The smoking chain: friendship networks, education, social background and adolescent smoking behavior in the Netherlands
Huisman, C.

Citation for published version (APA):
Huisman, C. (2013). The smoking chain: friendship networks, education, social background and adolescent smoking behavior in the Netherlands

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Introduction

1.1 The Rebellious Smoker?

‘Smoking a cigarette for the beginner is a symbolic act . . . ‘I am no longer my mother’s child, I’m tough, I am an adventurer, I’m not square.’ . . . As the force from the psychological symbolism subsides, the pharmacological effect takes over to sustain the habit.’

— 1969 draft report, “Why One Smokes,” to the Philip Morris board of directors.¹

‘The fragile, developing self-image of the young person needs all the support and enhancement it can get. Smoking may appear to enhance that self-image in a variety of ways. If one values, for example, an adventurous, sophisticated, adult image, smoking may enhance one’s self-image...This self-image enhancement effect has traditionally been a strong promotional theme for cigarette brands and should continue to be emphasized.’


‘When you’re a kid it’s really a kind of perverse need to try something that’s risky, because it’s frowned upon by older people. Also because you know it’s inherently bad for you.’

¹ Visited on 23-12-2011 from http://tobaccodocuments.org/landman/182914.html#images.
² R.J. Reynolds is the manufacturer of Camel, Century, Doral, Magna, Monarch, More, Now, Salem, Sterling, Vantage, and Winston.
— David Bowie in an interview on smoking by Jarvis Cocker in The Big Issue, No. 188, December 8-14, 1997.

Why do young people smoke? As the quotes above illustrate, a common explanation for adolescent smoking is a desire to rebel against parents or to develop an independent adult identity. It is the romantic image of a smoking James Dean in A Rebel Without a Cause. The tobacco industry even based its policy on this image in the 1960s and 1970s. This layman’s explanation for smoking as youthful rebellion speaks to the imagination, but reality is quite different. Of course, smoking is an individual act. The cigarette is lit by the smoker, not by the smoker’s social background, nor by society at large. Yet, as this study will show, social mechanisms largely govern adolescent smoking, and adolescence is the life phase when most smokers start. This study focuses on the smoking behavior of Dutch youth by examining the social factors relevant to their smoking and how these factors interact.

When examining smoking at the population level, we see patterns that cannot be explained only by individual motivations. For instance, friendship networks play an important role in the development of adolescent smoking (Ellickson, Bird, Orlando, Klein, & McCaffrey, 2003a; Ennett & Bauman, 1993, 1994; Flay et al., 1994). Friends often mimic each other’s smoking behavior or select friends with similar smoking habits. Furthermore, a young person’s type of secondary school is relevant. Dutch youngsters in the preparatory vocational school type smoke up to five times more than do their counterparts in the academic preparatory school type (Monshouwer, Dorsselaer, Gorter, Verdurmen, & Vollebergh, 2004; Monshouwer et al., 2008). This difference indicates that educational institutions are related to smoking behaviors. In addition, social background factors, such as socioeconomic status (De Vries, 1995; Droomers, Schrijvers, Casswell, & Mackenbach, 2005; Griesbach, Amos, & Currie, 2003) and the smoking habits and attitudes of parents, are relevant (Engels, 1998).

A recent American study, using data from the National Longitudinal Study of Adolescent Health (Add Health)4, shows that these three social contexts, friendship networks, school, and the home situation, are essential factors in adolescent smoking (Wen, Van Duker, & Olson, 2009). Researchers in other countries have also argued that the multiple social

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4 This is the largest and most comprehensive longitudinal survey on adolescents and health in the United States. See http://www.cpc.unc.edu/projects/addhealth.
contexts in which youth live affect the development of their smoking habits (Ennett et al., 2010; Wen, et al., 2009). However, the relationship between these three factors in terms of smoking among Dutch adolescents is unclear. Therefore, the interaction of these three factors is the focus of this study.

1.2 On the Intersection of Three Research Fields: Youth Studies, Sociology of Education, and Health Stratification

This chapter introduces the central question of this study by first considering adolescent smoking from the perspective of three different research fields: youth studies about friendship networks, sociology of education on the role of the Dutch education system, and the field of health stratification on the relevance of social background characteristics for health-related behavior. The novelty of this study lies in its combination of the insights of these three approaches to examine how multiple factors interact in the smoking of Dutch adolescents. Therefore, the association between smoking and friendship networks is first addressed in detail (section 1.3). Second, the role of education in smoking is examined (section 1.4). Third, the links between social background variables, such as socioeconomic status, smoking habits and parents' attitudes regarding smoking, are discussed (section 1.5). Fourth, we examine the relationship between social background, education, and smoking by Dutch adolescents (section 1.6.1). Fifth, the relationship between friendship networks and social background characteristics is discussed (section 1.6.2). Finally, we discuss how the relationship between friendship networks and education is linked to adolescent smoking (section 1.6.3). Figure 1.1 shows a schematic representation of the thematic focuses of this study.
To examine the questions of this study, longitudinal network data were collected from Dutch second-grade secondary school students in 2008 and 2009. This data set is called the Longitudinal Network data of Dutch Adolescents and is referred to in this study as LINDA. Furthermore, data are drawn from the Dutch National School Survey on Substance Use 2007, collected by the Trimbos Institute. Throughout this study, these data are referred to as the DNSSSU 2007.
1.3 Research Field One: Youth Studies on Friendship Networks and Adolescent Smoking

1.3.1 The Network Approach in Youth Studies

Relationships between people are essential for the conduct and welfare of individuals. They are important for health (Kawachi & Berkman, 2000; Kawachi, Kennedy, & Glass, 1999) and for educational performance (Coleman, 1988; Coleman & Hoffer, 1987; Dijkstra & Veenstra, 2000; Dijkstra, Veenstra, & Peschar, 2004). Socially isolated people have more negative health habits than do others. They often eat too much, drink too much alcohol and smoke (Putnam, 2000). However, it may be that people's healthy or unhealthy habits influence each other (Christakis & Fowler, 2007, 2008). Not surprisingly, since the early 1960s (Coleman, 1961), hundreds of findings in the field of youth studies have demonstrated the relevance of peer groups and friends for adolescents' behavior (Cotterell, 2007; Veenstra & Dijkstra, 2011; Veenstra & Steglich, 2012). These studies have examined the role of peers and friends in delinquency (De Cuyper, Weerman, & Ruiter, 2009; Knecht, 2007) substance use (Aloise-Young, Graham, & Hansen, 1994; Cotterell, 2007; Hussong, 2002; Kuipers & Zwart, 1999), academic motivation and classroom behavior (Cotterell, 2007). Studies within this field also consistently show a clear association between friends' smoking behavior and focal individuals' smoking behavior. However, it is not clear why similar behavior among friends occurs. Since the late 1970s, studies indicate that there are two possible mechanisms to explain this association: friends' influence and similarity-based friendship selection (Cohen, 1977; Kandel, 1978).

1.3.1.1 Adolescent Smoking and Friends’ Influence

The influence of friends is especially important during adolescence, the transitional phase between childhood and adulthood. This phase is essential for the formation of personal identity (Klimstra, Hale Iii, Raaijmakers, Branje, & Meeus, 2010). A crucial part of personal identity derives from a sense of belonging to a group (Eder, 1985; Gavin & Furman, 1989), and personal identity is largely social identity (Cotterell, 2007). Therefore, peer groups are crucial for understanding adolescent smoking. The peer group sets the standard of conduct. If an individual adolescent wants to be part of a peer group, it is important that he or she conforms to the group by exhibiting the behavior customary within the group. To achieve acceptance, the group's standard of conduct must be internalized. According to social learning theory (Akers & Cochran,
1985; Akers, Krohn, Lanza-Kaduce, & Radosevich, 1979; Bandura, 1977a, 1977b), internalization occurs through a process of observation and reinforcement to acquire the skills needed to perform a behavior. Taken together, the peer group is an important socializing context that influences adolescent smoking. Figure 1.2 provides a schematic representation of how smoking habits change over time through the influence of friends.

Harris (1998) stresses the importance of peer influence to emphasize that the role of parents is virtually irrelevant for adolescent smoking behavior. According to her, adolescents primarily identify with their peers rather than with their parents. Therefore, peers are much more important than parents in influencing adolescents’ behavior. Starting or abstaining from smoking becomes an important means of peer acceptance. Smoking acts as a signifier for peer group alliance with other smokers (Harris, 1998, p. 281) and a way to distance oneself from the parental norms of non-smoking parents.

1.3.1.2 Adolescent Smoking and Friendship Selection

Friendship selection is the second explanatory mechanism for the similarity of smoking habits among friends. People often select friends based on common characteristics, such as lifestyle, attitude and abilities (Haselager, Hartup, van Lieshout, & Riksen-Walraven, 1998; McPherson, Smith-Lovin, & Cook, 2001). This is called homophily. According to social exchange theory (Homans, 1961), it is easier to interact with people who are more similar to oneself because there is less chance of friction related to diverging attitudes and behaviors. If an individual finds smoking an unpleasant habit, interactions with a smoker are less attractive than are interactions with a nonsmoker.

Selection is also an important mechanism for social homogeneity, which should be considered when investigating the role of social influence on adolescent smoking behavior. Recent studies on adolescent smoking emphasize the importance of accounting for friendship selection (Mercken, Snijders, Steglich, & de Vries, 2009; Mercken, Snijders, Steglich, Vartiainen, & de Vries, 2010a, 2010b; Mercken, Snijders, Steglich, & Vries, 2009). Mouw (2006) demonstrated that in the case of the effect of social capital on individual outcomes, neglecting the possibility of selection can lead to serious biases in model outcomes.
**Friends’ influence.** Each node represents an actor and his or her smoking behavior. Black nodes represent smokers, and white nodes represent nonsmokers. The arcs between the nodes represent who sees whom as a friend. In this case, Person A, who is a nonsmoker; sees person C, who is a smoker, as a friend at T=0. Person D, who is a smoker, sees person B, who is a nonsmoker, as a friend at T=0. At T=1, the situation has changed. At this time, the relationships stay the same, but the behavior changes through a process of social influence. Person A has become a smoker, and person D has become a nonsmoker.

**Friendship selection.** Black nodes represent smokers, and white nodes nonsmokers. The arcs between the nodes represent who sees whom as a friend. In this case, at T=0, person A is a smoker and considers person B a friend who is a nonsmoker. Person D is a nonsmoker and considers person C a friend who is a smoker. At T=1, the situation has changed. The behavior of all actors stays the same, but the friendship relations have changed because the actors have selected each other based on similar smoking habits. Now, Person A sees person C as a friend, and person D sees person B as a friend.
1.4 Research Field Two: The Sociology of Education on Differentiation and Smoking among Dutch Adolescents

The majority (90 percent) of Dutch smokers adopt the habit during their teenage years, before their 18th birthday (Gielkens-Sijstermans et al., 2010). At that time, most of these teenagers are in secondary school. In 2007, approximately one in fifteen Dutch elementary school students (7 percent) had smoked on at least one occasion (Monshouwer, et al., 2008). After students enter secondary school, this percentage increases with age. By the age of sixteen, 52 percent of Dutch adolescents have smoked at least once in their lifetime. As mentioned, preparatory vocational students smoke five times more than academic preparatory students do. This raises the question of the role of education in smoking among Dutch adolescents. Therefore, it is relevant to examine how education is organized in the Netherlands, why it is organized this way, and how this organization affects adolescent smoking.

1.4.1 Differentiation within the Dutch Education System

In the Netherlands, all children between four and twelve years of age go to primary school (elementary school). The primary school period is followed by selection into different types of secondary education. The purpose of this selection, or differentiation, is to efficiently prepare students for further education, either vocational or academic (Netjes, Van de Werfhorst, Karsten, & Bol, 2011). Students’ cognitive abilities are the basis for this selection. These abilities are determined by means of a national test (the Cito test) and school performance. Based upon these two determinants, primary school teachers recommend the type of secondary education that is best suited for each student. This recommendation has an important impact on students’ further educational careers.5

Secondary education consists of three types: preparatory vocational education (VMBO), intermediate general education (HAVO) and academic preparatory education (VWO). Preparatory vocational education is a four-year program that prepares students for further education at the intermediate vocational level (MBO). Intermediate vocational education is aimed at training people for the middle segment of the labor market. Intermediate general education is a five-year program and provides a diploma that gives access to tertiary vocational education (HBO). This program prepares students for the higher segment of the labor market.

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5 There is, however, a thriving industry of commercial orthopedagogical organizations to which parents can go for a second opinion if they do not agree with the teacher’s recommendation.
The six-year preparatory academic program aims to prepare students for university, which provides access to the highest segment of the labor market.

In the first year (and sometimes in the first two years) of secondary school, students with different cognitive levels are placed together in a transitional class (brugklas). Two placement combinations of students with different cognitive levels are most common: there is a combination of students with preparatory vocational recommendations and intermediate general recommendations and a combination of students with intermediate general recommendations and academic preparatory recommendations. The reason for this transitional class is that secondary education teaching methods differ from those in primary school, and it is possible that students will perform differently from expectations based on their primary school teacher’s recommendations. This construction offers the opportunity for students to change school types after the transitional year. Figure 1.3 shows a schematic representation of the Dutch education system.
Differentiation at a young age can lead to greater dispersion in performance and an increase in social inequality. A literature review by Van de Werfhorst and Mijls (2010) shows that the school performance of students at the lower levels of differentiated education systems falls further behind. The loss to lower-level students in terms of school performance is greater than the gains to students at higher levels. Other studies show that tracking reinforces parental background effects and reduces the equality of opportunities (see Brunello & Checchi, 2007). Oakes (1985) argues that tracking leads to various undesirable effects for students at lower school types, including lower self-esteem, higher rates of misconduct in class, higher drop-out rates, and alienation from school. Furthermore, research shows that differentiation is associated with polarization between a pro-school culture in higher school types and an anti-school culture in lower school types, which is associated with poor academic attitudes (Abraham, 1989; Ball, 1981; Berends, 1995; Carbonaro, 2005; Van Houtte, 2006; Van Houtte & Stevens, 2009). Finally, Van Daalen (2010) shows that in the Netherlands, attending preparatory vocational education negatively stigmatizes students. That study stresses the shyness and insecurity of these students and relates these traits to a lack of educational attainment and self-efficacy (p. 28-31).

In addition to the above-mentioned cognitive outcomes, differentiation plays a role in non-cognitive outcomes in education (Netjes et al. 2011). Netjes et al. (2011) identify three forms of non-cognitive outcomes: civic involvement, deviance, and wellbeing. In the case of civic involvement, Van de Werfhorst’s (2007) study of 17 countries shows that students in differentiated school systems volunteer significantly less often than do students in undifferentiated school systems. Moreover, students in the vocational school type have lower participation than do students in the general school type. Other studies show that differentiation leads to inequality in active citizenship (Hyland, 2006; Netjes, Van de Werfhorst, & Dijkstra, 2011; Ten Dam & Volman, 2003). In relation to deviant behavior (e.g., dropping out, theft, violence and substance use), Netjes et al. (2011) find no clear evidence for the effect of differentiation, and they conclude that the identified effects are inconsistent or absent. In the case of wellbeing and differentiation, most studies show an indirect relation, including a relation between differentiation and self-perception, self-confidence, school attitudes, and school involvement (Ireson & Hallam, 2009; Ireson, Hallam, & Plewis, 2001; Marsh & Hau, 2003; Van Houtte & Stevens, 2009; Yogan, 2000). Netjes et al. (2011) suggest that these factors mediate well-being and differentiation and are important for students because they affect students’ achievement.
Positive associations have been found between students’ school achievement and self-perception, self-confidence, and school involvement (Marsh & Hau, 2003), and above-average students have been found to have lower academic self-conceptions\(^6\) compared to lesser-performing students (Marsh & Hau, 2003; Wong & Watkins, 2001). This study adds to these insights on the relevance of differentiation for non-cognitive outcomes by examining smoking behavior among students in the Dutch educational system.

1.4.2 Variation in Smoking Habits among Students across Different School Types

The previous section indicated that educational differentiation has a negative effect on the behavioral motivations and self-perceptions of students in lower school types. This is an important explanation for the relationship between school type and smoking habits, according to Elstad (2010). Students in the lower levels are aware of their future socio-economic position, and this bleak picture has a feedback effect on their behavioral motivations. Because of the small opportunity for these students to become socioeconomically successful, they look for alternative ways to manifest themselves. This may be reflected in displays of ‘bad’ behavior, such as smoking. Students’ awareness of being positioned at the bottom of the social ladder also affects their self-perception, which can lead these students to see themselves as inferior. Many students feel that the use of substances such as tobacco offers a way to manage the negative feelings that accompany this negative self-perception\(^7\).

Elstad (2010) argues that the relationship between health-compromising behavior and differentiation cannot be explained solely by social

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\(^6\) Self-conception refers to the degree to which a person is self-confident and feels positively about himself or herself (March and Hau 2003, p. 364).

\(^7\) Nicotine has been identified as the main psychoactive chemical compound in tobacco (Benowitz, 2010). It is known to have both a stimulating and a relaxing effect. From a pharmacological perspective, these two properties are responsible for the fact that people find smoking pleasurable and develop a smoking habit. However, it has also been argued that nicotine plays virtually no role at all in smoking. Collins (2004), for instance, points out that the nicotine thesis is historically incorrect. It was not until the mid 1800s (350 years after tobacco was introduced to Europe) that methods were discovered to prepare tobacco (flue-curing) in such a way that made tobacco smoke acidic and thus inhalable, and inhalation is the most effective means of nicotine uptake into the blood stream. Before that time, people smoked only pipes and cigars, which produce smoke that is alkaline and therefore too harsh to inhale. Around 1880, production methods were invented to produce cigarettes. This resulted in the spread of cigarette smoking and a rise in lung cancer, a rare disease before that time. In contrast to the nicotine thesis, Collins argues that people smoke because it is a pleasurable interaction ritual that charges them with emotional energy (Collins, 2004, pp. 297-344).
background or peer influence. Part of this relationship must be explained by ‘strong elements of self-determined behavior’ (Michell & West, 1996, p. 29) due to tracking, which affects adolescents’ identity formation. Elstad’s argument connects to what Van Houtte and Stevens (2009) have differentiation-polarization. Tracking affects self-categorization and study involvement; lower school type students often see themselves as failures. Elstad’s idea also relates to Pickens and Eick’s (2009) findings on how school type differentiation, mediated through teachers’ expectations and students’ self-image, affects students’ behavior as well as to the broader literature on the smoking-SES gradient, which argues that smoking functions as a stress coping mechanism (see Pampel 2006).

1.5 Research Field Three: Health Stratification on the Role of the Smoking Behavior of Dutch Adolescents and Social Background Characteristics for Health Inequalities

This study positions itself within the field of socioeconomic health inequalities, which is connected to a core subject in sociology: social stratification. Health is unevenly distributed across the population, is passed from generation to generation (Ahlburg, 1998), and is related to socioeconomic position (Adler et al., 1994; Adler et al., 2008; Demakakos, Nazroo, Breeze, & Marmot, 2008; Mackenbach, Kunst, Cavelaars, Groenhol, & Geurts, 1997; Mackenbach et al., 2005; Mackenbach et al., 2008; Minkler, Fuller-Thomson, & Guralnik, 2006). Despite the well-known relationship between health and socioeconomic status, the explanation for this relationship is unclear (Mackenbach, 1994, p. 76). We do know that smoking is a major determinant of health inequalities. Furthermore, people with low socioeconomic status have more smoking-related illnesses and are more likely to die from them (Cavelaars et al., 2000; Pampel, 2002, 2005, 2006). For this reason, it is important to examine the relationship between adolescent smoking and social background characteristics.

1.5.1 Adolescent Smoking and Social Background Characteristics

Although the relationship between parents’ socioeconomic position and their children’s smoking habits varies between countries (Richter & Leppin, 2007), in the Dutch situation, a clear association exists. A study by De Vries (1995) in the mid-1990s shows that Dutch adolescents from low socioeconomic backgrounds smoke more than their counterparts from high socioeconomic backgrounds. What is the mechanism that
explains this association? Children born and raised in families with low socioeconomic status are more likely to experience smoking in their environment. In particular, the role of significant others, such as parents, is important. According to social learning theory (Bandura, 1977a, 1977b), children learn behaviors through observation, imitation, and reinforcement of the examples set by that parents. Therefore, children from low socioeconomic backgrounds are more likely to smoke.

The mechanism described in the previous section provides a possible explanation for the intergenerational transmission of health inequalities. Mackenbach (1994) cautiously concludes that the socioeconomic health differences in the Netherlands are related to life conditions during adolescence. Children growing up in socioeconomically deprived environments are more likely to have poor health during adulthood. However, Mackenbach’s study only mentions material deprivation as a possible cause and explicitly states that the explanatory mechanism is unclear. Nevertheless, one of the direct determinants of poor health is smoking, and this is more prevalent in low socioeconomic status groups.

Of course, the socioeconomic status of parents is not the only factor in adolescent smoking. Children learn so much from their parents, however, that their parents’ smoking must also be significant. A large body of literature supports this claim (Avenevoli & Merikangas, 2003; Engels, 1998; Gilman et al., 2009). Again, the underlying mechanism can be described by social learning theory. This theory implies that the rules that parents impose upon their children are important. Other important issues include the example that parents set by their own behavior and whether their example is reinforced by approval or disapproval.

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8 Mackenbach shows that the occupational status of the father, the educational level of the mother and the financial situation at home during adolescence are strongly related to health during adulthood (Mackenbach 1994:102-3). Furthermore, he points out that the relationship to life conditions during the childhood years has decreased over the last decades.

9 Despite the lack of discussion about the link between parental smoking and the smoking of their offspring, no clear understanding about the exact nature and strength of this association exists (Avenevoli & Merikangas, 2003).
1.6 The Interaction of Friendship Networks, Education, Social Background Characteristics, and the Smoking Behavior of Dutch Adolescents

Paragraphs 1.3, 1.4, and 1.5 point out the relevance of friendship networks, education, and social background characteristics for the smoking behavior of Dutch adolescents. Each of these factors has its own effect on smoking behavior. However, it remains unclear how these factors are related. Does school type mediate or alter background effects? Do friendship networks play a role in this process? This is an important issue because in the Netherlands, differentiation begins at the young age of 12 and, as noted above, there is discussion of the effects of differentiation on non-cognitive outcomes. In addition to the scientific relevance of clarifying these interactions, it is important to determine how a differentiated educational system, such as the Dutch system, plays a role in health outcomes in an attempt to develop better prevention programs for adolescent smoking. Therefore, the novelty of this study is its examination of the interaction of these three factors.

1.6.1 The Relationship between Social Background, Education, and the Smoking Behavior of Dutch Adolescents

Elstad (2010) argues that the educational hierarchy of school types (i.e., differentiation) affects adolescents' identity formation, which, in turn, affects smoking behavior. In contrast, it may be possible that the frequently identified relationship between school type and smoking is spurious and that school type is simply a mediating factor. In the literature on social stratification, the relationship between educational attainment and parents' socioeconomic status is well established. Children whose parents have high socioeconomic status are more endowed with norms that are positively oriented toward education and have more of the appropriate cultural capital to succeed in school. Thus, these children are more likely to be at higher school levels. This mechanism may also explain the relation between smoking, socioeconomic status and education. Children from lower socioeconomic backgrounds are more likely to grow up in families that lack the above-mentioned cultural capital for educational attainment. Furthermore, these children also grow up in families where smoking and positive norms toward smoking are more prevalent. Therefore, school type mediates the socioeconomic background effect on smoking.

Section 1.5.2 noted that social background characteristics, such as parents' smoking habits and attitudes, are important for adolescent
smoking. However, as shown by findings within the field of sociology of education, in addition to norms at home, a student's educational success depends on the norms facilitated by the social networks in which the student’s school is embedded. Coleman and Hoffer’s (1987) study of Catholic schools in the United States shows that dense networks, in which there is close contact among parents and between parents and students, have a positive effect on educational performance. This relatively dense network of multiple connections is called norm-enforcing social capital.10 This type of social capital is only effective if the dominant norms within the network consistently provide a positive social setting for child rearing and education, which is called a functional community (Coleman & Hoffer, 1987; Dijkstra, et al., 2004). For the individual, this depends on the position in the network, such as whether the individual is at the periphery or embedded in the core.

The principle of norm-enforcing social capital is also applicable to adolescent smoking. A greater degree of embeddedness in networks that foster norms that refute smoking reduces the likelihood that a student will start smoking. Thus, there are four variables that constitute social capital: the network, the social node’s degree of embeddedness in the network, the presence of multiple (redundant) contacts, and the norms fostered by these contacts. It is important to note that in this study, embeddedness and redundancy are measured by the proxy variable of ties between friends’ parents in the school setting.

Elaborating on Coleman’s idea of norm-enforcing social capital, Morgan and Sørensen (1999) argued that the effect of social capital on educational performance is context dependent. Dense networks do not always have a positive effect on school achievement. In some cases, they can even have the opposite effect. Their study showed that compared to Catholic schools, norm-enforcing social networks have a smaller effect on educational performance in public schools. Social networks outside the school, or horizon-expanding networks, can compensate for this shortcoming. Horizon-expanding networks expose students to norms that are dominant in society at large and that value school achievement. Van de Werfhorst (2005) showed that this idea was also applicable to the Dutch educational system. He found that higher-level students benefit more from norm-enforcing social capital, and lower-level students benefit more from horizon-expanding social capital. This mechanism might

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10 According to Coleman, social capital can be defined as "(…) the norms, the social networks, and the relations between adults and children that are of value for the child's growing up" (1990, p. 334).
also be applicable to smoking among Dutch adolescents. If the school’s norms condone smoking, which is arguably more often the case for lower-level students, exposure to alternative norms that refute smoking might alter or even counter this effect.

Figure 1.4  The relationships between the school friendship network, students’ parents and the networks of parents outside of the school.

Chapters Five, Six, and Seven build upon each other, adding another type of network relation in each chapter. Chapter Five looks at the effect of secondary school friendship on smoking behavior. Chapter Six examines the role of the characteristics of friends’ parents concerning smoking, and Chapter Seven examines the effect of parents’ social capital (horizon-expanding social capital) outside of the school setting.

1.6.2 The Relation between Smoking, Social Background Characteristics, and Secondary School Friendship Networks

There is little doubt about the importance of secondary school friendship networks and social background characteristics, such as socioeconomic status and the smoking habits and attitudes of parents, for adolescents’ smoking. Furthermore, social capital is important for the transmission of these social background effects on the smoking behavior of adolescents.
Section 1.5 indicates that relationships with parents at home are important for transferring norms. However, the role of the secondary school friendship network for the transmission of these norms is unclear. Children take the norms learned at home with them into the school friendship network, where these norms affect the smoking behavior of other students. Therefore, examining only the relationships between parents and their children is insufficient to understand how social capital affects adolescent smoking. We must also consider the friendship relations within the school and how they relate to social background characteristics (see Figure 1.4 for a schematic overview of the types of network relations investigated in this study).

1.6.3 The Relation between Smoking, Friendship Networks, and Education

In the Dutch educational system, students are placed in different school types and classes. Therefore, the institutional setting of the school in terms of school type differentiation affects the formation of friendship networks. These networks, in turn, influence the socializing context of adolescents. Research on educational achievement indicates that several mechanisms explain the effects of friendship networks through school type differentiation. These mechanisms may also explain the variation in smoking among students across different school types.

In the case of educational achievement, the peer effect via differentiation can work in two opposite ways for low ability students (Van Houtte & Stevens, 2009). When low ability students are not tracked, more able students in the same class set the norm for better school achievement. When low ability students are tracked, they miss out on this normative example. The presence of better achieving peers may also have the counter-effect of relative deprivation, a process whereby people compare themselves to others whom they perceive as having more or being superior, which may lead to feelings of discontent and lower study involvement. Tracking was intended to prevent this problem. However, the effect of peer influence on educational achievement is meager (Driessen, 2007), and research consistently shows that students in the vocational school types have more negative self-attitudes than do students in preparatory academic school types (see Van Houtte & Stevens, 2009). Moreover, Van Houtte and Stevens (2009) show that the difference in study involvement is greater among students in academic school types compared to students in vocational school types, and this difference increases in schools that include different types in one location. This finding can also be applied to norms on smoking. School type limits the
options for within-class friendship formation to children with similar backgrounds. Students in preparatory vocational school type more often have low socioeconomic backgrounds, so it is likely that condoning smoking or positively oriented norms toward smoking may be more prevalent within the school network. However, if the preparatory vocational school type is housed in the same building as an intermediate general and/or academic preparatory education school type, then the school composition of social background characteristics differs from that of a school housed at a separate location. Thus, the prevailing school norms on smoking change. In a school with different school types housed at one location, students may be exposed to norms different from their own. For instance, students in preparatory vocational education are exposed to norms that disapprove of smoking, which leads to lower smoking prevalence among this group.

1.6.4 The Contributions of This Study
The novelty of this study is its focus on the combination of the three effects, which has not been studied previously. Because parents are part of the larger network, do their background characteristics affect the smoking behavior of a focal actor? What role does the Dutch educational system play in this putative effect? The role of friends’ parents for adolescent smoking behavior remains unclear and is a relevant topic to investigate in light of the discussion in the social network literature on ‘the three degree of influence rule’, or the extent of social contagion. Christakis and Fowler (2009) argue that social influence extends three steps away from a focal actor for obesity, smoking, voting, and other traits. However, Lyons (2011) argues that Christakis and Fowler cannot make such a claim because their methods are flawed. This study investigates whether there is, at least, social influence over two degrees of social distance concerning adolescent smoking behavior.

1.7 The Central Question, Sub-Questions and Chapter Overview
There is a rich body of literature on the relevance of friendship networks, social background characteristics, and education for adolescent smoking. Using the DNSSSU 2007 and the LNDA, this study revisits the relevance of these factors. Chapter Three is devoted to descriptive questions that set the stage for the other empirical chapters, which aim to answer the central question of this study:
How does the interplay between secondary school friendship networks, social background characteristics, and education affect smoking among Dutch adolescents?

Answering this question will provide a new perspective on adolescent smoking in the Netherlands. At the same time, it will contribute to a better understanding of the intergenerational transmission of health inequalities.

1.7.1 The Sub-Questions

The first sub-question is as follows: How does the relation between school friendship networks and education affect the smoking of Dutch youth? Many studies show that friendship networks are important for the smoking behavior of adolescents. We expect that even after controlling for friendship selection based on similar smoking habits, the influence of friends is an important factor for adolescent smoking. In addition, it is possible that friendship networks play a role in the difference in smoking among students across different school types. Students in the lowest school types are more likely to have parents with positive attitudes toward smoking and are more likely to smoke. Therefore, the frequency of smoking will be higher in networks in the lower school types, increasing the likelihood that friendship networks will have a positive effect on the smoking behavior of an individual student. It is also expected that school friendship networks will affect smoking in addition to the school-type effect.

The first sub-question focuses on the effect of friendship relationships for the transmission of norms regarding smoking behavior. However, the norms for smoking must come from adults, particularly parents. Therefore, the second subquestion is as follows: How does the relation between friendship networks and social background characteristics affect the smoking behavior of Dutch youth? Besides the direct effect of parental background characteristics, it is expected that friendship networks within schools are an important mediating factor for the effect of social background characteristics. In other words, friends’ parents are also relevant to the smoking behavior of an individual focal student. Parents influence the smoking behavior of their children, who, in turn, influence the smoking behavior of their school friends.

Finally, sub-question three reads as follows: How does the relationship between social background characteristics (socioeconomic status, attitudes toward smoking, and the smoking behavior of parents) and education affect the smoking behavior of Dutch youth? Based on insights from the
sociology of education, it is expected that the socioeconomic status effect on smoking is mediated by school type. Parents with low socioeconomic status are more positive toward smoking and are more likely to smoke. Thus, their children are also more likely to begin smoking. The socioeconomic background of these children increases their chances of being placed in the lower school types. In addition to the parental effect, children from low socioeconomic backgrounds are more often exposed to positive norms regarding smoking because there are more people who smoke in their social environment. In contrast, children from high socioeconomic backgrounds are more often exposed to norms that reject smoking. Therefore, based on the insights of Coleman (1988), is expected that students will smoke less if they are embedded in more functional communities where norms that disapprove of smoking are dominant, which is more likely to be the case for children in the highest school type. However, in contrast to Coleman and Hoffer (1987), Morgan and Sørensen (1999) argue that the norm-enforcing effect of social capital is context dependent. Students in the lower school types are more likely to be embedded in norm-enforcing social networks that transfer positive norms for smoking. It is therefore expected that the effect of horizon-expanding social capital on smoking behavior will be stronger for this group than for students in the higher school levels. However, for students in the higher school types, the effect of horizon-expanding social capital will be weaker because it is in accordance with the norms of their school environment.

1.7.2 Chapter Layout

Chapter Two discusses the data collection of the LNDA and DNSSSU 2007 and the network analysis techniques used in this study. Chapter Three describes various aspects of the data relevant to the explanatory questions addressed by this study. To address sub-question one about the effect of the relationship between school friendship networks and education on the smoking of Dutch youth, Chapters Four and Five investigate the role of secondary school peer networks in mediating the socioeconomic background effect and the school type effect on adolescent smoking behavior using the LNDA. To address sub-question two on the effect of the relationship between friendship networks and social background characteristics on the smoking behavior of Dutch youth, Chapter Six examines how the relationship between parents' smoking behavior, attitudes toward smoking and school friendship networks affects Dutch adolescents' smoking behavior using the LNDA. To address sub-question three on the effect of the relationship between social back-
ground characteristics and education on the smoking behavior of Dutch youth, Chapter Seven investigates the degree to which norm-enforcing social capital and horizon-expanding social capital affect adolescent smoking in different school types using the LNDA. Chapter Four also addresses sub-question three by investigating the extent to which adolescent smoking behavior is affected by social background, type of education, school composition, and school organization using the DNSSSU 2007. Chapter Eight is the concluding chapter and discusses the outcomes of Chapters Three, Four, Five, Six, and Seven in light of the main research question. Figure 1.5 provides a schematic representation of the chapters and the research questions they address.

Figure 1.5  A schematic representation of the research questions and relevant chapters