Chapter 2

Methods
ABSTRACT

This chapter provides a general overview of the methodology employed and the data used in this dissertation. It complements information provided in Chapters 3 to 6. The chapter starts with a description of the background, procedure and sample used in this dissertation, followed by an overview of the variables. Two sources of variables that were used are described: previous measurements within the context of the two cohort studies in secondary education, and variables from a follow-up questionnaire sent to a selection of these students in 2004.
BACKGROUND AND PROCEDURE

As mentioned in the Introduction, this dissertation has been written within the context of the large-scale educational cohort studies in secondary education in the Netherlands, the so-called VOCL cohorts (Voortgezet Onderwijs Cohort Leerlingen (Hustinx et al., 2005a; Hustinx et al., 2005b). In these cohort studies, students are followed during their educational careers from grade 1 in Dutch secondary education (equivalent to grade 7 in US education) until they leave full-time education. The general goal of these cohorts was and is to monitor students’ school career over time, to examine determinants of school success, and evaluate educational reforms. The VOCL cohort studies have been carried out by the Groningen Institute for Educational Research (GION), Statistics Netherlands (CBS), and the research institutes ITS (Institute for Applied Social Sciences) for VOCL ‘89 and OCTO (Onderzoeks Centrum voor Toegepaste Onderwijskunde, Twente University) for VOCL ‘93. The cohort studies were funded by the Netherlands Organization for Scientific Research (NWO).

Three cohorts of students have been followed so far. VOCL ‘89 started in the school year 1989/1990 among 19,524 students in 381 schools (Hustinx et al., 2005a). VOCL ‘93 started in the school year 1993/1994 among 20,331 students in 333 schools (Hustinx et al., 2005b). Finally, VOCL ‘99 started in the school year 1999/2000 among 19,391 students in 126 schools (Zijsling et al., 2005). Additionally to the VOCL’99 cohort study, a research program was funded by NWO called (Social-) psychological factors as determinants of educational attainment (grant number 015-001-031). Within the framework of this specific research program an Aspasia-grant was awarded for a follow-up study on the VOCL’89 and VOCL’93 cohorts. The current dissertation is based on this Aspasia-project.

In both cohort studies, data had been collected from students, their parents and the schools that the students attended. These data had been collected in the first, third, and fifth cohort year. Also, in each cohort year Statistics Netherlands (CBS) registered the school type and grade the students were in, as well as the students’ results on their final exams. A number of variables collected in cohort years one and three have been used for this dissertation; sex, date of birth, socio economic status and secondary school type recommendation measured in year one, and scores on a mathematics test and a text comprehension test assessed in year three (see Table 1).

In particular for the current dissertation study, the students from Senior General Secondary Education (SGSE, or HAVO in Dutch) and pre-university education (PUE, or VWO in Dutch) from both cohorts who had successfully finished secondary education were approached again in 2004. At that moment, VOCL ‘89 was in its 15-th cohort year and VOCL ‘93 was in its 11-th cohort year. The selected students received a questionnaire that was sent to their home address. In an accompanying letter, the students were assured that the information in the questionnaire would be kept confidential. No reminder was
sent afterwards. The questionnaire aimed at measuring (characteristics of) students’ personal network, social comparison, personality and self-esteem. A repeated measurement of study behavior, achievement motivation and study related well being was also included. Finally, the questionnaire also assessed students study progress and study results in higher education.

SAMPLES

In the first sample, from the VOCL ’89 cohort, 2,723 SGSE students and 2,373 PUE students were approached. Of these 5,096 students in total, 1,451 students responded. The response therefore is 28%. This first sample consisted of 588 male and 863 female students (61%), aged 25.8 to 28.9 years ($M = 27.06$, $SD = 0.36$). In the second sample, from the VOCL ’93 cohort, 3,133 SGSE students and 2,353 PUE students were approached. Of these 5,486 students in total, 1,951 students responded. Therefore, the response within the second sample is 36%. This second sample consisted of 669 male and 1,245 female students (65%), aged 21.8 to 24.7 years ($M = 23.04$, $SD = 0.36$). The total, combined sample consisted of 3,402 students, of which 2,155 are female students (63.4%). The average age of the total sample was 24.7 ($SD = 2.02$).

VARIABLES

The questionnaire that was sent to the students in 2004 consisted of five parts. Part 1 of the questionnaire was titled ‘About your study’, part 2 was titled ‘About the way you study’, part 3 was titled ‘About comparison’, part 4 was titled ‘About your network’ and part 5 was titled ‘About your personality’. Finally, a number of variables available from previous measurements in the cohort were used in this dissertation. Table 1 provides an overview of the variables used in this dissertation.

Questionnaire Part 1: About your study

Part 1 of the questionnaire, titled ‘About your study’, included questions about the date of the final exam in secondary education as well as the level of secondary education (1 = SGSE, 2 = PUE). Furthermore, information was gathered about the students’ study in higher education. They were asked to indicate the start date, name, level (1 = Higher Professional Education or 2 = University education) and discipline of their study. The academic disciplines in higher education in the Netherlands are generally ordered in three categories: alpha, beta and gamma studies. The alpha studies consist of, for instance, philology,
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literature, history, law and theology. The beta studies are, for instance, the science studies, mathematics, and medical sciences, and the gamma studies are the behavioral and social sciences like psychology, sociology, social work, sports education, and teacher education.

Following, a number of variables was included to measure educational attainment, which consisted of three different concepts. The first one is diploma attainment, which indicates whether or not a diploma was attained for the study (1 = yes, 2 = no, I changed studies, 3 = no, I am still studying, 4 = no, I am currently employed). Second, study progress measured the amount of time needed to attain the diploma, and whether this deviated from the nominal study time. Finally, the Grade Point Average (GPA) of the diploma was assessed, which could range from 5.5, just enough to attain the diploma, to 10, an excellent grade.

Questionnaire Part 2: About the way you study

The second part of the questionnaire was titled ‘About the way you study’. It contained an achievement motivation scale, a study related well-being scale, and two procrastination scales: procrastinatory behavior and procrastination as a trait. Furthermore, it contained questions about the average amount of time spent in college and/or doing homework, in hours per week, during students’ last year in higher education. Details on the achievement motivation and procrastination scales are given below.

The achievement motivation scale of Hermans (1980), also used in cohort year 1, 3 and 5 of the cohort studies, was adapted for use in higher education. It consists of two subscales: achievement motivation (16 items) and study related well-being (9 items). Example items are

- I wanted to be the best student in my year (achievement motivation)
- I liked most teachers (study related well-being)

The students rated themselves on a four point scale with scale anchors defined as, for instance, 1 = not at all applicable to 4 = entirely applicable. The internal consistency reliability (Cronbach’s coefficient alpha) of the achievement motivation subscale was .82 and of the study related well-being subscale .71.

Procrastination was measured using two procrastination scales of Schouwenburg (Schouwenburg, 1994). The first scale is named ‘Lay’s Procrastination Scale’ (LPS) and measures procrastination as a trait, both in academic and in other everyday situations. The LPS is a Dutch translation of a Canadian scale and consists of 20 items. Cronbach’s coefficient alpha for the scale was .88. The coefficient alpha in the original sample on which the scale was constructed was .89 (Schouwenburg, 1994). An example item is

- I usually have to hurry to finish my assignments in time.

The students rated themselves on a five-point scale with scale anchors defined as: 1 = almost never to 5 = almost always. The second procrastination scale is the Academic Procrastination State Inventory (APSI), which measures procrastinatory behavior (Schouwenburg, 1994). The APSI consists of 15 items. Cronbach’s alpha in this sample was .91, which is exactly the same as for the
sample on which the scale was constructed (Schouwenburg, 1994). An example item is 
last year, I ...interrupted studying to do other things. The students rated themselves on a 
five-point scale with scale anchors defined as: $1 = \text{almost never}$ to $5 = \text{almost always}$.

**Questionnaire Part 3: About comparison**

The third part of the questionnaire, titled ‘About comparison’, contained questions about 
the direction of social comparison, motives for comparison and information about three 
comparison others. Furthermore, this part also included a self-esteem scale.

First, the students were asked whether they liked to compare their grades with their 
fellow students. This resulted in a dichotomous variable, called ‘social comparison’ with 
a category called ‘comparison’ and a category called ‘no comparison’. Following, those 
students who indicated that they did like to compare their grades were asked to indicate 
with initials the person with whom they usually compared their grades. Following, the 
direction of comparison (upward, lateral or downward) was assessed by asking the 
respondents to indicate whether the grades of the person with whom they compared were 
usually higher (upward comparison), equal to (lateral comparison) or lower (downward 
comparison) than those of their own. The students rated themselves on a five-point scale 
with scale anchors defined as: $1 = \text{much lower}$ to $5 = \text{much higher}$. Based on this informa-
tion, a categorical variable was created with three categories; upward comparison (higher 
and much higher grades), lateral comparison (equal grades) and downward comparison 
(lower and much lower grades).

Three items were used to assess the motives students had to compare their results with 
other students. Students could indicate to what extent they compared their results to feel 
better (self-enhancement), to find out how well they performed (self-evaluation), and to 
find out how to get better results in the future (self-improvement). The students rated 
themselves on each of these questions on a five-point scale with scale anchors defined as: 
$1 = \text{not at all applicable}$ to $5 = \text{entirely applicable}$.

For measuring general self-esteem, the widely used Rosenberg Self-Esteem Scale 
(RSES) (Greenberger, Chuansheng, Dmitrieva, & Farruggia, 2003; Rosenberg, 1965) was 
translated into Dutch. The scale consists of five positively and five negatively formulated 
items. Example items are On the whole, I am satisfied with myself (positive item) and I feel 
I do not have much to be proud of (negative item). The original four-point Likert scale was 
extended to five points to make the scale more consistent with the other scales in the 
questionnaire. The scale anchors were defined as: $1 = \text{not at all applicable}$ to $5 = \text{entirely 
applicable}$. Cronbach’s alpha of the RSES in this sample was .89.
**Questionnaire Part 4: About your network**

Part four of the questionnaire was titled ‘About your network’. The students were asked to write down maximally five focal figures, which were defined as persons with whom the respondents discussed important matters during the last/preceding year of their study. For each of these focal figures, questions were asked about a) the frequency of contact, b) the kind of relationship (partner, parent, sibling, family, housemate, colleague, former classmate, co-student, neighbor, friend, acquaintance, team member, with multiple answers possible) and c) the topics being discussed (school/study, finance, work, sexuality, emotions, family and friends, sport, art/music/literature, personal problems, television, religion, politics, common topics, with multiple answers possible). Furthermore, for each focal figure their sex, age and educational level were asked. Lastly, the personal network density was assessed; the focal figures had to be placed in a diagram and the students were asked to draw lines between the focal figures who regularly had contact with each other. The more lines were drawn between the focal figures, the more dense the personal network.

The 12 item version of Cohen’s Interpersonal Support Evaluation List (ISEL) (Cohen, Mermelstein, Kamarck, & Hoberman, 1985) was fitted for gathering information about the source and type of social support for each focal figure within the personal network. The ISEL contains the subscales companionship, emotional support and instrumental support, each consisting of four items. Example items are *if I wanted to have lunch with someone, I could ask ... to join me* (companionship), *I feel that I can share my most private worries and fears with ...*(emotional support) and *if I were sick, I could ask ... to help me with my daily chores* (instrumental support). In this sample, Cronbach’s alpha of the subscale companionship was .75, of the subscale emotional support .76, and of the subscale instrumental support .75.

**Questionnaire Part 5: About your personality**

Finally, in the fifth part of the questionnaire the FiveFactor Personality Inventory (FFPI) was included (Hendriks et al., 1999a; Hendriks, Hofstee, & De Raad, 1999b) to assess the students’ personality. The FFPI consists of 100 statements in the third person singular, assessing Extraversion, Agreeableness, Conscientiousness, Emotional Stability, and Autonomy. Example items are *starts conversations* (Extraversion), *accepts people as they are* (Agreeableness), *loves order and regularity* (Conscientiousness), *readily overcomes setbacks* (Emotional Stability), and *takes the initiative* (Autonomy). The items were rewritten to first person singular for this study. The students rated themselves on a five-point scale with scale anchors defined as: 1 = not at all applicable to 5 = entirely applicable. FFPI factor scores were computed using the FFPI software (Hendriks et al., 1999a; Hendriks et al., 1999b). The internal consistency reliability coefficient stratified alpha (Rajatnam, Cronbach, & Gleser, 1965) was .86 for Extraversion, .81 for Agreeableness, .85 for Conscientiousness,
.84 for Emotional Stability, and .76 for Autonomy. The factors in this sample are identical to the factors in the norm sample in terms of interpretation (Lorenzo-Seva & Ten Berge, 2006); the congruence with the adult norm sample as assessed with coefficient Tucker’s phi (Tucker, 1951) was .98 for Extraversion, Agreeableness, and Conscientiousness and .97 for Emotional Stability and Autonomy.

**Variables from previous measurements in cohort year 1 and 3 of secondary education**

Information about the sex of the students, date of birth, primary school teacher’s recommendation for the level of education and prior achievement was provided by the schools for secondary education in the first cohort year (1989 and 1993, for VOCL ’89 and VOCL ’93, respectively). Recommendation refers to the advice that schools for primary education give about which level of secondary education the pupil should transfer to. The measurement of prior achievement contains two components. In the third cohort year of secondary education, tests were taken on mathematics and text comprehension. The mathematics test consisted of 31 multiple choice items in VOCL’89 and 33 multiple choice items in VOCL’93. Cronbach’s coefficient alpha for the mathematics test was .83 in VOCL ‘89 and .79 in VOCL ‘93. The text comprehension test consisted of 40 items in both cohorts. Cronbach’s coefficient alpha for the text comprehension test was .77 in VOCL ‘89 and .78 in VOCL ‘93. Finally, socioeconomic status (SES) was measured by the questionnaire sent to parents in the first cohort year and is defined as the average of the educational level of both parents.
Table 1 - Overview of the variables and data sources used in this dissertation

<table>
<thead>
<tr>
<th>Concept</th>
<th>Cohort year 1</th>
<th>Cohort year 3</th>
<th>Q 2004</th>
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<tbody>
<tr>
<td>Sex</td>
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<tr>
<td>Date of birth</td>
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<td>SES</td>
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<td>Personality</td>
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Note: cohort year 1 and cohort year 3 refer to secondary education, Q 2004 refers to the questionnaire sent in 2004 (higher education).