School leadership: perceptions and actions
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Chapter 3 - Research design

Chapter 3

Research design

In chapter one it was argued that in our view, school leadership should be measured by means of an integral model that takes into consideration the behavior of school leaders, their cognitive processes (roles), and the school context. The Competing Values Framework (chapter two) appears to be suitable for this study.

In this chapter, the research design will be examined. First, our research model and the research questions that follow from it are presented. In 3.2, we then discuss the variables distinguished in our model, followed by, in section 3.3, a description of how the data were collected, including the sample that has been used, the development of the instruments, and their psychometric qualities. In conclusion, there is a section on data analysis (3.4).

3.1 Research model

In chapter one we concluded that in order to measure school leadership we need an integral model that considers the mental processes (roles) of the school leader, his/her behavior, and the school context. Behavior is important because it gives more insight into the daily activities of the school leader; school effectiveness research has indicated that certain behaviors are more effective than others. For example, educational leadership proves to be more effective than administrational leadership (Krüger, 1994, 1997, Krüger et al., 2007; Leithwood, Begley, & Cousins, 1990). However, behavior by itself does not completely account for the effectiveness of the school leader (Krug, 1989, 1992); the intentions behind the behavior are important as well. Actions that, at first sight, do not seem to be related may be seen as related once the intention behind it is known. For example: expelling agitated students and pinning down the school rules may seem to be unrelated actions. However, the intention behind both actions could be the same, namely to maintain an orderly atmosphere inside the school. Therefore, two com-
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pletely different actions may serve the same goal. According to Krug, the best way to classify school leaders is to base oneself on intentions instead of actions. Here, both are taken into consideration because school effectiveness research has pointed out that behavior of the school leader is indeed an important factor. We also examine the relationship between the intentions and the behavior of the school leader.

Leithwood (1995) reasons that the mental processes of a school leader are influenced by factors both in- and outside the school. Bossert, Dwyer, Rowan and Lee (1982) empirically examined the context of the school and established a basis for contextual thinking. The factors in- and outside the school can be divided into three categories of antecedents. (Bossert et al., 1982):

- characteristics of the school context
- characteristics of the school
- personal characteristics of the school leader

We consider the relationship between these three antecedents and the intentions and the behavior of the school leader. Finally, we include the contingency perspective in our school leadership research: the effectiveness of the behavior depends on the context, and the leadership style should match the context of the school.

Based on the findings in the literature study in chapters one and two, the following model will be our starting point:

![Figure 3.1 Research Model]
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In this model, the behavior of the school leader is the dependent variable, influenced by the role perception of the school leader and by contextual factors. The variable ‘role perceptions’ is a dependent, as well as, an independent variable in our model. This variable affects the behavior of the school leader, but, itself, is influenced by personal characteristics of the school leader, characteristics of the school, and school context characteristics.

As an overall framework, we use the Competing Values Framework developed by Quinn and Rohrbaugh (1983). For a more detailed explanation of the model, the reader is referred to section 2.4. This general managerial framework has two key assumptions that are useful to us:

1. All leaders face competing demands
2. The most effective leaders have the ability to perform several roles within their organization (behavioral complexity)

Quinn and Rohrbaugh operationalize leadership problems by means of two different paths, along two different dimensions (section 2.4). The two dimensions (external-internal and flexibility-control) are placed within a framework, forming four quadrants. Within the framework, they distinguish 4 leadership styles and 8 leadership roles. These quadrants represent four major models in organizational theory: the rational goal model (maximization of output), the internal process model (consolidation and equilibrium), the human relations model (development of human resources), and the open system model (expansion and transformation). Each perspective is connected to a leadership style and each leadership style holds two roles. In this study, the four organizational orientations and the eight roles are used to explore the school leaders’ behavior, their role perceptions and the relationship between these aspects. We examine whether the producer and the director roles are related to rational goal behavior, b) the coordinator and the monitor roles are related to internal process behavior, c) the facilitator and the mentor roles are related with behavior in the human relations quadrant, and d) the innovator and the broker roles have a relationship with open system behavior. This dissertation strives to clarify the impact
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of the role perceptions of school leaders on their behavior in order to gain more insight into the complex job of a school leader. We also focus on the influence of antecedent factors on school leadership.

The model described above can be taken even further to include student achievement as well. In school leader effectiveness research, one of the main topics is the effect of leadership on student results. In section 1.4, based on the literature review, we stated that the effect of school leaders on student outcomes cannot be measured directly. According to Bossert, Dwyer, Rowan and Lee (1982), the effect on student results runs through the intermediary variables of school climate and instructional organization.

As mentioned in the introduction, this study is part of a larger project conducted at the University of Amsterdam and the University of Twente. The project attempts to shed more light on the links between antecedent variables, leadership variables (cognitive processes, vision, and strategies), intermediate variables (school organization and culture), and effect variables (student engagement and learning) through three strongly connected studies of 103 school leaders, 998 teachers, and 4,336 students in Dutch secondary schools. The University of Twente studies the relationship between the strategies of school leaders, the school culture and structure, and the effects at the student level. This thesis focuses on the strategies of the school leader, as well as the influence of role perceptions and antecedents on these strategies. The final study, conducted at the University of Amsterdam, examines the whole chain of variables (see figure 1.1).

In order to understand the effect of school leaders on student achievement, it is important to get more insight into school leaders' strategies. What behaviors do they exhibit, and through which antecedents and cognitive processes is this behavior affected? This thesis concentrates completely on the school leader.

3.1.1 Research questions

The following questions are the core of the investigation:
Which behavior do school leaders employ in secondary education in the Netherlands in order to steer the educational processes in
their schools and what is the influence of role perceptions, personal characteristics, school characteristics and context characteristics on this behavior?

- Which role perceptions do school leaders have in secondary education in the Netherlands?
- Which behavior is employed by school leaders in secondary education in the Netherlands?
- What is the relationship between antecedent factors and role perceptions?
- What is the relationship between antecedent factors, role perceptions, and behavior?

3.2 Variables

In figure 3.1 (our research model), the variables used in this study are shown in the five rectangles. This section discusses our choice of variables, starting from the left side of the model and ending at the right side. First, the antecedent variables used will be explained, followed by the role perceptions of school leaders and their behavior, and finally the relationship between these variables is elucidated.

3.2.1 Antecedent variables

Hallinger, Bickman and Davis (1996) found that school leadership is influenced by both personal and contextual variables (SES, parental involvement, and gender). Therefore, it is appropriate to view the principal’s role in school effectiveness through a conceptual framework that places the principal’s leadership behavior within the context of the school organization and the school's environment. In our model, the antecedents are the independent variables; three groups of antecedent variables are used: personal characteristics, school characteristics, and school context characteristics.

Personal characteristics

In the first group of antecedents, it is the personal characteristics of the school leader that are measured. In chapter one, several studies are mentioned which have shown that personal traits of
school leaders influence their school leadership. Hallinger, Bickman and Davis (1996) found that a principal’s leadership effectiveness is not only influenced by contextual variables, but also by personal variables such as gender. Bossert et al. (1982) found evidence that the management styles and actions of school leaders are shaped by a number of non-school factors, including personal characteristics of the school leader.

For example, gender and age are common factors in leadership studies. Earlier research indicates that, on average, male school leaders are younger than female school leaders (Leithwood, 1990; Hallinger, Bickman, & Davis, 1996). In some cases, gender accounts for differences found between types of school leaders, such as the fact that women consider themselves to be instructional leaders whereas men consider themselves to be general managers (Krüger, 1994; Hallinger, Bickman, & Davis, 1996). It has been confirmed that female elementary school principals are more actively involved in instructional leadership than their male counterparts are (Adkin-son, 1981; Glasman, 1984; Gross & Trask, 1976; Hallinger & Mur-phy, 1985). Bossert, Dwyer et al. (1982) point out that a number of studies suggest that women are better principals than men.

The number of years of teaching experience a school leader has prior to becoming a leader is another aspect that is believed to play a role in the effectiveness of school leaders (Hallinger, Bickman, & Davis, 1996). No relation was found between schooling and effective school leadership (Bossert et al., 1982).

The following personal characteristics of the school leader have been taken into consideration: gender, year of birth, education, refresher courses, years of experience in current job at current school, and whether or not the leader has had another job as a manager within the educational sector.

We also studied the tasks of the school leader (organiza-tional-development tasks, internal communication, educational af-fairs, personnel administration, student counseling, administration and control, external relationships, marketing). They were included in the same group of antecedent factors as the personal characteristics of the school leader.
School characteristics

The behavior of school leaders is not only influenced by their own personal characteristics, but also by school variables. Hallinger et al. (1996) state the aptness of presenting the role of the school leader in a conceptual framework that places the school leader's behavior in the context of the school organization. Opdenakker and Van Damme (2006) found positive effects of school composition and school climate on student achievement in secondary schools in the Netherlands.

One of the most frequently examined school characteristics is Socio Economic Status (SES). In chapter one, the fact that SES influences the effects of school leadership is mentioned. Opdenakker et al. (2006) discovered that SES is an important factor in determining the effectiveness of schools. According to Rowan and Denk (1984), in low-SES schools, the effects of school leadership could be clearly observed; however, in high-SES schools the relationship was negligible; other factors exert a larger influence on student outcomes. In other words: for schools with a relatively large population of students with a low-SES, school leaders play a bigger role than in schools with a large proportion of students with a high SES.

Student SES is not only related to the effect of school leaders, it also influences the type of leadership they exercise (Goldring, 1986, 1993; Hallinger & Murphy, 1986a, 1986b; Heck et al., 1990). School leaders in high SES-schools exercise more active instructional leadership than school leaders in lower SES-schools (Hallinger et al., 1996).

In section 2.6.2 another important variable in school effectiveness and school leadership research was put forward: school size. Opdenakker (2006) found that school size does not affect student outcomes, but it does make a difference insofar as other school aspects are concerned. For example, higher attendance rates were found for high school students in smaller schools than for students in larger schools (Lindsay, 1982; Finn et al. 1993). In small schools, classroom participation is better; students are not absent as often and they perceive the school as a warmer and more supportive place. School size also influences the school leader; at schools that
are part of a larger whole, school leaders have more time for educational duties.

Denomination of the school has a small effect on student outcomes, and it vanishes when the student population has been controlled for (Opdenakker et al., 2006).

In this study, we examine the following school characteristics: school size, school type, percentage of students with a low, medium, and high SES, percentage of students from a cultural minority, percentage of students receiving a contribution in school costs, and whether the school is part of a larger whole (if so, we included the size of the whole school).

**School context characteristics**

The final group of variables in our model that affect school leaders consists of school context characteristics. For the most part, school leaders are influenced by government policies. As described in section 2.6.1, a recent change from a centralized to a decentralized educational policy has taken place in the Netherlands. This changed the job of school leaders, giving them more autonomy to manage their schools; in addition, their accountability has increased. School leaders are now more responsible for the quality and effectiveness of the school. As a result, there is more need for schools to have an external orientation, and to draw attention to their own unique features (Krüger, Witziers, Sleegers, & Imants, 1999). However, decentralization does not affect every school equally: it has more effect on independent schools than on departments that are part of an entity. In the latter, it’s the board of directors that manages most affairs.

In the context of schools, competition with other schools is also an influence that affects school leadership in several ways. Schools that experience rivalry from other schools make more policies than schools that do not experience rivalry (Sleegers, 1991). It's this competitive environment that gives schools the urge to make their school known and to bring in more students. This urge may be the reason why the school makes more policies in all sorts of areas.
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Schools with a good reputation have the tendency to cooperate less with other schools and to make less agreements on PR and enrollment than schools that don’t have a good reputation (Pelkmans & Van Kuijk, 1986).

The school context characteristics we analyze are: decentralization, competition with other schools, parental involvement, the neighborhood/community’s opinion of the school, and the degree to which the school is integrated into the neighborhood/community.

3.2.2 School leader variables

As one can see in the research model, we have used two kinds of school leader variables: role perceptions and behaviors. According to the model, the behavior of school leaders is affected by their role perceptions, which in turn are affected by the antecedent variables. In addition, the behavior of school leaders may be directly influenced by antecedent variables.

According to the cognitive perspective described in section 1.2.3, mental processes affect the behavior of school leaders to a high degree (Leithwood, 1995; Krug, 1989, 1992). The values school leaders have, as well as their view on how to manage a school properly, are the steering power behind their actions. The current research measures the role of self-perceptions of the school leader as well as the role perceptions of the school leader as perceived by the teachers in their schools. As mentioned in chapter one, we use the Competing Values Framework by Quinn and Rohrbaugh (1983); therefore, the school leader and teacher questionnaires include questions concerning the eight role perceptions they distinguish. Besides these general managerial roles, we also used two additional roles that are often used in educational settings, namely educational and administrative leadership roles.

Literature shows that school leaders differ in their orientation towards primary processes and administrative issues. While some school leaders can be classified as educational leaders (leaders whose actions are always aimed at influencing primary processes in the
school, influencing at a student level), others can be considered as administrative leaders (the ‘managers’). We will examine whether the educational and the administrative leadership roles can be discerned in our sample, as well as studying how they relate to the roles of Quinn and Rohrbaugh. However, these roles will not be included in the analyses concerning the support of the use of general management models in educational leadership research.

School leaders who work at schools that are part of a larger whole have more time for educational leadership tasks. Educational leadership is also more exercised by women and by school leaders with more teaching experience (Adkinson, 1981; Glasman, 1984; Gross & Trask, 1976; Hallinger & Murphy, 1985; Eberts & Stone, 1988; Hallinger, 1983; Leithwood et al., 1990).

With regard to the behavior of school leaders, we will question teachers and school leaders on the four orientations distinguished by Quinn and Rohrbaugh (1983).

The description of the variables in the previous paragraphs enables us to specify the five different groups of variables in our research model (figure 3.2).

![Figure 3.2 Research model with specified variables](image-url)
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3.3 Data collection

3.3.1 Pilot
As a first step in exploring the field, pilot interviews were conducted with 15 school leaders of secondary schools in the Netherlands. The interviews were useful in discovering actual themes in the current state of affairs in the profession of school leadership; the pilot was also conducted in order to explore the suitability of our model (section 3.1). The results of the interviews were used to develop and adapt the questionnaires where necessary.

3.3.2 Sample
The data were collected by researchers from the University of Amsterdam and the University of Twente. The selection of respondents for the data collection was done using a two-step procedure. In November 2003 we invited (by regular mail) all 484 schools in the Netherlands that offer a secondary general education program (havo) to participate in a study regarding the effects of school leaders. We decided to approach all havo-schools in the country, because our target was 100 schools and we expected a response rate of 25% (based on prior experiences of the research team) and knowing that participation in the study would be a lot of work for a school. Not only were we planning to question the school leader, we also planned to include 15 teachers and two classes of students at each school to our research. In return we offered the schools a report with a comparison of their own scores and the national average of all the other havo-schools.

We have selected havo-departments for this study because, due to reform in junior vocational education and lower general education, the teacher population in these school types is much more diverse. Greater diversity among teachers makes it difficult to make general remarks. The disadvantage of choosing pre-academic education is that it is only attended by a very small part of the student population in the Netherlands.

In order to ensure comparability between the tasks and responsibilities of the school leaders at each school chosen to participate, we
chose to aim the research at school leaders in *havo* senior high schools, thus responsible for the final two years (out of five total) of the *havo* program.

Shortly after the written invitations, between January and April 2004, three researchers started to call the schools to ask the school leaders to participate in our study. In total, 80 school leaders were willing to participate. From April to July, 70 schools were visited, with each school visit lasting approximately one hour. Data collection was realized at 69 of those schools. During the first round of data collection, it was not possible to get in touch with every school because of lack of availability of the school leaders or conflicting scheduling demands between the researchers and the schools. In addition, the period in which the data could be collected was restricted by the year-end exams of the *havo*-5 classes, making these classes unavailable to fill in questionnaires. The response of the school leaders in the first round was 19% (based on the schools where we actually collected the data).

Following the first round, 122 schools had not yet been called; these schools were approached in the Autumn of 2004. This time, the school leaders were asked by means of a response form whether they wanted to participate in the study. Further, several schools from the first round were called again because they had indicated in the first round that they preferred to be approached at a later time. From the 122 schools that were approached for the first time, 28 agreed to participate. In the end, data collection was realized at 25 of these schools. The response rate for this procedure was 20%. From the schools that were called for the second time, nine joined the study. The second round of data collection took place between January and March 2005.

In total, the two rounds of data-collection resulted in the participation of 103 schools, an overall response rate of 21%.

In order to collect our data, questionnaires were completed, at each school, by:

- the school leader responsible for a *havo* program that included the two last years of the *havo* program;
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- 15 teachers that were teaching students from the last two years of the havo program;
- students from two havo-5 classes (senior year).

The first step during the one-hour visit to each school was to have the school leader complete his/her questionnaire, which addressed the school leader's role perceptions and behaviors. At the same time, data on relevant personal and school characteristics was collected from school leaders. School leaders completed the questionnaire in the presence of the researchers so that clarification could be given and questions answered. While the school leader completed the questionnaire, the researchers randomly selected 15 teachers from a list of teachers provided by the school leader. The teacher questionnaires were given to these selected 15 teachers in order to provide data on the perceptions of teachers regarding the behavior of their school leader. In addition two havo-5 classes were randomly selected. After the school leader had finished the questionnaire, he/she was asked to distribute the teacher and student questionnaires, which would then be mailed to the researchers by means of a stamped return envelope.

The school leader questionnaire and part of the teacher questionnaire were used for this thesis; the student questionnaire and the remaining part of the teacher questionnaire are used in the study of the University of Twente. This resulted in a response of 103 school leaders, 998 teachers, and 4,000 students. The University of Twente has analyzed the student data.

3.3.3 Response

In total, our data is based on responses from 103 school leaders and 998 teachers (table 3.1).

<table>
<thead>
<tr>
<th></th>
<th>School Leaders</th>
<th>Teachers</th>
</tr>
</thead>
<tbody>
<tr>
<td>Invited</td>
<td>485</td>
<td>1545</td>
</tr>
<tr>
<td>Positive response N</td>
<td>103</td>
<td>998</td>
</tr>
<tr>
<td>Positive response %</td>
<td>21</td>
<td>65</td>
</tr>
</tbody>
</table>
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A response rate of 21% for the school leaders may seem quite low; however, considering that a random sample of the population was not drawn, but that an invitation was sent to every havo-school in the country, and every school was subsequently called, it is actually a satisfying response. Our goal was to collect data from 100 schools, which is a goal that was met.

The results of our data collection are presented, beginning with the descriptives of the school leader and the teacher populations. Following these data, overall descriptives are given concerning the school population tested.

Description of the school leader and teacher population

One of the first notables in our results is that 81.6% of the school leaders and 70.4% of the teachers were male (table 3.2).

<table>
<thead>
<tr>
<th>Sex</th>
<th>School Leaders</th>
<th>Teachers</th>
</tr>
</thead>
<tbody>
<tr>
<td>Male</td>
<td>84 (81.6%)</td>
<td>703 (70.4%)</td>
</tr>
<tr>
<td>Female</td>
<td>19 (18.4%)</td>
<td>280 (28.1%)</td>
</tr>
<tr>
<td>Missing</td>
<td>0 (0.0%)</td>
<td>15 (1.5%)</td>
</tr>
</tbody>
</table>

Most school leaders in our study are male; only 18.4% of our school leaders are female. This is in line with data collected from the Ministry of Education concerning the overall population of school leaders in the Netherlands. In the 2006 data collection of the Ministry of Education, 18% of the managers in secondary education in the Netherlands were female. Therefore, our sample is highly representative of the national population as far as gender is concerned.

In terms of age, the youngest school leader in our sample was 35 years old, and the oldest school leader was 63 (mean = 52). The youngest teacher was 27, and the oldest teacher was 68 (mean = 48).

Most school leaders and teachers hold a first degree teaching certification (respectively 78.6% and 71%), which is due to the fact that in the Netherlands a first degree teaching certification is required to teach in havo-schools (for teaching at lower levels than the
havo, a second degree is sufficient). In addition to the first degree teaching certification, some school leaders hold an additional degree. The vast majority of the school leaders (95.1%) participated in professional development training.

Most school leaders have had (or currently have) another job as a manager in the educational sector (57.2%), 46.5% of this group has held another management job at the same school, while 53.5% have held a management job at another school. Of this last group, 4.9% works at both this and another school.

Our results show that almost a quarter of the school leaders and teachers are unqualified according to the requirements set forth for teachers and school leaders in the Netherlands. A possible explanation for this is the shortage of teachers in the Netherlands.

School leaders have worked 9.28 years on average at their current school; the median is four years. Teachers work much longer at the same school; on average, teachers have worked for 17.64 years at their current school, with the median being 19 years.

From the literature as well as practical experience, we know that school leaders are always busy. Their daily activities have often been subject to research, and many typologies have been developed in order to get more insight into the job of a school leader. Krüger (1994) developed a list of tasks, which she used to examine the distribution of school leader tasks among members of (management) teams. Using her instrument, an overview of the different types of school leader tasks, as well as who carries them out (the school leader him- or herself, the school leader together with someone else, or another person) has been put together. The results are presented in table 3.3.
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Table 3.3 School leader tasks by self vs. together vs. delegated completion. (Means: 1=mainly by the school leader, 2=by the school leader and another person, 3= mostly by others).

<table>
<thead>
<tr>
<th>Tasks</th>
<th>Organizational development</th>
<th>Internal communication</th>
<th>Educational affairs</th>
<th>Personnel management</th>
<th>Student guidance</th>
<th>Administration and control</th>
<th>External communication</th>
<th>Marketing</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mainly self %</td>
<td>28.2</td>
<td>17.5</td>
<td>16.5</td>
<td>31.1</td>
<td>3.9</td>
<td>19.4</td>
<td>38.8</td>
<td>17.5</td>
</tr>
<tr>
<td>Mainly together %</td>
<td>69.9</td>
<td>79.6</td>
<td>75.7</td>
<td>39.8</td>
<td>11.7</td>
<td>27.2</td>
<td>55.3</td>
<td>69.9</td>
</tr>
<tr>
<td>Mainly others %</td>
<td>1.9</td>
<td>2.9</td>
<td>6.80</td>
<td>29.1</td>
<td>83.5</td>
<td>53.4</td>
<td>4.9</td>
<td>11.1</td>
</tr>
<tr>
<td>Means %</td>
<td>1.74</td>
<td>1.85</td>
<td>1.90</td>
<td>1.98</td>
<td>2.80</td>
<td>2.34</td>
<td>1.66</td>
<td>1.94</td>
</tr>
</tbody>
</table>

Evidenced in table 3.3, most tasks are carried out by the school leader in cooperation with another person or other people. In contrast, a few tasks are more often carried out by someone other than the school leader than by the school leader in cooperation with others, namely: student guidance tasks, and administration and control tasks.

There are three tasks that school leaders often perform personally: organizational development, personnel management, and external communication. The latter is the task with the highest score on ‘mainly responsible for themselves’ (almost 40% of respondents).

Description of the population of schools in our sample

The schools in our population all provide a havo-program, but most of them also offer other types of education. Table 3.4 (below) presents the different kinds of programs offered by the schools in our sample.
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Table 3.4  School types.

<table>
<thead>
<tr>
<th>School type</th>
<th>N</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>havo</td>
<td>1</td>
<td>0.9</td>
</tr>
<tr>
<td>havo – vwo</td>
<td>25</td>
<td>24.3</td>
</tr>
<tr>
<td>havo – vwo – vmbo-t</td>
<td>52</td>
<td>50.5</td>
</tr>
<tr>
<td>havo – vwo – vmbo</td>
<td>25</td>
<td>24.3</td>
</tr>
</tbody>
</table>

**103** 100.0

Half of the *havo*-departments in this study also have a *vwo* (pre-academic/university track) and vmbo-T (lower general) department in their school. There is only one school that only offers a *havo* secondary education.

The variable 'school size' in our data is determined by counting the number of students attending that school. In our data, the average school size was 1,148.15 students; the smallest school had 340 students, and the largest school had 2,251.

The average school size in our sample is in line with the average school size for secondary schools in the Netherlands; in 2004, secondary schools had an average enrollment of 1,266 students (Statistics Netherlands, 2005).

In our sample, 76 schools (73.8%) are part of a larger entity, meaning that they belong to a school with several locations. The average size of these larger entities is 2,687 students, ranging from 800-7,000 students. The range shows that the variety in school size between the schools that are part of a larger entity is enormous.

With regard to the student population at the schools, we found that the *havo*-departments have a mean of 21% of students coming from families with a low SES, 45% of students coming from families with a middle SES, and 34% of students coming from families with a high SES (table 3.5).

Table 3.5  Percentage of students from low, middle and high SES families

<table>
<thead>
<tr>
<th>SES students</th>
<th>Low</th>
<th>Middle</th>
<th>High</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean</td>
<td>%</td>
<td>21</td>
<td>45</td>
</tr>
<tr>
<td>Range</td>
<td>%</td>
<td>0 - 66</td>
<td>8 - 75</td>
</tr>
<tr>
<td></td>
<td></td>
<td>6 - 90</td>
<td></td>
</tr>
</tbody>
</table>
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Most of the schools in our sample have low percentages of students from cultural minorities; only five schools have more than 50% of students coming from cultural minority groups. 75% of the schools have less than 8% students from a cultural minority. On average, schools have 20% of students who receive government compensation; however, it must be noted that only 19% of the school leaders answered this question, making knowing the actual percentage of students in this category impossible. It is possible that the 20% is biased because only school leaders in schools with a substantial amount of subsidized students are aware of this kind of information.

A positive learning environment at home has a powerful impact on student achievement (Opdenakker & Van Damme, 2006; Epstein, 1987; Clark 1983). For this reason, the school leaders were asked to what extent the parents of their students are involved in the school. The level of parental involvement within the schools in our sample is high, according to the school leaders; most parents (97.1%) are involved, or even highly involved, in the school. Only three school leaders indicated that the parents are hardly involved at their school.

3.3.4 Instruments

Both the school leader and the teacher questionnaires are based on the Competing Values Framework (Quinn & Rohrbaugh, 1983) as well as applications of the framework. The questionnaires were developed in close cooperation between researchers at the University of Amsterdam and the University of Twente (UT). Each questionnaire contains questions on three topics: role perceptions of the school leader, behavior of the school leader, and antecedent variables pertaining to the school, the teachers, and the school leaders themselves.

Role perceptions

The school leader questionnaire on role perceptions was constructed on the basis of the Competing Values Framework; specifically, it was based on the self-assessment test: ‘competing values:
management roles’ as developed by Quinn, Faerman, Thompson and McGrath (1996). With the goal of making the questionnaire more appropriate for use in an educational context, several of the original items were replaced by items developed by Kok (2002). His questionnaire was also based on the Competing Values Framework, but was adapted to the school setting. In our study, the instrument ‘Importance attached to the performance of educational and administrative tasks’ by Krüger (1994) was also used.

Our questionnaire’s main focus was the importance that school leaders attribute to certain tasks in the practice of their school leadership. Our questionnaire presented 51 tasks/items (36 items from the Competing Values Framework, and 15 items measuring the importance attached to the performance of educational and administrative tasks). School leaders addressed these 51 tasks/items on a four-point Likert scale (ranging from: 1 = not important at all to 4 = very important). The 36 items of Quinn et al. each fit into one of the four organizational models from the Competing Values Framework (Quinn & Rohrbaugh, 1983) and each model contains two roles. An example of items for each role is given below, followed by the number of items (out of 51) indicating that role:

- To encourage cooperation between teachers and/or departments within the school (facilitator, 4 items)
- To listen to personal issues of teachers (mentor, 5 items)
- To create an orderly atmosphere inside the school (coordinator, 4 items)
- To check whether teachers comply with the school rules (monitor, 5 items)
- To define roles and tasks, and formulate rules (director, 4 items)
- To continually encourage teachers to successfully achieve set goals (producer, 5 items)
- To experiment with new procedures (innovator, 5 items)
- To mediate between different departments (broker, 4 items)
- To manage school finances/budget (administrative leader, 8 items)
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- To evaluate student achievement (educational leader, 7 items)

After the 36 questions concerning the role perceptions of Quinn and Rohrbaugh (1983), the eight roles were presented again, this time by means of short descriptions of the roles (Quinn, 1988) instead of descriptions of actions that certain roles predict. School leaders were asked to indicate which two roles suited them best and which two roles least suited them. In addition, school leaders were asked to indicate which two roles were most expected of them by their staff and which two roles were most expected of them by their school's board of directors.

**Behavior**

In the Competing Values Framework, Quinn (Quinn, 1988; Quinn, Faerman, Thompson, & McGrath, 1990) has linked management behavior to each of the four organizational models. We use these links to operationalize school leader behavior both in the teacher and the school leader versions of the questionnaire. The actual items of the questionnaires were partly taken from existing instruments (Krüger, 1994; Hallinger, 1984) and partly formulated for the purposes of this study. The items used to examine the school leaders perception about the educational versus administrative leadership role came from the OGS manual (Onderwijs-kundige Gerichtheid van Schoolleiders = Principals' Instructional Orientation) (Krüger, 1994).

Teachers and school leaders answered questions on a four-point Likert scale (1 = completely disagree; 4 = completely agree). In total, the teachers and the school leaders each answered 42 questions concerning the behavior of the school leader. In both versions of the questionnaire (teacher and school leader), similar aspects of school leadership behavior were addressed, although worded slightly different. A teachers' item addressing positive feedback from the school leader reads: ‘To what extent does the principal of your school give positive feedback to teachers who have performed well?’. The identical item on the school principals' questionnaire reads: ‘To what extent do you give positive feedback to teachers
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who have performed well?’. Below, additional examples are given, one from each of the four models:

- My school leader/I support(s) and coach(es) teachers at the individual level (human relations model, 14 items)
- My school leader/I ensure(s) that the rules of the school are being enforced (internal process model, 11 items)
- My school leader/I develop(s) goals that are easily translated into classroom objectives by teachers (rational goal model, 8 items)
- My school leader/I ensure(s) that there are at least one or two educational experiments at this school (open system model, 9 items)

Antecedent Variables

The last category, antecedent variables, is made up of several background characteristics of the school, the school leader, and the teacher. The questions concerning the personal characteristics of the school leaders and teachers addressed the usual personal and job-related information, such as age, gender, teaching/managing experience, level of education, amount of hours worked per week (full-time appointments vs. various percentages of a full-time) and portfolio (school leader only). The descriptive statistics have already been addressed above (section 3.3.3).

An additional existing instrument was used to examine the tasks of the school leader (Krüger, 1994). Krüger developed a list with specific tasks that school leaders conduct in their job and this list was used to ask school leaders to indicate whether they were the main responsible person for that task, whether they shared the responsibility with someone else, or whether the task is the main responsibility of someone else. The tasks are: organizational development, internal communication, educational affairs, personnel management, student guidance, administration, relationship with the external environment and marketing.

The school leaders were the ones who were asked to answer the general informational questions about the school (e.g. size of the school, and complexity and composition of the student population
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(SES, ethnic background), see section 3.3.3). The context of the school consisted of the role of the school in the neighborhood, perceived rivalry from other schools, and public image of the school. Furthermore, the school leaders were asked if, as a result of decentralization, they experienced more or fewer possibilities to develop their own policies in the following domains: finances, organizational and educational matters, external policy, and personnel affairs. In this manner, decentralization and the perceived effects of decentralization on school leaders' job responsibilities were examined. School leaders were asked to score five items in regard to the perceived shift in policy space as a result of decentralization. The answers varied from: there is much more policy space than before (1), there is more policy space than before (2), the amount of policy space has not changed (3), there is less policy space than before (4) and there is far less policy space than before (5). The results of the questions on the context characteristics will be addressed in chapter 5.

3.4 Data analysis

We have conducted analyses with three different goals: 1) to establish whether the instrument has sufficient construct validity, 2) to examine the three groups of antecedent variables, cognitive processes, and behaviors, and 3) to study the relationship between our three groups of variables (by means of correlational, causal, relationships).

3.4.1 Construct validity

The validity of the instrument was tested by means of structural equation modeling using Mplus version 1.0 (Muthén & Muthén, 1998). Two nested models were fitted: the Kalliath model and the facet model; model fit was established by means of covariance structure analysis (Muthén & Muthén, 1998). As a measure of model fit, the root-mean-square error of approximation (RMSEA) was used (Steiger & Lind, 1980). RMSEA can be interpreted as a measure that indicates to what extent the assumed model fits the data. MacCallum, Browne and Sugawara (1996) consider an upper
bound of the 90% confidence interval of RMSEA to be indicative of a close fit when the value is less than .05. A value between .05 and .08 is indicative of a fair fit, values in the range of .08 to .10 indicate a mediocre fit, and values larger than .10 are a sign of a poor fit.

To verify the amount of school-level variance in the data originating from the teacher version of the questionnaire, multi-level regression analyses were conducted using MLwin, version 2.1 (Rasbash, Browne, Goldstein, Yang, Plewis, Healey, Woodhouse, Draper, Langford, & Lewis, 2000). In doing so, we address the recommendation of Hallinger and Heck (1998), which is to establish the amount of school-level variance as a means to test the validity of the teacher questionnaires in school leadership studies. Despite the importance of this validity check, it is absent in much school leadership research using teacher questionnaires.

We also assessed the convergent validity between corresponding variables in the teacher and the school leader versions of the questionnaire by conducting multi-level regression analyses. This analysis entails relating the behavior of school leaders (as perceived by the teachers, and as self-reported by the school leaders) by seeing how well the school leaders' answers are able to predict the corresponding answers from the teacher version of the questionnaire.

### 3.4.2 Descriptives

The three groups of variables: antecedents, role perceptions, and behavior of the school leader were studied both by means of frequency analyses and by means.

### 3.4.3 Causal relationships

In examining the predicted relationships between role perceptions of the school leaders and their behavior, multi-level regression analyses were carried out. The relationship between context variables, role perceptions, and context variables, as well as the relationship between role perceptions and school leader behavior, were examined by means of correlational and (multi-level) regression analyses. The coherence between the four dimensions of the
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Competing Values Framework by Quinn and Rohrbaugh (1983) was used as a starting point.

The relationships between relevant context variables and the role perceptions of the school leader were analyzed using correlations and regression analyses, with the role perceptions measured by school leader questionnaires as the dependent variable.

Regarding the relationship between the three groups of antecedent factors and the role perceptions of the school leaders, we first limited the number of antecedent variables \((c + \text{ covariates} / N < .10\), therefore in this study we cannot exceed 10 variables) by using sum scores for the items on decentralization.

Factor analyses were first conducted on the items concerning the perceived effect of decentralization, with the results showing that three factors could be discerned. The first factor is ‘perceived shift in policy space as a result of decentralization’ (5 items), the second factor is ‘perceived change in the job of school leaders’ (4 items) and the third factor is ‘perceived effect in student outcomes’ (1 item). We then examined the bi-variate correlations between the personal characteristics of the school leader, school characteristics, and context characteristics with the seven role perceptions. Stevens (2002, p.134) recommends that only correlation coefficients greater than .40 be used for further analyses. However, in this kind of research, correlations of .40 are rare, and, indeed, no such correlations were found in our data. For this reason, we decided to use significant correlations of .20 and above.

In order to predict the roles from the significant variables in relation to each other, we conducted multiple regression analyses. For each role, we selected the antecedents with a significant correlation of .20 and higher and inserted them into the regression analysis. The significant antecedents were inserted per group of antecedents. Based on the theory of proximity, we chose to start with the personal characteristics of the school leader, then the school characteristics, and finally the school context characteristics.

The relationships between relevant context variables and the role perceptions of the school leader and school leader behavior were analyzed in the same manner as the relationship between an-
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tecedent factors and role perceptions, except this time multi-level analyses were conducted. School leader behavior as perceived by teachers was the dependent variable. The significant personal characteristics were first inserted into the analysis, followed by the school characteristics, then the school context characteristics, and finally the role perceptions. After each step, only the variables that were significant in the multilevel regression analysis were included in the next step.