualised policy? Thrupp and Lupton (Thrupp and Lupton 2006, 54:308-328) presume that there exist clusters of schools with common contextual features. On the basis of these clusters, a contextualised policy could be underpinned better.

The conceptualisation of school context and the position of primary schools in the field of education

How can school context be conceptualised and measured? This study uses a multidimensional concept of school context.

Based on socio-economic and / or ethnic school composition characteristics, there seems to be at least a dichotomous division between advantaged and disadvantaged schools. The literature on socio-ethnic school segregation refers to schools in terms of pupils' characteristics (e.g. pupils from disadvantaged backgrounds; schools where pupils of white ethnicity form the majority; schools with a majority Black population, etc.) . (Agirdag, Loobuyck, and Van Houtte 2011, 18:46-55) (Ballet and Kelchtermans 2006, 113:15-19). Other sociological studies on education refer to elite schools versus social focus schools (Jungbluth 2003). Accordingly, pupil characteristics are often the main criterion to identify clusters of schools. However, school context based on school composition does not effectively capture the role of broader social, political and economic processes in generating the position of a school. Orhan Agirdag et al. (Agirdag et al. 2012), for instance, report that Flemish primary schools with a lot of migrant pupils are often rather well-off with respect to school infrastructure, new teaching materials and small class sizes. The strong motivation of teachers in those schools is also worth noting. They conclude that there exist both schools with a high proportion of ethnic minority students that perform excellently and schools with a high

proportion of ethnic minority students that perform poorly. Therefore it seems appropriate to distinguish different profiles of disadvantaged schools. A more refined picture with three or more groups of schools should be considered. This would also be useful for further research linking school profiles and implementation strategies for a school's policy on equal opportunities. Agirdag (Agirdag, Loobuyck, and Van Houtte 2011, 18:46-55) alludes here already:

“Why does one school perform better than another school? Schools, including schools with a high proportion of ethnic minority students, appear to obtain very different results. There are a lot of socially and ethnically diverse schools that are able to submit a good report because over time they have developed good practices and they have well spent the extra funds for equal opportunities in order to optimise the learning gains of their pupils.” (citation translated from Dutch to English)

Neighbourhood mechanisms (Galster 2010) are another often applied criterion to study school context but, because of free school choice in Flanders, not every school is attended by local children. Two processes are at work: on the one hand the effects of the neighbourhood on the individuals who take part in the school community and on the other hand the effects of the neighbourhood with a direct impact on the school itself as an organisation. Connecting to these processes, Mills and Gale (Mills 2010) emphasise in ‘Schooling in Disadvantaged Communities’ that the broader social, political and economic influences could position a school adversely. To this end, they use a set of thinking tools from Pierre Bourdieu. This French sociologist defines ‘context’ as a structured space of positions (Bourdieu and Wacquant 1992). In this space, the positions and their interrelations are determined by the distribution of different kinds of resources or ‘capital’. Individuals or a community (e.g. a school) have economic, cultural and social capital.

Economic capital refers to tangible and financial resources. This means income and property. The economic capital of a school includes for example the school infrastructure or its financial resources.

The cultural capital stands for (the experience of) various forms of art and culture, and in the embodied form it means knowledge, skills and training. Cultural capital is a broad concept which includes non-financial social assets such as reading books, team work or intercultural communication. The professional development of a school principal is an example of cultural capital.

Finally, social capital stands for the resources arising from relationships and networks. Different stakeholders characterise the social capital of a school: pupils and alumni, parents, neighbours, the governing body, teachers, the school principal, etc. Social capital also stands for trust and reciprocity, for social involvement and social skills.

These different types of ‘capital’ make up a multidimensional concept of school context whose operationalisation will be described in the methods section. Moreover, the volume and the structure of economic, cultural and social capital determine the position of a school in a ‘field’; in particular the field of education (Bourdieu and Wacquant 1992). This position can be either advantageous or adverse.

Methods

The methods section describes the data, the sample and the indicators used to measure school context.

Data and sample

The data used for the analysis are administrative data from the Flemish government and survey data from the SiBO database. SiBO (acronym for ‘Schoolloopbanen in het

basisonderwijs' – School careers in primary education) is a longitudinal study in Flemish primary education that started in 2002. In this study, more than 3500 children were followed from kindergarten throughout sixth grade. SiBO collected information from several stakeholders: the pupils and their parents, the teachers and the school principals. Most of the data used in this article were collected during the 2002-2003 school year when the Flemish decree on equal opportunities in education (Vlaams Parlement 2002, B.S.14-9-2002) took effect. This 'baseline' approach fits within a broader analysis of the implementation setting of the Flemish policy on equal opportunities in education. The sample contains 113 primary schools with an overrepresentation of schools receiving additional resources to implement a policy on equal opportunities in education. The next paragraph describes the variables that are used in the analysis.

Operationalisation of school context

In line with the thinking tools of Bourdieu, school context is made up by different kinds of resources. These are latent constructs that are not directly measurable. Therefore, social, cultural and economic capital are operationalised with concrete, measurable indicators related to the school infrastructure, the catchment area and the human resources.

School infrastructure

The indicator 'infrastructure' provides information about the quality of the school building and the school grounds. The Flemish Agency for School Infrastructure (AGION) (AGION 2009:-252) has examined a set of quality criteria relating to:

- safety;

- the condition of the buildings;
- ease of use;
- the functionality of the buildings;
- amenities;
- the cost of the buildings;
- the school grounds and the surroundings of the school;
- the implementation process of the construction project.

On the one hand these quality criteria contain a subset of 15 basic conditions relating to hygiene, habitability and safety and on the other hand a subset of 25 criteria relating to the new challenges the patrimony of school buildings faces. AGION notes that the school infrastructure in Flanders generally offers a good basic environment for both teachers and pupils. However, AGION also notes that the school infrastructure can hardly meet the new challenges of the 21st century such as sustainability, new teaching methods and the changing social role of the school.

AGION's school monitor classifies schools into ten clusters each of which have a different 'profile' for the scores on the evaluation items. These ten profiles range from 'very positive' to 'strongly negative' and were recoded in this analysis as three possible values for both the basic quality of the school infrastructure and the extent to which the school accommodation meets the 21st century challenges.

The catchment area

In order to determine the type of catchment area of a school, a binary variable was included in the analysis that indicates whether a school is located in a metropolitan area. The atlas 'Dynamic analysis of neighbourhoods in difficulty in the Belgian urban regions' (Kesteloot, Vandermotten, and Ippersiel 2007:-58) reveals the features of the

catchment area of a school on the basis of indicators on the socio-cultural and ethnic background of an (urban) area. Kesteloot et al. created a summary measure of deprivation based on numerous variables such as the proportion of tenants among private households, the proportion of long-term unemployed or an indicator of subjective health status. In this analysis, a binary variable is included that indicates whether a school is located in a neighbourhood facing difficulties, deprivation and/or disadvantage.

Accordingly, the school infrastructure and the catchment area are measured by four indicators: the basic quality of the school infrastructure, the capacity of the school infrastructure to face future challenges, the position (or not) in a metropolitan area and the socio-cultural and ethnic profile of the school district. These indicators help to determine the volume and the structure of the economic, social and cultural ‘capital’ of a school. The school location is decisive for a comfortable and stimulating working and learning environment.

Human resources

Along with the pupils, the teaching staff constitutes the ‘centre of gravity’ of the human capital of a primary school. Given the number of teaching hours to which a school is entitled, the quality of the teaching staff depends on the school’s ability to attract well-trained, experienced and dedicated staff.

Six aggregate variables were created to get a picture of the teaching staff:

- average age;
- average seniority in the education system;
- average seniority in the current school;

- average employment duration (per week, as a percentage of full-time work);
- ratio of male / female teachers;
- ratio temporary / tenured teachers.

On the other hand, seven variables characterise the school principal.

- age;
- number of years in the current school as a school principal;
- total number of years in the education system as a school principal;
- additional degree in Higher Pedagogical Studies;
- additional training for teaching pupils with additional needs;
- additional training for special education;
- introductory management training course.

The following results section first presents how school context was analysed by the observed variables described above. Then it identifies three latent classes of school context.

A latent class analysis of school context

The theoretical framework suggests the existence of groups of schools with common contextual features. Latent class analysis (LCA) was adopted as a way to classify schools into more or less homogeneous groups. This means that schools within a given class are similar to each other with respect to these contextual features. A latent class is typically an attribute that is not immediately observable. This is the case for school

context. The relationship between the (categorical[†]) latent attribute and a set of observed attributes is probabilistic, just like a disease can be identified with some degree of uncertainty on the basis of symptoms.

For example, suppose a psychologist wants to determine whether someone is depressed. Does that person belong to the class 'depressed' or to the class 'not depressed'? Psychologists investigate this by means of a list of symptoms. An immediate classification is not possible and, therefore, they exploit the fact that a person who is depressed scores (on average) differently on a number of easily observable symptoms than someone who is not thought to be depressed. These symptoms include loss of appetite, insomnia and lack of energy. It is believed that a person who is depressed is more likely to have these symptoms than someone who is not depressed. It is obvious that not everyone who is depressed suffers lack of appetite, and vice versa, not everyone who is depressed should have necessarily anorexia. Thus, the relationship between depression and its symptoms is probabilistic (Vermunt 2004, 47:2-14).

Similarly, the concept of 'school context' is a theoretical construct that can be measured only indirectly using the observed variables described in the methods section. When someone enters through an imaginary school gate and obtains information about a number of school characteristics, how likely is it that this school belongs to a particular group or class in terms of its school context? Conversely, someone could also predict with an estimated probability - if it is known to which class a school belongs - how a number of characteristics of that school look like.

Although latent class analysis (LCA) was introduced after World War II (Lazarsfeld

[†] Categorical refers to variables assessed on a nominal or an ordinal scale (Muthén and Muthén 2009, 5).

and Guttman 1950:362-472), it was the 1990s before this method was included in applied research. This was mainly due to a lack of computational power. In the meantime, Leo Goodman (1974, 61:215-231; Goodman 1974, 79:1179-1259) and his successors (Haberman 1978) (Hagenaars and McCutcheon 2009) have developed more enhanced and refined models at the University of Chicago. In Europe, LCA was further developed by the ‘Dutch school’ of Jacques Hagenaars (Hagenaars and McCutcheon 2009). Currently, latent class analysis is applied in several academic disciplines such as health sciences, psychology and sociology (Anthony et al. 35:82-90) (Garnett et al. 43:1225-1239) (Henry and Muthén 2010, 17:193-215) (Ward et al. 38:1407-1413).

Latent class analysis is based on the statistical concept of likelihood and has the advantage of being a theory-based approach to clustering. Put differently, on the basis of a sample, LCA provides a statistical model for the population. The interest lies in the estimated parameters of the model to describe the groups or classes. By the same token, it allows assigning an observation to a particular class. The latter is an important difference from the ‘traditional’ mathematical clustering methods that use e.g. the Euclidean distance: the observations are not assigned exclusively to a cluster but have a chance of membership of each group. Afterwards, the model allows the assigning of other observations from the population to a group or class (Vermunt and Magidson 2009:89-106).

Since the variables in this analysis have different levels of measurement including frequently nominal or ordinal scales, LCA offers the additional advantage of simultaneously handling different levels of measurement (‘mixed mode data’); even lower scales of measure (Vermunt and Magidson 2009:89-106).

Data about pupils’ characteristics were not included in the model as latent class

indicators but were kept apart as a covariate. Indeed, school composition is left out of the LCA in order to examine the a priori differences in economic, social and cultural resources between schools with many or few disadvantaged pupils.

The model was estimated by means of Mplus Version 5 (Muthén and Muthén 2009, 5) and this statistical software has the ability to choose the best starting values for the algorithm in order to avoid local solutions (Nylund, Asparouhov, and Muthén 2007, 14:535-569). Additionally, in order to investigate the different solutions thoroughly, the STARTS option was used to increase the number of randomly generated starting values to six hundred and to increase the number of optimisations in the final phase to sixty (Muthén and Muthén 2009, 5). The Mplus input instructions are available from the authors on request.

The LCA model was built requesting a series of models with increasing number of latent classes.

[Table 1. Model building: fit indices and classification quality]

During this class enumeration process, the statistical tools in table 1 evaluate the ‘candidate’ models. Across competing models, the three-class model was selected as the most parsimonious one. The information criterion BIC supports the choice of the number of classes taking into account that the lower the BIC the better it is (Nylund, Asparouhov, and Muthén 2007, 14:535-569).

The classification quality of the model is expressed by the entropy parameter. In the present case, the entropy index is 0,903 which means that the probability of a school being misclassified is very small.

Hence, the final output of the present latent class analysis (LCA) reveals three distinct

classes. Table 2 briefly identifies these three classes, and lists the proportion of schools that fit into these.

[Table 2. Summary of school context.]

The latent class model predicts the class to which a school belongs. Therefore, it predicts the value of the categorical latent variable ‘school context’ for that school.

Table 3 and table 4 show summary model results for the continuous items and the categorical items respectively. Graphs of distribution of latent class indicators in each latent class are shown in appendix 1 and appendix 2. They give a visual impression of the pattern of each latent class on their indicators.

[Table 3. Model results for continuous items: estimated parameters (means) for each latent class]

For the categorical variables, the results are expressed on a probability scale. This scale reflects the probability of a school belonging to a latent class given its value on a particular variable. For instance, a school located in a metropolitan area (other things equal) has a probability of 31% of belonging to the second class (low-resource schools).

[Table 4. Model results for categorical items: conditional response probability for each latent class]

The estimated parameters of the model are the basis for the elaboration of sociologically meaningful school context groups. The distinctive features of the model of school context are drawn out below.

Class 1 – Medium-resource schools

Medium-resource schools have a school building that responds well to the basic conditions of hygiene, and which is fit for habitation and security. This finding is not

exceptional because it applies to the vast majority of Flemish primary schools (AGION 2009:-252). However, it is striking that the infrastructure of medium-resource schools is most likely (42,6%) to receive negative evaluations in relation to the 21st century challenges about sustainability, new teaching methods and the changing social role of schools.

A school located in a metropolitan area has a probability of 25% of being a member of class 1 (medium-resource schools). This is five times more likely than a membership of class 3 (high-resource schools). The odds of endorsing[‡] a deprived neighbourhood in class 1 (medium-resource schools) are twice more likely than in class 3 (high-resource schools).

The experience of the teachers in medium-resource schools corresponds to the sample means. Teachers are on average 37 years old and they have an average seniority of fifteen years working in the educational system. As regards the proportion of male/female teachers in the team, these schools are situated around the average (note that teaching is a typically female occupation). The average workload of a team of teachers in the sample as well as in medium-resource schools is 89% full-time equivalent (FTE). On average, teams of teachers in the sample consist predominantly of tenured colleagues. This holds also for medium-resource schools.

The experience of the school principal in his or her function as a manager differs between the three groups of schools. The medium-resource schools serve as a reference class: they have a school principal who has more experience than a school principal in a

[‡] In the context of latent class analysis the terms ‘to endorse’ and ‘endorsement’ refer to the conditional response probability for each latent class on the categorical items.

low-resource school but less experience than a colleague from a high-resource school. In a medium-resource school, a school principal is on average 47 years old and he or she has an average seniority of seven years working as a school principal in the current school. As regards their professional development, the probabilities that school principals in medium-resource schools endorse additional degrees are the same as the overall sample proportions, except for special education. In particular, the odds of endorsing additional training for special education in class 1 are 45% less than in class 2 (low-resource schools) and 75% less than in class 3 (high-resource schools).

Class 2 - Low-resource schools

Compared to the other groups of schools, low-resource schools have the highest risk (16%) of endorsing on a negative profile in terms of the basic conditions (hygiene, security, etc.) for a quality school building. They have also the highest probability (31%) of being located in a metropolitan area (Brussels, Ghent or Antwerp).

The low-resource schools have a team of teachers that is on average five years younger and less experienced than teams in medium-resource schools. The ‘gap’ with high-resource schools is in fact ten years. This suggests a higher turnover among teachers in low-resource schools. This presumption is confirmed by the fact that they employ mainly temporary teachers. Low-resource schools have the highest share of women in the team of teachers and their teachers mainly have a full time work schedule.

The school principals of low-resource schools have the least experience in their management role: the difference compared with high-resource schools is up to three years. Additionally, school principals in low-resource schools are least qualified in their professional development.

Class 3 – High-resource schools

High-resource schools have a school building that perfectly accords to the basic conditions of hygiene. These buildings are fit for habitation and security equipped to meet future challenges. In general, high-resource schools are not located in a metropolis nor in a disadvantaged neighbourhood.

The teachers in high-resource schools have a lot of experience. They are on average 41 years old and they have twice as much seniority as the teams in low-resource schools. High-resource schools have the highest shares of male teachers in their teams and the human resources of these schools are fairly stable as high-resource schools have the highest share of tenured teachers.

High-resource schools also stand out in terms of the profile of their school principal. Compared to the other groups of schools, their principals have the longest amount of experience in a management function. As regards the professional development of these school principals, 81% has obtained an additional degree of Higher Pedagogical Studies. This is a three-year part-time training for primary school teachers organised by the Higher Institutes of Education. The training aims at providing a broad, fundamental basis for principals' daily and future practice. Additionally, the school principals of high-resource schools have a 78% probability of holding an introductory management training course. This course is organised by the respective umbrella organisations of school networks and aims at the professional development of school principals. A session takes half a day and school principals can register per school year for a dozen sessions.

Relating the LCA results to school composition

As described in the beginning of this section, pupils' characteristics were kept separately as a covariate in order to examine the a priori differences in economic, social and cultural resources between schools with many or few disadvantaged pupils. Linking the conceptual aspects of school context with covariates explores differences in demographics (such as school composition) across the classes (Masyn 2013).

Clark and Muthén (2009:1-55) have compared techniques for relating latent classes to auxiliary variables. Across all of the settings, including the covariate while forming the latent classes performed the best. Clark and Muthén (2009:1-55) suggest a strategy for how to decide on which covariates should be included in an analysis. The first step is to conduct the latent class analysis without any covariates in the model in order to understand the substantive interpretation of the latent classes. In the present study, conducting the LCA without a covariate gives the same results for the interpretation of the classes. In the second step, an equality test of means across classes is conducted to examine whether a potential covariate has some impact on the latent classes in terms of the mean differences. The proportion of disadvantaged pupils in a school (X1) and the number of teaching hours for equal opportunities per child (per year) (Y1) were considered as potential covariates.

[Table 5. School composition: test equality of means across classes for auxiliary variable X1.]

Table 5 shows that the school composition across the different classes is in line with what might be expected: low-resource schools have the highest share of disadvantaged pupils (class mean = 38%) and high-resource schools have the lowest share (class mean = 22,5%). The mean differences between these two groups of schools are statistically significant ($p = 0,02$). For the overall model, however, the null hypothesis - that is, the

observed impact of the proportion of disadvantaged pupils in a school on the latent classes occurred simply through chance - cannot be rejected ($p = 0,08$). The null hypothesis cannot be accepted either: a large p -value ($p > 0,05$) does not allow one to make statements in one way or another until other factors have been considered (Davies and Crombie 2009). The p -value of the overall chi-square test might have been smaller if the sample was larger.

[Table 6. School composition: test equality of means across classes for auxiliary variable Y1.]

In Flanders, the personnel subsidies of schools are expressed in number of teaching hours. Besides the 'regular' teaching hours based on the number of pupils, most primary schools receive additional teaching hours to pursue a school policy on equal opportunities. This teaching time for equal opportunities allocated during the school year 2002-2003 is for the present latent class analysis a potential covariate that might have some impact on the latent classes. Indeed, it is a proxy for school composition, since the allocation of additional teaching hours is based on the proportion of disadvantaged pupils and even on the 'type' of disadvantaged pupils (cf. the criteria to consider a pupil as disadvantaged[§]). This auxiliary variable was divided by the total number of pupils of the school and as a result, it represents a number of teaching hours for equal opportunities per child (per year). Table 6 shows that low-resource schools receive on average 0,15 teaching hours for equal opportunities per child. This is twice

[§] According to the Flemish decree on equal opportunities in education (Vlaams Parlement 2002, B.S.14-9-2002), since 2002, the criteria for considering a pupil as disadvantaged have been: the family has a low income and/or the mother has no degree of secondary education or equivalent and/or the child is residing outside the family and/or the parents belong to the itinerant population and/or the home language is not Dutch. Note that the language criterion only counts in combination with one or more of the other criteria.

as much as what the high-resource schools receive. The p-value of the overall chi-square test ($p = 0,04$) indicates that the observed differences across the classes are significant. This means that the auxiliary variable ‘number of teaching hours for equal opportunities per child’ helps to predict class membership.

According to the strategy of Clark and Muthén (cf. *supra*), the latter finding is an argument to include this proxy for school composition as a covariate in the latent class analysis. As a final step, an analysis with the variable ‘number of teaching hours for equal opportunities per child’ included while forming the latent classes was conducted, in order to obtain an unbiased estimate of the regression coefficient (Clark and Muthén 2009:1-55). Accordingly, covariates in an LCA model predict class membership via logistic regression (Wurpts 2012:1-101).

[Table 7. Parameterizations for the categorical latent variable regression using reference class 1]

In table 7, medium-resource schools (class 1) are chosen as an arbitrary reference class. This choice is supported by the fact that class 1 covers 51% of the schools in the sample and by the fact that the substantive interpretation of this class corresponds to the sample means or to the proportions of endorsement in the sample. The estimated coefficients 3,757 and -4,538 for class 2 and class 3 respectively are not easy to interpret because a logistic regression model is non-linear. These logistic slope coefficients are interpreted as the rate of change in the "log odds" for class membership as the covariate changes. Thus, 3,757 is the rate of change in the odds of a school to be member of low-resource schools instead of belonging to medium-resource schools given a change in the number of teaching hours for equal opportunities per child. Similarly for -4,538, this logistic slope coefficient can be read as the rate of change in the odds of a school being a member of the high-resource schools instead of belonging to medium-resource schools,

given a change in the number of teaching hours for equal opportunities per child.

The null hypothesis assumes that the covariate ‘number of teaching hours for equal opportunities per child’ cannot predict class membership of a school. According to the p-values ($p = 0,07$ for class 2 and $p = 0,41$ for class 3), this hypothesis cannot be rejected but it cannot be accepted either (Davies and Crombie 2009).

Relating the results of the latent class analysis to school composition suggests thus that the proportion of disadvantaged pupils in a school, and even the ‘type’ of disadvantaged pupils (measured by the number of teaching hours for equal opportunities per child), might not be a good predictor for the context of a school. By investigating pupils’ family background, low-resource schools and high-resource schools could not be distinguished from medium-resource schools.

Discussion

Interpretation of the results within the theoretical framework

According to Pierre Bourdieu’s definition of ‘context’ that includes economic, cultural and social capital (Bourdieu and Wacquant 1992), a multidimensional concept of school context is used to identify the position of Flemish primary schools and to outline their profile.

The results of this study provide support for the view of Thrupp and Lupton (Thrupp and Lupton 2006, 54:308-328) that there are clusters of schools with common contextual features. The latent class analysis (LCA) revealed three distinct groups of primary schools: medium-resource schools, low-resource schools and high-resource schools.

On a linear spectrum, medium-resource schools could be situated between low-resource schools and high-resource schools. They make up the majority of primary schools and serve as a reference class. In general, the parameter estimates for school infrastructure, catchment area and human resources are situated near the sample means (for continuous latent class indicators) or near the overall proportion (for categorical items). Thus, medium-resource schools have a profile without notable strengths. On the other hand, they have two notable adverse features: these schools have the highest risk of endorsing a deprived neighbourhood and of endorsing a negative evaluation for their school building facing the new challenges of the 21st century.

Low-resource schools clearly have a disadvantaged profile compared with the two other groups of schools. They have poor infrastructure, lacking the basic quality of hygiene and safety. One third of low-resource schools are located in a metropolitan area. Their school team consists of the least experienced, mainly temporary teachers and the least qualified and experienced school principal. These schools were labelled low-resource schools because in this group deficits of economic, cultural as well as social capital tend to reinforce each other.

The third and last group of schools are the high-resource schools. Their position in the field of education is the opposite of low-resource schools. They have the best school infrastructure for the basic environment as well as for the new challenges of the 21st century and their catchment area has no adverse features. High-resource schools have a highly qualified and experienced school principal and their school team consists of the most experienced, mainly tenured teachers.

To sum up, this study identifies hidden resource inequalities between primary schools in Flanders. This means that the field of education is *not* a level playing field. Thrupp and

Lupton (Thrupp and Lupton 2011, 26:289-312) argue that schools can be positioned on a spectrum of cumulatively advantaged to cumulatively disadvantaged. The real data of the present study confirm this hypothesis: high-resource schools can be regarded as cumulatively advantaged and low-resource schools can be regarded as cumulatively disadvantaged.

Relating these results to school composition shows that the proportion of disadvantaged pupils is in line with the position of a school in the field of education. However, the differences in pupil characteristics between schools with many or few economic, social and cultural resources are not statistically significant. Although pupil characteristics are often the main criterion used to identify clusters of schools, these findings support the assumption that school context based on school composition does not effectively capture the role of broader social, political and economic processes in generating the position of a school.

Limitations of the study and suggestions for future research

When discussing the implications of this study for policy and practice, it is important to be aware of some limitations.

The operationalisation of the school context is dependent on the available data of sociological processes. This is an obvious point which nonetheless needs to be underscored. Nevertheless, this analysis of school context includes a fairly wide range of social, political and economic influences. Moreover, including a variable in the analysis only makes sense if it has a distinctive effect on the position of a school in the field of education. The additional teaching time for extended care, for instance, is part of the resources of a school - but, as this teaching time is equally distributed across

schools according to the number of pupils, it does not contribute to the question of whether a school is advantaged or disadvantaged.

For the latent class analysis (LCA), Vermunt (Vermunt 2004, 47:2-14) recommends a large number of observations (e.g. 500 or 1000). The sample of this study contained no more than 113 schools. Therefore, the predictive power of the analysis might be weaker. It is possible that some small classes could not be found. Considering the theoretical arguments for choosing three latent classes, this is not problematic. The aim of this LCA is to identify some key types of schools rather than depicting in detail the smallest possible classes.

When relating the results of the LCA to auxiliary variables, it is possible that statistically significant differences could not be found due to the small sample size. Therefore, conclusions about covariates predicting class membership have to be made carefully. During the modelling procedure, the limits of LCA were nearly reached but a strategy was followed that includes a covariate and many latent class indicators in order to compensate for the small sample size (Wurpts 2012:1-101).

The performance of the latent classes was only checked against one criterion - specifically, school composition, which is based on the conceptualization of school context. Therefore, the latent class validation through the logistic regression does not account for other possible effects of other covariates (Masyn 2013).

The results of this study call for further research. They seem to indicate that quasi-market mechanisms in education operate not only on the level of pupils but also of teachers and school principals. Disadvantaged schools are struggling with less experienced teachers and with more staff turnover. Further investigation may reveal the amount of teacher salary spent per child in any particular type of school. A school with predominantly young teachers is expected to have a 'cheaper' team of teachers.

According to Bourdieu, medium-resource, low-resource and high-resource schools have their own ways of thinking and acting that follows from the position they take up in the field of education. This line of study will be pursued to clarify the way this positioning shapes the attitudes that schools adopt with respect to their pupils and more specifically the way in which this positioning shapes a school's own equal opportunity policy.

Implications for policy and practice

The findings of this study suggest that low-resource schools are not irreversible. These schools need better resources such as infrastructure and human resources. Although additional funding to educate disadvantaged children is clearly important for schools in a less favourable position, the analysis suggests that policy needs to address tools to attract and retain important skills in low-resource schools. In this regard, an OECD-project on teacher policy issues (OECD 2005:-240) reveals that teachers place a lot of emphasis on the quality of their relations with pupils and colleagues, on feeling supported by school leaders, on good working conditions, and on opportunities to develop their skills. In addition to maintaining effective teachers in low-resource schools, the certification of new school principals and their professional development are priorities for future policy development.

Indeed, how a school deals with its disadvantaged position depends strongly on its strategic capacity: vision, innovation, reflection, participation etc. (Van Petegem et al. 2006, OBPWO-project 03.07). By strengthening the capacity of schools to pursue their own policy, they can get a grip on their own position in the field of education.

The government can enhance the capacity of schools by combining generic with more targeted measures. This can be justified by the fact that the field of education is

not a level playing field. For schools in a less favourable positions, the contextualisation of education policy calls for a fairer evaluation of school performance, a more equitable distribution of resources and appropriate advice and better support. Indeed, we suggest that schools with different positions in the field of education deserve equal opportunities themselves to provide quality education. All of this would lead to a better response to the specific needs of disadvantaged pupils (Thrupp and Lupton 2006, 54:308-328).

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Tables

Table 1. Model building: fit indices and classification quality

Entropy	Model (n=113)	Loglikelihood	Parameter	BIC	LMR p-value (TECH11)	BLRT p-value (TECH14)
/	One-class	-2726,650 ^{**}	28 ^{††}	6434,449 ^{‡‡}	Not available	Not available
0,845	Two-class	-2613,513	49	5458,668	0,7270	0
0,903	Three-class	-2548,273	70	5427,463	0,2967	0
	Four-class	The best loglikelihood was not replicated				

^{**} Based on output LMR test (TECH11) of the two-class model where one-class (H0) is tested versus 2 classes.

^{††} For one-class model without covariate because ‘no reference to the slopes of the last class is allowed’ in the input instructions.

^{‡‡} For one-class model without covariate because ‘no reference to the slopes of the last class is allowed’ in the input instructions.

Table 2. Summary of school context.

Class	Label	%	Description
Class 1	Medium-resource schools	50,44	Reference class: largest group of schools with parameter estimates near the sample means
Class 2	Low-resource schools	29,20	Disadvantaged profile: deficits of economic, cultural as well as social capital reinforce each other Poor infrastructure Highest conditional response probability of endorsing a metropolitan area Least experienced, mainly temporary teachers Least qualified and least experienced school principal
Class 3	High-resource schools	20,35	Favourable position Very good school building Lowest conditional response probability of endorsing a disadvantaged and/or metropolitan area Most experienced, mainly tenured teachers Best trained and most experienced school principal

Table 3. Model results for continuous items: estimated parameters (means) for each latent class

Item	Label	Overall item means	Class 1 Medium-resource schools (n=57; 51%)	Class 2 Low-resource schools (n=33; 29%)	Class 3 High-resource schools (n=23; 20%)
X3	Teachers: average age	37,126	37,682	33,162	41,486
X4	Teachers: average seniority educ system	15,212	15,891	10,717	20,148
X5	Teachers: average seniority current school	11,372	11,811	7,503	16,036
X6	Teachers: average FTE	89,818	88,669	93,755	87,642
X7	Teachers: ratio_male_female	0,166	0,146	0,129	0,266
X8	Teachers: ratio_temp_tenured	0,692	0,590	1,135	0,360

BIRT	School principal: average age	47,000	46,809	45,626	48,686
DIR1	School principal: average seniority current school	7,013	7,294	5,629	8,987
DIR2	School principal: average seniority educ system	7,883	8,465	6,371	9,533

Table 4. Model results for categorical items: conditional response probability for each latent class

Item	Label	Overall proportion	Class 1 Medium-resource schools (n=57; 51%)	Class 2 Low-resource schools (n=33; 29%)	Class 3 High-resource schools (n=23; 20%)
Y4	Metropolitan area	0,230	0,249	0,310	0,059
Y5	Basic quality school infrastructure				
Cat1	Positive evaluation	0,712	0,688	0,568	0,935
Cat2	Moderate evaluation	0,182	0,218	0,271	0,000
Cat3	Negative evaluation	0,106	0,094	0,161	0,065
Y6	School infrastructure challenges 21 st century				

Cat1	Positive evaluation	0,167	0,116	0,174	0,261
Cat2	Moderate evaluation	0,485	0,458	0,482	0,545
Cat3	Negative evaluation	0,348	0,426	0,345	0,194
Y7	Deprived neighbourhood	0,150	0,184	0,132	0,092
DEGREE1	School principal: higher ped. studies	0,521	0,515	0,321	0,811
DEGREE2	School principal: teaching pupils with additional needs	0,146	0,166	0,070	0,202
DEGREE3	School principal: special education	0,073	0,042	0,073	0,149
DEGREE4	School principal: management training	0,750	0,754	0,719	0,782

Table 5. School composition: test equality of means across classes for auxiliary variable X1.

X1 = % disadvantaged pupils	Mean	S.E.
Class 1 – medium-resource schools	27,74	2,85
Class 2 – low-resource schools	37,73	4,69
Class 3 – high-resource schools	22,46	4,48
	Chi-square	p-value
Overall test	5,04	0,08
Class 1 vs. 2	3,24	0,07
Class 1 vs. 3	0,98	0,32
Class 2 vs. 3	5,48	0,02*
* significant with $p < 0,05$		

Table 6. School composition: test equality of means across classes for auxiliary variable Y1.

Y1 = # teaching hours equal opportunities/child	Mean	S.E.
Class 1 – medium-resource schools	0,10	0,01
Class 2 – low-resource schools	0,15	0,02
Class 3 – high-resource schools	0,07	0,02
	Chi-square	p-value
Overall test	6,43	0,04
Class 1 vs. 2	3,82	0,05
Class 1 vs. 3	1,30	0,25
Class 2 vs. 3	6,93	0,01

Table 7. Parameterizations for the categorical latent variable regression using reference class 1

		Estimate	S.E.	Est./S.E.	Two-tailed p-value
C#2	ON				
Y1		3,757	2,101	1,788	0,074
C#3	ON				
Y1		-4,538	5,499	-0,825	0,409
Intercepts					
C#2		-1,006	0,406	-2,475	0,013
C#3		-0,594	0,599	-0,991	0,321

Appendix 1. Distribution of (categorical) latent class indicators in each latent class

Appendix 2. Distribution of (continuous) latent class indicators in each latent class