Summary

Pupils – classes - schools

Using data on around 7,000 pupils from 450 classes in 150 schools (information from the cohort study VOCL'93), I have studied the extent to which differences in achievements and progress in Dutch and mathematics may be explained through characteristics of pupils, families, teachers and schools. I have focussed on the achievements and progress of pupils in lower secondary education in the Netherlands. The central questions are these:

1 To what extent do the estimates of the net achievements of schools differ between an analysis based on aggregated data and an analysis using a multilevel statistical model?

2a To what extent and why do characteristics at an *individual level* influence the *achievements* of pupils in the third year of secondary education?

2b To what extent and why do characteristics at *class and school level* influence the *achievements* of pupils in the third year of secondary education?

3a To what extent and why do characteristics at an *individual level* influence the *progress* (differences in the relative learning gain) of pupils between the first and the third year of secondary education?

3b To what extent and why do characteristics at *class and school level* influence the *progress* (differences in the relative learning gain) of pupils between the first and the third year of secondary education?

To understand the structure of Dutch secondary education, some general remarks might be helpful. Children start their education at the age of four and leave primary education about eight years later. Then they will enter secondary education, which is divided into five tracks: individual lower vocational education (IVBO; the duration is four years), lower vocational education (VBO; four years), lower general secondary education (MAVO; four years), intermediate general secondary education (HAVO; five years), and pre-academic education (VWO; six years). Each school track for secondary education has its own subsequent track. Pupils from pre-academic education are allowed to go to the university. However, one quarter of the pupils chooses higher professional training (HBO colleges) instead of university. A HAVO-certificate is also sufficient for admission to HBO colleges. The subsequent track for VBO or MAVO graduates is a junior professional training (MBO colleges).

A nested structure (question 1)

Multilevel analysis has various advantages over analyses at one level, such as a regression analysis with aggregated or disaggregated data. By taking into account the hierarchy of data (pupils within classes within schools), the results are more accurate and may be interpreted easier than the results from an analysis at one level. Another advantage of multilevel analysis is that differential effects may be studied. For example, the effect of ethnicity on achievements is not the same in each class. In some classes this effect is stronger and in others it is weaker. This means that one class may on average be more advantageous for an ethnic minority pupil and another class may be relatively less advantageous. A third advantage of multilevel analysis is that it can distinguish between regression within and between groups.

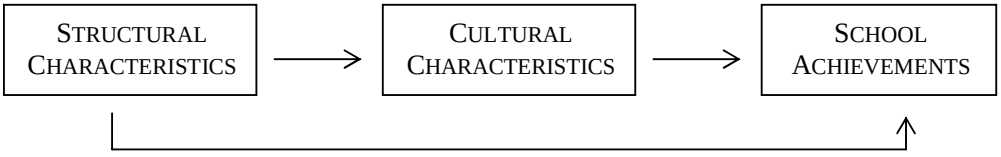
Recently, achievement data on schools have been made publicly available. In 1997 the newspaper Trouw published such information for the first time. A year later the government published similar data. These forms of information on schools raise some questions. For one thing, only data at an aggregated level are available. In a replication of the Trouw-study of school achievements I illustrated that the results of analyses at one and two levels differed significantly from each other. In more than half of the schools, the grades assigned differ one or more points (on a scale ranging from four to eight) between an analysis with aggregated data and a multilevel analysis. If the researcher does not take the nested structure into account, the results should at least be interpreted with a great deal of care. Measures of success from the one level analysis, such as the marks in the Trouw-study, will therefore not give a reliable picture of the difference in achievements between schools.

The results also differ significantly between analyses of gross and net achievements. An indicator of the gross achievements of a school is, for instance, the average level of competence in Dutch and mathematics. In order to give a fair picture of the way in which ‘schools matter’, it is necessary to take into account the circumstances of a particular school. The net achievements of a school, in which these circumstances are controlled for, is the average level of competence of pupils in these subjects, after taking into account differences in the composition of pupil populations. Using data at one level, as was done in the Trouw-study, it is not possible to take composition differences into account in a fully satisfactory way. However, when data are collected at both the individual and the school level, the net achievements of a school may be determined in a multilevel analysis.

Pupils and families differ

Many researchers have investigated the influence of pupil and family characteristics on achievements. In many of these studies researchers do not wish to restrict themselves to describing educational inequalities. More and more researchers seek to find out *why* there are differences between pupils from lower and higher social classes, between boys and girls, between pupils of ethnic minorities and native Dutch pupils, and between children from single-parent families and dual-parent families. However, as yet the cause of differences in the achievements of pupils can only be explained in part. One of the reasons for this might be that most researchers investigate the influence of just a few characteristics on achievements. Therefore, researchers are faced with the challenge of investigating the many characteristics of families and pupils in conjunction.

When explaining differences in pupils' achievements, the starting point should be the important position of pupils and their families. Differences in achievements may be explained in particular by characteristics at an individual level. On this level a distinction may be made between *structural* and *cultural* characteristics. Cultural characteristics, such as the life style of pupils or the parenting style in the family, may partially intermediate the influence of the structural characteristics, such as the socioeconomic status and the ethnicity (see the figure below).

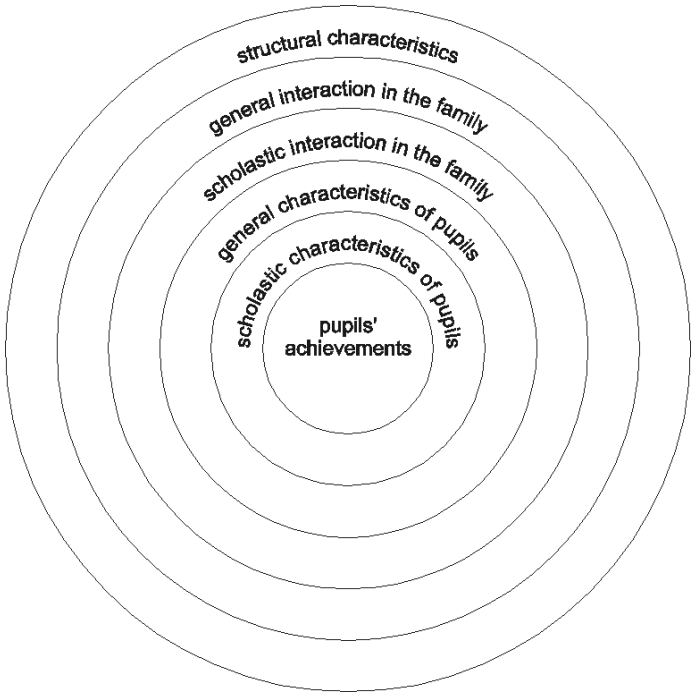


In the figure above it is clear that the influence of structural characteristics on the achievements of pupils may be either direct or indirect, via cultural characteristics. This model can be used to determine whether the influence of structural characteristics can be explained by cultural characteristics. Cultural characteristics may be subdivided into pupils and family characteristics, and into scholastic characteristics and more general characteristics. A combination of these distinctions results in four categories of cultural characteristics: general family characteristics, scholastic family characteristics, general pupil characteristics and scholastic pupil characteristics (see diagram below).

	FAMILY	PUPIL
GENERAL	4	2
SCHOLASTIC	3	1

These four categories may be arranged according to the extent to which they are directly related to the pupils' achievements. The first assumption in this arrangement is that characteristics of pupils are more related to their achievements than family characteristics. The second assumption is that scholastic characteristics in both pupil and family characteristics are more directly related to the achievements than are the general characteristics. This results in an arrangement of characteristics in which scholastic characteristics of pupils are most intimately related to the pupils' achievements and general family characteristics are least directly related to these achievements.

The structural and cultural characteristics are the independent variables which explain the differences in achievements. Apart from the independent variables, one can also distinguish dependent variables. In this study the dependent variables are the grades for a Dutch test (text comprehension) and a mathematics test.



I distinguish a total of six categories of characteristics at an individual level: one category with the dependent variables, one category with structural

characteristics, and four categories with cultural characteristics. These six categories form a *structure of concentric circles* (see figure above). The structural characteristics form the outermost circle (the fifth) and the dependent variables, the pupils' achievements, form the core. The cultural characteristics have been placed as intermediate variables between the structural characteristics and the dependent variables. The general interaction in the family, which consists of the parenting style, forms the fourth circle. The scholastic interaction in the family, for instance homework monitoring, comprises the third circle. The second circle consists of the pupils' general characteristics, such as their activities in their spare time. The scholastic characteristics of pupils form the first circle. These comprise, for instance, a pupil's earlier achievements and intelligence.

Using this model I aim to arrange the various influences and to offer more insight into the (causal) relations between the characteristics. It would also seem possible to explain the effects of characteristics such as the socioeconomic status or the ethnicity on school achievements by means of intermediate variables. An attempt will be made to explain the effects of characteristics from the outer circles by means of characteristics from the inner circles. The influence of characteristics in one circle will be regarded as a whole. This means that no investigation will be conducted on the possible arrangement of connections.

The individual level: achievements (question 2a)

The achievement levels of pupils in Dutch and mathematics are determined by both structural and cultural characteristics. Even if the prior achievements of pupils are taken into account, it is important to know the *education of the parents* and whether they belong to *ethnic minorities* or to *the native-born majority*. When the effect of these characteristics is studied in conjunction, there is a strong effect. A native-born pupil whose parents have received a higher professional education, will score one quarter of a standard deviation higher than a pupil of an ethnic minority whose parents have received only a basic education. Comparing this to the difference in achievements between pupils in different school types, for example a pupil in lower and a pupil in intermediate general secondary education, this is around one half of a standard deviation. The difference between pupils of ethnic minorities and native-born pupils does not disappear if the characteristics of the socioeconomic status are taken into account. Ethnicity has therefore an extra effect on achievements, not only in Dutch, but also in mathematics.

If the other characteristics are kept constant, *gender* also has a strong effect on the achievements of pupils. Girls have a better average score on Dutch and boys have a better average score on mathematics. Growing up in a *dual-parent family* positively influences the achievements in mathematics.

In addition to the effects of structural characteristics there are also effects of cultural characteristics. *Homework monitoring* and an *authoritative parenting style* are forms of interaction between parents and children which have a rather strong connection to the pupils' achievements. Pupils who are not urged on and whose homework is not monitored by their parents, and pupils who make 50 percent of their decisions after consulting their parents (meaning that the authoritative parenting style is regularly used), have scores on Dutch which are 0.33 of a standard deviation higher for Dutch and 0.18 of a standard deviation higher for mathematics than the scores of pupils who are subjected to homework monitoring and who are not raised in an authoritative manner.

One of the general characteristics of pupils with a strong positive effect is the pupils' self-concept. This effect is as strong as the combined effect of the education of both parents. The *life style* also has a strong effect on the achievement of pupils. Pupils who spend half their spare time going out, working or hanging out with friends, and who do not spend any time on reading or hobbies, have scores a quarter of a standard deviation lower on Dutch, and one fifth of a standard deviation lower on mathematics than pupils who spend 20 percent of their time on reading or on hobbies and who do not spend time on the three other aspects.

Naturally, the strongest effects on the achievements stem from the effects of *earlier achievements*. For instance, when a pupil has grades for all three tests (reading, information processing, and mathematics) which are one standard deviation above average, this pupil's achievements are at HAVO-level two years later. At two standard deviations above average, the pupil's grades are at VWO-level in the third year. A difference of one standard deviation is roughly equivalent to a difference in school type. Thus it is clear that the pupils' prior achievements are a good predictor of their later achievements. With regard to the other characteristics in circle one, the number of days that a pupil is given homework to do is of considerable influence. When a pupil does homework for only two days instead of five, the achievement in tests drops by one tenth of a standard deviation.

When the various circles are compared to one another, it appears that the achievements of pupils may be explained better through pupil characteristics than through family characteristics. In the survey of the literature many more pupil characteristics emerge than family interaction. It also appears that the explained variance increases much more by including the pupil characteristics (circles 1 and 2) than by including the family characteristics (circles 3 and 4). As far as the pupil characteristics are concerned, it turns out that the pupils' achievements may be better explained through school related characteristics than through general characteristics. This conclusion cannot be drawn for family characteristics. Furthermore, cultural characteristics are more important than structural

characteristics for the explanation of differences in achievements. The structural characteristics account for less than 10 percent of the variance. The cultural characteristics explain four to five times as much variance.

In addition to these pupil and family characteristics, the type of school is also influential. Not only does it provide an added effect, but it also mediates other effects, such as the effect of the education level of the parents or the number of days the pupils do homework.

The individual level: progress (question 3a)

In the previous paragraphs the central question was the extent to which the achievements of pupils at a certain moment in time could be explained by various characteristics of pupils and families. In order to determine the net achievements of pupils, the achievements of the pupils at an earlier time are taken into account. The test scores in year three are the dependent variables and the prior achievements in year one are included in the independent variables. This is a standard model in studies of school effectiveness and is referred to as the *covariance-analytical model*.

Using this model, pupils' achievements at a certain point in time can be explained. In this explanation the question is which pupils are *currently* behind or have a lead. Then the characteristics which influence the learning *achievements* are identified. This model is therefore used to study influences on learning achievements, not to study influences on learning progress. When a study is based on this model, the researcher cannot speak of effects on progress in achievements. In order to study the progress in achievements, the researcher should choose a *variance-analytical model of differences in relative learning gain*. The dependent variables in this model are for instance *the differences* between the standardized achievement scores in year three and year one.

The results of the covariance approach and the learning gain approach turn out to diverge strongly at the individual level. Structural characteristics (ethnicity, level of education of father and mother, or the number of parents) and part of the cultural characteristics (authoritative parenting style, spending time on reading and hobbies, opinion of class mates and non-verbal intelligence) do have an effect on the test scores for Dutch and mathematics, but have no effect on the differences in the relative position on these subjects. Conversely, the analysis of differences in the relative positions shows an effect of a cultural characteristic which accounts for the achievement motivation. That effect is absent in the covariance approach. Besides these pupil and family characteristics, the school type also has a weak influence on the progress pupils make.

The analyses show that structural characteristics hardly have any effect on the relative position on both subjects. Contrary to the common supposition, the disadvantage of pupils of ethnic minorities does not increase during secondary education. Various cultural characteristics do have an effect on the progress in Dutch and mathematics. The changes in achievements stem from pupil characteristics, such as their commitment to school and their life style. From a meritocratic point of view this result is favorable. Characteristics which are a given, such as the socioeconomic status and the ethnicity, do not influence differences in relative positions, but cultural characteristics do.

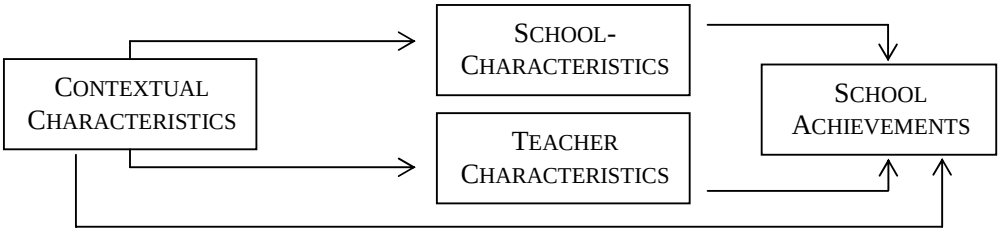
The influence of these changeable characteristics should not be overestimated. The cultural characteristics explain little of the variance in differences in relative positions. Therefore, individual characteristics hardly influence the learning gain. When entering secondary education, pupils take in a certain position as far as achievements are concerned. These positions hardly change during the first three years of secondary education (the correlation between the achievements in year one and three is 0.55 for Dutch and 0.74 for mathematics).

Teachers and schools differ

The effect of school characteristics is small compared to individual characteristics. Still, there are a number of reasons for stating that schools do matter. It appears that schools with good achievements in a particular year perform well the next year. Researchers remark regularly on the practical significance of school effects. Even small effects may be relevant, if only because the effects should be multiplied by the number of pupils benefiting from outstanding schools. Finally, in research on the effects of school characteristics the main issue is whether the *quality* of schooling makes a difference, not the question of whether the *quantity* of schooling is important. However, the quantity of schooling appears to be important for the pupils' achievements.

To what extent do characteristics of schools and teachers explain differences in achievements? Much research has been undertaken in this field. In particular, educational economists have studied the material school characteristics. The results of various studies are inconsistent and the effects of the material characteristics are weak at the most. The influence of immaterial school characteristics is the central issue in the *study of school effectiveness*. School effectiveness usually means the component of progress of pupils which cannot be ascribed to influences other than those of the school itself. This means that in school effectiveness studies the net achievements of schools is studied. The researchers look into the process characteristics of schools, such as the orderliness and safety of the school climate and a clear accent on the pupil's acquisition of the

basic skills. In the Netherlands the study of school effectiveness is receiving a lot of attention. Besides characteristics of effective schools, some researchers also study characteristics of effective teachers. This type of research is known as the study of *effective instruction* and it focuses on differences between classes. In this type of research characteristics such as the presence of the opportunity to learn and an effective learning time, structured education, high expectations about achievements, and stimulation are central issues. Finally, there are studies in which *contextual school characteristics* are central, such as research on the differences between public and private education.



There are three types of characteristics at the class and school level: teacher characteristics, school characteristics, and contextual characteristics. In various studies of effectiveness the importance of these types of characteristics has been pointed out. As the figure above shows, contextual effects may be explained by teacher and school characteristics, just as the effects of structural characteristics can be partly explained by cultural characteristics. In the study of the differences between public and private education the *black box* of the school may be said to be opened. It is not the label Catholic which explains the success of Catholic schools in the United States, but elements like the emphasis on basic skills or the school climate. This type of interpretive research aims to let teacher and school characteristics intermediate the influence of contextual characteristics as much as possible.

The class and school level: achievements and progress (questions 2b and 3b)

At the class and school level the similarities between the approaches of covariance and difference scores are stronger. The characteristics which influence the achievements in year three and which influence progress between year one and three are on the whole comparable.

In the Netherlands the gross variance in achievements at the school level turns out to be high. In this study the variance is 29 percent for Dutch and 38 percent for mathematics. Between classes and schools jointly these values are even higher: 51

and 65 percent. The variance between classes and schools is so high, because in Dutch secondary education pupils are ordered according to school type. In *Education at a glance* (OECD, 1998) it is stated that the Netherlands is an international frontrunner in interschool variance in secondary education. Other countries with high scores in this respect are Ireland, Germany, Switzerland, Austria and the Flemish part of Belgium. In contrast, in Korea and Japan the gross variance between classes and schools is less than 5 percent. Incidentally, this measure does not say anything about the inequality in achievements within a country. As it turns out, there is no clear relationship between the interschool variance (a relative measure) and the overall variance in achievements (an absolute measure).

The gross variance is not a measure of the difference in quality between schools. In order to compare schools with each other, the net variance should be computed. The net variance in achievements (in which value the pupil and family characteristics and the school type the pupil attends are taken into account) between schools is 12 percent for Dutch and 19 percent for mathematics. The net variance at the school level in the learning gain approach is 9 percent for Dutch and 12 percent for mathematics. In this approach too, only a small part of the variance in the gross variance is related to the systematic differences between schools. The composition of schools is not as strongly related to study progress as it is to study achievements. Furthermore, in both approaches there is more interschool variance for mathematics than for Dutch. This is caused by the fact that the relationship between what happens at school and mathematics achievement or progress is stronger than the relationship between what happens at school and the achievement or progress in text comprehension.

Of the *contextual characteristics*, the percentage of pupils of ethnic minorities and the size of the school location both influence the *achievements* of the pupils. For pupils in all school types the percentage pupils of ethnic minorities has a negative effect on the achievements in mathematics. An increase of one standard deviation in the percentage of pupils of ethnic minorities is associated with a decrease in the mark of 0.03 of a standard deviation. The achievements of pupils in Dutch on a HAVO or VWO school are also lower as the percentage of pupils of ethnic minorities rises. For each standard deviation difference in the percentage of pupils of ethnic minorities, the grades for the test change by 0.09 of a standard deviation.

For pupils in professional education the size of the school location accounts for a difference in the achievements in both subjects. When the number of pupils in a location rises from 300 to 600 or from 600 to 1200, this leads to a decrease in achievements of 0.07 of a standard deviation for both subjects. Since many pupils

undergo the consequences of such a school effect, it should be considered relevant. For pupils in MAVO, HAVO and VWO schools the size of the location does not influence the achievements.

In research outside the Netherlands, differences in achievements are regularly demonstrated between public and private schools. These differences occur in gross and net achievements. The current study shows that in the Netherlands differences occur in net achievements between denominations. Contrary to American studies, for instance, public schools do not perform worse than private schools. The differences occur mainly in the private sector. The arrears of pupils at interdenominational schools are conspicuous in this connection.

The *progress* of pupils is not influenced by the percentage of pupils of ethnic minorities, but it is associated with the size of the location and the denomination. However, the percentage of pupils of ethnic minorities is related to the achievements of pupils in year three of secondary education. This relationship is probably related mainly to the disadvantage of pupils at schools which had many pupils of ethnic minorities at the start of their secondary education, and not to the processes in the first three classes of secondary education. This is indicated by the fact that the disadvantage of pupils at 'black schools' does not increase between years one and three.

In the covariance approach the location size only has a negative effect on the achievements of pupils in professional education. In the learning gain approach a negative effect for all pupils is found. This effect indicates that the processes at a school differ according to the location size. There is also a denomination effect. Again, there are no significant differences between public, Protestant and Catholic schools. Interdenominational schools score negatively again. Pupils at this type of school incur arrears in mathematics.

Some of the *school characteristics* have significant effects. The stability of the team of teachers has a weak positive effect on the study achievements in both subjects. Each year that the team remains unchanged increases the achievements of pupils by one-twentieth of a standard deviation. This characteristic has no effect on study progress.

When schools substitute a canceled class by having another teacher take over or an obligatory homework class, the scores on Dutch of VBO or MAVO pupils are one-fifth to one-third higher than in cases where this class was canceled altogether. Substitution of lessons has an effect on the progress of VBO/MAVO pupils, but the effect of an obligatory homework class is not significant in the learning gain approach.

Pupils (except VWO pupils) in heterogeneous first classes have lower grades on Dutch in both the covariance and the learning gain approach than pupils in a homogenous first class or a so-called overlapping first class (a class in which pupils of at most two school types are brought together). When pupils of three or more school types were in the same class in the first year of secondary education, these pupils incur arrears for Dutch in the third year.

In both approaches the setup of the mentor system has the following characteristics: the more extensively this system has been set up, the lower the pupils' achievements. All forms score lower than a narrow, vertical mentor system, the reference group. Finally, it emerges that (I)VBO pupils perform better in a lower teacher-pupil ratio. Like pupils of IVBO, VBO-pupils benefit from a structure with not too many different teachers. In the learning gain approach this effect is only found for Dutch. In general these analyses showed it was hardly, if at all, possible to explain the influence of contextual characteristics by school characteristics.

Scientific relevance

The conclusion that pupil and family characteristics are decisive factors for differences in achievements accords with the research of Coleman et. al. (1966) and Jencks et. al. (1972). In thirty years time not much has changed in this respect. Technically there has been some progress, because of the development of *multilevel analysis*. This type of analysis has several advantages over one-level analyses of hierarchical structures.

It has not been usual in educational research to combine several achievement variables simultaneously in a *multivariate model*. In the current study, the analyses for Dutch and mathematics were conducted concurrently. This has the advantage that it facilitated a test of whether explanatory variables have the same effect on these two dependent variables. Moreover, the correlations between the dependent variables at various levels may be determined. Pupils who lack a certain value for one of the dependent variables may be included in the study, so incomplete data can be used more efficiently. A multivariate, multilevel model has important advantages over the models which were used a few decades ago. The development of these models enables better and more extensive research on differences in study achievements and study progress between pupils.

The development of multilevel analysis makes it possible to study the influence of pupils, families, teachers, and schools in *conjunction*. The current study shows the importance of verifying the characteristics at an individual level. In studies of effective teachers and schools the verification is often reduced. Researchers of effectiveness take structural characteristics and earlier

achievements of pupils into account, but they disregard cultural characteristics. However, in order to explain differences in achievements between pupils, these cultural characteristics are at least as important as structural characteristics. For an explanation of an increase or a decrease in relative position, structural characteristics are hardly important, if at all, whereas cultural characteristics do play a role. In order to make statements about effects at the class and school level the researcher should take both structural and cultural characteristics into account.

In a study with various characteristics at various levels, the danger exists that the research is directed entirely by empiricism. The researcher drags the data forward with a trailnet and after various analyses certain characteristics remain stuck in the net. These characteristics are then supposed to influence the dependent variable. In this study I have endeavored to avoid this trap by using a *structure of concentric circles*. Based on theoretical considerations, characteristics have been included in this structure. Using this structure analyses have been carried out per circle. The structure enables an organization of various influences and an indication of (causal) relations between characteristics. Effects, such as the mother's education or the ethnicity, can be explained for an important part by characteristics with a more direct relation to achievements. Around three-fifths of both effects can be explained by cultural characteristics. By adding the school type, the effects of the mother's and the father's education are explained entirely. Therefore, the structure of concentric circles seems particularly suited to *explaining* the differences in achievements at the individual level.

At the class and school level the analyses partly meet the expectations. At both levels there are a number of characteristics which were expected to be important for the differences in achievements in lower secondary education in the Netherlands. These expectations are in part confirmed empirically. For a number of characteristics, especially teacher characteristics, the measurement instruments from VOCL'93 are not suited. The current study can shed no light on the characteristics of effective teachers.

In the analyses IVBO, VBO, MAVO, HAVO and VWO pupils were studied in combination. It is technically feasible to carry out the analyses for *all school types at once*. This has the advantage that the number of research elements is not diminished unnecessarily. Moreover, by including interactions, effects may be studied which are specific to a certain school type. Therefore, a study of the characteristics of effective teachers and schools does not necessarily have to be carried out according to school type.

Finally, there are differences at the individual level between the results of the *covariance approach and the learning gain approach.* A covariance analysis does not provide an answer to the question of which pupils achieve a learning gain. An

increase or decrease in pupils' achievements can only be studied by an analysis of learning gain or relative positions. A comparison of both analytic methods reveals that they complement one another. The selection of one of these methods depends on the research question. When a researcher is interested in the question of which pupils have incurred a disadvantage or a lead at a certain point in time, the covariance analysis is called for. When a researcher wants to know which pupils incur a disadvantage or a lead in the course of their education, the right choice is an analysis of learning gain or relative positions. In contrast to a study of the characteristics of effective pupils and families, the choice of model in a study of the characteristics of effective schools is not very important.

Both technically and substantively, there has been progress in research on differences in achievements. The answer to the question of *differences in achievements* may be answered with more force and nuance. In order to explain differences in achievements, characteristics at an individual level are crucial. Of these characteristics the influence of cultural characteristics is much larger than that of structural characteristics. Of the cultural characteristics the influence of scholastic pupil characteristics is largest, followed by general pupil characteristics and the family characteristics.

To explain *differences in relative positions,* characteristics at an individual level are much less suited. With the exception of gender, structural characteristics do not influence differences in relative positions. Various characteristics do influence these differences, and the effects of pupil characteristics are stronger in this regard than those of family characteristics. There is no clear difference in the strength of effects between general and scholastic characteristics. As far as explained variance is concerned, it is striking that the characteristics at an individual level hardly explain any variance. It may be concluded that little is known about why certain pupils in lower secondary education incur a lead while others fall behind.

Social relevance

Newspapers publish achievement data on schools as lists. The government publishes a quality map with data about the exit level (examination results) and the entry level (recommended track of secondary education). However, these forms of publicly available information do not provide a sufficient basis for evaluating school effects. For one thing, only data at an aggregated level are available. Moreover, the initial level of pupils can only be taken into account to a limited extent. An initial test score would be more suited than the recommended track of secondary education. The researcher can only study what pupils learn at a school and what the added value of a school is if the entry level is determined in

this manner and multilevel data are available. An advantage of multilevel analysis is also that the distinction can be made between regression effects within a school and between schools for the benefit of parents. If parents seek to maximize the expected school achievements of their own child, they will want to order the schools according to a score which is corrected for the composition of the pupil population by means of within group, and not by means of between group regressions.

The present study also sheds light on the issue of inequality in the educational system. It appears that this issue requires a differentiated treatment. When we look into the *differences in achievement*, the large differences between pupils are striking. In year three of secondary education pupils of ethnic minorities perform less well than native-born pupils in Dutch and mathematics. In addition to ethnicity, there are also clear differences according to socioeconomic status. Adolescents from lower social classes have lower scores on the tests than pupils from higher classes. An inequality between the sexes is also apparent. Boys perform better in mathematics than girls. Girls perform better in Dutch than boys. To conclude, it may be stated that there are clear differences in these structural characteristics at the end of the school age.

When the *differences in progress* are studied, it appears that there is no influence of the characteristics of ethnicity and socioeconomic status. The only structural characteristic that has an effect on study progress is gender. The progress of girls in Dutch is larger than that of boys. In year three of secondary education significant differences in achievement become apparent, but these differences are hardly, if at all, caused by the pupils' progress in the first few years. Inequality according to ethnicity and socioeconomic status arises before pupils enter secondary education and does not increase between the first and the third year. In this period special policies to resolve the disadvantages for pupils with a different ethnic background or for pupils from lower social classes will, on average, be useless. The correction of disadvantages should focus mainly on the life style of the teenagers. No miracles should be expected of this type of policy. Cultural characteristics, such as the life style, do have an influence on differences in relative positions, but this influence is rather weak.