

# Adolescent smoking and parenting

Associations between smoking related parental behaviors and adolescent smoking

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## **Opvoeding en roken door adolescenten**

Verbanden tussen opvoedingsgedragingen met betrekking tot roken en het roken door adolescenten  
(met een samenvatting in het Nederlands)

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## Chapter 1

### **Introduction**

In the last few decades society's attitude toward smoking has radically changed. Since the Surgeon General of the United States published findings in 1964 that smoking has long term detrimental health effects (Warner, Davis, Holbrook, Novotny, Ockene, & Rigotti, 1989), smoking has become an important issue for health education and prevention programs. It is for this reason, among others, that research has been initiated to investigate not only the health implications of smoking, but also how and why people start smoking in the first place.

### **Adolescent Smoking Initiation and Prevention**

Although it was initially regarded as an adult problem, researchers recently have started to focus more closely on the first experimentation with cigarette smoking which starts at an early age, and also on the link between early smoking and increased risk of nicotine dependence later in life (Breslau, Fenn, & Peterson, 1993). The latter has been reported in several studies and has demonstrated the high degree of continuity in the development of smoking behavior: those who start to experiment with smoking at an early age are at greater risk to become regular smokers as adults (Chassin, Presson, Sherman & Edwards, 1990; Fergusson, Lynskey & Horwood, 1995; Stanton, 1995).

The most straightforward explanation for this phenomenon is the highly addictive nature of nicotine itself, both biological as well as psychological: once started, the habit is hard to break (Pierce & Gilpin, 1996). For health officials and prevention workers the goal of reducing adult smoking could therefore more easily be achieved by trying to prevent smoking initiation in adolescence, and smoking prevention programs were developed to discourage young people from even experimenting with cigarettes. The implementation of such programs took place in schools, as well as mass media campaigns, and nowadays smoking prevention programs are common in most secondary schools (Baan, 1990). Mass media campaigns still primarily focus on the image that accompanies smoking, for example, that smoking is cool and attractive, while school-based programs are more focused on the dangers of smoking as well as the enhancement of the adolescents' coping skills to resist peer pressure (Engels, 2000).

However, the mechanisms that play a role in smoking initiation of adolescents have proven to be more complex and therefore prevention programs have not been as successful as hoped for (Dalton, Sargent, Beach, Bernardt & Stevens, 1999). Adolescent prevalence rates have remained substantial: in the Netherlands, for example, 16% of the children in the last two grades of elementary school have experimented with smoking. In junior high school this percentage of experimental smokers increases rapidly from 41% ever smokers at ages of twelve and thirteen, to 65% by the age of fifteen and to 72% by the age of eighteen (Stivoro, 2001, 2005; Trimbos National Survey, 2001). It should further be noted that, at the beginning of the new Millennium in 2001 30% of the Dutch adults smoked. This statistic has an

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important implication: although many adolescents experiment with smoking, most of the experimenters will not continue to smoke in adulthood.

Although individual differences in regular smoking and nicotine dependence can be explained by genetic and brain maturation factors within the growing adolescent (Jamner, et. al., 2003), the initiation of smoking takes place in the social environment of the individual (e.g., Avenevoli & Merikangas, 2003; Vink, Willemsen, Engels & Boomsma, 2003; White, Johnson & Buyske, 2000). Petraitis, Flay and Miller (1994) conducted a review study in order to describe the theoretical concepts that are associated with the initiation of health-threatening behaviors during adolescence, such as smoking, and these concepts demonstrate the complexity that accompany the development of successful prevention programs. The theory by Petraitis Flay and Miller (1994) describes three domains of social influence that are considered important: (1) at the macro-level the influence of governmental policies, influence of tobacco industries, and the norms of society regarding smoking are considered, (2) at the meso-level the influence of characteristics of the school and the social-economic position of the parents is considered as well as parenting practices and peer influence, and (3) at the micro-level the personal characteristics of the adolescent, such as self-esteem, depression, personality, and motivations to become a smoker are conceptually associated with smoking initiation. Although I acknowledge the importance of those three levels, this dissertation will only focus on the meso-level of social influence.

In the past decades the main source of influence with regard to adolescent smoking experimentation that has been considered of crucial importance is peer influence, while family factors, such as parental smoking, have been considered to be more important in the development of regular smoking habits (e.g. Avenevoli & Merikangas, 2003; Chassin, Presson, Sherman, Montello, & McGrew, 1986; Stanton, Currie, Oei & Silva, 1996). Studies carried out in the 1970's show the tendency of adolescents to mimic their friends in their behaviors and attitudes (Cohen, 1977; Kandel, 1978). However, more recent research has focused on two models that play a role in homogeneity of smoking between peers that try to explain this process in more detail: influence and selection. The influence model states that an individual group member's behavior or opinion can be affected by other members of the group. The selection model states that adolescents acquire new friends with similar characteristics, attitudes and behaviors and avoid contacts or even break off friendships because of differences in opinions and behaviors (Ennett & Bauman, 1994; Engels, Vitaro, den Exter Blokland, de Kemp, & Scholte, 2004). These new insights have qualified the direct role that peers play in the process of smoking onset, and subsequently several longitudinal studies have demonstrated that selection processes can explain the homogeneity of smoking within peer groups (Ennett & Bauman, 1994).

Recent research, however, has demonstrated that selection itself is a process in which parental smoking status plays a role. Engels et al. (2004) demonstrated that adolescents with smoking parents were more likely to become affiliated with smoking friends. The implication of this finding is not only that peer pressure should be a focus of prevention programs, but also that the role of parents with regard to adolescent smoking has been overlooked in this regard. Neither parenting nor parents themselves have been the focus of smoking prevention efforts, mainly because it was assumed

that the role of parents diminishes during adolescence and the role of peers becomes more important. And although numerous studies have been conducted that demonstrate that the family environment is an important factor with regard to adolescent smoking, parents still are not integrated as an influential factor in prevention efforts (for an overview see Avenevoli & Merikangas, 2003). We will therefore briefly discuss the effect parental smoking has on adolescent smoking, and then discuss in detail the relationship between parents being socializing agents and adolescent smoking.

## **Parents as Role Models**

### Parental Smoking

The role of parental smoking in the development of adolescent smoking has received much attention in the literature. The first mechanism by which parents affect their children's smoking is through their own behavior. Parents function as important role models and parental smoking is considered to be a consistent predictor of adolescent smoking (Otten, Engels, & van den Eijnden, submitted). Further, several studies show that parents who smoke are more likely to have children who are regular smokers later in life as adults (e.g. Bauman, Foshee, Linzer, & Koch, 1990; Chassin, Presson, Todd, Rose, & Sherman, 1998; Conrad, Flay, & Hill, 1992; Petraitis, Flay, & Miller, 1995). Even though there is considerable evidence that parental smoking is associated with their offspring's regular smoking patterns later in life, it has been suggested that the factors responsible for patterns of regular smoking are not identical to those that are associated with smoking initiation (Bauman, Foshee, Linzer & Koch, 1990; Conrad, Flay & Hill, 1992; White, Johnson & Buyske, 2000). Therefore the role of parental smoking should be studied in more detail to assess at what developmental stage of the child parental smoking has the greatest impact.

In addition Flay, Hu and Richardson (1998) and Mayhew, Flay and Mott (2000) suggest that adolescent smoking is a developmental stage like other developmental stages, with identifiable levels of use. These authors assume that parent smoking is related to the persistence of adolescent smoking (Flay, Hu, & Richardson, 1998) and to smoking trajectories that are particularly problematic because they show early onset, rapid escalation, and long-term persistence (Chassin, Presson, Pitts, & Sherman, 2000).

### Parental Smoking and Modeling

The social learning theory of Bandura (1977) provides insight into the underlying mechanisms of the impact of parental smoking on adolescent smoking. According to social learning theory, many behaviors, such as smoking, are learned by observation. Individuals, such as parents, siblings, friends, and teachers, who share the same environment with the adolescent, influence the adolescents' behavior by exemplifying and by consciously or unconsciously reinforcing certain behaviors. According to Bandura's theory associations between parental smoking and adolescent smoking are due to modeling; by parents setting an example and consciously or unconsciously reinforcing certain behaviors related to smoking. A recent analysis on longitudinal

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data of a Dutch twin study depicted small but significant modeling effects of parental smoking on adolescent smoking onset (Vink et al., 2003).

Subsequently, when parents quit smoking during their lifetime, it may have an effect on their offspring's smoking behavior due to a reduction of exposure to parental modeling of smoking behaviors. However, only a few studies have focused on this question in the last decade. Peterson and Peterson (1986) found a strong effect of parental quitting behavior on adolescent smoking initiation in a sample of 344 children in Grades 6-9. Chassin et al. (2002) demonstrated that adolescents with an ex-smoking parent had lowered prevalence of smoking except when their other parent was a current smoker, particularly the mother.

Farkas, Distefan, Choi, Gilpin, and Pierce (1999) demonstrated a linear relationship between the age of the child when the parent stopped smoking and the likelihood that the child starts smoking when reaching adolescence. If parental cessation occurs before the child reaches the age of nine years, the child is less likely to start to smoke as an adolescent. This last finding shows that the effects of parental modeling (i.e., smoking behavior) are incremental until the age in which children start their first experiments with smoking. Stated differently: the younger the child is when the parent stops smoking, the stronger the modeling effect of parental non-smoking behavior. Stanton and Silva (1992), however, concluded in a longitudinal study that children between 9 and 13 years of age who had parents who were ex-smokers were not influenced to desist from smoking.

Therefore, although modeling theory can be used to describe the associations between parental smoking and adolescent smoking, these conflicting findings raise questions that should be addressed by future studies. Specifically, research should examine the characteristics of parents as ex-smokers compared to never smokers to investigate whether those ex-smokers still hold different norms and attitudes toward smoking and thereby reinforce their children's smoking. Additionally those associations should be studied over a longer time period to examine their effect from early adolescence to late adolescence and adulthood. A proposition towards prevention made by Chassin et al. (2002) is to manipulate parental smoking (i.e., in cessation interventions) to test the impact of parents' successful quitting on their adolescent children to determine whether parental smoking treatment can function as a form of preventive intervention.

### **Parents as Socializing Agents**

#### **Modern Parenting**

When children reach the age of early adolescence, the relationship with their parents starts to change. Parents are faced with the challenge of preparing their children to become adults, and therefore will have to change their parenting behaviors accordingly. The primary goal in childhood for parents has been guidance and nurturing, while during adolescence the shift is towards granting more independence and autonomy.

Rispens, Hermans, and Meeus (1996) argued that in the last few decades there has been a general tendency of parents to change their parenting behaviors from a more directive form of guidance towards a model of negotiation in which the opinions



of the child are taken into consideration as the child grows older. This implies that during adolescence parental instructions and advice do not necessarily have to be obeyed, but they evoke discussion and negotiation between parents and children. The claim that parental influence is seriously diminished by this change in the general parenting does not seem warranted. In a recent study, for example, Jackson (2002) focused on adolescent perceived legitimacy of parental authority with respect to tobacco use, and concluded that parenting style plays a significant role in adolescents' perceptions of parental authority, thereby discrediting the myth that adolescents disregard parental values and rules regarding tobacco use. According to Meeus et al. (1999) parental influence varies across domains and remains substantial in domains that parents value, such as educational choices and achievements. The the domains of friendships and time spent outside the house, however, are strongly influenced by an adolescent's friends. Additionally, Aunola and Nurmi (2005) suggest that a family environment where the child is allowed to express his or her thoughts and emotions freely creates a climate in which the child feels him or herself to be autonomous and respected as an individual, which is important in the process of internalizing parental rules and becoming self-governing.

An implication of this is that with regard to adolescent smoking it depends on whether parents value the non-smoking status of their child or not. If they do value non-smoking, the parents will communicate this to their child, if their child initiates smoking. Liberal attitudes towards smoking by parents, on the other hand, would imply that it would not be an issue to discuss, if the child takes up smoking. It should be noted that not only the parental attitudes towards smoking are important in this respect, but also parental skills to successfully communicate their message. If parents with clear anti-smoking attitudes lack the necessary skills to communicate their message, then the parental norms and values may be lost due to poor communication skills.

## Parenting Styles

Parenting can be defined as specific behavior in terms of normal daily interactions on the part of the primary caretaker(s) that is explicitly focused on the child. A positive parent-child relationship is characterized by parents providing positive feedback through praise, encouragement, and physical affection. Positive relations appear to be a direct consequence of parents spending time with their children as well as having frequent communication, asking for the child's opinions, spending time talking, and sharing secrets and other concerns (Cohen, Richardson, & LaBree, 1994).

Researchers, who have focused on patterns of interaction between parents and children, have identified two major dimensions of parenting: support (responsiveness, nurture, warmth) and control (being demanding, monitoring, consistent discipline). Each of these dimensions have been found to be independently associated with a range of adolescent problem behaviors, including smoking (e.g., Aunola & Nurmi, 2005; Chassin, Presson, Rose, Sherman, Davis & Conzalez, 2005; Jackson, Bee-Gates & Henriksen, 1994; Lamborn, Mounts, Steinberg & Dornbusch, 1991).

Baumrind (1991) distinguished four parenting types based on those two parenting dimensions: authoritative or democratic parenting (high support and control), neglectful or disengaged parenting (low support and control), permissive or

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indulgent parenting (high support and low control), and authoritarian parenting (low support and high control).

Simons-Morton, Crump, Haynie, Saylor, Eitel, & Yu (1999) studied authoritative parenting, parental knowledge and parental conflict. This cross-sectional study found that for boys authoritative parenting reduced the likelihood of smoking whereas for girls having knowledgeable parents reduced the likelihood of smoking. In a longitudinal study Pierce, Distefan, Jackson, White, and Gilpin (2002) studied strong and weak authoritative parenting. They reported that strong authoritative parenting is associated with a reduced risk of future adolescent smoking initiation. These studies indicate that the combination of high levels of parental support and control contributes to the reduction of adolescent smoking. On the other hand the lack of support and control is considered a risk, because there is no emotional bond between parents and child, and the lack of consistent behavioral control and supervision diminishes the possibility to keep open a channel of communication for parents to express their norms and values, which weakens the internalization of parental norms and values by their children (Chassin et al., 2005).

However, existing literature on parenting is not conclusive for several reasons. For example, the causal directions between parenting and adolescent smoking cannot be determined in cross-sectional studies. Chassin et al. (2005) suggest that a reverse direction of effects is also probable, indicating that adolescent smoking has an effect on the behaviors of parents, but they deem it even more likely that the relations between parenting and adolescent behavior will be bidirectional; parents both react to and influence their adolescent children and vice versa. Nevertheless, only longitudinal designs can address this issue of bidirectionality.

Another issue with regard to the assessment of parenting is that children's perception of their parent's behavior has more influence on their development than parental actual behavior (Steinberg, Lamborn, Dornbusch, & Darling, 1992). Studies that have examined the relationship between child-rearing and adolescent outcomes from parental and adolescent perspectives generally found that adolescents' rather than parents' perceptions of parental behavior are associated with adolescent adjustment. This could be explained by a parental tendency to give more socially desirable responses and present themselves in a more positive light (e.g. Noller & Callan, 1988). As a result of this correlations between reporters are generally low, but not only between the reports of parents and adolescents but also between those of fathers and mothers. Therefore, careful examination of the data is necessary when multi-informant data are available, not only to avoid reporter bias but also to judge whether the research questions are not better addressed with solely parental or adolescent data, of which the latter might even be preferred.

### General versus Smoking-Specific Parenting

The role of parents in their child's smoking has been extensively studied (e.g., Chassin, Presson, Todd, Rose & Sherman, 1998; Foshee & Bauman, 1992; Henriksen & Jackson, 1998) but most studies on parenting and adolescents' smoking have investigated the impact of general parenting practices (e.g., Chassin et al., 1998; Foshee & Bauman, 1992). However, more specific parenting practices, the so-called anti-smoking socialization practices, might be more important in discouraging or

preventing their children from smoking uptake (Chassin et al., 1998). Anti-smoking socialization practices include: reducing the availability of cigarettes in the home environment, setting rules not to smoke at home, establishing a non-smoking agreement with their children, warning children about the negative consequences of smoking, and discussing smoking-related topics (Engels & Willemsen, 2004; Fearnow, Chassin, Presson & Sherman, 1998).

Cross-sectional studies that have examined parents' anti-smoking socialization practices have shown that their offspring is less likely to start smoking when parents establish rules not to smoke at home, warn their children about the risks of smoking, and punish their children when they smoke, (Clark, Scarisbrick-Hauser, Gautam & Wirk, 1999; Henriksen & Jackson, 1998; Jackson & Henriksen, 1997). Anti-smoking socialization practices, therefore, may be an important component of public health campaigns to discourage adolescent smoking, since it is easier to achieve a change in parents' anti-smoking socialization practices than to change parents' global parenting practices (Ennett et al., 2001).

However, an important issue has been raised by Chassin, Presson, Rose, Sherman, & Prost, (2002); they suggest that antismoking parenting might be ineffective unless their adolescents also internalize these parental perceptions. Therefore the question of 'how' parents communicate their message is as legitimate as the question of 'what' they communicate. This issue will be addressed in the next paragraph.

### Parental Communication as a Specific Anti-smoking Socialization Practice

Several recent studies have addressed this issue of parental communication and have demonstrated that a constructive way of communicating about smoking issues by parents has a preventive effect on adolescent smoking, while the absence of this perceived 'in depth' communication was even counterproductive if parents continued to raise the subject of smoking very often (Harakeh, Scholte, De Vries, & Engels, 2005; Otten, Harakeh, Vermulst, Engels, & Van Den Eijnden, in press).

Based on the assumption that anti-smoking socialization practices by parents and smoking specific communication prevents adolescents from smoking, prevention campaigns often recommend parents to communicate with their adolescents about tobacco-related issues (e.g., Miller-Day, 2002; Stivoro, 2005). Studies on the impact of smoking-specific communication, however, have yielded conflicting results. Some studies showed that parental smoking-specific communication is a protective factor (e.g., Chassin, Presson, Todd, Rose & Sherman, 1998), while others found that smoking-specific communication had no significant effect on adolescent smoking (e.g., Chassin et al., 2005; Ennett, Bauman, Foshee, Pemberton, & Hicks, 2001; Otten, Harakeh, Vermulst, Van Den Eijnden, & Engels, 2006). Other studies indicated that the children of parents, who do communicate about smoking-related issues, tend to be less likely to smoke (e.g., Jackson, 1997; Jackson & Henriksen, 1997), in contrast to studies that indicated that parents who often communicate about smoking-related topics may have children that are more likely to smoke (e.g., Engels & Willemsen, 2004; Harakeh, Scholte, Vermulst, De Vries, & Engels, 2005).

An implication of these findings is that several aspects of parental communication about smoking appear to have their own dynamic. With regard to

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parental norms and attitudes toward smoking, Ennet et al. (2001) stresses the importance of content and timing of parental communication on adolescent tobacco use, especially whether the communication occurred before or after initiation of cigarette use. In addition it is suggested that the effects of parent-child communication on adolescent smoking could vary by whether the parents smoke themselves, inclining children to pay less attention to what parents say. On the other hand, if smoking parents have convincing arguments against smoking, their effort in communicating this message might be fruitful despite the fact they smoke themselves. Jackson and Henriksen (1997) demonstrated that even for smoking parents, parental communication about smoking reduced the onset rate of their children.

Future studies are warranted to investigate these ‘how’, ‘what’, and ‘when’ questions with regard to parental communication in more detail. The implication of this is that prevention programs can not offer a general message that will be helpful for *all* parents who want to communicate smoking relevant messages to their children. If indeed anti-smoking communication is dependent on parental skills, prevention advice for parents should be tailored to the specific needs and skills of the parents.

### Antismoking Socialization and Parental Smoking

In the literature it is suggested that children who have not yet tried smoking are likely to try smoking, if they have smoking parents, cigarettes are available at home and they have parents with permissive norms and attitudes towards smoking (e.g. Avenevoli & Merikangas, 2003; Chassin, Presson, Pitts, & Sherman, 1990; Eissenberg & Balster, 2000). Furthermore, it is suggested that smoking parents are less likely to take action to prevent their children from smoking (e.g., Fearnow et al., 1998). Smoking parents may think that engaging in anti-smoking socialization practices will do more harm than good when they give their children mixed messages, such as “don’t do what I do, but do what I say”. Smoking parents may therefore have difficulties in persuading their children not to smoke.

On the other hand, there is some evidence that even efforts of smoking parents to engage in anti-smoking socialization seem to be fruitful. As mentioned earlier, Jackson and Henriksen (1998) have shown that smoking parents are less engaged in antismoking socialization behaviors than non-smoking parents, but, even for smoking parents, parental communication about smoking reduced the rate of smoking onset of their children.

In sum, anti-smoking socialization could vary by whether the parents smoke themselves. However, if smoking parents have convincing arguments against smoking, their effort in communicating this message might be fruitful despite the fact they smoke themselves, as Jackson and Henriksen (1998) have argued.

### Outline of this Dissertation

In this introductory chapter we postulate that the goal of reducing adult smoking can more easily be achieved by trying to prevent adolescents from taking up smoking. Prevention programs, however, have traditionally primarily focused their efforts on the influence of peer pressure, thereby neglecting another possible powerful source of influence in the life of children entering the age of adolescence: their parents.

Therefore the main aim of this dissertation is to address the link between parenting and adolescent smoking.

We have reviewed literature addressing the topic of parental influence on adolescent smoking on a meso level, but the literature indicates that these associations between parenting and adolescent smoking are complex in nature, and research findings are not conclusive about specific parental behaviors with regard to adolescent smoking. For example, the role of parental smoking seems to differ if an adolescent first experiments with smoking at a somewhat later age as compared to those who start before the age of 14. Furthermore is it not clear whether or when parents should discuss smoking issues with their children, whether they should make a no-smoking agreement, or if on the other hand their own smoking behavior is more important. Additionally, parents might even differ to the extent that these differences alone can account for variations in their level of influence on the smoking behaviors of their children. After the review of the relevant literature, we addressed several questions that remained unclear with regard to parental influences on adolescent smoking, those being: parental modeling, parental socialization, parenting styles and parental communication as specific parts of the child's socialization, and finally, the effectiveness of the no-smoking agreement between parents and their children as a special form of anti-smoking socialization.

Chapter 2 focuses on the role of parental modeling of their current and past smoking behavior and will address two questions. First, the relationship between current parental lifetime smoking status and early adolescent smoking is explored. Secondly, the relationship between the length of exposure to parental former smoking and current early adolescent smoking behavior is examined. Data were used from a national sample of 2,206 Dutch adolescents, between ten and fourteen years old, who lived in two-parent households that were interviewed as part of the survey by STIVORO, the Dutch organization for smoking prevention and education.

Chapter 3 presents a longitudinal study among 600 families that explores the relations between parental anti-smoking socialization and parental norms about adolescent smoking and adolescent smoking initiation. Furthermore, it examines whether non-smoking and smoking parents differ in their anti-smoking socialization and whether the effectiveness of their efforts on preventing their children from starting to smoke differs.

Chapter 4 discusses the role of the parenting styles parental support and control on young adolescent smoking initiation, increase, continuation, and cessation. Longitudinal data with three measurements were collected among 1,012 young adolescents in the first grade of secondary school every six months over the period of a year.

In Chapter 5 the effectiveness of the no-smoking agreement between parent and child will be examined in terms of the odds that adolescents will start smoking. Three data sets will be used to answer these research questions. First the prevalence of the no-smoking agreement is determined using data from a national representative sample of 4,501 Dutch adolescents (Study 1). In this data set we further examine cross-sectionally whether parents, who establish such a no-smoking agreement, are less likely to have smoking adolescents. Second, using the data-set described in

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Chapter 3, we test whether establishing a no-smoking agreement actually prevents adolescents from smoking (Study 2). Third, in a longitudinal study among 856 early and mid adolescents and their parents, we test (1) whether parents, who implement a no-smoking agreement, are less likely to have children who smoke, (2) what kind of parents are more likely to implement an agreement and (3) whether frequency and quality of communication on smoking issues at home has an added effect on adolescent smoking over and above the effect of a no-smoking agreement.

In Chapter 6 the reciprocal associations between the frequency of smoking-specific parent-adolescent communication and adolescent's smoking will be examined. Longitudinal data of 428 families are used. Furthermore we test whether three moderators have influenced the association between frequency of smoking-specific communication and adolescent's continuation of smoking: (1) the quality of smoking-specific communication between parent and adolescent, (2) the overall quality of the relationship between parent and adolescent, and (3) parental smoking behavior.

In chapter 7 the main findings and conclusions of the various studies will be summarized. Some inconsistencies in the findings and a number of limitations will be addressed. Furthermore, some suggestions for new research and the implications for prevention will be discussed.

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## **Chapter 2**

### **Lifetime Parental Smoking History and Cessation and Early Adolescent Smoking Behavior**

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### Abstract

Associations are examined between parental smoking and smoking onset by their children. Smoking parents are more likely to have children, who start smoking in their teenage years. However, less is known about whether parental quitting is related to adolescent smoking. A cross-sectional national sample of 2,206 adolescents, aged 10-14 years and living in two-parent households, were interviewed for the STIVORO annual report on Dutch youth smoking behavior. Adolescent smokers reported they had tried smoking, even one puff. Respondents indicated whether their parents were never, former, or current smokers, and provided, in the case a parent had quit, their age at that time.

Logistic regression analyses revealed that there was a gradual increase of likelihood : adolescents with both parents being current smokers were four times more likely to be a smoker compared to adolescents with parents, who had never smoked. Additionally, within the group of adolescents whose parents quit smoking, the findings demonstrated that the earlier the parents stopped smoking in the life of their off-spring, the less likely their children were to start smoking in adolescence. Parental smoking history is associated with smoking initiation in early adolescence. Parental cessation at an early age of their offspring reduces the likelihood of adolescent smoking initiation. Preventive efforts, therefore, should focus on the benefits of parental cessation as early as possible.

### Introduction

Cigarette smoking starts early in life. Although prevalence rates among American adults have declined in the last few decades, the prevalence rate among American adolescents has remained stable during this period. Since 1992, however, the increased smoking prevalence among adolescents in the U.S. has been accompanied by a decrease in the age of initiation. Approximately 25% of all adolescents have used tobacco within a year period, according to a 1989 survey by the National Institute on Drug Abuse. Nevertheless, more recent statistics show that during the 1990s, only 20.2% of 12<sup>th</sup> grade adolescents still had never smoked during their lifetime, defined as having ever smoked, even one or two puffs [1]. However, data analyzed by CDC from the national Youth Risk Behavior Survey [2] indicate that this increase in cigarette smoking rates during the 1990s is now significantly declining since 1997 among 9 – 12 grade students, reducing the prevalence of lifetime ever smoking to 63.9% in the year 2001.

In the European Union, the Commission of the European Communities carried out 12 public opinion surveys on smoking between the spring of 1987 and the spring of 1995. These surveys show a slight decrease in the percentage of smokers in the European Union in the period 1987-1995; from 29% to 27% among women and from 46% to 39% among men. Rates for smoking initiation, however, are similar among young men and young women. In most European countries smoking among youngsters is not declining [3]. In the Netherlands, 16% of the children in the last two grades of elementary school have ever smoked. In junior high school this percentage of ever smokers increases rapidly from 41% ever smokers at ages of twelve and

thirteen, to 65% ever smokers by the age of fifteen and to 72% ever smokers by the age of eighteen [4, 5]. In the 1970's, smoking was a fairly common adult habit in the Netherlands, especially among men (75% vs. 42% for women). Although there was a steady decrease of smoking between 1970 to 1990, on average from 59% to 35% for both sexes, this decrease did not continue throughout the 1990's [5]. Since 1990, the percentage of adult smokers remained stable at around 34%, but showed a renewed decline at the beginning of the new Millennium: in 2001 30% of Dutch adults smoked [6]. Although each year approximately 1.6% of the Dutch population quit smoking, equal proportions initiate smoking; particularly adolescents under the age of nineteen, people with low education and women who were in cessation during pregnancy [6]. In total 38% of the adolescents in Dutch households are confronted with a smoking father and 32% with a smoking mother [7].

Peto and Lopez [8] stated, that for males and for females, the average loss of life expectancy from smoking for those killed by the habit in middle age (35-69) is about 22 years. On closer inspection it can be seen that for the older group (60-69) the mean loss is about 16 years, while for the younger age group (35-59) the mean loss increases to 27 years [8]. This means that smoking is a preventable cause of disease. Preventing smoking among adolescents could substantially contribute to a decrease in health risks in adult life. Therefore, knowledge about the mechanisms of how smoking initiation comes about, especially in early adolescence, is essential for the development of effective prevention programs.

Several studies have shown that parental smoking status does not only affect children's health through exposure to nicotine [9 - 11], but is also related to children's smoking onset [12 - 16]. This suggests that young people who grow up in a smoking family environment are more likely to take up smoking themselves. Concerning the impact that parents have due to their own smoking behavior, the social learning theory of Bandura [17, 18] provides insight into the underlying mechanisms. According to social learning theory, many behaviors, such as smoking, are learned by observation. Individuals, such as parents, siblings, friends, and teachers, who share the same environment of the adolescent, influence the adolescents' behavior by exemplifying and by consciously or unconsciously reinforcing certain behaviors. Whether the adolescent will adapt these behaviors depends largely on actual and anticipated consequences. Thus adolescents are more likely to smoke if they anticipate that smoking will result in generally positive outcomes, for example, watching their parents smoke at a party, thus associating smoking with pleasure and intimacy. If, on the other hand, the smoking behavior of role models is associated with negative outcomes, such as illness or stress, adolescents will be more inclined to refrain from smoking. In sum, if an adolescent anticipates that imitating the smoking habits of his or her parents will not have negative consequences, he or she will be more inclined to smoke.

Furthermore, there is a discussion in the literature whether direct parental actions towards adolescent smoking more strongly affect them than parental own smoking behavior: what parents say may be more relevant than what they do. There is preliminary evidence that active parental efforts to prevent their offspring from starting to smoke, such as setting rules to eliminate cigarette smoking in the house, or applying disciplinary measures, are related to lower rates of smoking onset [19, 20]. Adolescents who perceive that both parents would respond negatively and would be

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upset by their smoking are less likely to smoke [21, 22]. However, these findings are not conclusive [20]. There is evidence that despite the high prevalence and range of content in parental communication about tobacco use, the effects of verbal communication on tobacco use are unimportant at best and might be detrimental at worst. In a study by Ennett, Bauman, Foshee, Pemberton, & Hicks [23] content and timing of parent-child communication about tobacco use play a different role at different stages of adolescent smoking. They found a complete absence of influence of parent-child communication about tobacco use on adolescent initiation of smoking. However, parental discussions about rules and reprisals for use may actually have caused adolescents, who had already tried smoking, to increase their use [23]. Hence, their overall findings indicate that despite their verbal communication, it is especially the nonverbal communication of parents, i.e., their actual smoking behavior that is modeled by the parents and is predictive of adolescent's initiation of tobacco use. This suggests that what parents communicate non-verbally by what they do is much more important than what they say.

An interesting issue is, therefore, whether differences in parental lifetime smoking status are directly associated with the likelihood of adolescent smoking behavior. To address this issue, in contrast with most studies, we will not concentrate on current parental smoking status, but rather on their lifetime smoking status. Concerning the relationship between the life-time influence of parental smoking and the subsequent smoking behavior of adolescents, Bailey et al. [12] report strong effects of parents' smoking history compared with parents' current smoking on adolescent smoking. Their results support the results reported by Bauman et al. [13] who stresses the importance of the parents' smoking history at any time during the child's life in predicting adolescent smoking.

Subsequently, when parents quit smoking during their lifetime, it may have an effect on their offspring's smoking behavior. During the eighties and nineties only a few studies had focused on this question. Peterson and Peterson [24] found a strong effect of parental quitting behavior on adolescent smoking initiation in a sample of 344 children in Grades 6-9. Stanton and Silva [25], however, concluded in a longitudinal study that children between 9 and 13 years of age, who had parents who were ex-smokers, were not influenced to desist from smoking, thus not modeling their parents behavior. On the other hand, Farkas, Distefan, Choi, Gilpin, and Pierce [26] demonstrated a linear relationship between the age the child was when the parent stopped smoking and the likelihood that this child starts smoking when reaching adolescence. If parental cessation occurs before the child reaches the age of nine years, the child is less likely to start to smoke as an adolescent. In a more recent cross-sectional study among 446 parent-child couples, Chassin, Presson, Rose, Sherman, and Prost [27] conclude that parental smoking cessation lowers the risk of adolescent smoking only in the case the partner does not currently smoke. In addition Bricker et al. [28] report similar findings in a nine year prospective study among 3012 two parent families. In this study the parental smoking status and cessation history was determined when the child was 8-9 years old in order to calculate the likelihood the child smoked as an adolescent at age 17-18 years. Their results also showed that one parent's smoking cessation was associated with reduced daily and occasional smoking of their adolescent child, but in the case two parents quit before the child reached the

age of 8-9 years the likelihood of adolescent smoking nine years later was even further reduced, albeit not as large as in the case the other parent was a never smoker.

These last findings and those of Farkas et al. [26] imply that the effects of parental modeling (i.e., smoking behavior) are incremental until the age in which children start their first experiments with smoking. Stated differently: the younger the child is when the parent stops smoking, the stronger the modeling effect of parental non-smoking behavior. This draws the attention to two points of interest; namely, parental smoking cessation is an effective contribution in reducing the likelihood their offspring starts to smoke, and secondly, the importance of the timing of parental smoking cessation.

The present study focuses on two other questions. First, this study explores the relationship between current parental lifetime smoking status and early adolescent smoking. Secondly, we examine the relationship between the length of exposure to parental former smoking and current early adolescent smoking behavior. Data were used from a national sample of 2,206 Dutch adolescents between ten and fourteen years old, who lived in two-parent households that were interviewed as part of the survey by STIVORO, the Dutch organization for smoking prevention and education, in the year 2000 to monitor the development of smoking behavior among Dutch adolescents. This study extends that of the study by Farkas et al. by: (a) employing a national sample of non-US youth, (b) looking at a younger age sample to explore early adolescent smoking behavior, (c) comparing the associations between both paternal and maternal smoking history and adolescent smoking, and (d) comparing the effects of smoking cessation of one of the parents when the smoking status of the partner is taken in consideration.

## **Method**

The respondents described in this report are a national sample of the Dutch youth population between the ages of ten to fourteen years. Each year STIVORO, the Dutch organization for smoking prevention and education, conducts a survey to monitor the development of smoking behavior among Dutch adolescents. The current data were gathered in March and April 2000 by the NIPO research bureau. Interviews with respondents, conducted by trained interviewers of the NIPO, took place at the schools after permission of the school board. The interviewers carried out additional face-to-face interviews with the aid of a laptop computer and without the presence of teachers, parents or other persons during the interview of the adolescent. Adolescents who were school dropouts due to illness or family circumstances were interviewed at their homes (N=5). The interviewers guaranteed total anonymity of the respondents.

A total of 2,206 adolescents living in two-parent households took part in this study; 51.6% of the sample were boys. The data included five age groups: a group of 10 year olds represented 7.7% of the total sample; 11 year olds: 19.7%; 12 year olds: 30.1%; 13 year olds: 22.9% and 14 year olds 19.5%. A total of 44.9% of the respondents reported to be religious: 39.2% Christians (Protestant and Catholic) and 5.7% reported other religions, such as Islam and Buddhism. Elementary schoolchildren formed 45.9% of the sample ( $M_{\text{age}} = 11.3$  years), special and low education 18.0% ( $M_{\text{age}} = 13.0$  years), first grade of secondary education 17.8% ( $M_{\text{age}} = 12.8$  years), trade school education 13.4% ( $M_{\text{age}} = 13.5$  years), the highest level of

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secondary school in the Netherlands, namely, preparatory college and university education 4.6% ( $M_{\text{age}} = 13.4$  years) and finally school dropouts due to illness or family circumstances 0.2% ( $M_{\text{age}} = 13.8$  years). Of the fathers, 6.1% were unemployed, 25.5% did unschooled labour, 43.3% were engaged in middle level employment and finally 25.2% in high education professions. Of the mothers 34.7% were considered housewives, 30.8% did unschooled labour, 20.8% were engaged in middle level employment and finally 13.7% in high education professions. In order to explore the influence of possible differences in smoking condition between the father and mother of the respondent, with respect to adolescent smoking behavior, the analyses were conducted with adolescents who were living with both parents. This enabled us to examine the role of both the father and the mother.

### Measures

The dependent measure, adolescents' smoking status, was based on self-reported smoking. Respondents were asked whether they had ever smoked, even one puff. Never smokers were coded 0, experimental and regular smokers were coded 1. Before constructing this variable a seven-point ordinal scale was used ranging from never smoking to several levels of experimentation (less than once a month; not weekly, but once a month; not daily, but once a week), to regular smoking. Parental smoking status was measured by asking the respondent whether their father or mother currently smoked, had stopped or had never smoked. Each parent was classified into one of three groups on the basis of their lifetime smoking status: never smoker, former smoker or current smoker. Six levels of parental smoking behavior were constructed: (1) both parents had never smoked, (2) one parent is a former smoker and the other had never smoked, (3) both parents are former smokers, (4) one parent is a current smoker and the other had never smoked, (5) one parent is a current smoker and the other is a former smoker, or (6) both parents are current smokers. In addition, in the case that the respondent indicated that his or her parent was a former smoker, the respondent had to report his or her age at the time the parent stopped. Three age-groups were constructed to categorize the ages of the respondent at the time the parent stopped: (1) younger than 7 years old, (2) age between 7 and 10 years old and (3) age between 11 and 14 years old.

### Data analyses

The first analysis assessed the relationship between parental smoking status and adolescent smoking status ( $N = 2,206$ ). A logistic regression analysis was computed and for reasons of comparability with other literature, background characteristics were included as control variables: gender, age, religious background and educational level of the respondent, educational level and employment status of the father and of the mother respectively. The educational level of the respondent was categorized into elementary school (45.9%), special and low education (18.0%), the first grade of secondary education (17.8%), trade school education (13.4%), preparatory college and university education (4.6%) and one category for school dropouts (0.2%).



Secondly, logistic regression analyses were used to examine the relationship between the length of exposure to parental former smoking and adolescent current smoking behavior. A selection was made by only including respondents who reported parental smoking cessation between birth and the time of the measurement. This was done in order to explore the risk of adolescent smoking as a function of the length of exposure to parental smoking. Separate analyses were done for paternal and maternal cessation.

Finally, additional analyses were conducted on the relationship between the timing of parental smoking cessation and adolescent smoking behavior in the group of adolescents who reported that the other parent was a former smoker or had never smoked, but was not a current smoker. This was done to examine whether the effects of smoking cessation by one parent were stronger in the case the partner was not a current smoker. We have provided the 95% confidence intervals (CIs) for the odds ratios in Tables 1-3.

## **Results**

With respect to the dependent measure, namely, adolescent smoking status, findings revealed that 60.9% of the respondents had never smoked. Of the 39.1% reporting that they had ever smoked based on the initial seven-point scale, it appeared that approximately a quarter considered themselves regular smokers (10.4% of the total sample). As the adolescent grows older, the likelihood increases that he or she has ever smoked. For example, a fourteen year old has a 5.1 times greater likelihood to be an ever smoker compared with a ten year old (i.e., reference group, see Table 1). With respect to the independent measure, i.e., parental smoking status, 42.4% of the fathers were current smokers, 30.2% former smokers (of whom 55.1% had quit before the birth of their child;  $n = 379$ ) and 27.4% never smokers. Of the mothers, 35.6% were current smokers, 30.0% former smokers (of whom 63.9% had quit before the birth of their child;  $n = 440$ ) and 34.3% never smokers. The father and mother smoking status was moderately correlated ( $r = .37, p < 0.01$ ). Of the parents who had quit, 44.9% of the fathers ( $n = 309$ ) and 36.1% of the mothers ( $n = 249$ ) did so after the birth of the adolescent. Nevertheless, only a total of 76 couples were in cessation simultaneously ( $r = .67, p < 0.001$ ). As a result, 51.6% of the adolescents in this sample had been confronted with at least one currently smoking model in his/her home surrounding, 30.7% of the adolescents reported at least one former parental smoker in his/her lifetime and 17.7% reported that both parents never had smoked.

The findings of the logistic regression analysis reported in Table 1 show the likelihood of adolescent ever smoking (E.S.) as a function of exposure to parental smoking controlled for age, gender, religion, and educational level of the respondent as well as educational level and employment of both parents. Respondents who did not provide answers to all the variables included, were omitted in the final analysis, thus reducing the initial sample from  $N = 2,402$  to  $N = 2,206$ . Adolescents living in households where both parents never smoked (i.e., the reference group) were the least likely to have become smokers (19.8% of the sample E.S.). Adolescents living in households where neither parent currently smoked, but at least one parent was a former smoker and the other parent was a never smoker, were significantly more

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likely to have become smokers (30.8% of the sample E.S.; OR = 1.67), although to a lesser extent than if the parents were both former smokers (36.8% of the sample E.S.; OR = 2.03). If one parent currently smoked and the other never smoked, adolescents were almost 2.4 times more likely to take up smoking compared to the likelihood of adolescents with never-smoking parents. (39.4% of the sample E.S.; OR = 2.36). By contrast, adolescents living in households where one parent currently smoked and the partner was a former or a current smoker were the most likely to have become smokers (50.9% of the sample E.S.; OR = 3.87 vs. 52.3% of the sample E.S.; OR = 4.00). Except for educational level and age, none of the background variables contributed significantly to the explanation of adolescent smoking. Trade education students were 1.5 times more likely to take up smoking (OR = 1.45) compared to elementary school students (i.e., the reference group). Twelve year olds were 2.5 times more likely to take up smoking (37.9% of the sample E.S.; OR = 2.53) compared to ten year olds (i.e., the reference group), thirteen year olds 2.7 times (43.9% of the sample E.S.; OR = 2.73) and finally fourteen year olds 5.1 times (58.9% of the sample E.S.; OR = 5.12).

In order to explore differences between the different parental smoking statuses, five additional logistic regressions were conducted; with the parental smoking status being the reference group. These additional analyses revealed that in the cases that both the parents were current smokers (i.e., reference group), all analyses were significant except for the difference with the parental smoking status 'one parent is a current smoker and the other a former smoker' which was not significant (see table 1, subscripts 'a' through 'c'). In the case both parents were former smokers (i.e., reference group), the difference between this group in comparison to the group 'one parent is a current smoker and the other never smoked' did not reach statistical significance. Finally, in the case one parent was a former smoker and the other never smoked (i.e., reference group), the difference with the group 'both parents were former smokers' did not reach statistical significance.

Table 2A shows adolescent smoking as a function of their age when their fathers became former smokers. In this analysis we also controlled for the associations of demographics with adolescent smoking. This analysis has been restricted to those respondents, who (1) provided their age the moment the parent had quit smoking and (2) had a parent who quit smoking after the birth of their child. Compared with the reference group (younger than seven years old when the father stopped), the likelihood that an adolescent was an ever smoker if their father ( $n = 307$ ) stopped smoking when the child was between seven and ten years old was significantly higher. This finding also applies to the group of adolescents between eleven and fourteen years old (OR = 1.86 vs. OR = 2.05). In other words, if the father stopped smoking before his child reached the age of seven, the likelihood that the child would become a smoker as an adolescent was significantly lower than if the father stopped when his child was between seven and fourteen years old. In Table 2B, a similar analysis is presented for those fathers whose partner was a never or former smoker ( $n = 220$ ). In the case the mother was a former or never smoker, the likelihood that the adolescent was a smoker was also significantly greater for both groups, adolescents between seven and ten years olds as well as adolescents between eleven and fourteen years old (OR = 2.77 vs. OR = 2.59) at the time the father stopped (i.e. compared with the reference group).

Table 3A depicts the findings of the logistic regression analysis for mothers who stopped smoking after the birth of the respondent and displays adolescent smoking as a function of their age when their mothers became former smokers. Compared with the reference group (younger than seven years old when the mother stopped), the likelihood that the adolescent, whose mother stopped smoking when her child was between eleven and fourteen years old, was a smoker was significantly higher (OR = 3.09). In this analysis three of the background variables reached statistical significance. First, thirteen and fourteen year old adolescents smoke significantly more than ten year olds (OR = 7.72 vs. OR = 11.16) in households where the mother stopped after the birth of the respondent. Second, adolescents with unskilled/low educated or middle level working mothers smoked significantly less (OR = 0.47 vs. OR = 0.33) than children from housewives (i.e., reference group). Third, adolescents without religious affiliation were significantly more likely to have become ever smokers (OR = 3.12) compared with the Christian religious group (i.e., reference group).

A similar analysis was conducted on the subsample of adolescents who reported not having a father who is a current smoker (Table 3B). This analysis revealed that adolescents, whose mothers quit smoking when her child was between eleven and fourteen years old, were still more likely to have become smokers (OR = 2.75) compared to the reference group. In this analysis, none of the background variables reached statistical significance.

Although we were interested to test whether adolescent ever smoking would not only depend on the moment of quitting by one of the parents, but also on the moment of cessation of the partner, an interaction effect between the father and the mother could not be tested because of too low cell counts ( $n = 76$ ).

Table 1. Logistic Regression of Ever Smoking among Adolescents (ages 10-14) Controlled for Demographics and Parental Smoking Status

		Adolescent Ever Smoking (39.1% of sample ever smokers (E.S.) N = 2,206			
		<i>n</i>	E.S.	Odds ratio	95% CI
					Lower      Upper
<b>Age group</b>					
	10	163	19.1%	1.00	
	11	433	23.6%	1.43	0.90      2.30
	12	664	37.9%	2.53***	1.61      3.98
	13	509	43.9%	2.73***	1.62      5.08
	14	437	58.9%	5.12***	2.97      8.80
Sex	Girl	1061	36.5%	1.00	
	Boy	1145	41.5%	1.16	0.96      1.39
<b>Educational level respondent</b>					
	Elementary school	997		1.00	
	Special education and low education	405		1.36	0.98      1.88
	First grade of secondary education	401		1.24	0.93      1.71
	Trade education	299		1.45*	0.99      2.13
	Preparatory college and university education	101		0.79	0.47      1.32
	School dropouts	3		0.89	0.07      10.78
<b>Educational level and employment of the father</b>					
	Unemployed	126		1.00	
	Elementary educated or unschooled labour	561		0.91	0.60      1.40
	Middle level employment	952		0.77	0.51      1.17
	High education professions	567		0.67	0.44      1.04
<b>Educational level and employment of the mother</b>					
	Housewives	746		1.00	
	Elementary educated or unschooled labour	696		1.17	0.92      1.47
	Middle level employment	452		0.80	0.62      1.05
	High education professions	312		0.98	0.73      1.32
<b>Religion</b>					
	Christian	862		1.00	
	Islam, Buddhist or other	123		1.15	0.74      1.80
	No religion	1221		1.18	0.98      1.45
<b>Parental smoking status</b>					
	Both parents never smoked	329	19.8%	1.00	
	One parent is a former smoker and the other never smoked	396	30.8%	1.67** <sub>a</sub>	1.17      2.39
	Both parents are former smokers	307	36.8%	2.03*** <sub>a,b</sub>	1.40      2.95
	One parent is a current smoker and the other never smoked	307	39.4%	2.36*** <sub>b</sub>	1.63      3.42
	One parent is a current smoker and the other is a former smoker	328	50.9%	3.87*** <sub>c</sub>	2.68      5.57
	Both parents are current smokers	539	52.3%	4.00*** <sub>c</sub>	2.86      5.61

Note.<sub>a, b, c</sub>: similar subscripts do not differ significantly.

\*  $p < .05$ . \*\*  $p < .01$ . \*\*\*  $p < .001$ .

Table 2A. Logistic Regression of Ever Smoking among Adolescents (ages 10-14) Controlled for Demographics and Parental Cessation after birth for Fathers in Two-Parent Households

Father stopped after birth respondent Total sample $N = 307$				
<i>Percentage of children ever smoking</i>		39.1%		
	<i>n</i>	Odds ratio	95% CI	
			Lower	Upper
<i>Age group</i>				
10	23 <sup>1</sup>	1.00		
11	47	0.38	0.11	1.27
12	93	1.16	0.40	3.41
13	74	1.18	0.33	4.32
14	70	2.00	0.52	7.72
<b>Sex</b>				
Girl	150	1.00		
Boy	157	1.05	0.63	1.76
<i>Educational level respondent</i>				
Elementary school	134	1.00		
Special education and low education	54	0.98	0.39	2.46
First grade of secondary education	55	0.95	0.40	2.28
Trade education	47	1.38	0.50	3.81
College and university education	17	0.23	0.05	1.06
School dropouts		-		
<i>Educational level and employment of the father</i>				
Unemployed	24	1.00		
Low educated or unschooled labour	75	1.15	0.39	3.38
Middle level employment	132	1.00	0.37	2.74
High education professions	76	0.58	0.20	1.71
<i>Educational level and employment of the mother</i>				
Housewives	100	1.00		
Low educated or unschooled labour	92	1.05	0.54	2.02
Middle level employment	73	0.73	0.37	1.47
High education professions	42	1.16	0.51	2.66
<i>Religion</i>				
Christian	116	1.00		
Islam. Buddhist or other	13	0.29	0.05	1.62
No religion	178	1.12	0.66	1.89
<i>Age of child when father quit</i>				
< 7 years	119	1.00		
7 – 10 years	105	1.86*	1.02	3.38
11 – 14 years	83	2.05*	1.09	3.87

<sup>1</sup> 23 respondents could not chose the category “my father quit smoking when I was 11 – 14 years old”

\*  $p < .05$ .

Table 2B. Logistic Regression of Ever Smoking among Adolescents (ages 10-14) Controlled for Demographics and Parental Cessation after birth for Fathers in Two-Parent Households

<i>Percentage of children ever smoking</i>	<i>n</i>	Father stopped after birth respondent Mother never/former smoker <sup>1</sup> <i>N</i> = 220		
		Odds ratio	34.1% 95% CI	
			Lower	Upper
<i>Age group</i>				
10	16	1.00		
11	38	0.60	0.13	2.77
12	62	1.55	0.38	6.35
13	52	1.52	0.29	7.92
14	52	3.57	0.64	19.92
<b>Sex</b>				
Girl	99	1.00		
Boy	121	1.08	0.55	2.11
<i>Educational level respondent</i>				
Elementary school	93	1.00		
Special education and low education	42	0.67	0.21	2.09
First grade of secondary education	42	0.76	0.25	2.30
Trade education	28	1.47	0.40	5.44
College and university education	15	0.20	0.03	1.29
School dropouts		-		
<i>Educational level and employment of the father</i>				
Unemployed	15	1.00		
Low educated or unschooled labour	51	1.11	0.27	4.64
Middle level employment	95	1.49	0.39	5.64
High education professions	59	0.85	0.21	3.46
<i>Educational level and employment of the mother</i>				
Housewives	75	1.00		
Low educated or unschooled labour	63	1.40	0.62	3.15
Middle level employment	54	0.73	0.31	1.72
High education professions	28	0.86	0.22	2.67
<i>Religion</i>				
Christian	88	1.00		
Islam. Buddhist or other	10	0.23	0.02	2.37
No religion	122	0.99	0.52	1.91
<i>Age of child when father quit</i>				
< 7 years	85	1.00		
7 – 10 years	74	2.77**	1.28	6.02
11 – 14 years	61	2.59*	1.15	5.79

<sup>1</sup> This analysis conducted without the partner being a current smoker.

<sup>2</sup> 23 respondents could not chose the category “my father quit smoking when I was 11 – 14 years old”

\*  $p < .05$ . \*\*  $p < .01$ .

Table 3A. Logistic Regression of Ever Smoking among Adolescents (ages 10-14) Controlled for Demographics and Parental Cessation after birth for Mothers in Two-Parent Households

<i>Mother stopped after birth respondent</i> Total sample $N = 246$				
39.1%				
<i>Percentage of children ever smoking</i>	<i>n</i>	Odds ratio	95% CI	
			Lower	Upper
<i>Age group</i>				
10	13 <sup>1</sup>	1.00		
11	39	3.26	0.58	18.05
12	81	4.04	0.76	21.49
13	55	7.72*	1.22	49.01
14	58	11.16*	1.62	76.88
<i>Sex</i>				
Girl	115	1.00		
Boy	131	0.80	0.45	1.45
<i>Educational level respondent</i>				
Elementary school	106	1.00		
Special education and low education	46	0.82	0.28	2.36
First grade of secondary education	51	0.80	0.31	2.08
Trade education	35	1.06	0.02	3.57
College and university education	8	0.15	0.03	1.07
School dropouts		-		
<i>Educational level and employment of the father</i>				
Unemployed	10	1.00		
Low educated or unschooled labour	65	0.67	0.14	3.19
Middle level employment	106	0.37	0.08	1.65
High education professions	65	0.49	0.10	2.38
<i>Educational level and employment of the mother</i>				
Housewives	74	1.00		
Low educated or unschooled labour	92	0.47*	0.23	0.96
Middle level employment	47	0.33*	0.14	0.78
High education professions	33	0.44	0.17	1.17
<i>Religion</i>				
Christian	92	1.00		
Islam. Buddhist or other	5	0.31	0.03	3.32
No religion	149	3.12***	1.67	5.85
<i>Age of child when father quit</i>				
< 7 years	76	1.00		
7 – 10 years	92	1.48	0.73	3.01
11 – 14 years	78	3.09**	1.47	6.51

<sup>1</sup> 13 respondents could not chose the category “my mother quit smoking when I was 11 – 14 years old”

\* $p < .05$ . \*\* $p < .01$ . \*\*\* $p < .001$ .

Table 3B. Logistic Regression of Ever Smoking among Adolescents (ages 10-14) Controlled for Demographics and Parental Cessation after birth for Mothers in Two-Parent Households

<i>Percentage of children ever smoking</i>	<i>n</i>	<i>Mother stopped after birth respondent Father never/former smoker<sup>1</sup> N = 163</i>		
		<i>Odds ratio</i>	<i>95% CI</i>	
			<i>34.1%</i>	
			<i>Lower</i>	<i>Upper</i>
<i>Age group</i>				
10	7	1.00		
11	23	2.04	0.18	22.58
12	53	2.33	0.23	23.84
13	39	6.22	0.47	82.07
14	41	7.82	0.51	116.66
<b><i>Sex</i></b>				
Girl	74	1.00		
Boy	89	0.63	0.29	1.33
<i>Educational level respondent</i>				
Elementary school	67	1.00		
Special education and low education	31	0.70	0.16	3.15
First grade of secondary education	30	0.60	0.16	2.33
Trade education	27	1.30	0.27	6.41
College and university education	8	0.20	0.02	1.75
School dropouts		-		
<i>Educational level and employment of the father</i>				
Unemployed	6	1.00		
Low educated or unschooled labour	38	0.57	0.09	3.78
Middle level employment	72	0.36	0.06	2.22
High education professions	47	0.58	0.10	3.67
<i>Educational level and employment of the mother</i>				
Housewives	45	1.00		
Low educated or unschooled labour	60	0.59	0.24	1.48
Middle level employment	36	0.45	0.16	1.26
High education professions	22	0.86	0.26	2.82
<i>Religion</i>				
Christian	65	1.00		
Islam. Buddhist or other	2	1.63	0.09	30.72
No religion	96	2.19*	0.99	4.82
<i>Age of child when father quit</i>				
< 7 years	54	1.00		
7 – 10 years	62	1.66	0.68	4.06
11 – 14 years	47	2.75*	1.07	7.07

<sup>1</sup> This analysis conducted without the partner being a current smoker.

<sup>2</sup> 13 respondents could not chose the category “my mother quit smoking when I was 11 – 14 years old”

\* $p < .05$ . \*\* $p < .01$ . \*\*\* $p < .001$ .



## **Discussion**

The first aim of this study was to explore the direct relationship between the lifetime history of parental smoking habits and early adolescent smoking initiation. We used a national sample of 2,206 10-14 year old Dutch adolescents living in two-parent households for analyses. Although adult smoking is declining the last few decades, it should be noted that half of the adolescents in this national sample (52%) have been confronted with at least one currently smoking parent in his home surrounding during time of the survey. Since smoking initiation and experimentation occurs at an early age [4, 5, 2], factors in the nearby social environment of the young adolescent may play an important role in explaining adolescent smoking initiation. Many studies have, therefore, focused on peer pressure, and by doing so have more or less underestimated the importance of the role of the family. However, in recent years the role of the family has become a significant factor in research on smoking initiation, even more so than peer pressure (see for an overview [29]).

Our study underscores the relevance of taking parental smoking into account, because, as we have demonstrated, several aspects of parental smoking history are related to early adolescent smoking. First, the findings of our study support the assumptions of Bauman et al. [13] and Bailey et al. [12] who both stress the importance of parental smoking history at any age during the child's life in predicting adolescent smoking. We demonstrated not only that growing up in an environment where one or both parents smoke increases the likelihood that the young adolescent will start experimenting with cigarettes, but also that this influence is incremental. Adolescents living with parents who never have smoked were the least likely to have experimented with cigarettes. However, in the case that one of those parents is a former smoker, the likelihood the adolescent has ever smoked increases significantly and even increases further when *both* parents are former smokers, although the situation remains that the adolescent is not confronted with a currently smoking parent at the time of the survey. In the hierarchal construction of parental smoking statuses that we used as proposed by Farkas et al. [26], this increase in the likelihood of adolescent ever smoking remains. In the situation that a currently smoking parent has a 'never smoking partner' moves up to having a 'former smoking partner' and finally changes into 'both current smokers', the latter couple has a four times higher likelihood their child is an ever smoker compared with two-parents who never have smoked. A possible explanation for this phenomenon that even when parents are former smokers the likelihood their child becomes a smoker is higher compared with parents who both never smoked might be that a parent who has smoked can hold different norms and attitudes about smoking, thereby communicating a more tolerant attitude when smoking is concerned [21, 23]. However, in their study Jackson and Henriksen [19] also conclude that parental quitting does not totally eradicate the effects of parent modeling, nevertheless, antismoking socialization by parents reduces the chance their children start to smoke, independent of their smoking status. Chassin et al. [27] on the other hand, conclude that ex-smoking parents show more antismoking socialization than non smoking parents, but these antismoking parenting behaviors were undermined when the other parent continued to smoke, thereby negating the benefits of parental smoking cessation. It should also be noted, however, there is evidence that cigarette smoking shows intergenerational transmission,

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therefore, not only environmental factors, but also genetic and biological factors contribute to the complex mechanisms by which adolescent smoking initiation can be explained [20, 30].

Our next focus of the study was to determine whether parental smoking cessation between birth of the child and early adolescence played a role in the likelihood of early adolescent smoking. Our findings contribute to the findings of studies by Peterson and Peterson [24], Jackson and Henriksen [19], Bricker et al. [28] and Farkas et al. [26] by demonstrating that parental smoking cessation after birth has differential effects on early adolescent smoking, depending on the age the child was when the parent stopped. For fathers who had quit after birth of his child, the likelihood his early adolescent child was an ever smoker was higher when the father had quit between the ages of seven and ten years or between eleven and fourteen years compared to quitting before his child reaches the age of seven years. In the latter situation, the father had the most impact on reducing the likelihood of his child becoming an ever smoker in early adolescence, especially in the case the partner was a never or former smoker. This finding contributes to the study of Chassin et al. [27] who also conclude that, particularly if the mother continued to smoke, the impact of paternal cessation was largely negated. In our study, the modeling effect of the father quitting at an early age of his child seems stronger if the partner is a never or former smoker, however, the impact remained substantial although the partner continued to smoke. Although the study by Farkas et al. [26] in a sample of 4,502 adolescents ages between 15-17, did not differentiate between fathers and mothers concerning quitting behavior and conducted the analysis only on couples of which the only or last parent who smoked became a former smoker, our study shows that quitting by the father has a stronger effect on adolescent ever smoking in the case the partner was a never or former smoker. This finding implies that postponing quitting smoking by the father is associated with increases in the likelihood his child will be an ever smoker, even to a greater extent than if the mother still smokes, indicating that fathers' behavior does make a difference concerning adolescent smoking. Because parental cessation is correlated ( $r = .37, p < 0.01$ ) this finding, however, should be interpreted with caution.

For mothers, regardless of the smoking status of the father, the likelihood her child was an ever smoker at the time of the survey was three times higher if she had quit when her child was between ten and fourteen years old compared with quitting before her child reached the age of seven years. These findings underline those of Farkas et al. [26] who found a linear relationship between the likelihood an adolescent would be a smoker for each year the parent quit later. Nonetheless, we show that these patterns are apparent for both parents.

The preventive effect of parental smoking cessation on adolescent smoking behavior can be explained by the social learning theory of Bandura [17, 18] and be understood in terms of reduced modeling of parental smoking behavior, thereby setting an example and consciously or unconsciously reinforcing certain behaviors related to (non)-smoking behavior. However, little is known about whether the modeling of the cessation process itself has implications for adolescent smoking onset, for example, what does a child learn from a parent who has many difficulties with giving up the habit of smoking? Future research may concentrate on whether adolescent norms and attitudes about smoking change when parents quit, because this

could provide insight in the underlying processes of the impact of parental quitting on adolescent smoking. In addition it would be worthwhile to examine the reasons parents quit smoking and what determines the exact moment of successful quitting. This may help us to understand the implications parental quitting has for adolescent smoking behavior.

Some limitations of this study should be mentioned. The cross-sectional design of the study does not allow any conclusions about causality. Some parents might actually quit smoking because their young child starts experimenting with cigarettes. In this case adolescent smoking onset affects the parental smoking behavior. However, a longitudinal study by Engels et al [16] demonstrated that adolescent smoking behavior had no effect on parental smoking status, which makes it unlikely to assume strong bi-directional relationships between parental and adolescent smoking. Furthermore, there might be a third variable responsible that influences parental smoking behavior as well as adolescent smoking initiation. The death of a relative caused by smoking, for example, might lead to parental smoking cessation and at the same time might lead the adolescent to decide never to try a cigarette in his or her life.

Another limitation is the use of adolescent self-reports. With respect to the measurement of adolescent smoking, self report is considered to be reliable and valid as long as total anonymity is guaranteed [16, 31]. According to Dolcini and coworkers [32], the findings on smoking behavior by means of self-reports are comparable with those when biochemical verification of smoking behavior is employed. It may, however, prove to be more difficult to collect such data when respondents are asked to provide information about the smoking status of others. There is some evidence that children are very capable to estimate current or recent parental smoking behavior. Engels and Willemsen [33] demonstrated that, within a sample of 116 families in which both parents and one adolescent were involved, that adolescent' reports on parental smoking strongly coincides with the self-reports of parents. However, the measurement of parental quitting further away in time may be more troublesome to collect (on the recollection errors of one's own personal smoking history see [34, 35]). When the actual moment of quitting is early in the life of the child, he or she might not remember whether the parent had smoked or not, or at which moment the parents stopped. It is even conceivable that parents hid their smoking history prior to their child's first cigarette, which would mean that the child could not have known at what age their parent had stopped smoking. Future research could reduce measurement errors by cross-validating information on smoking history by asking parents as well, although it is relevant to state that parental reports may also suffer from recollection errors. Nevertheless, it is important to state that our results do resemble those of Farkas et al. [26] who used information provided by parents and, additionally, we believe it is important to use data collected from the adolescents themselves. We feel the latter is important because when adolescents do not have information about their parents' smoking history, it is not very likely that this would affect their own smoking behavior. By way of example, when the parent would indicate on the questionnaire that he or she quit smoking, but the child could not remember whether the parents even had smoked at all, it is not very likely that parental reports would be associated with adolescent smoking onset.

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Although this study focuses on early adolescence and thus describes smoking initiation and experimenting rather than regular smoking, using a sample of older adolescents would provide insight in whether parental cessation is associated with lower levels of regular smoking in mid and late adolescence or whether experimenting is merely postponed to an older age.

Findings of this study clearly show that parental smoking history plays an important role in early adolescent smoking behavior. Thus in terms of prevention efforts, parental cessation can make a difference: it reduces the likelihood their child will smoke in early adolescence. The prevention message is straightforward; for parents as well as children it is beneficial to quit smoking. Not only are there direct positive health effects for parents and their children, but it also reduces the likelihood that their child starts to smoke. This study shows that this reduction in likelihood is higher when the parent quits before his or her child reaches adolescence. For prevention efforts to be successful in this respect, the focus should not only be on the child and the time that children reach the age of smoking initiation, but parents should also be informed about the positive effects of smoking cessation already during pregnancy and the first years of their child's life [26]. Not only should prevention be targeted at the mother but also at the father, because this study clearly demonstrates the importance of cessation by the father. Nevertheless, in the Netherlands primary prevention efforts focus mainly on the adolescent rather than on the parents. Although some written documentation for parents is available and some schools invite parents to visit information sessions on how to deal with smoking, this information is sparse.

Currently, a pilot study is being conducted in the Netherlands in which the effectiveness is examined of a mass media campaign educating parents about how their own smoking behavior influences the chances that their children start smoking [6]. The findings of the present study indicate that parental involvement is important in reducing smoking in their children, not only in terms of their own smoking history but also in encouraging smoking cessation. The group of parents of very young children could especially benefit from these prevention efforts, not only in terms of their own and their children's health, but also in terms of reducing the likelihood their children starting to smoke.

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### Parental Anti-smoking Socialization: Associations between Parental Anti-smoking Socialization Practices and Early Adolescent Smoking Initiation

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## Abstract

This longitudinal study of 600 families, concentrates on the influence of parental anti-smoking socialization by examining both (a) the effects of eight indicators of anti-smoking socialization on adolescent smoking and (b) the influence of parental smoking on the effectiveness of their anti-smoking socialization. Robust differences between smoking and non-smoking parents demonstrated that both kinds of families hold different norms and attitudes about adolescent smoking and how to deal with it. In terms of effective anti-smoking socialization, it appeared that parental involvement on a more abstract level, such as, feeling confident one has influence on the smoking behavior of one's child and having knowledge whether one's child and his or her friends smoke, seemed important in preventing early adolescent smoking, while concrete communication or house rules about smoking were not.

## Introduction

Research has identified a range of factors affecting the risk of taking up smoking at an early age, such as, socio-economic status, availability and price of tobacco products, personality traits, perceptions of social norms concerning smoking and peer influence [1-7].

Recent research has focused on parental anti-smoking socialization as a specific way parents might prevent onset of smoking in their offspring by, for example, setting house rules and warning about the health dangers. These studies have examined the role of parental anti-smoking socialization and have shown that restrictive parental policy [8], establishing non-smoking rules at home, warning about the effects of smoking [9], and reacting constructively, when parents find out that their child experiments with smoking, has a preventive effect on adolescent smoking [10]. To develop effective prevention programs it is therefore necessary to explore the psychosocial factors that are associated with the prediction of adolescent smoking initiation.

In order to study which parental actions affect the transition from non-smoking to smoking, longitudinal research is required. To our knowledge only one longitudinal study has examined the impact of frequency of communication on smoking-related topics by parents [11]. In that study it was demonstrated that this frequency of communication did not affect the likelihood of smoking onset.

Smoking parents may have difficulties in persuading their children not to smoke. Andersen et al. [12] demonstrated that inconsistency between parental attitudes and their behavior, that is, when smoking parents encourage children to “do as I say and not as I do” was not associated with a reduction in the odds of smoking by their children. On the other hand, there is some evidence that even efforts of smoking parents to engage in anti-smoking socialization seem to be fruitful. Jackson and Henriksen [9] showed that smoking parents are less engaged in antismoking socialization behaviors than non-smoking parents, but, even for smoking parents, parental communication about smoking reduced the rate of smoking onset of their children. In sum, it is suggested that anti-smoking socialization could vary by whether the parents smoke themselves. However, if smoking parents have convincing



arguments against smoking, their effort in communicating this message might be fruitful despite the fact they smoke themselves, as Jackson and Henriksen [9] have argued.

Chassin, Presson, Sherman, Montello and McGrew [13] suggest that smoking initiation and smoking maintenance may have different determinants, and they stress that family influences are important in the early preparation stages of smoking, while peer factors play a more important role in later stages. They also suggest that initial smoking transitions should be studied on its own, separately from the later transitions from experimental to regular smoking.

This longitudinal study explores the relations between parental anti-smoking socialization and parental norms about adolescent smoking and actual adolescent smoking initiation. This study will try to identify those adolescents who make the transition from never smoker to initiator. Furthermore, we will examine whether non-smoking and smoking parents differ in their antismoking socialization and whether the effectiveness of their efforts on preventing their children from starting to smoke differ.

## **Methods**

### **Sample Characteristics**

The sample consisted of 550 two-parent families and 50 single-parent families that had one adolescent child in the first year of secondary education in the region of Utrecht in the Netherlands. Two self-report questionnaires were used; one questionnaire which was administered to the children at school twice with a one-year interval (in winter 2000 - 2001) under supervision of a teacher, and a one-time questionnaire which was sent to the parents at the first school-wave measurement.

Four types of Dutch high schools participated in the study, namely, trade school (14.3%), the lower level high school (24.7%), middle-level high school (19.0%) and finally preparatory school (42.0%). The mean adolescent age at T1 was 12.3 years (SD = .52), ranging from 10 to 14 years. Fifty-three percent (n = 315) of the adolescents were males. Three percent had a foreign nationality, 92% lived with both their parents, 6% lived only with their mother, 1% lived only with their father, and 1% were adopted. With respect to parental smoking as reported by the adolescent, 64.1% of the families consisted of non-smoking parents, 25.4% of one smoking parent, and 10.5% of two smoking parents.

The parents of the respondents were informed of the objectives of this study by a written letter, personally addressed to them, and were given the opportunity to withdraw their child from the study. In addition to the letter, the parent-questionnaire and a return envelope were also included. Parents were requested to fill in this questionnaire on a voluntary basis. We sent 1,380 letters and questionnaires to the parents' homes and a total of 718 (52%) returned the questionnaire. In 75% of the cases the mother filled out the questionnaire. Parents who had returned the questionnaire could indicate whether they were interested to receive the final results of the study.

Analyses are restricted to those parent-adolescent pairs that we have complete data of, resulting in the loss of 118 parental responses due to absence of their child at the school testing. There were, however, no significant differences in the distribution

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of the variables of interest on parental anti-smoking socializing between the initial complete set of parental data (N = 718) and the data used for analyses (N = 600).

In regard to the confidentiality of responses [14], the letters of introduction and the questionnaires emphasized privacy aspects.

### Measures

Adolescent smoking behavior and parental smoking status were measured in the first and second wave school-questionnaires. Anti-smoking socialization was assessed once during the first wave among the parents.

#### *Adolescent report*

*Adolescent smoking behavior.* Adolescents' smoking status was based on self-reported smoking in both waves. An ordinal scale was used, ranging from never smoking to regular smoking [15]. Two outcome variables were used for longitudinal analyses: (1) initiators, those respondents who started smoking at the second wave and (2) maintainers, those who indicated to be a smoker at both waves.

*Parental smoking status.* This was determined by asking the adolescent whether the father or mother currently smoked (yes or no).

#### *Parental report*

*Parental anti-smoking practices.* Eight measures of parental anti-smoking socialization were used: communication about smoking, house rules, parental warnings, knowledge about own child smoking, knowledge about friends smoking, psychological control, confidence in effecting child's smoking behavior and availability of cigarettes at home. Parental norms about adolescent smoking were measured by questions regarding parental approval of adolescent smoking. Three parental reaction patterns on smoking were determined: anger and punishment, *laissez faire* and explaining disappointment.

*Parental communication.* Six items assessed the frequency that parents start discussions about smoking at home [10]. For example: 'How often do you talk about smoking' and 'How often do you talk about at what age your child may start to smoke.' Response categories ranged from 1 'never' to 5 'at least once a week' (alpha = .84).

*House rules.* Six items assessed the existence of parental rules on adolescent and adult smoking at home [10]. For example: 'I am / my partner is allowed to smoke at home' and 'It is a rule that someone who wants to smoke, smokes outside home'. Responses ranged from 1 'definitely not' to 5 'definitely yes' (alpha = .83).

*Parental warnings.* Seven items assessed how often parents make explicit warnings about the dangers and disadvantages of adolescent smoking [10]. Examples are: 'Smoking gives you a bad breath' and 'Smoking does not make you popular among friends'. Responses ranged from 1 'never' to 5 'very often' (alpha = .86).

*Parental knowledge about own child and friends smoking.* Seven items assessed whether parents know if their child smokes [10]. For example: 'Even if my child tried his or her first cigarette, I would find out?' Response categories ranged from 1 'absolutely not' to 5 'absolutely yes' (alpha = .69). Two additional items assessed whether parents know if their child's friends smoke or will start to smoke [10]. For example: 'I know whether my child's friends smoke or not?' (alpha = .62).

The scales were summed to construct one variable called 'knowledge', that is, however, a measure of perceived, not actual knowledge.

*Psychological control by parents.* The Dutch translation of the parenting style index [16] was converted into seven smoking specific items measuring psychological control regarding smoking. The scale assesses the extent to which parents exert coercive, non-democratic discipline and discourage children to express individuality. For example: 'I would behave unfriendly and keep some distance if my child would smoke'. Responses ranging from 1 'not true at all' to 5 'very true' (alpha = .77).

*Confidence in affecting child's smoking behavior.* Five items measured the confidence of parents that they are able to affect adolescents' smoking behavior [10]. Examples are: 'Do you think that you are able to prevent your child from smoking' and 'If you say that you do not want your child to start smoking, does your child take any notice of that message'. Responses ranged on a 5-point scale from 1 'probably not' to 5 'probably yes' (alpha = .70).

*Availability of cigarettes at home.* This was assessed by 3 items [10]. For example: 'Do you have several packages of cigarettes somewhere at home', with responses ranging from 'never' (1) to 'always' (4) (alpha = .80).

*Norms.* Two items aimed to assess parental views on adolescent smoking [17, 18]: 'Do you approve that your child smokes or would start to smoke?' and 'Do you approve that young people smoke?' Responses ranged from 1 'certainly not' to 5 'certainly yes' (alpha = .79).

*Possible reactions.* Finally, we measured fourteen possible reactions of parents on adolescent experimental and regular smoking [10]. Parents had to indicate whether they would endorse these reactions, on a scale ranging from 1 'definitely not' to 5 'definitely yes.' A factor analysis revealed three factors, namely 1) anger and punishment, 2) *laissez faire* and 3) explaining disappointment. The factor anger and punishment consisted of 6 items (alpha = .84), the factor *laissez faire* consisted of 4 items (alpha = .75) and finally the factor explaining disappointment consisted of 4 items (alpha = .77).

## Strategy for analyses

The main focus of the present study was to explore the relations between parental anti-smoking socialization as the independent variables on the one hand, and actual smoking initiation or maintenance as the dependent variables on the other hand.

First, to examine the associations between parental anti-smoking socialization and adolescent smoking initiation, multivariate logistic regression analyses were computed with adolescent smoking behavior at wave 2 as the dependent variable. These analyses were conducted with the sample of respondents indicating to be non-smokers at wave 1. The dependent variable was assessed by coding the wave 2 never smokers as 0 and ever smokers as 1.

Second, multivariate logistic regression analyses were computed with adolescent smoking behavior at both waves as the dependent variable. The dependent variable that was constructed consisted of the group never smokers (at both waves) coded 0 and the maintainers coded 1. In this way we could test whether parenting variables were related to actual smoking onset as well as smoking maintenance in their

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offspring. Those who had quit ( $N = 13$ ) between both waves were excluded from analyses.

Thirdly, to examine possible differences in anti-smoking socialization between smoking and non-smoking parents and subsequent adolescent smoking initiation and maintenance, these analyses were computed with parental smoking status \* anti-smoking socialization as interaction terms.

Finally, to explore potential differences in parental anti-smoking socialization, ANOVA's were computed comparing households where no parent smoked with those where either one or both parents smoked.

### Results

Of the adolescent sample 58.8% had never smoked by the second wave, 16.0% initiated smoking between the waves, 23.0% smoked at both waves (of which 45% called themselves regular smokers and 55% considered themselves still to be experimenters) and 2.2% indicated they had quit.

*Longitudinal logistic regression on adolescent smoking initiation.* This analysis, presented in Table 1, demonstrated that 'knowledge about friends and own child's smoking' was significantly associated with a decreased likelihood of adolescent smoking initiation. It should be noted that the variables 'psychological control' as well as 'anger and punishment' almost reached significance ( $p < .07$  and  $p < .10$  respectively). Adding the interaction terms revealed a significant interaction for the parental reaction pattern 'anger and punishment' by parental smoking, indicating that for adolescent never-smokers, non-smoking parents would show high levels of anger and punishment in the case of smoking detection as compared with smoking parents, while for adolescent smoking initiators the smoking parents scored themselves higher on the anger and punishment scale as compared with the non-smoking parents.

*Longitudinal logistic regression on adolescent smoking maintenance.* This analysis demonstrated on the one hand that 'confidence in effecting child's smoking behavior' and the parental reaction pattern 'anger and punishment' were significantly associated with a decreased likelihood of adolescent smoking maintenance (see Table 1). On the other hand, the fact that parents smoke themselves was significantly associated with a higher likelihood of adolescent smoking maintenance. It should also be noted that the variable 'parental communication' almost reached significance ( $p < .08$ ). When the interaction terms were added, it was revealed that there is a significant interaction for the parental reaction pattern 'anger and punishment' by parental smoking ( $p = .003$ ,  $OR = 3.68$ ). This indicates that for adolescent never-smokers, non-smoking parents would show high levels of anger and punishment in the case of smoking detection as compared with smoking parents. However, for the group adolescent smoking maintainers the non-smoking parents scored themselves lower on the anger and punishment scale as compared with the smoking parents. Hence, smoking parents have the same level of anger and punishment, either if their child is a never smoker or a maintainer.

The interaction of parental smoking status with the parental reaction pattern 'explaining disappointment' reached almost significance ( $p < .07$ ), meaning that smoking parents explain their disappointment more frequently compared with non-

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smoking parents in the case that their child continues to smoke. For adolescent never smokers, on the other hand, smoking parents showed lower frequencies of explaining their disappointment compared to non-smoking parents.

Table 1. Logistic Regressions of Adolescent Smoking Initiators and Maintainers on Parental Anti-smoking Socialization and Smoking Status

	Initiators <sup>1</sup>			Maintainers <sup>2</sup>		
	Odds ratio	95% CI Lower	95% CI Upper	Odds ratio	95% CI Lower	95% CI Upper
<i>Parental anti-smoking socialization</i>						
Communication	1.29	.87	1.90	1.36	.96	1.91
House rules	1.10	.84	1.45	1.16	.88	1.52
Warnings	1.12	.82	1.53	1.24	.92	1.68
Knowledge about friends and own child smoking	<b>.58*</b>	.36	.92	.75	.49	1.16
Psychological control	1.66	.95	2.88	1.51	.88	2.59
Confidence in effecting child's smoking behavior	1.11	.65	1.88	<b>.57*</b>	.35	.94
Availability of cigarettes	1.31	.79	2.17	1.11	.73	1.67
<i>Parental norms about adolescent smoking</i>						
Approval friends and own child smoking	.98	.62	1.55	1.06	.72	1.56
<i>Parental reaction pattern on own child's smoking detection</i>						
Anger and punishment	.70	.46	1.07	<b>.62*</b>	.42	.93
Laisser faire	1.12	.73	1.73	.90	.59	1.37
Explaining disappointment	.80	.45	1.41	1.09	.65	1.85
<i>Parental smoking status</i>						
Non-smoking parents	Ref.			Ref.		
At least one smoking parent	.85	.40	1.82	<b>2.96**</b>	1.59	5.50

\* $p < .05$ . \*\*  $p < .01$ . \*\*\*  $p < .001$ .

<sup>1</sup> *Initiators*: indicated to be a never smoker at the first wave and to have smoked the second wave

<sup>2</sup> *Maintainers*: indicated to be a smoker at the first wave and second wave

Significant Odds ratios printed in bold

*Smoking and non-smoking parents.* In Table 2, ANOVAs are presented which show robust differences between smoking and non-smoking parents on the anti-smoking socialization measures. It appears that smoking parents communicate and warn their children more about the negative consequences of smoking as compared to non-smoking parents. Non-smoking parents, on the other hand, apply more house rules, have more knowledge about their child's and his or her friends' smoking, exert more psychological control and are more confident in affecting their child's smoking behavior. Smoking parents had more cigarettes available in the house and showed greater approval of both adolescent smoking in general and their child's own smoking.

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In respect to parental reaction patterns of smoking detection, non-smoking parents explained more disappointment when confronted with their child experimenting with smoking.

To examine whether those differences in anti-smoking socialization between smoking and non-smoking parents had any impact on smoking initiation or maintenance we conducted multivariate logistic regressions on all the socialization variables with the parental smoking status as interaction term. As mentioned previously, for both smoking initiators as well as maintainers, the parental reaction pattern 'anger and punishment' showed a significant interaction effect with parental smoking status.

Table 2. ANOVAs of Parental Anti-smoking Socialization for Smoking and Non-smoking Parents

	Non-smoking parents N = 384			At least one smoking parent N = 215		
	M <sup>1</sup>	95% CI Lower Upper		M <sup>1</sup>	95% CI Lower Upper	
<i>Parental anti-smoking socialization</i>						
Communication	<b>2.26***</b>	2.19	2.33	<b>2.50</b>	2.40	2.60
House rules	<b>3.76***</b>	3.66	3.86	<b>2.79</b>	2.68	2.90
Warnings	<b>2.98**</b>	2.89	3.07	<b>3.20</b>	3.09	3.32
Knowledge about friends and own child smoking	<b>3.50*</b>	3.44	3.55	<b>3.39</b>	3.31	3.47
Psychological control	<b>2.45**</b>	2.39	2.51	<b>2.29</b>	2.22	2.37
Confidence in effecting child's smoking behavior	<b>3.60***</b>	3.54	3.65	<b>3.36</b>	3.29	3.43
Availability of cigarettes	<b>1.02***</b>	1.01	1.04	<b>2.10</b>	1.98	2.21
<i>Parental norms about adolescent smoking</i>						
Approval friends and own child smoking	<b>1.23***</b>	1.18	1.28	<b>1.46</b>	1.36	1.56
<i>Parental reaction pattern on own child's smoking detection</i>						
Anger and punishment	2.61	2.54	2.69	2.53	2.43	2.63
Laisser faire	1.73	1.67	1.79	1.81	1.72	1.90
Explaining disappointment	<b>4.45*</b>	4.40	4.50	<b>4.36</b>	4.28	4.43

\* $p < .05$ . \*\*  $p < .01$ . \*\*\*  $p < .001$ .

<sup>1</sup> Significant differences printed in bold

## **Discussion**

Anti-smoking socialization practices were explored in a cohort of 600 families. The associations between anti-smoking socialization and early-adolescent smoking initiation and maintenance were examined longitudinally. Furthermore, differences in parental anti-smoking socialization practices were explored for both smoking and non-smoking parents, and we tested whether the magnitude of effects of anti-smoking socialization on smoking onset differed for smoking and non-smoking parents.

Following suggestions made by Chassin et al. [13] that smoking initiation and smoking maintenance might have different determinants, we closely focused on those parental socialization variables that are assumed to affect the early stages of adolescent smoking [1,10,19,20]. In our study 'knowledge about friends and own child smoking' was associated with lower likelihood of smoking initiation, while the variables 'confidence in affecting child's smoking behavior' and 'anger and punishment' were associated with lower likelihood of smoking maintenance. However, we found no differences between predictors of smoking initiation and smoking maintenance for more concrete parenting practices, such as communication, house rules, warnings and availability of cigarettes. But in the case of smoking maintenance the parental smoking status was strongly associated with an increased likelihood of smoking maintenance. This is in agreement with the study by Chassin, Presson, Sherman, Montello and McGrew [13] that noted that smoking initiation and smoking maintenance might indeed have different determinants.

In the literature [1,2,3,21], it is suggested that children who have not yet tried smoking are likely to try smoking, when they have smoking parents, cigarettes available at home and have parents with permissive norms and attitudes towards smoking [9]. In our study, however, none of these variables were associated with early adolescent smoking initiation. Only parental knowledge about the smoking behavior of their child and his or her friends was associated with a reduced likelihood of smoking initiation. Our finding is in agreement with previous studies that have demonstrated that parental monitoring prevents adolescents from experimenting with smoking [22, 23]. For smoking maintenance, parental smoking status also played a crucial role as has been suggested in the literature [24].

Another important finding is that high parental confidence in their ability to control their child's smoking behavior, was associated with a lower likelihood of smoking maintenance in their children. However, one should keep in mind that this measure of parental confidence is not a measure of a concrete parental practice, but rather reflects a parenting style. Darling and Steinberg [25] point out that concrete parenting practices do differ from the more general parenting styles. They have argued that the general parenting style moderate the efficacy of specific parenting practices.

With regard to parental anti-smoking socialization and early adolescent smoking initiation, previous studies have reported mixed results. In a longitudinal study, Chassin, Presson, Rose, Sherman and Todd [20] showed that specific smoking conversations are associated with a lower likelihood of adolescent smoking. In cross-sectional studies by Jackson and Henriksen [9] and Henriksen and Jackson [8], they also found lower rates of adolescent smoking initiation when parents engage in anti-smoking socialization. However, Ennett, Bauman, Foshee, Pemberton and Hicks [11] reported that there is no longitudinal effect of parent-child communication about

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tobacco on adolescent smoking initiation. The results of Ennett et al. are supported by our findings. In respect to parental communication, house rules and warnings, we found no associations with adolescent smoking initiation or maintenance. Hence, future research should be conducted that specifically investigate the discrepancy between these conflicted findings.

Another purpose of the study was to determine whether smoking and non-smoking parents differ in their antismoking socialization. Our results clearly indicate that smoking and non-smoking parents strongly differ in norms and attitudes about smoking. Though many smoking parents try to communicate the overall message that smoking is bad, they do not support that message with concrete behaviors, such as setting house rules, reducing availability of cigarettes or acquiring as much knowledge about their child's smoking. Furthermore, with regard to the aforementioned measure of parental confidence in affecting their child's smoking, smoking parents are less confident about the way they can deal with their child's smoking behavior and show stronger approval of adolescent smoking. Our findings support those of Clark, Scarisbrick-Hauser, Gautam and Wirk [26] who demonstrated that smoking parents believed that teen smoking is not worth getting into a conflict with their children about and they additionally feel that they need not involve themselves actively in their children's decisions regarding smoking. However, although those crucial differences between the smoking and non-smoking parents seem straightforward, they only have a strong influence in the case of early adolescent smoking maintenance, not the first phase of experimentation.

When it comes to smoking detection of their child, non-smoking parents would explain their disappointment to their child significantly more than smoking parents. It is noteworthy to mention that on closer inspection of our results, the effect of using the strategy 'anger and punishment' when finding out that the child starts smoking, only prevents children of non-smoking parents from smoking. High levels of 'anger and punishment' were associated with a higher likelihood the child was a never smoker, while low levels of 'anger and punishment' were associated with smoking maintenance. This finding implies that for non-smoking parents the fact that they are willing to show their anger in the case of the child's smoking and punish in an effective way, they influence the smoking behavior of their child. This finding warrants further research to determine whether different levels of parental 'anger and punishment' contribute to differences in the smoking careers of adolescents.

What can parents do in terms of adolescent smoking prevention? Since smoking parents are prone to a more passive attitude when it comes to putting their words into action, as shown by more communication and warnings that is not accompanied by setting rules or having less cigarettes available in the house, their child will have a higher likelihood of smoking maintenance. The dilemma that this study brings up is that, if parents care, they know what their child is up to when it comes to smoking, and if they know what their child is up to, it seems they can prevent their child from continuing to smoke. But, if parents smoke themselves, the job of trying to prevent their child to continue to smoke seems a more complex one and demands their conscious effort to reach this goal. Anti-smoking socialization practices may be an important component of public health campaigns to discourage adolescent smoking, since it is easier to achieve a change in parents' anti-smoking socialization practices than to change parents' global parenting practices [11]. Further,



smoking parents are less likely to take action to prevent their children from smoking [19]. Smoking parents may think that engaging in anti-smoking socialization practices will do more harm than good when they give their children mixed messages, such as “don’t do what I do, but do what I say”. Findings of the present study, however, imply that what parents do (their own smoking) is not more important than what they say. Although the benefits of parents who quit smoking should not be underestimated, smoking parents should nevertheless be encouraged to communicate anti-smoking messages to children [8,9].

Some shortcomings of the study should also be mentioned. First of all, parental reports were only assessed once at the first wave, therefore changes in the way parents deal with smoking specific issues in relation with the changes their child is going through in this specific age frame, were not measured.

Non-smoking parents were slightly over-represented in this sample [27]. Parents volunteered to fill out a questionnaire that was sent to their homes and they might be interested in the main topic of the study or wanted to contribute purposefully in order to help children with regard to smoking.

Another limitation is the use of adolescent self-reports regarding their own smoking behavior. However, the prevalence of ever smoking and the increase of ever smoking between the two waves is similar to smoking prevalence in the Netherlands [27].

In summary, the findings of this study suggest that it is not specific concrete parental behaviors, such as setting house rules or warn about the dangers of smoking, but rather a general parental attitude, reflecting itself in having knowledge about friends and own child's smoking or to have confidence one can affect his or her child's smoking, that affects the early phases of adolescent smoking. Further studies, therefore, should focus on the link between general and smoking-specific parenting practices.

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## **Chapter 4**

# **Parental Support and Control and Early Adolescent Smoking: A Longitudinal Study**

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### Abstract

The aim of this study is to examine the role of parenting styles, parental support and control, on young adolescent smoking initiation, increase, continuation and cessation. Longitudinal data, collected every six months over a year period, were collected in the Netherlands among 1,012 young adolescents (12 - 13 year-olds on average) in the first grade of secondary school. Longitudinal logistic regressions demonstrated that only low parental control significantly predicted adolescent smoking initiation. Parental support and control did not predict an increase in adolescent smoking. Additionally, we found that parental smoking was important in predicting adolescent smoking continuation. These findings demonstrate the relative importance of parenting styles to adolescent smoking and these findings are then related to implementation in smoking prevention programs.

### Introduction

In the study of adolescent smoking, two family factors that influence adolescent smoking have been identified. These factors are social influences and genetic influences, which have been shown to be primary sources of transmission underlying individual differences in adolescent smoking (e.g., Avenevoli & Merikangas, 2003; Vink, Willemsen, Engels & Boomsma, 2003; White, Johnson & Buyske, 2000). In addition to the adolescent's genetic make-up (Vink et al., 2003), social influences also play an important role in adolescent smoking (e.g., Bell, Pavis, Amos & Cunningham-Burley, 1999). The social life of the adolescent is embedded in his or her family structure and this family structure has its own specific characteristics, styles of parenting, and interactions between the family members. In this study, we will focus on the role parenting styles have in the onset and transition to regular smoking in early adolescence (see Avenevoli & Merikangas, 2003, for a review of the literature). Additionally we will examine whether parenting plays a role in the continuation of low levels of experimentation, i.e. experimentation with a frequency of less than once a month (Mayhew, Flay & Mott, 2000) or quitting after a short period of experimentation.

Researchers that have focused on patterns of interaction between parents and children have identified several major dimensions in which families differ and that are significant for the child, such as quality and amount of communication, responsiveness to the child's needs, the manner in which control is exercised, and the emotional climate. Parents are faced with the task of coping with children who do things against their wishes or children that refuse to obey. As parents they have to make clear what the rules are and what the consequences of disobeying are by exerting control in a consistent way. Control is a continuum that ranges from permissiveness to restrictiveness. Restrictive parents are less likely to explain rules to the child and they use directives to control their child, as opposed to permissive parents, who exert too little control (Bee, 1995). In previous studies researchers have found that in addition to control, support is also an important variable associated with adolescent smoking (e.g., Chassin, Presson, Rose, Sherman, Davis & Conzalez, 2005; Jackson, Bee-Gates & Henriksen, 1994). Support is described as the variation in the amount of

responsiveness by the parents, such as responding to the child needs in a sensitive way or responding to the child's signals in an appropriate way (Bee, 1995).

Most studies on adolescent smoking have concentrated on a variety of parental behaviors that might be associated with adolescent smoking, such as communication about smoking, setting house rules, punishment and reward of the child, and parental monitoring of child behaviors, or they use variables tapping into specific aspects of parental control and support, such as nurturing/involved parenting and harsh/inconsistent discipline (e.g., Cohen, Richardson & LaBree, 1994; Jackson & Henriksen, 1997; Melby & Conger, 1993). However, until now only a few studies have employed the concept of parenting styles to predict adolescent smoking, and each study employed different operationalizations. Simons-Morton, Crump, Haynie, Saylor, Eitel, and Yu (1999) studied authoritative parenting, parental knowledge, and parental conflict. This cross-sectional study found that for boys authoritative parenting reduced the likelihood of smoking, whereas for girls having knowledgeable parents reduced the likelihood of smoking. In a longitudinal study Pierce, Distefan, Jackson, White, and Gilpin (2002) examined strong and weak authoritative parenting styles. They reported that a strong authoritative parenting style is associated with a reduced risk of future adolescent smoking initiation among never smokers, regardless of parental smoking status.

In a cross-sectional study, Koetting O'Byrne, Haddock, Poston, and the Mid-America Heart Institute (2002) employed a one dimensional parenting style measure, the Family of Origin Scale (FOS) which combines measures of autonomy and intimacy into one score. Their findings indicate that although parenting style does not appear to be predictive of early smoking experimentation, it is predictive of adolescent regular smoking. In a recent study Chassin et al. (2005) tested whether adolescent smoking was predicted by smoking-specific parenting practices or by a more general parenting style. With regard to smoking specific parenting and adolescent smoking increase, they found that the positive influence of smoking specific parenting, that is, reduced likelihood of adolescent smoking increase, was only found for non-smoking parents. With regard to general parenting they found strong support for the influence on adolescent smoking. Low levels of parental control and acceptance were associated with adolescent smoking initiation for both smoking and non-smoking parents. Our study aims to contribute to this field of research by investigating, whether general parenting styles also predict several transitions in early adolescent smoking status in a group of adolescents in the first year of secondary school.

Baumrind (1991) distinguished four parenting types based on the two parenting styles, support (responsiveness) and control (demandingness). The four parenting types are: authoritative parenting (or democratic; high support and control), neglectful parenting (low support and control), permissive parenting (high support and low control), and authoritarian parenting (low support and high control) (Baumrind, 1991). These parenting types are associated with a wide range of adolescent outcomes, such as social competence, autonomy, self-esteem, deviance, delinquency, peer group orientation, food intake, and academic performance (e.g., Kremers, Brug, de Vries & Engels, 2003; Shucksmith, Hendry & Glendinning, 1995; Smetana, 1995; Steinberg, Lamborn, Darling & Mounts, 1994). We studied the parental styles of Baumrind (1991) by looking at the support and the control dimension separately and testing

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whether there was an interaction between them as suggested by Aunola and Nurmi (2005) in their study of parenting styles and children's problem behaviors.

We also examined whether parental smoking influences adolescent smoking (e.g., Harakeh, Scholte, de Vries & Engels, in press; Jackson & Henriksen, 1997; Exter Blokland, Engels, Hale, Meeus & Willemsen, 2004). The role of parental smoking in the development of adolescent smoking has received much attention in the literature. Although there is considerable evidence that parental smoking is associated with their offspring regularly smoking later in life, there is a debate whether parental smoking affects a child's smoking experimentation (Bauman, Foshee, Linzer & Koch, 1990; Conrad, Flay & Hill, 1992; White, Johnson & Buyske, 2000). In the present study we will not only investigate the direct effects of parental smoking on early adolescent smoking initiation and increase, but we will also test the moderating role of parental smoking on the associations between parenting and adolescent smoking.

In sum, the aims of the current study are to explore associations between early adolescent smoking behavior and parenting. As we previously noted, we believe our study is a welcome addition to the literature, because this study focuses only on young adolescents, covering the period when smoking initiation occurs, and directly relates initiation to parenting styles.

Our short-term longitudinal design with three waves over a period of one year enables us to identify those early adolescents who make the transition from never smoker to occasional smoking (Fergusson & Horwood, 1995), that is, less than once a month, or who make the transition from occasional smoking to regular smoking. Additionally we explore associations between parenting and the continuation of occasional smoking and between parenting and quitting. To assess these associations, we first tested if smoking initiation between first and second waves (a six month period) was predicted by parenting at the first wave (T1). Secondly we tested if smoking initiation between second (T2) and third wave (T3) (also a six month period) was predicted by parenting assessed at the second wave. Thirdly increase in smoking was analyzed by first wave parenting for the group who smoked at T1 and increased their use at T2, and second wave parenting style for the group who smoked at T2 and increased their use at T3. Finally we tested the associations between parenting and adolescents that quit smoking and between parenting styles and adolescent low levels of smoking at all three waves.

## Method

Data used in this study were collected from a large scale three wave longitudinal study in the Netherlands among early adolescents in their first year of secondary school. A total of five schools participated and provided the necessary classrooms and teachers who administered the questionnaires during a regular school hour. The teachers received instructions regarding the purpose of the questionnaire and means of administration in advance. The first wave (T1) was conducted in the fall of 2000, the second wave (T2) was conducted that same school year six months later, and the third wave (T3) approximately 6 months later, at the beginning of their second year of secondary school. Testing procedures were identical for all three waves. Initially 1,209 respondents were invited to participate in this research project; attrition over the waves was only due to student absence on the day of measurement. None of



the adolescents refused to participate initially. Respondents, however, who did not participate in all three waves or had missing data on criterion variables, were excluded from the analyses, which resulted in 1,012 respondents. Attrition analysis showed that adolescents excluded from the analyses due to incomplete data smoked significantly more on the T1 smoking measure ( $T(1,209) = 2.03, p < .05$ ). However, no significant differences were found between the excluded and included adolescent groups for the parental support and control styles.

The parents were informed about the study's objectives and were given the opportunity to withdraw their child from the study (passive informed consent). None of the parents refused participation. The respondents were informed that their responses would be kept strictly confidential and the testing procedures at school were organized to assure this confidentiality by (1) giving each respondent an envelope in which the questionnaire could be put into, (2) the teacher had to put each envelope in a box and bring it to the coordinator at the school immediately after administration, and (3) the questionnaire could only be identified by the researcher, no names were written on the questionnaires. To increase the motivation to participate, the respondents could win a music compact disc at each wave. The winners at each school were announced shortly after participation in that particular wave.

A total of 520 boys (51.4%) and 492 girls (48.6 %) participated. The ages varied between 11 and 14 years (T1:  $M = 12.29, SD = .50$ ) at the first wave. At T1, 89.8% of the respondents lived with both their parents; the other 10.2% lived in a broken home situation. A total of 4.1% reported to have an ethnic background not of Dutch origin. At T1 all the schoolchildren were enrolled in their first year of secondary education: trade school (36.2%), high school (33.2%) and preparatory school (30.6%).

## **Measures**

*Adolescent smoking.* A widely employed method to assess smoking was used (Kremers, Mud n a de & de Vries, 2001). Respondents had to indicate their (non)smoking behavior on a 7-point scale, ranging from 1 ("I have never smoked, not even one puff") to 7 ("I smoke at least once a day"). In order to conduct logistic regressions the scores were dichotomized. Four variables were subsequently constructed: (1) one variable to identify smoking initiation between the first and the second wave; those respondents indicated to be a never smoker at T1 but had smoked at T2; (2) one variable to identify smoking initiation between the second and the third wave; those respondents indicated to be a never smoker at T1 and T2 but had smoked at T3; (3) one variable to identify smoking increase between T1 and T2 and (4) between T2 and T3. To account for all respondents we constructed several variables to identify those who smoked at low levels (we use the term occasional smokers: less than once a month) but did indicate this at each wave, and those who reported smoking at T1 and/or T2 but had quit at T3.

*Parental smoking.* This was determined by first asking the adolescent whether the father and mother currently smoked. If the respondent indicated that one or both parents smoked, we asked about the frequency of smoking: less than once a month, once a month, a few times a month, a few times a week, and daily. One variable was constructed to differentiate between non-smoking and (one or two) smoking parents.

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We coded a parent as a smoker, if the respondent indicated parental smoking at any wave. We coded a parent as a non-smoker, if the respondent indicated that the parents were non-smokers at at least two waves. Respondent who provided no classifiable information were excluded.

*Parenting.* The parenting styles were measured by the Dutch version of the Parenting Scales of Lamborn, Mounts, Steinberg, and Dornbusch (1994) (see also: Exter Blokland, Engels & Finkenauer, 2001; Finkenauer, Engels & Baumeister, 2005; Kremers et al., 2003). The total scale of 19 items consists of two subscales, namely support (11 items) and control (8 items). Respondents were asked to rate their parents in specific situations, for example, “My parents take time to talk with me” and “If I get bad grades at school, my parents encourage me to perform better”. Response categories ranged from 1 (‘not true at all’) to 5 (‘absolutely true’) on a 5-point scale. The internal consistencies of the subscales were: support: T1  $\alpha = .80$ , T2  $\alpha = .86$ , T3  $\alpha = .84$ ; control: T1  $\alpha = .71$ , T2  $\alpha = .76$ , T3  $\alpha = .75$ .

### Strategy for analyses

Descriptive analyses were first conducted on adolescent smoking, perceived parenting and parental smoking.

For the longitudinal analyses on smoking onset, we selected the non-smokers at T1 and T2, respectively, and predicted whether respondents initiated smoking at the subsequent wave (Engels, Finkenauer, Kerr & Stattin, in press; Engels, Knibbe, de Vries, Drop & Breukelen, 1999; Harakeh et al., in press; Vink et al., 2003). For the analyses on smoking increase we selected and compared two groups; those adolescents who did smoke less than once a month at T1 and continued to do so at T2, compared with those who increased their smoking level to more than once a month at T2. A similar strategy was followed for analyses on this transition between T2 and T3.

Thus, a total of four groups were composed for the longitudinal logistic regressions. Each group indicated transition or stability of their smoking status between the waves: (1) never smoker versus initiator between T1 and T2, (2) never smoker versus initiator between T2 and T3, (3) smokers who smoke less than once a month versus those who increased their use to more than once a month between T1-T2, (4) smokers who smoke less than once a month versus those who increased their use to more than once a month between T2-T3.

Four logistic regression analyses were computed. In the first, smoking initiation between first and second wave was predicted by the control variables (age, sex, living arrangement, educational level, and parental smoking status) and reported parenting at T1. In the second analysis smoking initiation between second and third wave was determined and analyzed by second wave parenting. In the third and fourth analysis both groups that increased their smoking levels between T1-T2 and T2-T3, respectively, to more than once a month were analyzed. Finally we conducted additional analyses to determine the relationship between parenting and quitting and to determine the relationship between parenting and the continuation of occasional smoking, that is, less than once a month but at each wave.

To determine whether the role of parenting differs for smoking and non-smoking parents, a parental smoking status \* parental style interaction term was added

in the final step of the analysis. We tested also for interaction between the support and control styles.

It is possible that parental behaviors not only affect subsequent smoking in their offspring, but engagement of children in smoking in its turn provokes responses in parents. For instance, it is possible, when children start to experiment with smoking and parents find out about it that the latter will increase efforts to control their children (see Stattin & Kerr, 2000). In order to test whether smoking initiation influences subsequent parenting we applied a multivariate general linear model (GLM) to calculate whether parenting before the occurrence of smoking initiation differs from parenting after smoking initiation. This could only be tested for the group that had initiated smoking at T2, controlled for first wave parenting and calculating whether there was a difference on the subsequent measurement of parenting at T3 compared to those respondents that had remained never smokers T3.

## **Results**

### *Adolescent Smoking Characteristics*

Smoking initiation occurred in 8.3% of the adolescent sample between T1- T2 and 9.9% of the adolescents had initiated smoking between T2-T3. Regular smoking (i.e., more than once a month) increased from 4.5% at T1 to 8.3% at T2 and finally to 13.4% at T3.

Occasional smoking (i.e., less than once a month) increased from 4.5% at T1 to 5.1% at T2 and finally to 9.9% at T3. Within this group of occasional smokers a total of 3.4% continued to smoke less than once a month during each wave. The transition from occasional to regular smoking was made by 4.5% of the respondents between T1 and T2, and by 5.3% between T2 and T3. A total of 14.0% of the sample indicated some level of smoking at T1 or T2 but indicated to be a non-smoker at T3. At T3, 55.9% of the adolescents had reported to be a 'never smoker' over all three waves.

With respect to parental smoking, 503 respondents (49.7%) lived with two non-smoking parents, 322 (31.8%) lived with one smoking parent, and 187 (18.5%) with two smoking parents. Of those respondents with one or two smoking parents, 409 (40.4%) indicated to have a smoking father and 314 (31.0%) to have a smoking mother. Pearson correlations of the parental smoking status between the waves were all significant; mothers: T1 - T2 ( $r = 0.90$ ;  $p < .01$ ) and T2 - T3 ( $r = 0.73$ ;  $p < .01$ ); fathers: T1 - T2 ( $r = 0.88$ ;  $p < .01$ ) and T2 - T3 ( $r = 0.65$ ;  $p < .01$ ).

### *Stability of Parenting*

Mean scores on the parental control style were fairly stable (T1:  $M = 3.51$ ,  $SD = .67$ ; T2:  $M = 3.45$   $SD: .70$ ; T3:  $M = 3.47$   $SD: .67$ ). Pearson Correlations between T1 - T2 and T2 - T3 on this dimension were  $r = .51$  and  $r = .53$  ( $p < .001$ ) respectively. Reports on the parental support style were higher (T1:  $M = 4.03$   $SD: .53$ ; T2:  $M = 3.97$   $SD: .61$ ; T3:  $M = 3.98$   $SD: .64$ ). Correlations on the support dimension were  $r = .53$  between T1 and T2, and  $r = .56$  ( $p < .001$ ) between T2 and T3.

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### *Longitudinal analyses of Parenting Styles and Parental Smoking on Transitions in Smoking Stages among Adolescents*

All analyses presented were controlled for the background variables age, gender, educational level, parental smoking status, and living arrangement (two parent family or broken home). Additionally we tested for two types of interactions in the final step of each analysis, namely, 1) support \* control, and 2) interactions between support or control and parental smoking status.

The first two longitudinal logistic regressions presented in Table 1 demonstrated that the associations between the predictor variables support and control, and adolescent smoking initiation between T1 and T2 as well as between T2 and T3 (first and second column) were significant for the control dimension only. In this second analysis on smoking initiation between T2 - T3, the interaction between control and parental smoking status was significant ( $OR = .39, p < .05$ ). Further examination indicated that for smoking parents only, higher levels of control are associated with lower likelihood of smoking initiation ( $OR = .37, p < .01$ ). Additionally, a separate analysis of the smoking and non-smoking parents for smoking initiation between T1 and T2 resulted in a similar contribution of control, however the interaction control \* parental smoking status did not reach significance in this analysis.

The third and fourth logistic regression analyses presented in Table 1 demonstrated that the predictor variables support and control were not associated with an increase of smoking from less than once a month to more than once a month. When we selected children who indicated that they smoked during all three waves but with a frequency of less than once a month ( $N = 34$ ) and contrasted them with never smokers ( $N = 566$ ) we found that the only significant association was with the parental smoking status ( $OR = 2.52, p < .05$ ). Children that smoked less than once a month during all three waves were most likely to be children of smoking parents. It is noteworthy that the control dimension almost reached statistical significance in this analysis ( $OR = .60, p < .10$ ).

Furthermore, in an analysis to test associations between parenting and quitting no significant predictors were found for children who were smokers at T1 or T2, but had quit at T3 ( $N = 142$ ) when contrasted with those who still smoked at T3 ( $N = 163$ ). In this analysis, however, the interactions control \* parental smoking status as well as support \* parental smoking status were both significant ( $OR = .47, p < .05$  and  $OR = 2.28, p < .05$  respectively). Separate analyses for the group with smoking ( $N = 184$ ) and non-smoking parents ( $N = 121$ ) presented in Table 2 showed that for the group with non-smoking parents, parental control was associated with a higher likelihood of quitting as compared to the group with smoking parents. The analysis for the group of smoking parents demonstrated that parental support was associated with a higher likelihood of quitting as compared to the group with non-smoking parents.

Table 1. Logistic regressions of parenting dimensions on early adolescent T2 & T3 smoking initiation and T2 & T3 smoking increase.

Parenting dimension	Smoking initiation <sup>1</sup> between T1 and T2 by first wave parenting (N = 750)			Smoking initiation <sup>1</sup> between T2 and T3 wave by second wave parenting (N = 666)		
	OR	95% CI		OR	95% CI	
		Lower	Upper		Lower	Upper
Control	.61*	.41	.89	.69* <sup>3</sup>	.48	.99
Support	.89	.55	1.43	.89	.60	1.33
Parenting dimension	Smoking increase <sup>2</sup> between T1 and T2 by first wave parenting (N = 97)			Smoking increase <sup>2</sup> between T2 and T3 by second wave parenting (N = 214)		
	OR	95% CI		OR	95% CI	
		Lower	Upper		Lower	Upper
Control	1.66	.90	3.08	.71	.40	1.27
Support	1.22	.54	2.74	.82	.48	1.40

Note: \* $p < .05$ . OR = Odds Ratio; 95% CI = 95% Confidence Interval

All analyses controlled for the background variables age, gender, educational level, parental smoking status and living arrangement (two parent family or broken home) and tested for two types of interactions: 1) support x control, 2) interactions between support or control and parental smoking status.

<sup>1</sup> Reported to be a never smoker initially, but reported to have smoked at the subsequent wave (N = 84 at T1; N = 100 at T2), contrasted with never smokers (N = 666 at T1; N = 566 at T2).

<sup>2</sup> Increased smoking level from less than once a month to more than once a month

(N = 46 at T1; N = 54 at T2), contrasted with the group that continued to smoke less than once a month (N = 51 at T1; N = 160 at T2).

<sup>3</sup> The interaction term control x parental smoking status reached significance (OR = .39,  $p < .05$ ), additional analysis indicated that for smoking parents only, control is associated with lower likelihood of smoking initiation (OR = .37,  $p < .01$ ) and not for non-smoking parents (OR = .77, n.s.)

Table 2. Logistic regressions of parenting dimensions on early adolescent T3 smoking cessation for the groups with smoking and non-smoking parents

Parenting dimension	Smoking cessation <sup>1</sup> at T3 by second wave parenting Smoking parents (N = 184)			Smoking cessation at T3 by second wave parenting Non-smoking parents (N = 121)		
	OR	95% CI		OR	95% CI	
		Lower	Upper		Lower	Upper
Control	.91	.56	1.48	1.89*	1.06	3.35
Support	1.90*	1.11	3.24	.84	.46	1.54

Note: \* $p < .05$ . OR = Odds Ratio; 95% CI = 95% Confidence Interval

All analyses controlled for the background variables age, gender, educational level, and living arrangement (two parent family or broken home) and tested for the interaction between support and control.

<sup>1</sup> Indicated to be smokers at T1 and/or T2, but had quit at T3 (N = 142, of which 60 had non-smoking parents and 82 had smoking parents), contrasted with the group that continued to smoke at T3 (N = 163, of which 61 had non-smoking parents and 102 had smoking parents).

## Discussion

The present study investigated the associations between the parenting styles of support and control on the one hand, and early adolescents' smoking (initiation and increase from occasional to regular smoking) on the other hand. We also tested whether parenting styles significantly contributed to smoking cessation and/or the continuation of low levels of smoking.

We found that smoking initiation could be predicted by parental control, indicating that higher levels of parental control are associated with lower likelihood of adolescent smoking initiation. Increases in smoking were not predicted by any of the parenting styles. None of the background variables reached statistical significance in our multivariate analyses, except in the case of smoking initiation between T2 - T3; the interaction between parental control and parental smoking status was significant. Examination of this interaction indicated that for smoking parents only, control is associated with lower likelihood of adolescent smoking initiation.

For occasional adolescent smoking no significant associations were found with regard to the parental styles. However, the continuation of occasional smoking was positively predicted by parental smoking. With respect to quitting a different picture emerged; for both support and control the interaction with parental smoking status was significant. In further analyses the following differences for smoking and non-smoking parents became apparent. Children of smoking parents who reported high levels of parental support were most likely to be quitters, while on the other hand children of non-smoking parents who reported high levels of parental control were most likely to be quitters.

### *Parenting*

With regard to the two parenting styles our findings show that in the case of adolescent smoking initiation the parental control style plays an important role. In Baumrind's classification control is high in both democratic as well as authoritarian parenting, while permissive and neglecting parenting are low on control. Jackson, Bee-Gates, and Henriksen (1994) found that high parental control was positively associated with child competencies, such as school achievement and social skills. Child competencies, in turn, were protective factors in preventing children from smoking. Our findings are only partially supportive of this finding, since increased levels of child competencies could not be addressed with our study design.

Although previous studies (e.g., Chassin et al., 2005; Jackson, Bee-Gates & Henriksen, 1994) have reported that in addition to control support is also an important variable associated with adolescent smoking, we, however, found no associations with this parenting style in the case of smoking initiation and increase to regular smoking. A possible explanation is that judged by their children Dutch parents in this sample scored high on this style (see Engels, Finkenauer, Kerr & Stattin, 2005) and continue to be supportive of their children in subsequent waves.

Our main finding that a lack of parental control has an impact on the young adolescent's decision to initiate smoking, but not on the adolescent's subsequent transition to increase smoking to more regular levels, is interesting. As mentioned before, parents are faced with the task of coping with children who go against their wishes. They have to make clear what the rules are and apply them by exerting control. This study demonstrates that the consequences of not exerting this parental

control are twofold: on the one hand rules are not clear, and on the other hand, there are no consistent responses, if the child displays behavior that parents do not agree with.

The design of this study did not permit us to disentangle whether lack of parental control experienced by the adolescent does in fact imply that parents are not willing or trying to exert control. Stattin and Kerr (2000) demonstrated that with regard to adolescent problem behavior the exertion of parental control is a complex interplay between the willingness of parents to monitor their children and the willingness of the child to disclose information about what he or she is doing. Hence, although we found that a lack of parental control precedes adolescent smoking initiation, an alternative explanation, following the suggestions of Stattin and Kerr (2000), might be that if the adolescent is engaged in some level of smoking, it causes him or her to withdraw from his or her parents. Feelings of guilt induced by smoking secretly or a lack of trust in one's parents to initiate a conversation about one's smoking experiments might play a role in this process (Finkenauer, Engels & Meeus, 2002). Therefore we tested whether smoking initiation had any influence on subsequent parenting by analyzing the group of smoking initiators and tested whether involvement in smoking had an effect on subsequent parenting styles. However, we did not find evidence for this process of parental disengagement, as evidenced by the finding that smoking initiation had no influence on subsequent parenting of (non-)smoking parents, the relatively stable means for both parenting styles, and the high correlations between parenting styles assessed at the three waves.

#### *Parental smoking*

With regard to the role of parental smoking in the development of adolescent smoking we specifically investigated whether parental smoking affects a child's smoking experimentation (Bauman, Foshee, Linzer & Koch, 1990; Conrad, Flay & Hill, 1992; White, Johnson & Buyske, 2000). Our findings do not indicate that parental smoking plays a role in the first phase of adolescent smoking initiation and increase. However, we found some support that smoking and non-smoking parents differ in the way they exert control. Adolescents who indicate that they are beyond the first phases of experimentation are more likely to have smoking parents. Our results support the findings of Pierce et al (2002), who reported that strong parental control is associated with a reduced risk of future adolescent smoking initiation, regardless of parental smoking. Jackson et al. (1994) indicated that authoritative parenting and parental smoking status had independent associations with the early phase of adolescent smoking. With respect to the findings of our study and parental smoking status, the dynamics of this interplay seems to indicate that it is not the parental smoking status as such that predicts smoking outcomes, but rather the way smoking parents exert control in the case of initiation or being supportive in the case of cessation and non-smoking parents exert control with regard to cessation, that illustrates the difference in behaviors between smoking and non smoking parents.

#### *Prevention*

Several suggestions for smoking prevention can be made. Smoking takes place at an early age, as our results show, but smoking levels are relatively low and daily smoking is not yet a habit among these early adolescents in their first year of secondary education. They even might be ambivalent about their experimentation and therefore not consider themselves to be a smoker as Bell et al. (1999) suggest. They

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point out the complex dynamics and variable nature of young teenager's smoking status and their tendency to associate with smoking peers. Prevention programs designed for this group should take this into account because, for example, it might not be peer pressure per sé but rather peer affiliation that inclines young smokers to select peers with the same attitudes and behaviors as Bell et al. (1999) suggest. As we pointed out earlier, parents may play a role in this process of peer selection by means of enforcing control (see also Chassin, Presson, Sherman, Montello, & McGrew J., 1986; Engels, Vitaro, Exter Blokland, de Kemp & Scholte, 2004). With regard to the family situation, our study indicates that it might be fruitful to identify children who experience low parental control, because those children are prone to initiate smoking, regardless of their education, living situation, or parental smoking status. Such identification can easily be done by using short questionnaires at school that measure parenting styles. Parents then can be involved in prevention efforts, be educated about the effects of parental control, and be empowered to cope effectively with smoking in adolescence. Additionally smoking parents can be educated about the influence they have on the smoking experimentation of their adolescent child.

### *Limitations*

Concerning the measurement of adolescent smoking, our use of exclusively self-reports can be viewed as a weakness, since the parents' views were not included, so we were unable to cross-validate our findings. However, smoking self-reports are considered to be reliable and valid as long as total anonymity is guaranteed (e.g., Engels et al., 1999; Williams, Eng, Botvin, Hill & Wynder, 1979). According to Dolcini, Adler & Ginsberg (1996), the findings on smoking behavior by means of self-reports are comparable to those that employ biochemical verification of smoking behavior.

While many studies have assumed that parents are better reporters of their own upbringing behaviors than adolescents are, M. Dekovic (personal communication, September 23, 2005) has noted two compelling reasons why adolescent reports may in fact be the best representation. First off, parents have been found in research to have a strong positive bias of their own upbringing behaviors (Cook & Goldstein, 1993; Jessop, 1981; Paikoff, 1991) and less agreement with outside observers than adolescents have. Secondly, the subjective experience of being “brought up” has more influence on adolescent development (Steinberg, Lamborn, Dornbusch, & Darling, 1992) and is more strongly related to adolescent adjustment than parents' reports of their upbringing behaviors (Gecas & Schwalbe, 1986; Noller, 1995). Dekovic quotes Gecas and Schwalbe (1986) “It is our perception of others' attitude or behavior which are more consequential for our own attitudes and behavior than the actual attitudes or behavior of others” (p. 42). Therefore, in light of our findings, we would suggest that our use of adolescent reports of parental upbringing is justified.

In summary, we investigated whether parenting styles were associated with different stage transitions in adolescent smoking. Our longitudinal findings demonstrated that adolescents who reported low levels of parental control were prone to initiate smoking. However, parenting styles could not predict whether an adolescent became a regular smoker. Additionally, we found effects of parenting on quitting, and parental smoking was important in predicting adolescent smoking continuation of low levels of smoking.



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## Chapter 5

### If Parents Establish a No-Smoking Agreement with their Off-spring, Does this Prevent Adolescents from Smoking? Findings from Three Dutch Studies

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## Abstract

Data from three studies were used to investigate whether the establishment of a no-smoking agreement is an effective tool for parents in preventing adolescents from smoking. We first explored the prevalence of a no-smoking agreement by using data from a national sample involving 4,501 Dutch adolescents. Second, data from a longitudinal study among 595 early adolescents and their parents were used to test whether establishing a no-smoking agreement prevents adolescents from smoking. Third, in a longitudinal study among 856 early and mid adolescents and their parents, we tested whether in addition to the establishment of a no-smoking agreement, the frequency and quality of communication on smoking issues had an effect on adolescent smoking. Findings showed that establishing a no-smoking agreement is not an effective tool for adolescent smoking prevention and in some cases adolescents were even more likely to smoke. Parents who want to prevent their adolescents from smoking should focus their efforts on maintaining good quality of communication on smoking issues instead of implementing a no-smoking agreement. Parents who just talk frequently about smoking issues without considering the quality of the communication might do more harm than good.

## Introduction

In the last decade increasing attention has been paid to the relationships between parental child rearing strategies, parental smoking habits, and their attitudes about juvenile smoking on the one hand, and actual adolescent smoking on the other (e.g., Avenevoli & Merikangas, 2003). In families where parents are affectionate, stimulating and supportive, but also structure their children's activities and control their whereabouts, children are more likely to refrain from smoking (e.g., Engels & Willemsen, 2004; Chassin, Presson, Rose, Sherman, Davis, & Gonzalez, 2005). Furthermore, children who grow up in households, in which parents do not smoke, are less likely to start smoking themselves (e.g., Avenevoli & Merikangas, 2003; Vink, Willemsen, Engels, & Boomsma, 2003).

Recently research has focused on anti-smoking socialization as a specific way parents might prevent onset of smoking in their off-spring. These studies have shown that, for example, restrictive parental policies (Henriksen & Jackson, 1998), establishing no-smoking rules at home, warnings about the effects of smoking (Jackson, 1997), responding constructively when parents find out that their child experiments with smoking (Den Exter Blokland, Hale III, Meeus, & Engels, 2006; Engels & Willemsen, 2004), and a constructive way of communicating about smoking issues (Harakeh, Scholte, De Vries, & Engels, 2005; Otten, Harakeh, Vermulst, Engels, & Van Den Eijnden, in press) have preventive effects on adolescent smoking.

In the Netherlands many parents establish a no-smoking agreement with their children when the latter reach the teenage years. This is a popular way among parents to try to prevent children from starting to smoke. Harakeh et al. (2005) showed that one out of three parents have established such an agreement with their children. This agreement generally implies that parents promise their children a substantial gift (e.g., money, lessons for a driver's license) if they do not smoke until they become adults

(i.e. reach the age of 18). In their prevention program, STIVORO, the Dutch organization for smoking prevention and education, strongly advises parents to establish such a no-smoking agreement with their off-spring ([www.stivoro.nl/antipeukenpas](http://www.stivoro.nl/antipeukenpas)). However, to our knowledge there is no empirical evidence for the effectiveness of a no-smoking agreement in families. Furthermore a well-known, widely adopted primary prevention campaign conducted at secondary schools in the Netherlands (as part of the European Smoke-free Class competition) starts with the assumption that students in school classes should make very explicit no-smoking agreements ([www.stivoro.nl](http://www.stivoro.nl)). It is essential to gather empirical support for the effectiveness of such no-smoking agreements, because, if it actually prevents children from smoking, it is a simple and real tool both parents and schools can offer: Make a clear agreement with young children!

One might argue that though establishing a no-smoking agreement may not turn out to be effective, it can never be harmful. In our opinion this perspective might be overly naive. From other studies we know that in the majority of families parents do not regularly discuss the issue of smoking (Engels & Willemsen, 2004, Harakeh et al., 2005). It is possible that some parents see settling a no-smoking agreement as a relatively simple tool to deal with the issue of smoking; such an agreement is less demanding than talking regularly about the pros and cons of smoking. If many parents, who establish such an agreement, do not engage in other strategies to deal with adolescent smoking, such as discussing the issue of smoking frequently and constructively, it might even be counterproductive. In addition parents, who smoke themselves, find it more difficult to raise the topic of smoking and are consequently less often engaged in anti-smoking socialization efforts, such as warning their children of the dangers of smoking, and setting house rules (Jackson, 1997; Den Exter Blokland et al., 2006; Harakeh et al., 2005). In the current study, we will test what kinds of parents (smoking or non-smoking, and with or without an adolescent who already started smoking or not) establish a no-smoking agreement with their child. Furthermore, in addition to making a no-smoking agreement, parents may prevent smoking in their off-spring by frequently and constructively discussing smoking issues at home (see longitudinal studies by Ennett, Bauman, Foshee, Pemberton, & Hicks, 2001; Otten et al., in press). Therefore we will rigorously test whether in addition to a no-smoking agreement communication about smoking issues has a preventive effect on adolescent smoking.

The current paper will focus on the effectiveness of a no-smoking agreement between parent and child in terms of the odds that adolescents will start smoking. We use three data sets including adolescents and their parents to answer our research question. First we explore the prevalence of the no-smoking agreement by using data from a national representative sample of 4,501 Dutch adolescents (Study 1). In this data set, we further examine cross-sectionally whether parents, who establish such a no-smoking agreement, are less likely to have smoking adolescents. Second, in a short-term longitudinal study among 595 early adolescents and their parents, we test whether establishing a no-smoking agreement actually prevents adolescents from smoking (Study 2). Third, in a longitudinal study among 856 early and mid adolescents and their parents, we test (1) whether parents, who implement a no-smoking agreement, are less likely to have children who smoke, (2) what kind of

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parents are more likely to implement an agreement and (3) whether frequency and quality of communication on smoking issues at home has an added effect on adolescent smoking over and above the effect of a no-smoking agreement (Study 3).

### Study 1:

#### A national study of Dutch adolescents

In a sample of 4,501 Dutch adolescents we explore the prevalence of the no-smoking agreement and examine whether parents, who establish such a no-smoking agreement, are less likely to have smoking adolescents.

### Method

The respondents are a representative national sample of the Dutch youth population between the ages of ten to nineteen years (for more details see Den Exter Blokland, Engels, Hale III, Meeus, & Willemsen, 2004). STIVORO, the Dutch organization for smoking prevention and education, conducted this survey to monitor the development of smoking behavior among Dutch adolescents. The data were gathered in March and April 2000 by the NIPO research bureau ([www.nipo.nl](http://www.nipo.nl)). Interviews with respondents conducted by trained interviewers of the NIPO took place at the schools with permission of the school board. The interviewers carried out additional face-to-face interviews with the aid of a laptop computer and without the presence of teachers, parents, or other persons during the interview of the adolescent. Adolescents not attending school were interviewed at their homes. The interviewers guaranteed total anonymity of the respondents.

A total of 4,501 adolescents took part in this study; 50.6% of the sample consisted of boys. The data included ten age groups: a group of 10 year olds represented 4.2% of the total sample; 11 year olds: 10.9%; 12 year olds: 16.4%; 13 year olds: 13.1%; 14 year olds 11.0%; 15 year olds: 10.0%; 16 year olds: 8.8%; 17 year olds: 9.1%; 18 year olds 7.5.0% and 19 years old 8.9%. Elementary schoolchildren formed 25.2% of the sample, special education 5.5% (schools for children with learning disabilities), first grade of secondary education 10.1%. From second grade on the sample could be differentiated into: low level high school (22.4%), middle level high school (16.8%), the highest level of secondary school in the Netherlands, namely, preparatory school (13.4%). Finally 5.8% of the sample had jobs and 0.6% was unemployed and did not attend school.

### Measures

*No-smoking agreement.* Respondents had to indicate whether they had made a no-smoking agreement, the age at which they had made the agreement and with whom, and until what age they had to keep this agreement.

*Adolescent Smoking.* The two dependent measures, adolescents' ever smoking and regular smoking, were based on self-reported smoking. Respondents were first asked whether they had ever smoked, even one puff (cf. Engels, Knibbe, & Drop, 1999). Never smokers were coded 0, ever smokers were coded 1. To construct the second variable (regular smoking) a seven-point ordinal scale was used, ranging from



never smoking, several levels of experimentation (quit smoking, tried smoking, smoked less than once a month; not weekly, but once a month; not daily, but once a week,) up to daily smoking (Engels, Vitaro, Den Exter Blokland, De Kemp, & Scholte, 2004). Never smokers and smokers who had not smoked in the last month were coded 0, regular smokers, those who had smoked the last month, were coded 1.

*Parental smoking status* was measured by asking the respondent whether their father or mother currently smoked or not. Each parent was classified into one of two groups on the basis of their smoking status: non-smoker or current smoker. Two levels of parental smoking were constructed: (1) both parents do not smoke, (2) at least one parent is a smoker. Recently, Harakeh, Engels, De Vries and Scholte (2006) have shown that adolescents can provide highly reliable reports of parents' current smoking behavior (see also Vink et al., 2003).

## **Results**

Of the adolescents, 30.6% indicated they had a no-smoking agreement with their parents. There were no differences in this respect between boys and girls. Of these agreements 28.6% were made before the age of ten, 22.5% at the age of ten, 13.7% at the age of eleven, 21.7% at the age of twelve and 13.5% at the age of thirteen or older. Most adolescents (66.7%) reported that they had to keep their agreement until the age of 18, a total of 15.5% until the age of sixteen and seventeen and 17.8% until the age of nineteen through twenty-two. In 90% of the cases the no-smoking agreement was made with the parents. In the remaining 10% the agreement was made with other family members or with the school. Concerning smoking 53.8% of the adolescents indicated having ever smoked and 25.5% had smoked in the last month. 51.6% of the sample indicated having at least one smoking parent.

The logistic regression analyses in Table 1 show the relationship between having a no-smoking agreement and adolescent ever smoking and regular smoking, respectively. For reasons of comparability with the two other studies some background characteristics were included as control variables: gender, age, educational level and parental smoking status. Due to the broader age range of this sample, educational levels of the respondent were categorized into more categories than the other two studies, namely: (1) low, (2) middle and (3) high level of secondary school, (4) last year of elementary and first year of secondary school, (5) the working and unemployed respondents were grouped as 'not attending school' and finally (6) special education.

The findings demonstrated that having a no-smoking agreement was not related to ever smoking, but was negatively related to regular smoking. So adolescents, who had a no-smoking agreement with their parents, were less likely to be regular smokers. Being male, older, and having a lower level of education was related to higher odds of ever smoking. Being young, having a higher level of education, or being in the last year of elementary/first year secondary school, or working was related to lower odds of regular smoking. Further, parental smoking was related to higher involvement in ever and regular smoking among adolescents. Additional analyses were conducted to test whether the associations between no-smoking agreement and adolescent smoking differ between smoking and non-smoking

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parents. This was done by including interaction terms in the final step of the equation (cf. Aquinis, 2004). For both analyses the interaction was significant (OR = .67,  $p < .01$  and OR = .60,  $p < .01$  respectively). Further examination showed that only for smoking parents having a no-smoking agreement reduced the chances that their child was an ever smoker (OR = .77,  $p < .01$ ). With regard to regular smoking it turned out that having a no-smoking agreement was related to a lower likelihood of regular smoking in the case that there was at least one smoking parent (OR = .45,  $p < .001$ ) as compared to the group of non-smoking parents (OR = .72,  $p < .05$ ).

Table 1. Cross-sectional Associations between No-smoking Agreement and Adolescent Ever and Regular Smoking: Logistic Regression Analyses

	Representative Dutch Sample (N = 4501)					
	Ever Smoking			Regular Smoking		
	OR	C.I.		OR	C.I.	
		Lower	Upper		Lower	Upper
<i>Step 1</i>						
<i>Sex</i>						
Female	1.00			1.00		
Male	1.15*	1.01	1.31	1.04	.89	1.22
<i>Age</i> <sup>1</sup>	1.37***	1.31	1.43	1.50***	1.42	1.59
<i>Educational Level</i>						
Low secondary education	1.00			1.00		
Middle secondary education	.62*	.49	.78	.53***	.41	.67
High secondary education	.41***	.32	.53	.32***	.24	.42
Last year elementary and first year secondary	.59***	.48	.73	.39***	.29	.51
Not attending school (working)	.79	.54	1.15	.63**	.45	.89
Special education	.77	.57	1.04	.77	.54	1.10
<i>Parental smoking status</i>						
Non-smoking parents	1.00			1.00		
At least one smoking parent	2.32***	2.03	2.65	2.28***	1.95	2.68
<i>Step 2</i>						
No-smoking agreement <sup>2</sup>	.92	.80	1.07	.54***	.45	.65

Note: \*  $p < .05$ . \*\*  $p < .01$ . \*\*\*  $p < .001$ . OR = Odds Ratio; C.I. = 95% Confidence Interval.

<sup>1</sup> Age between 10 – 19 years old.

<sup>2</sup> Both analyses tested for the interaction between parental smoking and no-smoking agreement reached significance. For ever and regular smokers OR = .67,  $p < .01$  and OR = .60,  $p < .01$  respectively. Only for smoking parents having a no-smoking agreement was associated with reduced likelihood of ever smoking (OR = .77,  $p < .01$ ). Regular smoking: having a no-smoking agreement was more strongly associated with a reduced likelihood of adolescent regular smoking for smoking parents (OR = .45,  $p < .001$ ) as compared to the group of non-smoking parents (OR = .72,  $p < .05$ ).

Study 2:  
A Short-term Longitudinal Study among Early Adolescents

In this longitudinal study among 595 early adolescents and their parents we test whether establishing a no-smoking agreement actually prevents adolescents from smoking.

**Method**

The sample consisted of 545 two-parent families and 50 single-parent families that had one adolescent child in the first year of secondary education (for more details see Den Exter Blokland et al., 2006; Engels et al., 2004; Harakeh, Scholte, De Vries, Vermulst, & Engels, 2004). Two self-report questionnaires were used; one questionnaire which was administered to the children at school twice with a one-year interval (T1 took place in winter 2000 and T2 in winter 2001) under supervision of a teacher, and a one-time questionnaire which was sent to the parents at the same time the first wave was conducted among adolescents at school. Four types of Dutch high schools participated in the study, namely trade schools (14.3%), lower level high schools (24.7%), middle-level high schools (19.0%) and finally preparatory schools (42.0%).

The mean adolescent age at T1 was 12.3 years ( $SD = .52$ ), ranging from 10 to 14 years. Fifty-three percent ( $N = 315$ ) of the adolescents were males. Most of the adolescents had the Dutch nationality (97%). The majority of the adolescents (92%) lived with both their parents, 6% lived only with their mother, 1% lived only with their father and 1% was adopted. With respect to parental smoking as reported by the adolescent, 62.7% of the families consisted of non-smoking parents, 25.5% of one smoking parent and 11.8% of two smoking parents.

A total of 712 parents returned the questionnaire that was only administered at T1. In 75% of the cases the mother completed the questionnaire. Analyses are restricted to those parent-adolescent pairs that we have complete data of, resulting in the loss of 117 parental responses due to the absence of their child at the school testing. There were, however, no apparent differences in the distribution of parental reports of the no-smoking agreement between the initial complete set of parental data ( $N = 712$ ) and the data used for analyses ( $N = 595$ ), namely 29.6% vs. 27.6% of the parents indicated to have a no-smoking agreement, respectively.

**Measures.**

Adolescent and parental smoking status were measured in the first and second wave school-questionnaires. Whether families had made a no-smoking agreement was only assessed among parents at the first wave. Parental smoking and questions regarding a no-smoking agreement were the same as employed in Study 1.

*Adolescent Smoking.* Adolescents' smoking status was based on self-reported smoking at both waves. An ordinal scale was used, ranging from never smoking to regular smoking (Kremers, Mudde, & de Vries 2001)(see study 1).

## Results

### Descriptives

Of the families, 27.6% of the parents reported to have a no-smoking agreement with their child. A total of 12.8% reported to have made this agreement when their child was below 10 years of age, 35.9% when their child was 10, 20.5% when their child was 11, and 30.8% when their child was 12 or 13. For the majority of the adolescents (79.9%), the agreement is made until they reach the age of 18. In the vast majority, the agreement is made with one or both parents (92.6%), in other cases with the school (1.2%), another family member (4.9%) or someone else (1.2%).

Concerning smoking, 25.1% of the adolescents reported to have ever smoked at T1 as compared to 39.8% at T2. At T2 11.4% reported to have smoked in the past month (regular smokers).

Table 2. Longitudinal Associations between No-smoking Agreement at T1 and Early Adolescent Smoking at T2: Logistic Regression Analyses

	Longitudinal Analysis on Ever Smoking at T2			Longitudinal Analysis on Regular Smoking at T2		
	OR	C.I.		OR	C.I.	
		Lower	Upper		Lower	Upper
<i>Step 1</i>						
<i>Sex</i>						
Male	1.00			1.00		
Female	1.48	.96	2.28	1.70	.96	3.02
<i>Age</i>	.92	.60	1.40	1.05	.59	1.87
<i>Educational level</i>						
Low	1.00			1.00		
Middle	.56	.31	1.02	.45*	.19	1.03
High	.58*	.36	.94	.42**	.22	.83
<i>Parental smoking status</i>						
Non-smoking parents	1.00			1.00		
At least one smoking parent	1.40	.88	2.17	1.04	.58	1.87
<i>Adolescent Smoking at T1</i>	38.59***	20.18	73.76	7.50***	4.14	13.57
<i>Step 2</i>						
No-smoking agreement	.90	.55	1.47	1.01	.55	1.86

Note: \*  $p < .05$ . \*\*  $p < .01$ . \*\*\*  $p < .001$ . OR = Odds Ratio; C.I. = 95% Confidence Interval. All presented estimates are those in the final step of the equation.

### *Does a No-smoking agreement Have a Longitudinal Effect on Adolescent Smoking?*

The longitudinal analyses presented in Table 2 predicting ever smoking (i.e. differentiating never smokers versus those who at least smoked once) and regular smoking (differentiating non-regular smokers versus regular smokers i.e. those who smoked at least once in the past 4 weeks) showed no predictive associations between a no-smoking agreement and adolescent smoking after controlling for age, gender, educational level and parental smoking. Additional analyses were conducted to test

whether parental smoking might possibly affect the associations between no-smoking agreement and adolescent smoking. However, no interaction effects were found.

All in all these analyses clearly show that in this sample of early adolescents having a no-smoking agreement is not effective in causing children to refrain from smoking.

### Study 3: Family and Health

In a sample of 428 families we test (1) whether parents who implement a no-smoking agreement are less likely to have children who smoke, (2) what kinds of parents are more likely to implement an agreement and (3) whether frequency and quality of communication on smoking issues at home has an added effect on adolescent smoking over and above the effect of a no-smoking agreement.

#### **Method**

##### *Participants*

Families participated in a longitudinal study, “Family and Health,” which had three waves with a one-year interval between each wave. The families were approached between November 2002 and April 2003. A total of 428 Dutch families were selected to participate at baseline. A full family design was used: each family consisted of a mother, father, and two adolescents in the age of 13 to 16 years old (for more details see Harakeh, Scholte, De Vries, & Engels, 2005; Van Der Vorst, Engels, Meeus, Dekovic, Van Leeuwe, & Meeus, 2005). Families had to meet the following inclusion criteria to participate in our study: the adolescents in the families were biologically related to each other, and the mother and father were the biological parents of these adolescents; parents were married or living together during the project (two families had to be excluded from the third measurement because the parents were divorced or not living together any more) and the two adolescents participating in each family were neither twins nor mentally or physically disabled.

At baseline older adolescents were 14 to 17 years old ( $M = 15.22$ ,  $SD = .60$ ), younger adolescents were 13 to 15 years old ( $M = 13.36$ ,  $SD = .50$ ), mothers were 35 to 56 years old ( $M = 43.82$ ,  $SD = 3.57$ ), and fathers were 37 to 62 years old ( $M = 46.18$ ,  $SD = 4.00$ ). Males and females were equally distributed among the adolescents: 52.8% of the older adolescents were male and 47.7% of the younger adolescents were male. The educational level of the older adolescents was distributed as follows in this sample: 30.9% attended lower-level education (i.e., preparatory secondary school for technical and vocational training); 29.3% attended middle-level education (i.e., preparatory secondary school for college); and 39.6% high-level education (i.e., preparatory secondary school for university).

With respect to the educational level of the younger adolescents: 36.4% attended lower-level education, 36.7% attended middle-level education, and 26.5% attended high-level education.

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### *Procedure*

The addresses of families with both parents and two adolescents (13 to 16 years) were selected from the registers of 22 municipalities in the Netherlands. We sent letters and informed consent forms to 5,602 families to invite them to participate in our study; 981 families responded. From these families, 96 turned out not to meet the inclusion criteria or indicated they were not willing to participate. The total of 885 families were phoned to check whether they met all the entry criteria. However, 120 families could not be approached/contacted. The remaining 765 families met the inclusion criteria. To ensure an equal distribution of the educational level of adolescents and an equal number of all the possible sibling dyads (i.e., boy-boy, girl-boy, boy-girl, girl-girl) 428 families were selected to participate. Interviewers visited all the families at home at baseline. The baseline was between November 2002 and April 2003 (T1; N = 428). The follow-up was two years later (T2; N = 402). Attrition between the waves was low: in total 26 families dropped out of the study, because they didn't want to participate any more, for example, because they had moved, or because the parents had divorced. During the interviewer home visits each family member completed the questionnaire individually and separately. The questionnaire took about 90 minutes to complete. At each measurement wave each family received 30 Euros when all four family members had filled in the questionnaires. At the end of the longitudinal project five traveler's checks of 1000 euros each were raffled between families who took part at all three waves.

### *Measures*

No-smoking agreement, parental and adolescent smoking were assessed with similar questions as in Study 2.

*Frequency of Smoking-specific Communication.* This factor refers to how often in the past 12 months the mother and father talked with their adolescents about issues concerning smoking at T1. This scale is similar to the scale used by Ennett and colleagues (2001) to assess smoking-specific communication, and consisted of 8 items (e.g., 'During the past 12 months, how many times did your mother talk to you about how to resist peer pressure to use tobacco?'). Response categories ranged from 1 'never' to 5 'very often'. Cronbach's alpha was .86. We used adolescent reports to calculate the sum score of the scales for both father and mother communication.

*Quality of Smoking-specific Communication.* We assessed the quality of smoking-specific communication at T1. This factor represented the quality of communication about smoking between parent and adolescent (Harakeh et al., 2005). This scale consisted of 6 items (e.g., the questionnaire version for adolescents was 'My mother and I are interested in each other's opinion about smoking') on a 5-point scale. Response categories ranged from 1 'completely not true' to 5 'completely true'. Cronbach's alpha was .84. We used adolescent reports to calculate the sum score of the scales for both father and mother.

## **Results**

### *Descriptives*

Of all adolescents 36.4% of the youngest adolescents and 34.4% of the oldest adolescents indicated to have a no-smoking agreement with their parents. There were no differences in this respect between boys and girls. The average age when this

agreement was established was 9.98 (SD = 2.12) according to the youngest adolescent and 11.18 (SD = 1.97) according to the oldest adolescent. Most adolescents reported that they had to keep this agreement until the age of 18; 67.8% of the youngest adolescents, and 74.6% of the oldest adolescents.

It turns out in many cases that parents make this agreement with both siblings. In 224 (52.3%) families there is a no-smoking agreement with neither of the adolescents, and in 107 (25%) families there is a no-smoking agreement with both adolescents ( $\chi^2(1, 409) = 140.11, p < .001$ ). Most adolescents reported having a no-smoking agreement with their parents at both time-points; 84% of the youngest adolescents reported the same at both time points ( $\chi^2(1, 388) = 165.76, p < .001$ ), and 86% of the oldest adolescents ( $\chi^2(1, 385) = 183.83, p < .001$ ).

Concerning smoking 35.7% of the youngest children indicated ever smoking at T1 and 48.5% at T2. A total of 5.6% reported to be a regular smoker at T1 and 15.9% at T2. Of the oldest adolescents, 48% reported ever smoking at T1 and 54.7% at T2. Further, 10.7% reported being a regular smoker at T1 and 17.7% at T2.

#### *Which Parents do Establish a No-smoking agreement with their Children?*

First, we tested whether some parents are more likely to establish a no-smoking agreement than others. We examined cross-sectionally whether parents with smoking adolescents are more likely to establish a no-smoking agreement (not presented in Tables). We did not find any indication for the assumption that parents with adolescents who had already initiated smoking are more likely to establish a no-smoking agreement at T1. Furthermore, we did not find an association between parental smoking and having a no-smoking agreement at T1. Further, parents who have established a no-smoking agreement with their children may be less or more likely to be involved in communication on smoking matters. In both adolescents we did not find any differences in quality of communication between parents who had a no-smoking agreement or not. However, parents who had a no-smoking agreement discussed smoking issues with their children more frequently ( $t_{\text{oldest adolescent}}(416) = 4.05, p < .001$ ;  $t_{\text{youngest adolescent}}(416) = 5.53, p < .001$ ). In sum, except for the frequency of communication on smoking issues, which was associated with the establishment of a no-smoking agreement, we did not find an indication that the establishment of a no-smoking agreement depended on parental smoking status, having already smoking children, or a lack of constructive communication with their children on smoking matters.

#### *Does a No-smoking Agreement Have a Longitudinal Effect on Adolescent Smoking?*

With hierarchical logistic regression analyses we examined whether a no-smoking agreement affected adolescent smoking in the long run (Table 3). Separate analyses were carried out for the younger and older adolescent in the family, and for ever smoking and regular smoking. In all analyses we controlled for possible confounders in the first step. Moreover, in these analyses we included adolescent smoking at T1 in the first step, so our prospective findings can be interpreted in terms of predicting changes in smoking between T1 and T2.

In three out of four longitudinal analyses presented in Table 3, no association was found between having a no-smoking agreement at T1 and adolescent smoking at T2. In one analysis (oldest adolescent predicting ever smoking) we even found that

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when parents had a no-smoking agreement adolescents were more likely to smoke two years later.

In a second series of analyses presented in Table 4 we examined whether quality and frequency of communication concerning smoking at T1 added to the prediction of adolescent smoking at T2 (Table 4). A clear pattern emerged resulting in strong, robust effects of quality of communication on adolescent smoking at T2. Adolescents who reported a low quality of communication on smoking with their parents were up to three times more likely to smoke two years later as compared to adolescents who reported a high quality of communication. Frequency of communication in contrast was positively associated with smoking; parents who often talked about smoking issues were more likely to end up with smoking children. In all analyses we corrected for the strong effects of smoking status at T1, stressing the relevance of quality of communication concerning smoking as a tool for parents to prevent smoking in their off-spring.

To verify whether the findings are similar, if we test the associations in a subsample of adolescents, who reported never having smoked at T1, we conducted additional analyses for the group of adolescents (youngest adolescent,  $N = 257$ ; oldest adolescent;  $N = 207$ ), who were never smokers at T1 (Not in Tables). In a way this is a means of testing predictors of onset of smoking. For the youngest adolescent we found that after controlling for age, gender, educational level, and parental smoking, having a no-smoking agreement was not associated with smoking onset ( $OR = 1.39, p > .05$ ), the quality of communication was negatively associated with smoking onset ( $OR = .49, p < .01$ ), and the frequency of communication was positively associated with smoking onset ( $OR = 1.65, p < .05$ ). For the oldest adolescent we found no significant associations between no-smoking agreement ( $OR = 2.06, p = .056$ ) and frequency of smoking specific communication ( $OR = 1.1, p > .05$ ) on the one hand, and smoking onset on the other. Low quality of communication on the contrary was strongly associated with smoking onset ( $OR = .27, p < .001$ ).

Additional analyses were conducted whether associations between no-smoking agreement and adolescent smoking at T2 are moderated by parental smoking status, adolescent smoking at T1, quality of communication, and frequency of communication. We tested this by including interaction terms in the final step of the regression analyses. We found no support for existence of these interaction effects in any of the analyses.



Table 3. Longitudinal Associations between No-smoking Agreement at Baseline Measurement and Adolescent Smoking Two Years Later: Logistic Regression Analyses

	Youngest Adolescent						Oldest Adolescent					
	Ever Smoking		Regular Smoking		C.I.		Ever Smoking		Regular Smoking		C.I.	
	OR	Lower	Upper	OR	Lower	Upper	OR	Lower	Upper	OR	Lower	Upper
<i>Step 1</i>												
<i>Sex</i>												
Male	1.00			1.00			1.00			1.00		
Female	1.38	.83	2.31	.62	.34	1.14	1.51	.87	2.62	1.57	.88	2.82
<i>Age</i>	1.65	.99	2.76	1.39	.78	2.50	1.68*	1.04	2.70	1.15	.71	1.87
<i>Educational level</i>												
Low	1.00			1.00			1.00			1.00		
Middle	1.06	.54	2.09	.68	.34	1.39	1.46	.69	3.06	.58	.28	1.18
High	1.34	.13	13.80	.63	.29	1.36	1.32	.66	2.68	.44	.22	.86
<i>Parental smoking status</i>												
Non-smoking parents	1.00			1.00			1.00			1.00		
At least one smoking parent	1.14	.65	2.01	2.36**	1.26	4.21	.91	.49	1.69	1.32	.71	2.44
<i>Adolescent Smoking at T1</i>	27.46***	13.96	53.85	6.01***	3.18	11.33	32.88***	17.54	61.63	6.89***	3.43	13.85
<i>Step 2</i>												
No-smoking agreement	1.43	.84	2.44	1.39	.75	2.58	1.83*	1.03	3.26	.74	.40	1.34

Note: \*  $p < .05$ . \*\*  $p < .01$ . \*\*\*  $p < .001$ . OR = Odds Ratio; C.I. = 95% Confidence Interval.

Table 4. Longitudinal Associations between No-smoking Agreement, Quality and Frequency of Communication on Smoking Issues at Baseline Measurement, and Adolescent Smoking Two Years Later: Logistic Regression Analyses

	Youngest Adolescent						Oldest Adolescent								
	Ever Smoking		Regular Smoking		Ever Smoking		Regular Smoking		Ever Smoking		Regular Smoking				
	OR	C.I.	OR	C.I.	OR	C.I.	OR	C.I.	OR	C.I.	OR	C.I.			
<i>Step 1</i>															
Male	1.00		1.00		1.00		1.00		1.00		1.00		1.00		1.00
Female	1.38	.82	2.33	.34	.64	1.20	1.75	.98	3.11	1.59	.87	2.90			
Age	1.66	.98	2.83	.77	1.40	2.55	1.92*	1.16	3.17	1.26	.76	2.07			
<i>Educational level</i>															
Low	1.00		1.00		1.00		1.00		1.00		1.00		1.00		1.00
Middle	1.26	.66	2.41	.38	.80	1.68	1.84	.85	4.00	.54	.26	1.16			
High	1.25	.63	2.49	.35	.79	1.76	1.81	.86	3.78	.53	.25	1.10			
<i>Parental smoking status</i>															
Non-smoking parents	1.00		1.00		1.00		1.00		1.00		1.00		1.00		1.00
At least one smoking parent	.98	.54	1.75	1.14	2.19*	4.20	.80	.43	1.50	1.51	.80	2.87			
<i>Adolescent Smoking at T1</i>	25.54***	12.80	50.99	2.51	4.87***	9.44	31.85***	16.47	61.56	5.24***	2.56	10.77			
<i>Step 2</i>															
No-smoking agreement	1.31	.75	2.27	.56	1.08	2.11	1.83*	1.01	3.35	.58	.30	1.11			
<i>Step 3</i>															
Quality of Communication	.52**	.32	.85	.25	.44**	.78	.31***	.18	.52	.46**	.29	.75			
Frequency of Communication	1.76**	1.17	2.64	1.38	2.18***	3.43	1.15	.73	1.81	1.94**	1.25	3.02			

Note: \*  $p < .05$ . \*\*  $p < .01$ . \*\*\*  $p < .001$ . OR = Odds Ratio; C.I. = 95% Confidence Interval.

## **Discussion**

The current paper has investigated whether the establishment of a no-smoking agreement is an effective tool for parents to prevent their offspring from smoking. In the Netherlands many families have such an agreement; the prevalence varies between 27.6% and 36.4% over the three studies. We used three separate data sets to test associations between a no-smoking agreement and adolescent lifetime and regular smoking. In the first study we explored in a national representative cross-sectional sample of adolescents (a) how many parents have an agreement and (b) how strongly it is related to adolescent smoking. In the second study we used short-term longitudinal data to test the effect of establishing a no-smoking agreement on smoking in early adolescents. Finally, in the third study we used data from a longitudinal full family study to test the effects of a no-smoking agreement on smoking. In addition, we tested whether frequency and quality of communication on smoking issues had a positive effect on adolescent non-smoking.

Our initial assumption was that the establishment of a no-smoking agreement is a relatively simple communication tool. Parents only have to briefly discuss the topic of smoking with their young children. By simply making the agreement - and subsequently rewarding their children when they keep the agreement - there is no further need for intensive discussion and parents might feel they have made a constructive effort in preventing their children from becoming smokers. The seeming popularity of the no-smoking agreement is probably based on the assumption that parents can be protective gatekeepers if they set clear rules, and if keeping the rules is accompanied by a substantial reward (e.g., Clark, Scarisbrick-Hauser, Gautam, & Wirk, 1999).

Surprisingly no prior research has been conducted into the effectiveness of the no-smoking agreement while preventive programs stress the importance of making such an agreement. And although it seems straightforward, parents do *not* make the no-smoking agreement as a reaction to adolescent experimentation with smoking as shown in our findings. As a tool the no-smoking agreement can be used in two ways. In the first way the agreement is implemented to prevent future smoking in adolescents who have never smoked, hence the goal of the agreement is to reinforce the continuation of an existing habitual pattern. In the second way adolescents that experiment with smoking are offered the agreement with the goal of trying to change an existing pattern. From a behavioral viewpoint, however, these two goals are separate phenomena and both goals require different approaches to be effective (Bandura, 1986). The cross-sectional findings of Study 1, using a representative sample of 4,501 adolescents in the age range of 10 to 19 years old, seem to indicate that the no-smoking agreement is an effective tool in dealing with adolescent smoking, especially for smoking parents. However, these findings merely represent cross-sectional associations and should be interpreted accordingly. Longitudinally our results indicate that the no-smoking agreement is not effective in supporting the continuation of existing non-smoking behavior. We only found partial support for change in smoking behavior, but in a direction not intended by the parents. The older adolescents in the third study showed an increased likelihood of smoking.

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It was shown that a high quality of communication on smoking matters helps parents to prevent smoking in both younger and older adolescents. However, conversely, a high frequency of communication is associated with smoking; parents who often talk about smoking issues are more likely to end up with smoking children. The findings of Study 3 clearly demonstrate both the positive and the negative effects of communication on smoking issues. High quality communication on the part of the parents has a powerful preventive effect on adolescent smoking while frequently raising the subject of smoking on the part of the parents has a persistent counterproductive effect on adolescent smoking (see also Harakeh et al, 2005). This is consistent with the old adage, it is the quality not the quantity of parental interactions with their children that is important. Further, our finding that a higher quality of parental communication as perceived by the adolescent is associated with lower likelihood of future adolescent smoking can be interpreted as being the result of good parenting; the adolescent feels comfortable to discuss the topic of smoking with his or her parents and the parents are willing to address the topic in a constructive manner. Previous research into parental communication about smoking issues has been mixed, much in line with our longitudinal findings that the quality of parental communication is helpful, but if parents raise the issue very often it has negative repercussions (Harakeh et al, 2005). Ennett et al. (2001) suggest that when adolescents experiment with smoking, parents communicate more frequently with their children in an attempt to prevent them from continuing to smoke. However, their findings indicate that these attempts are not fruitful. Continuing to raise the topic of smoking when the adolescent is not willing to enter into the discussion with the parents, can be experienced by the adolescent as nagging. Nagging is indicative of a lack of mutual trust and respect which is required for a real transfer of information to take place. Nagging may also be an indication that the parents lack the necessary skills associated with good parenting.

Dishion and McMahon (1998) suggest that a high quality of communication is an important aspect in their definition of parental monitoring, which includes those behaviors that facilitate awareness of the child's activities and communicate to the child that the parent is concerned about and aware of the child's activities. Indeed, various studies among youths in the United States have shown that parental monitoring creates a climate in which children are less likely to experiment with smoking (Hill, Hawkins, Catalano, Abbott, & Guo, 2005; Kodl & Mermelstein, 2004). Kerr, Stattin, and Trost (1999) have added the concept of trust to this debate arguing that the concept of monitoring largely depends on the child's willingness to disclose information to the parents. They suggest that the information disclosed by the child produces a certain level of parental trust but also that trusting parents respond in such a way that children feel more free to disclose. Our findings indicate that when the adolescent experiences open communication with the parents about smoking issues in an atmosphere of trust and respect, this has a preventive effect on future adolescent smoking. Future studies should investigate whether other care taking mechanisms, monitoring, for example, are useful in this respect.

### *Limitations*

It would be useful to gather more information about the motivation of parents to implement the no-smoking agreement or the motivations of the adolescent to agree. We have implicitly assumed that parents make the agreement with their children, but we do not know who takes the initiative, which might be relevant with regard to the

adolescent's willingness to comply. For example, an adolescent with a high intention to remain a never smoker might ask his or her parents for a no-smoking agreement because the reward, although far in the future, will be easily earned. Additionally, some parents may have communicated with their children about smoking long before they have reached an age at which they are at increased risk to smoke. However, we have no measurements of these processes in childhood and therefore cannot determine whether early communication is effective in preventing smoking when the child reaches the teenage years.

We only studied parents and their children with regard to the no-smoking agreement and smoking-specific communication. Although relevant, we cannot speculate what the effects of school-based no-smoking agreement programs are. School-based smoking prevention programs, such as the European Smokefree Class competition, are founded on the idea that risk perception, social norms, personal skills and motivation, attitudes, social support, feedback, and self-efficacy are crucial factors in prevention programs (Botvin, 2000; De Vries et al., 2003). These factors are all woven into the design of the program of which the no-smoking agreement is just one aspect.

### *Conclusion*

However, some suggestions with regard to prevention can be made based on our findings. First of all parents need to be informed that they should not make the well-known 'no-smoking agreement' since it does not seem to serve its purpose, namely the prevention of future smoking. Second, if parents are motivated to prevent smoking in their children, they should be helped with enhancing their communication skills and learn to fine tune their communication to the needs of their child in a respectful and mutually trusting manner in order to avoid an atmosphere of frequent nagging about smoking issues. Our study demonstrates that parents, who want to prevent their early adolescent children from smoking, should focus their efforts on good quality communication about the subject instead of implementing a no-smoking agreement with a substantial reward far in the future. High quality communication seems to contain the positive aspects that are considered very important in parenting literature. Our study demonstrates that parents who just talk a lot about smoking issues without considering the quality of their communication might do more harm than good.

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Chapter 6  
Parental Communication and Adolescent Smoking: Should we  
Encourage Parents to Talk with their Adolescents about Smoking-  
Related Topics?

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## Abstract

This longitudinal study examined the reciprocal effect of the frequency of smoking-specific communication between parents and adolescents, and adolescents' smoking. Participants were 428 Dutch families (mother, father, and two adolescents). Smoking-specific communication was not associated with older and younger adolescent smoking. With regard to the transition from never smoking to smoking initiation, smoking-specific communication also proved not to be associated with adolescent smoking onset. Further, our findings showed that in some cases frequent communication even increased the likelihood for younger adolescent's smoking, and that when adolescents already smoke, parents start to talk more frequently about smoking-related issues with their adolescents later on. Neither the quality of smoking-specific communication, the quality of the parent-adolescent relationship, nor parental smoking moderated these effects.

## Introduction

Parents that want to prevent their children from smoking have to resort to specific activities, such as setting rules not to smoke at home, warn the adolescent about the negative consequences of smoking, or punish the adolescent when he/she is smoking. Although the literature on parental smoking-specific communication is not conclusive, some of these smoking-specific strategies appear to be effective in preventing adolescents from smoking (Chassin, Presson, Rose, Sherman, Davis, & Gonzalez, 2005; Clark, Scarisbrick-Hauser, Gautam, & Wirk, 1999; Den Exter Blokland, Hale, Meeus, & Engels, 2006; Harakeh, Scholte, De Vries, & Engels, 2005; Henriksen & Jackson, 1998; Jackson & Henriksen, 1997). However, studies on the impact of smoking-specific communication have yielded conflicting results. Some studies showed that parental smoking-specific communication is a protective factor (e.g., Chassin, Presson, Todd, Rose & Sherman, 1998), while others found that smoking-specific communication had no significant effect on adolescent smoking (e.g., Chassin et al., 2005; Den Exter Blokland et al., in press; Ennett, Bauman, Foshee, Pemberton, & Hicks, 2001; Otten, Harakeh, Vermulst, Van Den Eijnden, & Engels, 2006). Other studies indicated that the children of parents who do communicate about smoking-related issues tend to be less likely to smoke (e.g., Jackson, 1997; Jackson & Henriksen, 1997), in contrast to other studies that indicated that parents who often communicate about smoking-related topics may have children that are *more* likely to smoke (e.g., Engels & Willemsen, 2004; Harakeh et al., 2005). Many of the studies are cross-sectional and the reported longitudinal studies do not clarify the issue of strength and the direction of effects. Thus, some of the findings challenge the assumption that parent-adolescent communication prevents adolescents from smoking. Based on this assumption, prevention campaigns often recommend and encourage parents to communicate with their adolescents about tobacco-related issues (e.g., Miller-Day, 2002; Stivoro, 2005). However, we question whether it should be encouraged or even recommended that parents communicate about smoking-related issues with their adolescents because there is no clear empirical evidence that this parental strategy is effective in discouraging adolescents from smoking.

The present study addresses two major issues by examining both the strength and the direction of effects with regard to communication on smoking-related topics in a family. The first issue is whether adolescents who are involved in frequent smoking-specific communication with their parents will have a lower risk to smoke. The second issue is whether there is a reciprocal relation between the frequency of smoking-specific communication and adolescent smoking. It is plausible that adolescent smoking will, in turn, cause parents to start or increase the frequency of smoking-specific communication in their attempt to discourage their adolescents from further smoking, and this has not been investigated in previous studies.

*Aspects of Communication on Smoking*

Although the time spent between adolescents and parents tends to decrease between early and late adolescence (Larson, Richards, Moneta, Holmbeck, & Duckett, 1996), the parents continue to influence adolescents' norms, values and behavior (e.g., Deković & Meeus, 1997; Parke & Ladd, 1992). In line with the evidence that parents remain influential in the adolescent period, the assumption would be that parents who continue to communicate with their adolescents are more successful in preventing risk behaviors of their offspring. In their framework on parent-adolescent communication, Miller, Kotchick, Dorsey, Forehand and Ham (1998, p.96) suggested that: "Dialogues should be continuous and sequential (building one upon the next as a child's cognitive, emotional, physical, and social development and experiences change) and time-sensitive (i.e., information is immediately responsive to the child's questions and anticipated needs, rather than programmed curriculum)" (see also Miller-Day, 2002). This definition of communication between parents and adolescents indicates how complex the communication process is, because it states that the communication should be continuous and that the interaction between parent and adolescent is important. Thus, it is not only a matter of investigating whether or not communication occurs between parents and adolescents (and its frequency); in the aim to understand the effectiveness of frequent communication on health issues like smoking, other important aspects in the process of communication (such as the timing, style or manner, and general family environment) should also be taken into account.

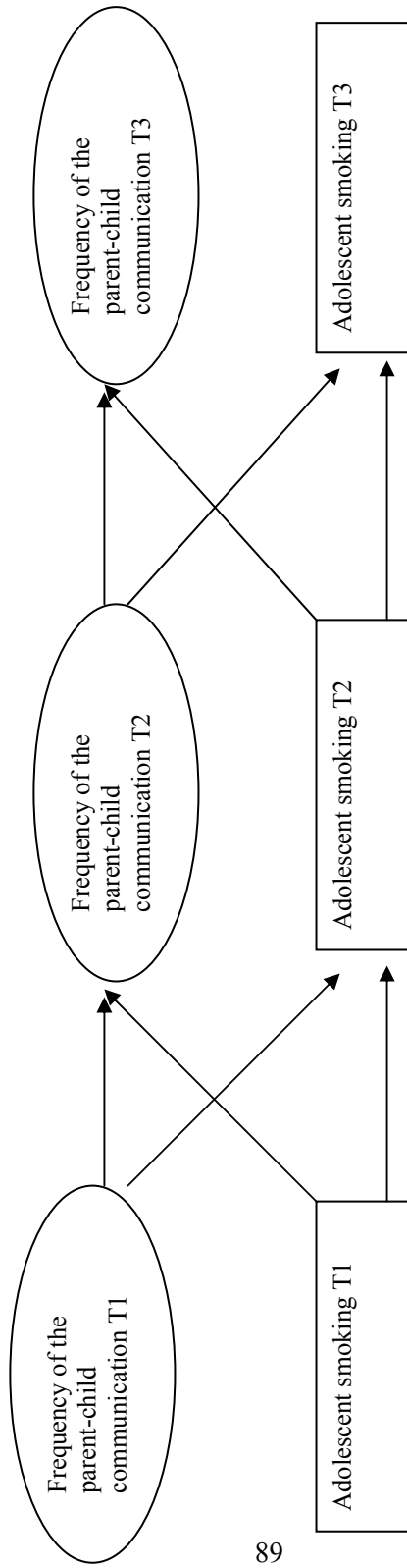
First of all, with respect to timing, Ennett et al. (2001) suggest that it is counterproductive for parents to wait or delay communication about smoking-specific issues until they assume that their adolescent is smoking and then try to discourage him/her. Therefore communication might be most effective when children have not yet started to experiment with smoking. The timing of communication is also important, because older and younger adolescents within a family may react differently to the parents' communications, other parenting strategies and/or parental authority (e.g., Rohde, Atzwanger, Butovskaya, Lampert, Mysterud, Sanchez-Andres & Sulloway, 2003; Sulloway, 1995). A study by Harakeh and colleagues (2005) showed that the frequency of smoking-specific communication between parent and adolescent differed for older and younger adolescents (e.g., Harakeh et al., 2005). For example, fathers reported that they communicated more with the younger adolescent than with the older one; moreover, communication may be less effective for older adolescents, if they are less inclined to follow parental advice. That study also indicated that the higher the quality of parent-adolescent smoking-specific communication, the less likely adolescents are to smoke (Harakeh et al., 2005); this suggests that the effect of communicating frequently to the adolescent about smoking

may depend on whether or not these discussions take place in a constructive and respectful manner (Harakeh et al., 2005). Third, concerning the quality of the parent-adolescent relationship, if the overall quality is satisfactory, parents will be more accurate in identifying the smoking status of their adolescents, will monitor their adolescents in an appropriate way, and will communicate more with their adolescents on different topics including smoking (see Jaccard, Dittus, & Gordon, 1998). Finally, non-smoking parents are more frequently and more constructively engaged in discussing smoking related-topics with their adolescents than smoking parents (Den Exter-Blokland et al., 2006; Harakeh et al., 2005; Henriksen & Jackson, 1998). A longitudinal study by Chassin et al. (2005) showed that adolescents with non-smoking parents were less likely to smoke when their parents communicated with them about smoking-specific topics, compared to adolescents with smoking parents. Smoking-specific communication between adolescents and smoking parents did not affect adolescents' smoking. It is important to take parental smoking into account because of the above-mentioned evidence that smoking and non-smoking parents differ in their communication strategies.

### **Design of the present study**

Longitudinal data of 428 families were used to investigate the reciprocal associations between the frequency of smoking-specific parent-adolescent communication and adolescent's smoking. This longitudinal design and the inclusion of these reciprocal associations in one model will provide new insights on the effect of smoking-specific communication compared to previous studies. The initial model tested is depicted in Figure 1. The timing of communication was investigated by testing the initial model for adolescents' smoking initiation, and by examining the associations for the older and younger sibling within a family separately. Further, we tested whether three moderators influenced the association between frequency of smoking-specific communication and adolescent's continuation of smoking: (1) the quality of smoking-specific communication between parent and adolescent, (2) the overall quality of the relationship between parent and adolescent, and (3) parental smoking behavior.

We further investigated whether the effect of the frequency of communication about adolescent smoking differed between the mother and father. It has been reported that, during childhood and adolescence, mothers (as compared to fathers) talk more frequently with their children and cover a broader range of topics (e.g., Miller-Day, 2002). Further, adolescents indicated that they felt more attached to their mothers and felt more at ease about talking with them about issues related to alcohol, tobacco and other drug use (Miller-Day, 2002). One of the unique features of the present study is that we take into account the perceptions of mothers, fathers, older, and younger adolescents within a family. The assessment and evaluation of different perspectives within families may reveal different effects on adolescents' smoking (see also review of Holmbeck, Li, Schurman, Friedman, & Coakley, 2002). For example, adolescents reported a much lower frequency of communication with their parents about smoking-related issues compared to the reports of their parents (Harakeh et al., 2005).



*Figure 1. The theoretical model tested in the present study*

## Method

### *Participants*

Families participated in a longitudinal study “Family and Health” which had three waves (T1 = baseline, T2 and T3) with a one-year interval between T1 and T2, and between T2 and T3. The families were approached between November 2002 and April 2003. A total of 428 Dutch families were selected to participate at baseline. A full design was used: each family consisted of a mother, father, and two adolescents (for more details see Harakeh et al., 2005; Van Der Vorst, Engels, Meeus, Dekovic, & Van Leeuwe, 2005). Families had to fulfill the following inclusion criteria to participate in the present study: the adolescents in the families were biologically related to each other and the mother and father were the biological parents of these adolescents; parents were married or living together during the project (two families had to be excluded from the third measurement because the parents were divorced or were no longer living together) and the two adolescents participating in each family were neither twins, nor mentally or physically disabled.

At baseline, the older adolescents were aged 14 to 17 years ( $M = 15.22$ ,  $SD = .60$ ), the younger adolescents 13 to 15 years ( $M = 13.36$ ,  $SD = .50$ ), the mothers 35 to 56 years ( $M = 43.82$ ,  $SD = 3.57$ ), and the fathers were 37 to 62 years ( $M = 46.18$ ,  $SD = 4.00$ ). Most of the family members were of Dutch origin (i.e. 96.1% of the fathers, 97.4% of the mothers, 98.1% of the older adolescents, and 98.8% of the younger adolescents). Males and females were equally distributed among the adolescents: 52.8% of the older adolescents were male and 47.7% of the younger adolescents were male. Of the older adolescents 30.9% attended lower-level education (i.e., preparatory secondary school for technical and vocational training); 29.3% middle-level education (i.e., preparatory secondary school for colleges below university level); and 39.6% high-level education (i.e., preparatory secondary school for university). Of the younger adolescents: 36.7% attended lower-level education, 35.5% middle-level education, and 26.3% high-level education. With regard to parents’ educational level, 2.1% of the mothers and 1.4% of the fathers had attended primary school only; 31.4% of the mothers and 17.9% of the fathers had finished secondary school; 30.0% of the mothers and 30.5% of the fathers had finished technical and vocational training; 30.3% of the mothers and 32.2% of the fathers finished college; while 5.4% of the mothers and 17.4% of the fathers had finished university. In the Netherlands, university education is viewed as being a slightly higher level than college education. Among the participating families, 18.6% of the mothers and 3% of the fathers did not work; and 5.7% of the mothers and 91.4% of the fathers worked more than 33 hours a week.

### *Procedure*

The addresses of two-parent families with at least two adolescents (aged 13 to 16 years) were selected from the registers of 22 municipalities in the Netherlands. A letter was sent to all these families inviting them to participate in a longitudinal study; 885 families responded that they were willing to participate and gave their informed consent. These families were then telephoned to establish whether they fulfilled all the inclusion criteria. Finally, of the 765 families fulfilling the criteria, 428 were selected to participate (see for more details Otten et al., 2006).

Interviewers visited all the families at home at baseline between November 2002 and April 2003 (T1; N=428), the first follow-up was one year later (T2; N=416), followed one year later by a second follow-up (T3; N=404). However, because at T3 two of the 404 families were divorced or no longer living together, these two families had to be excluded from the third measurement. Therefore, for the analysis at T3 the sample included 402 families. Attrition between the three waves was extremely low: in total only 26 families dropped out of the study. During the home visits by the interviewers each family member filled in the questionnaire individually and separately. The questionnaire took about 90 minutes to complete. At each wave the family (as a whole) received 30 euros and at the end of the study five cheques of 1000 euros each were raffled between the 404 families who took part in all three waves.

## **Measures**

The frequency of smoking-specific communication, the quality of communication measures, and the scale assessing the overall quality of the relationship were administered to all participants.

*Frequency of smoking-specific communication.* This variable refers to how often in the past 12 months the mother and father talked with their adolescents about issues concerning smoking (Ennett *et al.*, 2001). This scale is similar to that used by Ennett and colleagues to assess smoking-specific communication and consisted of 8 items. For example, the questionnaire version for adolescents was ‘During the past 12 months, how many times did your mother talk to you about how to resist peer pressure to use tobacco?’, and adolescents had to answer a similar question about their father. For parents it was ‘During the past 12 months, how many times did you talk to your adolescent about how to resist peer pressure to use tobacco?’, and parents had to answer a similar question for their other participating child. Response categories ranged from 1 ‘never’ to 5 ‘very often’. Cronbach’s alphas at T1, T2 and T3 ranged from .86 to .91 for the various reporters.

*Quality of smoking-specific communication.* We used the quality of smoking-specific communication assessed at T1. This concept represents the quality of communication about smoking between parent and adolescent (Harakeh *et al.*, 2005). The scale consisted of 6 items on a 5-point scale. For example, the questionnaire version for adolescents was ‘My mother and I are interested in each other’s opinion about smoking’. For parents it was ‘My child and I are interested in each other’s opinion about smoking’, and parents had to answer a similar question for their other participating adolescent. Response categories ranged from 1 ‘completely untrue’ to 5 ‘completely true’. Cronbach’s alphas at T1 ranged from .74 to .84.

*Quality of parent-adolescent relationship.* We used information on the quality of the parent-adolescent relationship assessed at T1. The quality of this relationship represented the affect dimension of parenting and was assessed by the inventory of parent and peer attachment (IPPA; Armsden & Greenberg, 1987). The IPPA distinguishes three subscales: communication, trust, and alienation. The response scales of these three subscales ranged from 1 (‘never’) to 6 (‘always’). In the present study we used the total scale of the IPPA assessing the general quality of the parent-adolescent relationship (see also Heiss, Berman, & Sperling, 1996). Cronbach’s alphas ranged from .77 to .87.

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*Parents' smoking.* We used parents' smoking assessed at T1 (De Vries, Engels, Kremers, Wetzels, & Mudde, 2003). To use parental smoking as a moderator a dichotomous variable was used to compare smoking and non-smoking parents in the multi-group analyses: 1= 'not a current smoker' and 2= 'current smoker'.

*Adolescents' smoking.* To assess adolescents' smoking, adolescents were asked to report which stage of smoking applied to them (De Vries, Engels, Kremers, Wetzels, & Mudde, 2003). On a 9-point scale responses ranged from 1='I have never smoked, not even one puff' to 9='I smoke at least once a day'. We recoded the responses into 4 categories: 1='never smoked' (not even one puff), 2='stopped smoking', 3='smoked occasionally, less than weekly', 4='smoked at least once a week'.

### Data analyses

Descriptive statistics about adolescents and parents' smoking, and the frequency of communication were provided including paired t-tests to test differences in the frequency of communication over time. To test the consistency in reports from parent and children, correlations between parents and their children about the frequency of communication were computed. Pearson correlations were reported between the frequency of communication and adolescent smoking at the three waves. Models were tested as depicted in Figure 1 using Structural Equation Modeling (SEM). To construct models for smoking initiation we selected adolescents who had never smoked at T1. To test the smoking onset models, we used the model as depicted in Figure 1 but excluding the smoking variable of adolescents at T1.

In our models, the frequency of the smoking-specific communication (T1, T2 and T3) are latent variables, and adolescents' smoking (T1, T2, and T3) are included as manifest variables. Because the smoking variables are categorically ordered (ordinal) variables, standard SEM procedures are not appropriate. To overcome this problem the software package MPLUS (Muthén & Muthén, 1998-2004) was used which easily handles these kind of data. The WLSMV-estimator (Weighted Least Square with adjusted Mean-and Variance chi-square statistic) was used to estimate the parameters of the model. Standard chi-square tests are replaced by robust chi-square variates to test model fit. To make optimal use of the information in our data we decided to use the missing option in MPLUS (footnote 1). In this case pair-wise information was used with categorical outcomes in combination with the WLSMV estimator.

To overcome the problem of having too many parameters to be estimated in the models, parceling was used for the latent variable 'frequency of communication' by replacing the original 8 items of a latent variable with 2 parcels of 4 items each

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<sup>1</sup> Because four out of the eight models for smoking did not work adequately when using the missing option in Mplus, we left the missing option out of these four models. This is the reason why the sample sizes in Table 4 for the four models of smoking do not equal 428.



(e.g., Harakeh, Scholte, Vermulst, De Vries & Engels, submitted; Bandalos & Finney, 2001). The factor loadings in the eight models for smoking onset ranged from .71 to .97, and for the eight models on smoking the factor loadings ranged from .74 to 1.02, indicating substantial loadings.

To examine the reciprocal relations between the frequency of smoking-specific parent-adolescent communication and adolescent's smoking, cross-lagged panel analyses (Finkel, 1995) were carried out (see Figure 1). In such models, error terms of corresponding indicators (parcels) between T1, T2 and T3 are allowed to correlate (Byrne, 1998, pp. 359-360). An initial model was estimated (depicted in Figure 1). Significant cross-relations over time (T1 to T2 and T2 to T3) are an indication for causal predominance: does the frequency of communication have an impact on adolescent smoking behavior, or does the adolescent smoking behavior have an impact on the frequency of communication? The existence of two significant cross paths is an indication for a reciprocal relationship. We started with an initial model with specified paths as shown in Figure 1, including correlations between the two variables at T1 and correlations between the disturbance terms at T2 and T3.

The moderation effects of the quality of smoking-specific parent-adolescent communication, quality of parent-adolescent relationship, and parents' smoking on cross-lagged effects of the frequency of smoking-specific communication and adolescent smoking were tested with multi-group analyses (Bollen, 1989). For the quality of smoking-specific parent-adolescent communication and the quality of parent-adolescent relationship we dichotomized each of these variables into high and low scores using median split (Poelen, Engels, Van Der Vorst, Scholte, & Vermulst, 2006). With regard to parents' smoking, two groups were formed: one group with the non-smokers and a second group with the smokers. We tested the model separately for fathers and mothers to examine whether parental smoking was a moderator in the model. Differences in structural paths between the two groups were tested with chi-square difference tests. Because differences between robust chi-square variates do not have a standard chi-square distribution, the robust chi-square values are first rescaled to standard chi-square values. This procedure is standard in MPLUS. Because testing the moderating influences for several parameters and many models will increase the risk of Type 1 errors, we decided to use  $p < .01$  as significant criterion.

## **Results**

### *Descriptive statistics*

Table 1 gives the smoking prevalence of the adolescents at waves T1, T2 and T3; the majority of the adolescents had never smoked or had quit smoking. At T1 20.7% of the mothers were current smokers compared with 23.8% of the fathers. On average parents and adolescents did not talk very often with each other about smoking-related topics (Table 2). Mothers indicated to talk the most about smoking issues, followed by fathers, older adolescents and younger adolescents. Table 2 shows that the frequency of communication between parent and adolescent on average decreased significantly over time for both the older adolescents and the younger adolescents (except between T2 and T3 for mother reports, father reports, and younger adolescent reports on the father which were not significant).

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Table 1: Smoking Prevalence (in %) over the Three Waves for Older and Younger Adolescents

	Time 1 (T1)		Time 2 (T2)		Time 3 (T3)	
	Older Adolescent	Younger Adolescent	Older Adolescent	Younger Adolescent	Older Adolescent	Younger Adolescent
<i>Smoking Status</i>						
Never smoked	51.6	64.0	48.3	57.6	44.8	51.9
Quit smoking	31.2	28.2	31.3	27.2	31.2	28.2
Smoked occasionally but less than weekly	8.2	2.8	8.7	5.1	9.3	5.5
Smoked at least once a week	8.9	4.9	11.8	10.1	14.6	14.5

*Note.* Percentages for the older and younger adolescents are shown separately. The smoking status among nonsmokers at T1, the adolescents at T1 who indicated to have never smoked were selected, and the prevalence of the smoking status of these adolescents at T2 and T3 are shown in the Table.

Table 2. Comparison of the Indicator of the Frequency of Communication Reported by Adolescents, Mothers and Fathers over the Three Waves

	Time 1 (T1)		Time 2 (T2)		Time 3 (T3)	
	M	(SD)	M	(SD)	M	(SD)
<i>Older Adolescent</i>						
Frequency of communication mother (O)	1.82 <sup>a</sup>	.69	1.73 <sup>b</sup>	.66	1.58 <sup>c</sup>	.59
Frequency of communication mother (M)	2.17 <sup>a</sup>	.71	2.06 <sup>b</sup>	.70	1.93 <sup>c</sup>	.69
Frequency of communication father (O)	1.75 <sup>a</sup>	.71	1.67 <sup>b</sup>	.66	1.53 <sup>c</sup>	.60
Frequency of communication father (F)	2.09 <sup>a</sup>	.71	1.97 <sup>b</sup>	.68	1.87 <sup>c</sup>	.67
<i>Younger adolescent</i>						
Frequency of communication mother (Y)	1.97 <sup>a</sup>	.74	1.83 <sup>b</sup>	.70	1.74 <sup>c</sup>	.63
Frequency of communication mother (M)	2.18 <sup>a</sup>	.75	2.09 <sup>b</sup>	.74	2.03 <sup>b</sup>	.70
Frequency of communication father (Y)	1.91 <sup>a</sup>	.80	1.79 <sup>b</sup>	.73	1.71 <sup>b</sup>	.70
Frequency of communication father (F)	2.13 <sup>a</sup>	.73	2.01 <sup>b</sup>	.73	1.95 <sup>b</sup>	.73

*Note.* Means with different superscripts (a, b or c) are significantly different ( $p < .01$ ). Paired t-tests were used. The Letter between brackets stands for the reporter: O is older adolescent, M is mother, F is father and Y is younger adolescent.

Table 3: Correlation Matrix between the Frequency of Smoking-Specific Communication and Adolescent Smoking

	Smoking T1	Smoking T2	Smoking T3
<i>Older adolescent</i>			
Freq. Com. mother T1 (O)	.14 **	.15 **	.15 **
Freq. Com. mother T2 (O)	.18 ***	.22 ***	.22 ***
Freq. Com. mother T3 (O)	.22 ***	.27 ***	.30 ***
Freq. Com. mother T1 (M)	.29 ***	.26 ***	.24 ***
Freq. Com. mother T2 (M)	.36 ***	.38 ***	.39 ***
Freq. Com. mother T3 (M)	.34 ***	.36 ***	.36 ***
Freq. Com. father T1 (O)	.12 *	.11 *	.11 *
Freq. Com. father T2 (O)	.16 **	.19 ***	.19 ***
Freq. Com. father T3 (O)	.15 **	.18 ***	.22 ***
Freq. Com. father T1 (F)	.24 ***	.27 ***	.18 ***
Freq. Com. father T2 (F)	.30 ***	.35 ***	.29 ***
Freq. Com. father T3 (F)	.22 ***	.30 ***	.25 ***
<i>Younger adolescent</i>			
Freq. Com. mother T1 (Y)	.11 *	.16 **	.18 ***
Freq. Com. mother T2 (Y)	.16 **	.15 **	.23 ***
Freq. Com. mother T3 (Y)	.09	.15 **	.24 ***
Freq. Com. mother T1 (M)	.18 ***	.20 ***	.22 ***
Freq. Com. mother T2 (M)	.22 ***	.31 ***	.32 ***
Freq. Com. mother T3 (M)	.19 ***	.26 ***	.35 ***
Freq. Com. father T1 (Y)	.10 *	.18 ***	.18 ***
Freq. Com. father T2 (Y)	.16 **	.16 **	.23 ***
Freq. Com. father T3 (Y)	.15 **	.16 **	.20 ***
Freq. Com. father T1 (F)	.15 **	.16 **	.16 **
Freq. Com. father T2 (F)	.27 ***	.30 ***	.28 ***
Freq. Com. father T3 (F)	.23 ***	.30 ***	.37 ***

Note. \*  $p < 0.05$ , \*\*  $p < 0.01$ , \*\*\*  $p < 0.001$ . The letter between brackets stands for the reporter: O is older adolescent, M is mother, F is father and Y is younger adolescent.

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Table 4: Fit Measures for Each of the Sixteen Models; Eight Models for Smoking and Eight Models for Smoking Onset

	Smoking				Smoking Onset			
	Older adolescent report		Parent report		Older adolescent report		Parent report	
	Mother	Father	Mother	Father	Mother	Father	Mother	Father
N	393	428	394	389	220	220	220	220
Df	6	6	7	7	6	6	6	6
X <sup>2</sup>	2.802	7.626	9.682	10.925	3.820	3.340	12.757	17.913
<i>p</i>	.8332	.2666	.2072	.1418	.7009	.7651	.0470	.0064
CFI	1.000	.997	.996	.993	1.000	1.000	.955	.926
RMSEA	0	.025	.031	.038	0	0	.072	.095

	Smoking				Smoking Onset			
	Younger adolescent report		Parent report		Younger adolescent report		Parent report	
	Mother	Father	Mother	Father	Mother	Father	Mother	Father
N	428	428	396	428	272	272	272	272
Df	6	6	7	7	6	6	6	6
X <sup>2</sup>	7.638	3.404	3.342	5.584	3.214	2.957	3.273	5.551
<i>p</i>	.3655	.7566	.8516	.5890	.7814	.8141	.7739	.4751
CFI	.999	1.000	1.000	1.000	1.000	1.000	1.000	1.000
RMSEA	.015	0	0	0	0	0	0	0

Table 5: Standardized Beta Weights for the Tested Models

	Smoking Behavior				Smoking Onset			
	Adolescent report		Parent report		Adolescent report		Parent report	
	Mother	Father	Mother	Father	Mother	Father	Mother	Father
<i>Older adolescent</i>								
Freq. Com. T1 – Freq. Com. T2	.55	.66	.69	.69	.53	.66	.63	.71
Freq. Com. T2 – Freq. Com. T3	.44	.41	.41	.51	.45	.36	.40	.57
Freq. Com. T1 – Freq. Com. T3	.25	.32	.36	.28	.29	.38	.42	<i>ns</i>
Smoking T1 – Smoking T2	.75	.75	.74	.73	-	-	-	-
Smoking T2 – Smoking T3	.76	.75	.76	.80	.53	.53	.53	.53
Smoking T1 – Smoking T3	.12	.14	.10	.11	-	-	-	-
Freq. Com. T1 – Smoking T2	<u>.07</u>	<u>.02</u>	<u>.06</u>	.11	<u>.11</u>	<u>.07</u>	<u>.05</u>	<u>.11</u>
Freq. Com. T2 – Smoking T3	<u>.04</u>	<u>.01</u>	<u>.05</u>	<u>-.06</u>	<u>-.01</u>	<u>-.03</u>	<u>.01</u>	<u>-.00</u>
Smoking T1 - Freq. Com. T2	.13	.10	.17	.15	-	-	-	-
Smoking T2 – Freq. Com. T3	.15	.08	.13	<u>.02</u>	<u>.07</u>	<u>.08</u>	.15	<u>.03</u>
<i>Younger adolescent</i>								
Freq. Com. T1 – Freq. Com. T2	.57	.54	.66	.68	.58	.52	.68	.68
Freq. Com. T2 – Freq. Com. T3	.38	.46	.43	.54	.39	.45	.49	.53
Freq. Com. T1 – Freq. Com. T3	.17	.14	.37	.27	.22	.13	.29	.29
Smoking T1 – Smoking T2	.65	.66	.64	.65	-	-	-	-
Smoking T2 – Smoking T3	.78	.78	.76	.79	.55	.55	.53	.55
Smoking T1 – Smoking T3	.11	.11	.13	.12	-	-	-	-
Freq. Com. T1 – Smoking T2	.12	.12	.09	<u>.08</u>	<u>.06</u>	<u>.12</u>	<u>.04</u>	<u>-.03</u>
Freq. Com. T2 – Smoking T3	.10	.09	.08	<u>.01</u>	.22	.19	.17	<u>.06</u>
Smoking T1 - Freq. Com. T2	.10	.12	.10	.17	-	-	-	-
Smoking T2 – Freq. Com. T3	<u>.06</u>	<u>.09</u>	<u>.07</u>	.09	.13	<u>.07</u>	<u>.10</u>	.19

Note. The underlined estimates are not significant ( $p > .05$ ).

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### Correlations

All correlations between the parents' reports and the older adolescents' reports on the frequency of communication were significant ( $p < 0.001$ , ranged .31 to .38). The correlations between parents' and younger adolescents' reports were also significant ( $p < 0.001$ , ranged .22 to .49). Table 3 shows that the frequency of communication and adolescents smoking was cross-sectionally positively related at all three waves.

### Model for the total sample

The following eight models were tested for the total sample including both non-smokers and smokers.

*Initial model for smoking among older adolescents.* The fit of the four models was satisfactory (Table 4). The cross-sectional correlations between the frequency of communication and adolescent smoking are given in Appendix 1.

The frequency of communication with the mother or father generally did not influence adolescent's smoking (Table 5). There was, however, one exception; with regard to the father's perspective, adolescents with fathers who talked more frequently with them about smoking-related issues at T1 were more likely to smoke one year later. Adolescent's smoking did, however, influence the frequency of communication with both the parents. Adolescents who smoked are more likely to talk more frequently with their parents about smoking-related issues one year later. There was one exception with regard to the father's perspective: adolescent smoking was not related to the frequency of communication between the father and adolescent.

*Initial model for smoking among younger adolescents.* The fit of the four models was satisfactory (Table 4). The cross-sectional correlations between the frequency of communication and adolescent smoking are given in Appendix 1.

In the model, the stability paths of the frequency of communication over time and the stability paths of smoking over time were significant (Table 5). The frequency of communication with the mother or father at T1 influenced adolescent's smoking one year later at T2. In other words, younger adolescents who frequently talked with their parents about smoking-related issues at T1 were more likely to smoke one year later at T2; there was one exception, implying that the frequency of communication between father and younger adolescent at T1 did not predict adolescent smoking one year later at T2 (father's perspective). Further, the frequency of communication with the mother or father at T2 also influenced the adolescent's smoking one year later at T3. In other words, younger adolescents who frequently talked with their parents about smoking-related issues at T2 were more likely to smoke one year later at T3. However, there was one exception with regard to the father's perspective: the frequency of communication between the father and younger adolescent at T2 did not predict adolescent smoking one year later at T3. Adolescent's smoking at T1, however, did influence the frequency of communication with both parents one year later. Adolescents who smoked were more likely to talk frequently with their parents about smoking-related issues one year later. Adolescent's smoking at T2, however, did not influence the frequency of communication with both of the parents one year later at T3. However, the father's perspective was an exception, showing that adolescents who smoked at T2 were more likely to talk more frequently with their fathers about smoking-related issues one year later at T3.

*Model for smoking onset*

To explore the timing of the communication, we tested eight models on smoking onset.

*Initial model for smoking onset among older adolescents.* Two models were tested on mother-adolescent communication, with each model focusing on the perspective of the older adolescent or parent separately. A similar strategy was followed for father-adolescent communication. The fit of the four models was satisfactory (Table 4). The cross-sectional correlations between the frequency of communication and adolescent smoking at T1 and their disturbance terms at T2 and T3 are given in Appendix 1.

In general, both for the adolescent and parent perspectives, the frequency of communication had no effect on the older adolescent's smoking at T2 and T3 (Table 5). Further, adolescent smoking had no effect on the frequency of communication with the mother or with the father. There was one exception with regard to the mother's perspective: smoking at T2 had an impact on the frequency of communication at T3; this shows that older adolescents who smoked had more frequent smoking-related discussions with the mother one year later. The stability paths of the frequency of communication over time and the stability paths of smoking over time were relatively strong.

*Initial model for smoking onset among younger adolescents.* The fit of the four models was satisfactory (Table 4). The cross-sectional correlations between the frequency of communication and adolescent smoking are given in Appendix 1.

The frequency of communication between the younger adolescents and their parents did not affect adolescent smoking onset one year later (Table 5). However, the frequency of communication between parent and adolescent at T2 did affect adolescent smoking at T3. In other words, the children of parents who communicated frequently with them about smoking-related issues at T2 were more likely to smoke one year later. Further, with respect to adolescents' perspective on the father and mothers' perspective, younger adolescents' smoking had no effect on the frequency of communication. However, with regard to adolescents' perspective on the mother and fathers' perspective, there was a significant effect of adolescent smoking at T2 on the frequency of communication one year later; younger adolescents who smoked at T2 were more likely to be involved more frequently in communication with their parents on smoking-related issues. The stability paths of the frequency of communication over time and those for smoking were relatively strong.

*Moderators*

Multi-group analyses were conducted for the eight models on the total sample to see whether the three moderators (i.e., the quality of smoking-specific communication, the quality of the parent-adolescent relationship, and parental smoking behavior) influenced the effects of the frequency of smoking-specific communication or adolescent's smoking.

*Multi-group analyses among older adolescents.* We tested whether the quality of the parent-adolescent communication on smoking-related issues, the quality of parent-adolescent relationship, and parent's smoking were moderators. We found that the quality of communication did not moderate the effects of the frequency of communication or that of adolescent's smoking. However, there was an exception with respect to the older adolescents' perspective; the quality of communication

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between mother and older adolescent moderated the effect of older adolescent smoking at T2 on the frequency of communication at T3 ( $\Delta\chi^2(1) = 8.46, p = .004$ ). The path for the low group was positive (unstandardized  $\beta = .238, SE = .06$ ) and for the high group the path was not significant (unstandardized  $\beta = .037, SE = .06$ ). This finding showed that the older adolescents who smoked at T2 and perceived that the frequent discussions with mothers on smoking-related issues took place in a constructive and respectful manner will not communicate more frequently one year later, in contrast to smoking adolescents who perceived that the discussions took place in a less constructive and respectful manner.

Secondly, we tested whether the quality of the parent-adolescent relationship moderated the association between the frequency of communication and adolescent's smoking over time. We found no indications for such moderating effects.

Finally, we tested whether parental smoking moderated the effects of the frequency of communication and adolescent's smoking over time. It was found that parental smoking generally did not moderate the effects of the frequency of communication or of adolescent's smoking. However, there were two exceptions to the model about the older adolescent's perspective on the mother. The first finding showed that mother's smoking moderated the effect of older adolescent smoking at T1 on the frequency of communication at T2 ( $\Delta\chi^2(1) = 11.48, p = .0007$ ). For the group with non-smoking mothers, this path was positive (unstandardized  $\beta = .220, SE = .06$ ) while for the group with smoking mothers this path was not significant (unstandardized  $\beta = -.154, SE = .13$ ). This finding indicated that the older adolescents who smoked at T1 and have a smoking mother will not communicate more frequently with their mother one year later, in contrast to smoking adolescents with non-smoking mothers. Further, mother's smoking moderated the effect of older adolescent smoking at T2 on the frequency of communication at T3 ( $\Delta\chi^2(1) = 7.65, p = .0057$ ). For the group with non-smoking mothers, this path was positive (unstandardized  $\beta = .103, SE = .05$ ) while for the group with smoking mothers this path was positive and higher than the group with the non-smoking mothers (unstandardized  $\beta = .165, SE = .078$ ).

*Multi-group analyses among younger adolescent.* First, we tested whether the quality of communication moderated the association between the frequency of communication and adolescent's smoking over time. The findings indicated that the quality of communication did not moderate the effects of the frequency of communication or of adolescent's smoking. However, there was one exception; the younger adolescent perspective on the mother showed that the quality of smoking-specific communication between the mother and younger adolescent moderated the effect of the younger adolescent smoking at T1 on the frequency of communication between the older adolescent and the mother at T2 ( $\Delta\chi^2(1) = 6.95, p = .008$ ). The path for the low group was still positive and significant (unstandardized  $\beta = .302, SE = .10$ ) and for the high group the path was not significant (unstandardized  $\beta = -.166, SE = .12$ ).

Secondly, we tested whether the quality of the parent-adolescent relationship moderated the effects of the frequency of communication and adolescent's smoking over time. In all of the four models it was found that the quality of the parent-adolescent relationship did not moderate the effects of the frequency of communication or of adolescent's smoking.



Finally, we tested whether smoking of the parent moderated the effects of the frequency of communication and adolescent's smoking over time. The findings indicated that parent's smoking did not moderate the effects of the frequency of communication or of adolescent's smoking.

## **Discussion**

The aim of the present study was to obtain more insight into the associations between smoking-specific communication in families and adolescent smoking. It was shown that younger and older adolescents within the same family may react differently to smoking-specific communication with their parents. Smoking-specific communication did not affect older adolescents' smoking, while younger adolescents' smoking was affected by smoking-specific communication over time. The more frequently the parents talked with their younger adolescent about smoking-related issues, the more likely the younger adolescent was to smoke one year later. One explanation for this may be that parents tend to talk more frequently with their younger adolescent about smoking-related topics because they may feel more protective toward their younger adolescent or because they think their older adolescent is more responsible and therefore would not smoke. Another explanation may be that parents respect the older adolescent's wish to be more independent and be treated as an equal concerning more adult themes, such as smoking. Younger adolescents within the family may consider that they are treated differently from their older sibling and act opposite to their parents' expectation, which could be interpreted as an act of rebellion (Spijkerman, Van Den Eijnden, & Engels, 2005). Among several smoking-specific parenting strategies (such as setting house rules or reducing the availability of tobacco at home) smoking-specific communication is supposed to be a more difficult strategy for parents to establish because both the parent and the adolescent have to be involved and interact to make this work. Both parties are important to establish communication about smoking-related issues, and both have to perceive these conversations as useful (Dittus, Jaccard, & Gordon, 1999). However, we speculate that the parents' initiative to communicate with their adolescents on smoking-specific topics is less important than when adolescents initiate the communication because this suggests that they value their parents' opinion. At that moment it is essential what the parents convey to their children with respect to smoking and whether they communicate with strong or weak arguments. By contrast, when the parents initiate communication on smoking-related topics, the adolescents may not be interested at that moment, or the communication may even trigger adolescents to start to smoke. This is only speculation, because in a survey design it is difficult to examine who *really* took the initiative to communicate on smoking-specific issues. Observational studies would enable to observe families in a laboratory or naturalistic setting and provide more insight into the adolescent-parent interaction when communicating about smoking-related topics. Such observational studies would provide information on who initiates the communication on smoking-related topics, how the other person reacts to it, and the barriers parents and adolescents face in communicating with each other on smoking-related topics.

The present study also showed that when adolescents smoke, the likelihood increases that one year later they will have more smoking-related conversations with

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their parents. There are two possible explanations for this. First, parents who know or suspect that their child is smoking may try to discourage him/her from smoking by talking about smoking-related topics more frequently. Second, adolescents who smoke may have a greater need to talk with their parents about smoking-related topics as they may want more information on smoking or on the experiences of their parents with respect to smoking, or may even seek their parents' approval. Again, this is speculative. We can only conclude that whenever adolescents smoke, there will be more frequent communication on smoking-specific topics between the parent and the adolescent.

With respect to the timing of smoking-specific communication, additional analyses were conducted to investigate smoking initiation. It was shown that parents who frequently talk with their adolescents about smoking-related issues are not effective in preventing their offspring from initiating smoking; in a positive sense one might argue that at least this does not show a counterproductive effect. With regard to the effects of the frequency of smoking-specific communication on adolescents' smoking onset, the results show a similar pattern for the older adolescent and his/her younger sibling. Thus, we have no evidence that the specific timing of starting discussions on smoking has a preventive effect on adolescent smoking.

Neither the quality of the smoking-specific communication between parent and adolescent, nor the overall quality of the relationship between parent and adolescent, nor parents' smoking moderated the associations between the frequency of smoking-specific communication and adolescent smoking. Thus, even in families where communication on smoking-related issues takes place in a constructive and respectful manner, where the general family environment is good and parents do not smoke, the counterproductive effects of the frequency of smoking-specific communication can still occur. This strongly underscores the robustness of our findings.

The basic assumption that communication itself would prevent adolescents from smoking could not be supported by our findings. This is in contrast with the results of other studies; however, those studies assessed smoking-specific communication in different ways. For example, some only asked the adolescents how often parents talked with them about not smoking cigarettes (Jackson, 1997), others assessed how often parents talked with adolescents more extensively by including several specific smoking-topics (Den Exter-Blokland et al., 2006; Ennett et al., 2001; Harakeh et al., 2005), and yet others assessed smoking-specific communication as parents' intentions to discuss reasons for not smoking with their children (Chassin et al., 2005). We believe the instrument we used, as described by Ennett et al. (2001), is a reliable and valid way of assessing the frequency of smoking communication. Our findings are in line with other prospective studies investigating the effect of the frequency of smoking-specific communication on adolescent smoking (e.g., Chassin et al., 2005; Den Exter-Blokland et al., 2006; Ennett et al., 2001), which have indicated that the frequency of smoking-specific communication does not prevent adolescents' smoking. A strong limitation of these studies, however, is that they did not test reciprocal associations between communication and smoking.

Our study showed that parents generally do not talk frequently with their adolescent children about smoking-related issues, and the frequency of communication decreases even further as the adolescent grows older. However, there

is little agreement between the family members as to how frequently smoking-related communication has occurred. Adolescent reports may also reflect whether they think that this communication has had an effect on their behavior or whether the discussions were important. Parents may report that they communicate more often than adolescents did because they have to conform to (cultural) standards of being a 'good' parent and may therefore include in their reports all the efforts they have undertaken, or may overestimate positive parenting behaviors (Harakeh et al., 2005). Thus, both perspectives (adolescents and parents) are probably a biased representation of the frequency of smoking-related communication. However, our results indicate that this bias does not necessarily mean that measuring the frequency of communication in parents and adolescents provides no insight into the effects of frequent communication as such.

In sum, investigating the reciprocal associations between the frequency of smoking-specific communication and adolescent smoking showed that adolescents' smoking does affect the frequency of smoking-specific communication. In other words, parents engage in smoking-specific communication more as a reaction to adolescents' smoking than as a preventive strategy prior to adolescent smoking. Parents will react to adolescents who smoke by communicating more frequently with them; however, this study indicates that this may not be effective and may even be counterproductive. The three moderators (i.e., quality of smoking-specific communication, overall quality of parent-adolescent relationship, and parental smoking) did not affect the associations between the frequency of smoking-specific communication and adolescent smoking.

#### *Limitations*

Some limitations of this study should be mentioned. First, because we included only intact families in which the children were biologically related and the mother and father were married or living together, we can not generalize these findings to single parent or remarried families, or to families with step-siblings or adoptive siblings. In addition, cross-national studies are needed to determine whether communication processes in relation to smoking may differ between countries. Second, adolescents may have under-reported their actual smoking because they completed their questionnaire in the presence of their parents. To diminish this problem interviewers were also present when the four family members completed the questionnaire, and family members were asked to complete the forms separately without discussion between each other. Third, family members were asked by means of questionnaires how often they talked about smoking-related issues in the last 12 months; however, this may not be precise enough. Besides this, we lack information about the communication processes in childhood which may be important, because some parents may have communicated with their children about smoking long before they are at an age where they are at an increased risk to smoke. Finally, some moderators not tested in our study may influence the effect of smoking-specific communication. For example, Jaccard et al. (1998) mention three moderators with respect to adolescent sexual behavior, which may also be important for smoking: socio-economic status of the parents, family size, and the age of the parent. Another moderator may be the adolescents' and parents' personality; e.g. children high on agreeableness may be more inclined to follow parental advice on non-smoking in their discussions than children low on agreeableness.

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### Implications

Prevention campaigns often recommend and encourage parents through television and newspapers to communicate with their adolescents about alcohol, tobacco and other drugs (Miller-Day, 2002). Our findings show that such discussions do not prevent adolescents from smoking, and may even have a counterproductive effect. Also, adolescents' who smoked were more likely to communicate with their parents about smoking-related issues, presumably because parents think that they might persuade their adolescent to quit smoking. Thus, before prevention programs are developed to encourage parents to communicate about smoking-related issues as an effective strategy to prevent adolescents from smoking, more (observational) research is needed to elucidate the circumstances under which communication is effective. To obtain a better understanding of the communication process we need to know how parents could effectively transmit their norms on risky behavior, and empower their offspring to individually make responsible decisions regarding risky behavior during childhood and adolescence (Miller-Day, 2002).

In conclusion, encouraging the parents to talk frequently with their adolescents about smoking-related issues through the media, prevention programs or other sources, may not be an appropriate message to broadcast.

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*Appendix 1: Correlations between the Frequency of Communication and Smoking at T1 and between their Disturbance Terms at T2 and T3.*

	Smoking						Smoking Onset						
	Adolescent report			Parent report			Adolescent report			Parent report			
	Mother	Father	Mother	Father	Mother	Father	Mother	Father	Mother	Father	Mother	Father	
<b>Older Adolescent</b>													
Freq. Com. T1	x Smoking T1	.13	.12	.32	.26	-.01	.18	.17	.18	.17	-.01	-.01	-.01
Freq. Com. T2	x Smoking T2	<u>.05</u>	.08	.11	.11	.13	<u>.10</u>	<u>.10</u>	<u>.10</u>	<u>.10</u>	<u>.10</u>	<u>.10</u>	<u>.10</u>
Freq. Com. T3	x Smoking T3	.06	.06	<u>.02</u>	<u>.02</u>	<u>.05</u>	<u>.05</u>	<u>.05</u>	<u>.02</u>	<u>.02</u>	<u>.02</u>	<u>.02</u>	<u>.02</u>
<b>Younger Adolescent</b>													
Freq. Com. T1	x Smoking T1	.12	.11	.20	.17	-.01	.14	.14	.14	.14	.14	.14	.14
Freq. Com. T2	x Smoking T2	<u>-.00</u>	<u>.00</u>	.13	.10	<u>-.01</u>	<u>-.02</u>	<u>-.02</u>	<u>.14</u>	<u>.14</u>	<u>.14</u>	<u>.14</u>	<u>.14</u>
Freq. Com. T3	x Smoking T3	.08	<u>.01</u>	.11	.12	<u>.06</u>	<u>.01</u>	<u>.01</u>	<u>.19</u>	<u>.19</u>	<u>.19</u>	<u>.19</u>	<u>.23</u>

*Note.* The underlined correlations are not significant ( $p > .05$ ).





## Chapter 7

### **General Discussion**

In this closing chapter we will summarize the main findings and conclusions of the various studies. Some inconsistencies in the findings and a number of limitations will be addressed in the subsequent paragraphs. Furthermore, some suggestions for new research and the implications for prevention will be discussed.

In the previous chapters five empirical studies were presented that examined to what extent parental factors are associated with adolescent smoking. Children learn from interactions with their parents but are also influenced by siblings, peers and teachers with whom they interact frequently. Therefore, parents contribute to, but obviously are not the only persons involved in the upbringing process.

As was noted in the introduction, the main aim of this dissertation is to address the link between parenting and adolescent smoking. We address this question since the role of parents has been traditionally neglected in smoking research as well as prevention programs. Recent research has shown that the prevention of adult smoking in the long term can only be achieved by preventing smoking initiation in adolescence.

Generally, scholars and prevention workers have assumed that smoking uptake has been primarily a matter of peer influence and the focus of most prevention programs for many years has subsequently been on resisting peer pressure (Avenevoli & Merikangas, 2003; Dalton, Sargent, Beach, Bernardt & Stevens, 1999). Although numerous studies have found solid evidence for the influence of peers (e.g., Chassin, Presson, Sherman, Montello & McGrew, 1986; Rose, Chassin, Presson & Sherman, 1999), focusing prevention primarily on peer pressure has not contributed to a substantial decline in prevalence rates among adolescents (Engels, 2003). It has become apparent that the role of parents with regard to adolescent smoking might be important as well and subsequently, in the past 10 years, the role of the parents has increasingly become a factor in research about smoking initiation. This line of research has focused on the observation that parents have a direct as well as an indirect impact on adolescent smoking. Direct in the sense of what parents do and say, and indirect in the sense that their children internalize parental attitudes and beliefs which are reflected in the adolescent's decision to take up smoking or not. Another indirect impact is that parents affect selective peer affiliations (e.g., Chassin, Presson, Todd, Rose & Sherman, 1998; Engels, Knibbe, de Vries, Drop & van Breukelen, 1999; Engels, Vitaro, den Exter Blokland, de Kemp & Scholte, 2004).

In this first part of this concluding chapter we will summarize and discuss the findings of the five empirical studies. A table of the positive and negative associations between predictors and dependent measures in this dissertation (Table 1) will be presented after the discussion in order to facilitate comparison of the various operationalizations of adolescent smoking between the studies. A summary of findings will be presented first.

## Chapter 7

### A Summary of the Findings in this Dissertation

	Chapter
1 Adolescents with both parents being current smokers are four times more likely to be an ever smoker compared to adolescents with parents who have never smoked. The likelihood of adolescent ever smoking increases gradually depending on the basis of parental lifetime smoking status: never smoker, former smoker or current smoker	2
2 The earlier the parents stop smoking in the life of their off-spring, the lower the likelihood that their children will start smoking in adolescence.	2
3 Smoking and non-smoking parents hold different norms and attitudes about adolescent smoking and how to deal with it.	3
4 Smoking parents are less confident about the way they can deal with their child's smoking.	3
5 The general parenting dimension involvement is more important in preventing early adolescent smoking as compared to concrete anti-smoking socialization actions, such as communication, house rules, and warnings.	3
6 Parental smoking is associated with an increased likelihood of adolescent smoking continuation. Differences between smoking and non-smoking parents seem to be more important in the case of early adolescent smoking maintenance. In the first phase of experimentation this influence is less strong.	3 & 4
7 Smoking and non-smoking parents differ in the way they exert control depending on the age of the adolescent. Higher levels of control predicted lower levels of smoking initiation for both smoking and non-smoking parents. For smoking parents only, higher levels of control are associated with lower likelihood of adolescent smoking initiation later in time.	4
8 Children of smoking parents who report high levels of parental support are more likely to quit. Children of non-smoking parents who report high levels of parental control are more likely to quit.	4
9 Parenting styles are not predictive of the transition to adolescent regular smoking.	4
10 Establishing a no-smoking agreement is not an effective tool for adolescent smoking prevention.	5
11 Parents do not make the no-smoking agreement as a reaction to adolescent experimentation with smoking.	5
12 High quality of communication on the part of the parents has a powerful preventive effect on adolescent smoking while frequently raising the subject of smoking has a counterproductive effect.	5
13 Frequently raising the subject of smoking has a counterproductive effect, even in families where communication takes place in a constructive and respectful manner and parents do not smoke.	6
14 When adolescents smoke, they will have more smoking-related conversations with their parents one year later. Parents engage in smoking-specific communication more as a reaction to adolescents' smoking than as a preventive strategy prior to adolescent smoking.	6

## **Discussion of Main Findings**

### Parents as Role Models - Chapter 2

The most imperative findings of chapter 2 were two-fold. First, we found that adolescents with both parents being current smokers are four times more likely to be ever smokers compared to adolescents with parents who had never smoked. The likelihood of adolescent ever smoking increases gradually depending on the basis of parental lifetime smoking status: never smoker, former smoker or current smoker. Secondly, we found that the earlier the parents stop smoking in the life of their offspring, the lower the likelihood that their children will start smoking in adolescence. Parental quitting was most effective in the case the parent stopped smoking before the child reached the age of 7.

In respect to our first finding, it can be concluded that even if parents are former smokers, their past smoking behavior seems to translate into higher odds that their adolescents will experiment with smoking. Our findings revealed that adolescents living with parents who never have smoked were the least likely to have experimented with cigarettes. These findings emphasize the importance the parents play as role models. Previous studies also have demonstrated that the presence of a parental role model has a significant influence on the likelihood the adolescent will experiment with smoking (e.g., Conrad, Flay & Hill, 1992; Bailey, Ennett, & Rignwalt, 1993). Furthermore, our findings indicate that more attention should be given to the parental smoking history in the prediction of adolescent smoking. The findings of our study support the assumptions of Bauman, Foshee, Linzer, and Koch (1990) and Bailey et al. (1993) that stress the significance of parental smoking history at any age during the child's life in predicting adolescent smoking. We demonstrated not only that growing up in an environment where one or both parents are former or current smokers increases the likelihood that the young adolescent will start experimenting with cigarettes, but also that this influence is incremental. Chassin et al. (1998) demonstrated in a longitudinal multigenerational design that general as well as smoking specific parenting practices contribute to the intergenerational transmission of smoking, indicating not only that parent smoking is related to offspring smoking in two generations, but also that antismoking attitudes in one generation may increase antismoking parenting practices in the next generation. They point to two other explanations of why smoking seems to run in families. First, mediation through heritable differences in personality and second, mediation through prenatal exposure to nicotine and second-hand smoke.

Secondly, we found that the earlier the parents stop smoking in the life of their offspring, the less likely their children start smoking in adolescence. These findings underline those of Farkas, Distefan, Choi, Gilpin and Pierce (1999) who found a negative linear relationship between the likelihood an adolescent would be a smoker for each year the parent delayed quitting. Additionally, our findings are in agreement with those of Peterson and Peterson (1986), Jackson and Henriksen (1997), Bricker, Leroux, and Peterson (2003) and Farkas et al. (1999) who also found that parental smoking cessation has differential effects on early adolescent smoking, depending on the age of the child at the time the parent quit smoking.

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In our study, the modeling effect of the father's smoking cessation at an early age of his child seems stronger, if the mother is a never or former smoker. This finding implies that fathers might make a substantial difference concerning adolescent smoking. In a recent study, Blackburn, Bonas, Spencer, Coe, Dolan, and Moy (2005) have made a few suggestions with regard to differences in smoking behavior between fathers and mothers that should give direction to future studies. Their study focused on the relative contribution that mothers' and fathers' tobacco smoke makes to passive smoking among infants. They conclude that tobacco consumption patterns vary across different categories of parental smokers and they explain why environmental tobacco smoke exposure levels vary among infants and are highest among children in households where two parents smoke. Although as a group fathers consumed less tobacco in the house than mothers, in this study infants were more likely to live in a household with a smoking father than a smoking mother (Blackburn et al., 2005). This finding is in agreement with the general Dutch population with regard to adolescents: 38% of the adolescents in Dutch households are confronted with a smoking father and 32% with a smoking mother (Stivoro, 2001, 2005). Additionally, in households where both parents smoked fathers' cigarette consumption was higher than in father-only smoking households (Blackburn et al. 2005). For paternal smokers, living with a partner who smoked increased total tobacco consumption. Among mothers, however, consumption did not vary according to whether they did or did not live with a partner who smoked. This study further indicates that mothers' tobacco smoke makes a significant contribution to the total amount of exposure, simply because mothers spend more time at home, but that only fathers living in households with two parent smokers increased their tobacco consumption in the house. Therefore, higher exposure in infants living in homes where both parents smoke can be explained, at least in part, by their father's tobacco consumption (Blackburn et al., 2005).

These findings might help us to explain our findings with regard to differences in effect size between fathers and mothers quitting; the impact of fathers quitting might be more powerful because adolescents are (1) more likely to live in a household with a smoking father than a smoking mother and (2) fathers appear to have different levels of use depending on whether his partner smokes while for mothers this does not seem to be the case. The effect of paternal quitting presented in chapter 2 might therefore be stronger than maternal quitting, especially in the case the mother is a never or former smoker. The implication of these findings is not only that the role of the father has been underestimated in most studies with regard to his smoking behavior and subsequently his role as model figure, but also that health promotion and prevention programs need to focus on fathers as well as mothers. Future studies should determine whether paternal levels of smoking indeed depend on the smoking status of the mother among families with adolescents.

### Parental Socialization - Chapter 3

The most essential findings of chapter 3 were four-fold. First, smoking and non-smoking parents hold different norms and attitudes about adolescent smoking and how to deal with it. For example, smoking parents communicate and warn their adolescents more often about the health dangers, while non-smoking parents apply more house rules regarding non smoking. Second, smoking parents are less confident

about the way they can deal with their child's smoking. Third, overall parental knowledge about friends' and own child smoking was found to be more effective in preventing early adolescent smoking as compared to concrete anti-smoking socialization actions, such as communication, house rules, and warnings. And finally, parental smoking was found to be associated with an increased likelihood of adolescent smoking continuation.

Following suggestions made by Chassin et al. (1986) that smoking initiation and smoking maintenance might have different determinants, we closely focused in chapter 3 on those parental socialization variables that are assumed to affect the early stages of adolescent smoking (Avenevoli & Merikangas, 2003; Engels & Willemsen, 2004; Fearnow, Chassin, Presson, & Sherman, 1998; Chassin et al., 1998). We defined parental anti-smoking socialization as the frequency of communication, existence of house rules, warnings, knowledge about friend and own child smoking, psychological control, confidence in affecting the child's smoking and availability of cigarettes, parental approval of smoking, and three reaction patterns in case the adolescent starts to smoke (anger and punishment, *laissez faire*, explaining disappointment).

Parental knowledge about friends' and own child smoking was associated with lower likelihood of smoking initiation, while confidence in affecting child's smoking behavior and reacting with anger and punishment, when finding out the child started to smoke, were associated with a lower likelihood of smoking maintenance. Engels and Willemsen (2004) suggest that parents who perceive that they have some influence are also the parents who are more involved in setting rules at home not to smoke, talk about smoking, and warn their children about the negative effects of smoking. However, we found no differences between predictors of smoking initiation and smoking maintenance for more concrete parenting practices, such as communication, house rules, warnings, and availability of cigarettes. However, in the case of smoking maintenance parental smoking status was strongly associated with an increased likelihood of smoking maintenance, while this was not the case with initiation. This is in agreement with the study by Chassin et al. (1986) that noticed that smoking initiation and smoking maintenance might indeed have different determinants.

Although it is suggested in the literature that adolescents are likely to experiment with smoking when they have smoking parents, when there are cigarettes available at home, and when they have parents with permissive norms and attitudes towards smoking (e.g. Avenevoli & Merikangas, 2003; Chassin, Presson, Pitts, & Sherman, 2000; Eissenberg & Balster, 2000; Mayhew, Flay, & Mott, 2000), none of these concepts were associated with early adolescent smoking initiation in our study. With regard to parental anti-smoking socialization and early adolescent smoking initiation, previous studies have reported mixed results. In a longitudinal study, Chassin, et al. (1998) showed that specific smoking conversations are associated with a lower likelihood of adolescent smoking. In cross-sectional studies by Jackson and Henriksen (1997) and Henriksen and Jackson (1998), they also found lower rates of adolescent smoking initiation when parents engage in anti-smoking socialization. However, Ennett, Bauman, Foshee, Pemberton, and Hicks (2001) reported that there is no longitudinal effect of parent-child communication about tobacco on adolescent smoking initiation. The results of our longitudinal study support those of Ennett et al. (2001).

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Another purpose of the study was to determine whether smoking and non-smoking parents differ in their antismoking socialization. Our results clearly indicate that smoking and non-smoking parents strongly differ in norms and attitudes about smoking. Though many smoking parents try to communicate the overall message that smoking is bad, they do not support that message with concrete behaviors, such as setting house rules, reducing the availability of cigarettes or acquiring a lot of knowledge about their child's smoking. These findings are in agreement with Otten, Engels, and van den Eijnden (submitted) who demonstrated not only that parental smoking leads to an increased risk of smoking onset, but also that parental smoking is negatively related to anti-smoking socialization as well.

Furthermore, with regard to the aforementioned measure of parental confidence in affecting their child's smoking, smoking parents are less confident about the way they can deal with their child's smoking behavior and show stronger approval of adolescent smoking. Although these crucial differences between smoking and non-smoking parents seem straightforward, they only have a strong influence in the case of early adolescent smoking maintenance, not the first phase of experimentation. Our findings support those of Clark, Scarisbrick-Hauser, Gautam, and Wirk (1999), who demonstrated that smoking parents believe that adolescent smoking is not worth getting into a conflict with their adolescents about and additionally feel that there is no need to become actively involved in their offspring's decisions regarding smoking. Additionally, based on opinions of parents as well as their children, Harakeh, Scholte, De Vries, and Engels (2005) demonstrated that non-smoking parents in general are engaged in more constructive anti-smoking socialization practices than smoking parents.

When it comes to smoking detection of their adolescent, non-smoking parents demonstrate their disappointment to their adolescent significantly more clearly than smoking parents. It is noteworthy to mention that on closer inspection of our results, the effect of using the strategy 'anger and punishment' when finding out that the adolescent starts smoking, is only effective for adolescents of non-smoking parents. High levels of anger and punishment were associated with a higher likelihood the adolescent was a never smoker, while low levels of anger and punishment were associated with smoking maintenance. This finding implies that non-smoking parents appear to react adequately: the fact that they are willing to show their anger in the case of the adolescent's smoking and punish in an effective way influences the smoking behavior of their adolescent. Clark et al. (1999) argue that disproportional levels of anger and punishment can backfire and make the adolescent more cautious about getting caught. Additionally, Chassin et al. (1998) reported that mothers who punished their children for smoking had children who were less likely to affiliate with smoking peers. These findings warrant further research to determine not only whether different levels of parental 'anger and punishment' contribute to differences in the development of smoking in adolescents, but also whether differences between other possible parental reactions with regard to the first experimentations of their adolescent contribute to differences in adolescent smoking. In other words, the question can be raised whether the first parental reaction is a crossroad that determines future adolescent smoking.

## Dimensions of General Parenting: Support and Control - Chapter 4

In chapter 4 it was demonstrated that smoking initiation could be predicted by parental control, indicating that higher levels of behavioral control are associated with lower likelihood of adolescent smoking initiation. We found a similar pattern in the case adolescents had entered the next grade after their first year in secondary education, but only for those with smoking parents.

In Baumrind's classification of parenting styles, control is high in both democratic as well as authoritarian parenting, while permissive and neglecting parenting are low on control. In a longitudinal study Pierce, Distefan, Jackson, White, and Gilpin (2002) examined strong and weak authoritative parenting styles. They reported that a strong authoritative parenting style is associated with a reduced risk of future adolescent smoking initiation among never smokers, regardless of parental smoking status. Chassin et al. (2005) tested whether adolescent smoking was predicted by smoking-specific parenting practices or by a more general parenting style. With regard to general parenting they found that low levels of parental control and acceptance were associated with adolescent smoking initiation for both smoking and non-smoking parents. In our study we did not find an effect of parental support on initiation, much in line with Huver Engels, Vermulst, & De Vries (submitted) who report no effect of the dimension support on adolescent smoking. But with respect to the effect of parental control on initiation our findings are in agreement with the findings of both Pierce et al. (2002) and Cassin et al. (2005). However, Harakeh, Scholte, Vermulst, de Vries & Engels (2004) studied the associations between parenting and adolescent smoking through direct and indirect influence on adolescent smoking cognitions, but found no direct or indirect association between parental control and smoking onset in a comparable age group of adolescents.

Stattin and Kerr (2000) demonstrated that with regard to adolescent problem behavior the exertion of parental control is a complex interplay between the willingness of parents to monitor their children and the willingness of the child to disclose information about what he or she is doing. Hence, although we found that a lack of parental control precedes adolescent smoking initiation, an alternative explanation, following the suggestions of Stattin and Kerr (2000), might be that if the adolescent is engaged in some level of smoking, it causes him or her to withdraw from his or her parents. Feelings of guilt induced by smoking secretly or a lack of trust in one's parents to initiate a conversation about one's smoking experiments might play a role in this process which leads to lower levels of parental control (Finkenauer, Engels & Meeus, 2002).

Increases in smoking as well as occasional smoking were not predicted by any of the parenting dimensions. Although previous studies (e.g., Chassin et al., 2005; Jackson, Bee-Gates & Henriksen, 1994) have reported that in addition to control, parental support is also an important variable associated with adolescent smoking initiation and low levels of experimentation, we found no associations with this parenting style in the case of smoking initiation, occasional smoking, and increase to regular smoking.

The continuation of occasional smoking was positively predicted by parental smoking. A more thorough discussion about differences between smoking and non-smoking parents will be presented in the paragraph 'Integrating the Main Findings'.

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With respect to quitting however, a different picture emerged; adolescents of smoking parents who reported high levels of parental support were most likely to be quitters, while on the other hand adolescents of non-smoking parents who reported high levels of parental control were most likely to be quitters. With respect to parenting styles and adolescent smoking cessation in this age group, Chassin, Presson & Sherman (1984) demonstrated that for younger adolescents, cessation was related mainly to parental support and attitudes towards smoking, while older adolescents responded primarily to peer influences in choosing to quit. Our findings do indicate that parents can be successful with helping their adolescent to quit smoking after a period of experimentation. It should be noted, however, that Chassin, Presson & Sherman (1984) demonstrated that adolescents who would later quit smoking were different on a psychological level with respect to personal motivation and the motivation to resist peer pressure from those who continued to smoke even prior to the transition. Further research is warranted to determine whether these parental actions are indeed helpful in the long run to prevent future smoking in their off-spring or whether individual characteristics of the adolescent are more significant.

### No-smoking Agreement and Smoking Communication - Chapters 5 & 6

The most important findings of chapter 5 and 6 are as follows. First, establishing a no-smoking agreement is not an effective tool for adolescent smoking prevention. Secondly, it is the quality of communication on the part of the parents that has a powerful preventive effect on adolescent smoking, while very frequently raising the subject of smoking has a counterproductive effect. Thirdly, parents engage in smoking-specific communication more as a reaction to adolescents' smoking than as a preventive strategy prior to adolescent smoking. And finally, even in families where communication on smoking-related issues takes place in a constructive and respectful manner and parents do not smoke, a higher frequency of smoking-specific communication has counterproductive effects

Chapter 5 examined by means of one cross-sectional and two longitudinal data sets whether the establishment of a no-smoking agreement is an effective tool for parents to prevent their offspring from smoking. The initial assumption was that the establishment of a no-smoking agreement is a relatively simple communication tool. By making the agreement - and subsequently rewarding their children when they keep the agreement - there is no further need for intensive discussion. The popularity of the no-smoking agreement in the Netherlands, at least, is probably based on the assumption that parents can be protective gatekeepers if they set clear rules (e.g., Clark et al., 1999), and if keeping the rules is accompanied by a substantial reward. No previous studies, however, have addressed the issue of the effectiveness of such an agreement between parents and adolescents. Recently, however, Huver, Engels, and De Vries (2006) demonstrated in a longitudinal study among a representative sample of Dutch early adolescents, that rewards for adolescent non-smoking actually increased the likelihood of adolescent smoking.

The findings of the first cross sectional study of chapter 5 seem to indicate that the no-smoking agreement is an effective tool in dealing with adolescent smoking, especially for smoking parents. However, these findings represent only cross-sectional associations and should be interpreted accordingly. Longitudinally, however, the results



in the second and third study of chapter 5 indicated that the no-smoking agreement is not effective in supporting the continuation of existing non-smoking behavior. We even found counter evidence for the effect of the no smoking agreement on change in smoking in the third study of chapter 5; the older adolescents with a no-smoking agreement even showed an *increased* likelihood of ever smoking. An explanation for this finding may be that parents respect the older adolescent's wish to be more independent and to be treated as an equal, as suggested by Rispen, Hermans, and Meeus (1996).

It was additionally demonstrated in chapter 5 that a high quality of communication on smoking helps parents to prevent smoking in both younger and older adolescents. However, conversely, a high frequency of communication was associated with smoking; parents who often talk about smoking issues were more likely to end up with smoking adolescents (see also: Harakeh et al., 2005; Huver et al., 2006; Otten, Harakeh, Vermulst, Van Den Eijnden & Engels, in press). These findings clearly demonstrate both the positive and the negative effects of communication on smoking issues regardless of whether the parents have made a no-smoking agreement. Although in this dissertation the questionnaire method has been used to assess communication, it would be interesting to gather additional empirical data by means of 'in depth' interviews with parents or camera observations at home. Observing family interactions on film can tell us more about the interaction between parents and their adolescents. More specifically, body language can be observed, which is an important indicator of the process of communication, and therefore using interviews and observations might help us to address these 'how', 'what', and 'when' questions with regard to parental communication in more detail.

In chapter 6 the reciprocal associations between the frequency of smoking-specific communication and adolescent smoking were examined with the same data set as study three of chapter 5. It was shown that younger and older adolescents within the same family react differently to smoking-specific communication with their parents. Smoking-specific communication did not affect older adolescents' smoking, while younger adolescents' smoking was affected by smoking-specific communication over time. The more frequently the parents talked with their younger adolescent about smoking-related issues, the more likely the younger adolescent was to smoke one year later. The question whether this finding can be attributed to age as such, or can be explained as a sibling effect has not been addressed separately in our study. In this study the older siblings were aged 14 to 17 years and the younger siblings from 13 to 15 years, which means that the ages partly overlap. Thus it might be that we are measuring the effect of birth order (which has no overlap). However, Harakeh et al. (2005) propose that it is possible that parents tend to talk more frequently with their younger adolescent about smoking-related topics because they feel more protective toward their younger adolescent. Another explanation may be that parents respect the older adolescent's wish to be more independent and be treated as an equal concerning more adult themes, such as smoking. Noteworthy in this respect is that Harakeh et al. (2005) report that anti-smoking socialization practices generally do not differ between the older and younger sibling (except for the frequency of communication), indicating that parents treat their older and younger adolescent in the same way when it comes to smoking, and that the impact of their parenting is identical for both siblings. A question that should be

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addressed by future studies is that despite the fact that parental anti-smoking socialization practices do not seem to differ between younger and older adolescents, a higher frequency of anti-smoking communication as such seems to have impact on the younger adolescents only. The issue that remains to be addressed is whether this is a consequence of age or birth order.

Furthermore, it was demonstrated that adolescents' smoking affects the frequency of smoking-specific communication. In other words, parents engage in smoking-specific communication more as a reaction to adolescents' smoking than as a preventive strategy prior to adolescent smoking. However, it was demonstrated that this kind of parental communication is not effective and can even be counterproductive. This finding is in agreement with Ennett et al. (2001) that suggest that when adolescents experiment with smoking, parents communicate more frequently with their children in an attempt to prevent them from continuing to smoke. Nonetheless, their findings also indicate that these attempts are not fruitful. Moreover, in chapter 6 the three potential moderators (i.e., quality of smoking-specific communication, overall quality of parent-adolescent relationship, and parental smoking) did not affect the associations between the frequency of smoking-specific communication and adolescent smoking. In other words, even in families where communication on smoking-related issues takes place in a constructive and respectful manner and parents do not smoke, a higher frequency of smoking-specific communication has counterproductive effects.

### Integrating the Main Findings

In the previous paragraphs the main findings have been discussed. Because some findings might give the impression to be inconsistent over the studies, the main findings will again be presented in Table 1 in order to facilitate comparison of the various operationalizations of the dependent measure 'adolescent smoking' among the studies. This may clarify why some predictors are significant in one study, but not in another. The table shows all the operationalizations of adolescent smoking used in this dissertation and the study in which this specific measure was applied. Additionally, it is mentioned in Table 1 whether the findings are based on parental or adolescent report, which can add to the explanation of results. A more thorough discussion and some limitations of using parental or adolescent reports will also be addressed in the following section. It should further be noted that the adolescent smoking statuses of chapter 6 were not comparable with those employed in chapters 2 - 5 because Structural Equation Modeling (SEM) was used instead of logistic regressions. The finding on smoking initiation of this chapter will be presented in Table 1, however, for reasons of comparison. The main findings and particularly some (in)consistencies will now be discussed with respect to each relevant dependent measure.

Throughout this dissertation various measurements of parental behaviors and attitudes with regard to distinct levels of adolescent smoking have been employed. A few remarks can be made about the findings that appear quite consistent regardless of the study design and method used. First of all, in studies with cross-sectional designs, parental smoking systematically contributes to the prediction of adolescent smoking while in studies with longitudinal designs this is not always the case. However, irrespective of the specific outcome, parental smoking always contributes to *higher* likelihood of the dependent measure when it reaches statistical significance. In other

words, parental smoking is never associated with *lower* odds of adolescent smoking. Second, any significant measure of parental influence is associated with *lower* odds of adolescent smoking except for the frequency of communication. The findings on parenting do give rise to the overall idea that there is a divergent quality aspect of parenting at work; parents that are confident, controlling, knowledgeable and able to express themselves through good communication have adolescents that are less engaged in smoking experimentation or continuation after initiation. The unfavorable outcome of frequent communication might therefore be interpreted as 'parental efforts with supposedly good intentions' but without the necessary endeavor that accompanies successful parenting. Parents who seek help to deal with adolescent smoking but seem to lack these skills or qualities consequently should be helped to improve these skills. This aspect should be implemented in the design of new prevention programs targeting parents.

An imperative question throughout this dissertation was whether parental smoking plays a central role in early adolescent smoking behavior. We demonstrated cross-sectionally in chapter 2 that parental smoking, current as well as former, indeed predicts ever smoking in early adolescence. As mentioned previously, however Chassin et al. (1986) further noted that smoking initiation and smoking maintenance might have different determinants and therefore our measures of adolescent smoking must be more specific than 'ever smoking' and above all longitudinal in order to scrutinize this assumption. Further inspection of Table 1 shows that parental smoking predicts adolescent smoking continuation in both our studies described in chapters 3 and 4, but not initiation as such. In the latter case the parental smoking status demonstrates itself in the way smoking parents apply control to successfully prevent adolescent smoking onset but is not a predictor by itself. Also with respect to regular smoking, which is more severe in the frequency of occurrence of smoking than continuation in our studies, parental smoking was cross-sectionally related to adolescent regular smoking, but longitudinally this effect remains significant for the younger group of adolescents, but not for the older adolescents in chapter 5. These findings are an indication that parental smoking might not play a major role in the first transition from never smoker to initiator as has been suggested in the literature (see for an overview: West, Sweeting & Ecob, 1999), but contributes on the other hand to the later stages of smoking where patterns of continuation are being established, as suggested by Chassin et al. (1986). Recently, however, Bricker, Peterson, Leroux, Andersen, Rajan & Sarason (2006) demonstrated that parental smoking influences both initiation and escalation of children's smoking. In their longitudinal study three smoking transitions were assessed (from 8th up to 12th grade): (1) transition from never smoking to trying smoking, (2) transition from trying to monthly smoking and (3) transition from monthly to daily smoking. The probability that smoking parents influence their child to make the first transition to trying smoking was 32%; to make the second transition from trying to monthly smoking, 15%; and to make the third transition from monthly to daily smoking, 28%. Additionally, Otten, Engels, van de Ven, van den Eijnden, & Bricker (submitted) demonstrated that the process of modeling with respect to parental smoking, takes place during the complete process of adolescent smoking acquisition rather than only during the first phase of smoking onset.

Table 1. Positive and negative associations between predictors and dependent measures in this dissertation.

Dependent measure: <i>Adolescent smoking status</i>	(Chapter 2)	(Chapter 3)	(Chapter 4)	(Chapter 5)	(Chapter 6)	Design
Ever smoking	Main predictors found Parental former and current smoking (H.L. - adolescent report) <sup>2</sup>	X	X	Parental smoking (H.L.) (Parental smoking status is not significant longitudinally)	X	Cross-sectional
Initiation <sup>1</sup>	Parental cessation after the age of 7 (H.L. - adolescent report)			No-smoking agreement - for older group of adolescents only (H.L.) Quality of communication (L.L.) <sup>3</sup> Frequency of communication - for younger group of adolescents only (H.L.)		Cross-sectional  Longitudinal - parental and adolescent report
		Parental knowledge about friends and own child smoking (L.L. - parental report)	Parental control – later in time significant for smoking parents only (L.L. - adolescent report)		Frequency of communication - for younger group of adolescents only (H.L. parental and adolescent report.)	Longitudinal

Notes: background variables that reached statistical significance not reported in this table. Other adolescent smoking statuses of chapter 6 not comparable with chapters 2 - 5 because Structural Equation Modeling (SEM) was used instead of logistic regressions. X = not measured in this study. Findings reported in each row are found to be predictive of the dependent measure presented in the left column.

<sup>1</sup> Reported to be a never smoker initially, but reported to have smoked at the subsequent wave, contrasted with never smokers.

<sup>2</sup> H.L. = Higher Likelihood. <sup>3</sup> L.L. = Lower Likelihood.

Continuation Table 1. Positive and negative associations between predictors and dependent measures in this dissertation.

Main predictors found		(Chapter 2)	(Chapter 3)	(Chapter 4)	(Chapter 5)	(Chapter 6)	Design
Continuation <sup>4</sup> (maintainers)	X	Confidence in effecting child's smoking behavior (L.L. -parental report)	Parental smoking (H.L. - adolescent report)	X			Longitudinal
Increase <sup>5</sup> Regular <sup>6</sup>	X X	Anger and punishment (L.L. - parental report) Parental smoking (H.L. - adolescent report)	None found	X X	Parental smoking (H.L. - adolescent report) No-smoking agreement (L.L.) – (not significant longitudinally)	X X	Longitudinal Longitudinal Longitudinal Cross-sectional Cross-sectional
Cessation <sup>7</sup>	X		Parental support for smoking parents only (H.L. - adolescent report)		Parental smoking - for younger group of adolescents only (H.L.) Quality of communication (L.L.) Frequency of communication (H.L.)	X	Longitudinal - parental and adolescent report Longitudinal

<sup>4</sup> Indicated to be a smoker at all measurements, contrasted with never smokers. <sup>5</sup> Increased smoking level from less than once a month to more than once a month, contrasted with the group that continued to smoke less than once a month. <sup>6</sup> Indicated to have smoked the last month, contrasted with never smokers and smokers who had not smoked in the last month. <sup>7</sup> Indicated to be smokers but had quit at the final measurement, contrasted with the group that continued to smoke.

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The findings with regard to the importance of parental smoking described in this dissertation should therefore be interpreted cautiously. Parental smoking has impact on several adolescent smoking transitions according to Bricker et al. (2006) and Otten et al. (submitted), and whether parental smoking reaches statistical significance in analyses might also be dependent on the sample characteristics and the other predictor variables used. Engels, Knibbe & Drop (1999) addressed this issue and suggest that the predictability of adolescent smoking is largely dependent on the design and the analytical strategy of the study at hand. In their study of both cross-sectional as well as longitudinal analyses and several predictor variables, they stressed the importance of parental smoking as a predictor for adolescent current smoking and initiation.

The cross-sectional findings of chapter 4 would seem to indicate that the no-smoking agreement is an effective tool in dealing with adolescent smoking, especially for smoking parents. Having a no-smoking agreement was associated with a reduced likelihood of ever smoking only for smoking parents, while with regard to regular smoking having a no-smoking agreement was more strongly associated with a reduced likelihood of adolescent regular smoking for smoking parents as compared to the group of non-smoking parents. This finding, however, could not be replicated longitudinally. Longitudinally our results indicated that the no-smoking agreement is not effective in supporting the continuation of existing non-smoking behavior. We only found partial support for a change in smoking behavior, but in a direction not intended by the parents. The older adolescents in the third study showed an increased likelihood of ever smoking regardless of whether their parents smoked or not.

Closer inspection of the other findings in which parental smoking plays a role give rise to the suggestion that it is not their smoking behavior by itself that has predictive power in longitudinal analyses, but the way they act as parents in general, as demonstrated by our findings (reduced likelihood of initiation by parental control and knowledge about friends and own child smoking behavior; reduced likelihood of continuation by feeling angry and punishing adequately or feeling confident that they have influence in affecting their child's smoking). Additionally, smoking parents appear to be more supportive while non-smoking parents appear to be more controlling of their adolescents with respect to the latter's successful cessation. Although chapter 3 clearly demonstrated significant differences in smoking and non-smoking parents with respect to anti-smoking socialization as suggested in the literature previously discussed, those differences are not indicative of how parents successfully react to adolescent smoking, as has been demonstrated by the more general parenting practices that seem to be effective to reduce adolescent smoking. Darling and Steinberg (1993) have pointed out that concrete parenting practices do differ from the more general parenting styles. They have argued that the general parenting style moderates the efficacy of concrete parenting practices. General parenting styles facilitate or undermine parents' efforts to socialize their children, whereas concrete parenting practices are the mechanisms through which parents directly help their child attain their socialization goals. Therefore concrete parenting practices as such are domain-specific (Darling & Steinberg, 1993). Important in this respect are the socialization goals and values parents hold towards their child (i.e., general parenting styles), but it is only through parenting behavior (i.e., concrete parenting practices) that these goals can influence the child's development. Our findings suggest that this idea proposed by Darling and Steinberg (1993) might hold for the domain of adolescent smoking as well: regardless whether parents smoke

themselves or not, parents are able to have some influence on adolescent smoking and its development. However, we did not examine these possible moderating properties of parenting dimensions in our study and future studies should address this issue.

It was further demonstrated in chapter 5 that adequate communication skills to discuss the topic of smoking are a very effective deterrent, even after controlling for parental smoking status, but are counterproductive when communication is applied too frequently. Continuing to raise the topic of smoking often, when the adolescent is not willing to enter into the discussion with the parents, can be experienced by the adolescent as nagging. Nagging is indicative of a lack of mutual trust and respect which is required for a real transfer of information to take place. Nagging may also be an indication that the parents lack the necessary skills associated with good parenting.

In other words, high quality of smoking specific communication on the part of the parents is, in fact, a concrete parenting practice that includes an adequate balance between confidence and involvement, and could therefore be part of their general parenting practices, regardless of whether they smoke or not. Ennett et al. (2001) suggest with regard to this issue that the protective effect of parental support and control can be explained by the tendency of authoritative parents to engage in communication as a means of conveying their feelings, concerns, and expectations about their child's behavior (see also Jackson, Bee-Gates & Henriksen, 1994). In sum, parental smoking does not seem to be the most powerful predictor as such. Rather, it is the combination of parental smoking with other parental characteristics, such as involvement and confidence that seems significant. This suggestion has previously been put forward by Bailey et al. as well. (1993).

In the following paragraphs the measurement of adolescent smoking as well as the use of parental or adolescent report will be discussed. Further, some suggestions for future research and implications for prevention will be presented, based on the main findings in this dissertation.

### **The Pro's and Con's of the Measurement of Adolescent Smoking**

Many studies have shown that smoking increases rapidly between the ages of 13 and 15 (see: Fergusson & Horwood, 1995; Stivoro, 2005; Willemsen & de Zwart, 1999). By constructing a dependent measure that assesses specific aspects of the respondents smoking behavior in this time frame, analyses can be conducted in great detail. However, knowledge about processes that lead to initiation or to transitions to other levels of smoking is still lacking. Accurate examination of smoking progression is necessary, because children with early onset of smoking behaviors and experimentation are at increased risk of regular smoking later in life compared to individuals that initiate smoking in late adolescence or adulthood (Fergusson & Horwood, 1995). It is for this reason that all the variations in adolescent smoking statuses require different operationalizations to examine which predictors are influential in the uptake and development of adolescent smoking behaviors (see also: Darling & Cumsille, 2003). Some drawbacks associated with the assessment of adolescent smoking discussed in this dissertation, however, should be mentioned.

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### Measures

When the findings of the studies in this dissertation are considered, several extrapolations can be made that support the operationalizations of the various smoking statuses reported. The discrimination between never and ever smokers is legitimate, for it clearly distinguishes those who are definitely not engaged in smoking from those who are, but the measure is not a true indicator of transition, for it does not assess the moment of initiation nor the frequency and quantity of consumption. The variable ‘initiator’ presented in chapter 3 indicates a true transition into a next stage and is very accurate to capture this exact moment in time. This measure, however, can not inform us about the amount of smoking, which might be an important indicator for susceptibility to addiction (Colby, Tiffany, Shiffman & Niaura, 2000; Darling & Cumsille, 2003; Mayhew et al., 2000). Future studies should address the issue whether smoking initiation that is instantly accompanied with high intensity of cigarette use is an important discriminator with regard to the development of nicotine dependence later on, as Colby et al. (2000) suggest.

The measure ‘maintainer’ presented in chapter 3, is adequate to capture those who continue to experiment, and is clearly an indicator for elevated risk. This measure, however, does not address the issue of frequency or intensity of smoking. The variable ‘smoking increase between two measurements’ presented in chapter 4 is a possible indicator of stage transition because those individuals increased their smoking level from less than once a month to more than once a month. Those individuals who made this transition are more prone to develop further into daily smokers according to Fergusson and Horwood (1995), and should be regarded as the group that is on the verge of becoming fully addicted; subsequently smoking cessation has become more difficult at this stage (see also Stanton, 1995). Finally, the groups occasional smokers and quitters described in chapter 4 are both the groups that are vulnerable for misclassification as a non-smoker according to Fergusson and Horwood (1995).

In sum, although the classifications of smoking behaviors used in this dissertation are adequate to measure differences in adolescent smoking, especially those measures that identify more established smoking patterns, it seems that low levels of experimentation and quitting on the other hand are harder to investigate due to the adolescents’ ambiguous state as smoker or non-smoker (see for an overview: Darling & Cumsille, 2003). Another issue regarding adolescent smoking is that in longitudinal designs respondents are not consistent in their reports on subsequent measurements. Engels, Knibbe, and Drop (1997) suggest this might be due to both recollection errors and a change in the adolescents’ definition of a specific behavior at a later measurement (e.g., smoking one puff at the age of 10 might be considered non-smoking at the age of 14). Fergusson and Horwood (1995) suggest in this respect that the most robust way of measuring is to contrast the regular smokers with all the others rather than compare all smokers with nonsmokers, a method which we have applied in chapter 5 to operationalize regular smokers: they indicated to have smoked the last month and were contrasted with never smokers and smokers who had not smoked in the last month. Further, our operationalizations measure the frequency of smoking occurrence (monthly, weekly and daily) but do not measure intensity (how many cigarettes do you smoke on that particular occasion) and therefore our discrimination in severity is based on frequency, not intensity. This, however, does not hamper our findings according to



Fergusson and Horwood (1995), since the number of adolescents who smoke intensively before the age of 16 is negligible.

Several important suggestions to improve the measurement of adolescent smoking have been made. For example, Stivoro (2005) has developed specific standards and guidelines that help researchers to operationalize their measures of adolescent smoking. Furthermore, recently several scholars are developing new instruments to enhance accuracy of measurement. For example, Prokhorov, de Moor, Suchanek Hudmon, Hu, Kelder, and Gritz (2002) and Kremers, de Vries, Mudde, and Candel (2004) have demonstrated a significant improvement in the detection of those individuals with elevated risk to become a smoker. By measuring the susceptibility to smoking they improved the assessment of individuals who were in the pre-contemplation stage, thereby identifying those individuals who are at elevated risk for smoking initiation (see also: Kremers, Mudde & De Vries, 2004).

### Parental versus Adolescent Reports

Most of the research examining relations between parenting practices and adolescent substance use relies on self-reports with a single reporter, usually the adolescent. Research that tests the agreement of parent and adolescent reporting repeatedly shows that correlations between parent and adolescent reports related to family relations, parenting, and adolescent behaviors are generally low (e.g., Avenevoli & Merikangas, 2003; Hartos & Power, 2000). Relying on data from only one reporter, especially regarding family processes or adolescent behaviors, may focus on only one-sided views.

Engels and Willemsen (2004) have specifically addressed this research question in a cross-sectional study to explore the associations between anti-smoking socialization and adolescents' smoking cognitions through gathering data from fathers, mothers, and adolescents in order to compare adolescents' perceptions of anti-smoking socialization with those of both their parents separately. We have adopted the same instruments in chapter 3, but used parental reports exclusively on anti smoking socialization. Their results pointed to some significant differences between parents and adolescents reports with respect to anti-smoking socialization. For example, mothers are generally more positive about their anti-smoking socialization practices to prevent their children from smoking than fathers and adolescents. What are the implications of this debate about reporters with regard to the studies discussed in this dissertation? This question will be addressed by focusing on chapter 3.

In chapter 3 parental reports on anti-smoking socialization are used as predictor variables. The study reveals a tendency that it is general parenting that matters and not concrete anti-smoking socialization practices. It should be noted, however, that parents who returned the questionnaires voluntarily, were indeed interested in the topic of adolescent smoking, for a total of 52% returned the questionnaires. We have no idea why the other 48% of the parents did not return it. We can only speculate that adolescent smoking is not a major concern for these parents. Although the findings of chapter 3 have their own merits, this is surely a limitation. We therefore have examined whether the children of the other 48% of the parents could give us some background information about their parents. It was clearly the case that those parents smoked significantly more than the parents who participated. It very well might be the case that

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if we had used child reports in this study a different picture with regard to anti-smoking socialization would have emerged. Therefore it is crucial to consider the implications of studies that rely on single reporters. Not only is there a possible tendency that parents give a more positive image of their behaviors, but there is also a tendency that the parents that are important to investigate with regard to adolescent smoking are less likely to participate in this kind of study. A further remark is that while the parents answer our questionnaires voluntarily, their children are more or less obliged to fill out forms at school. Selective attrition among the adolescents seems to have occurred, when we inspected the longitudinal data described in chapter 3: adolescents already involved in experimentation with smoking were more inclined to drop out. The attrition, however, was only due to absence at the day of measurement. All the parents provided permission to include their child in our study, and none of the children explicitly refused to participate. Additionally, there were no significant differences in the distribution of the variables of interest on parental anti-smoking socializing between the initial complete set of parental data and the data used for analyses.

In sum, the use of single reporters has implications with regard to the interpretation of the findings. Although studies of this kind provide valuable insights in underlying mechanisms, the generalization of findings is hampered by this limitation of reporter biases (see also Harakeh et al., 2005). However, the use of multi informants does not totally eradicate this limitation, for people who participate in studies seem to have a personal willingness to do so, and these types of selection are hard to avoid. Respondents that normally are not eager to participate in studies are approachable in other ways. They can be motivated to participate by payments and by personal contact with the researcher who visits them at home.

### **Future Research Topics**

Although several suggestions for future research has been made throughout this discussion, some elaborations will be presented.

First, little is known whether the modeling of the parental cessation process itself has implications for adolescent smoking. For example, what does a child learn from a parent giving up the habit of smoking? Future research may concentrate on whether adolescent norms and attitudes about smoking change when parents quit, because this could provide insight in the underlying processes of the impact of parental quitting on adolescent smoking. Additionally, research should examine the characteristics of parents as ex-smokers compared to never smokers to investigate whether those ex-smokers still hold different norms and attitudes toward smoking and thereby still reinforce their children's smoking. Chassin, Presson, Rose, Sherman & Prost (2002) conclude that ex-smoking parents show even more antismoking socialization than non smoking parents, but these antismoking parenting behaviors are undermined when the other parent continues to smoke, thereby negating the benefits of parental smoking cessation. The design of our study described in chapter 3 does not allow speculation about this issue, because the category 'non-smoking parents' we used also includes the group of former smokers which were not investigated separately. Nevertheless, the comparison between two currently non-smoking and at least one smoking parent in a family showed substantial differences between them. Future studies should be conducted to address this issue. However, it would require large samples to

have sufficient parents who have quit smoking to conduct analyses. In order to circumvent this problem, respondents could be recruited, for example, by advertising in the media to invite former smokers and new quitters to participate. If parental former smoking is indeed reflected in a different approach towards adolescent smoking, that can even be jeopardized, if the partner continues to smoke, then these implications have to be incorporated in the development of prevention programs targeting parents.

Second, the timing of anti-smoking communication is another issue. As has been demonstrated in chapter 6, parents initiate these conversations more as a reaction to smoking of their adolescent (see also: Ennett et al., 2001). Little is known, however, whether these conversations would have more impact at an age when smoking is not an issue, that is, before entering secondary education. Future research should address this issue by assessing whether parents who discuss smoking in infancy help their children to resist smoking when they reach adolescence. However, study designs to address this problem must be longitudinal in nature, and for the first few years after birth of their child only the parents can be questioned, as such. It might even be offending for parents to ask them about potential dangers in the future while their child is still an infant or pre-adolescent. To realize a study of this type would require tremendous efforts to motivate the parents, which, if not impossible, would certainly present a challenge.

Third, most parents do not approve of early adolescent smoking (e.g. Clark et al., 1999; Ennett et al., 2001) and it is one of the issues that parents have to face, especially when their child enters secondary school. It is therefore not unreasonable to assume that parents will put a lot of effort in coping with this issue. Some will address the problem before their child start experimenting, but most of them do so when the problem has manifested itself, as we have demonstrated in chapter 6. In this dissertation it has been suggested that parental smoking as such might not be the key factor in predicting adolescent smoking. An explanation of why smoking parents are more inclined to have smoking adolescents who develop into regular smokers might therefore be that they lack the necessary communication skills to deter their adolescents from smoking. These skills might be hampered by feelings of guilt or the belief in the inevitability of their children's smoking as suggested by Clark et al. (1999). As has been demonstrated in chapter 4, smoking parents that apply parental control, however, are successfully preventing smoking initiation among older adolescents. The theory of learned helplessness can help us to understand the process in which parents might feel caught up. This theory states that humans' basic drive is to control their environment. In turn, if a person has a lack of control over an aspect of their environment in one situation, this will impair learning in similar situations. If a person is put in a situation where their behavior is unaffected, they become passive and their desire to act or try harder dissolves (Peterson, 1993). In the situation that smoking parents are confronted with the first experimentations of smoking of their child, it might well be that they engage in substantial efforts to prevent further smoking, as has been demonstrated by means of the high frequency of anti-smoking communication in chapter 3 and 6. But if their communication skills are not sufficient to have any effect, they are on the verge developing a state of learned helplessness, which might explain why smoking parents do not succeed in deterring their children from smoking in the long run. This line of reasoning is in accordance with Engels & Willemsen (2004) who demonstrated that, if parents think they are unable to influence their children's opinions and behaviors, they are more likely to end up with smoking children. Their findings, however, did not

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depend on the smoking status of the parents. Therefore, this explanation using the theory of learned helplessness could merely indicate a tendency for smoking parents to give up hope more easily. This could be a promising direction for future research: if indeed a state of learned helplessness has the tendency to develop more easily among smoking parents, this could partly explain why smoking parents end up with smoking children.

Fourth, within the concept of general parenting, Dishion and McMahon (1998) suggest that a high quality of communication is an important aspect in their definition of parental monitoring. It includes behaviors that facilitate awareness of the child's activities and communicate to the child that the parent is concerned about and aware of the child's activities (see also: Chassin, Presson, Rose, Sherman, Davis, & Gonzalez, 2005). Indeed, various studies among youths in the United States have shown that parental monitoring creates a climate in which children are less likely to experiment with smoking (Hill, Hawkins, Catalano, Abbott, & Guo, 2005; Kodl & Mermelstein, 2004). Kerr, Stattin, and Trost (1999) have added the concept of trust to this debate, arguing that the concept of monitoring largely depends on the child's willingness to disclose information to the parents. They suggest that the information disclosed by the child produces a certain level of parental trust, but they also argue that trusting parents respond in such a way that children feel more free to disclose. In this dissertation the concept of bidirectionality of communication has only been addressed in chapter 6, but this field of research should give promising directions to future research on communication. For example, Ennett et al. (2001) showed that the relationship between parent-child communication of rules and consequences for adolescent smoking behavior is bi-directional; smoking by adolescents at baseline predicted parent-child communication at a follow-up measurement, and vice versa, which is much in line with our finding in this regard. They stress the need to develop study designs that examines the content, timing, and family environment in which communication takes place. Not only the frequency with which communication about smoking takes place, but also the content of anti-smoking messages, whether communication takes place before or after smoking initiation and increase, and whether the content of parent-child communication varies by family characteristics, are considered factors that determine whether parents are able to express their feelings and concerns about smoking and transfer expectations for behavior of their child.

Our findings indicate that when the adolescent experiences open communication with the parents about smoking issues in an atmosphere of trust and respect, this has a preventive effect on future adolescent smoking, much in line with Engels and Willemsen (2004) who showed that, if parents talk with children about their smoking behavior, letting their children know that they would be disappointed and that they would find it annoying, seem effective ways to prevent adolescents from taking up smoking. Future studies should further investigate these complex dynamics of parent-child communication and adolescent behavioral responses. Concepts just described, like monitoring and bidirectionality of communication, for example, might be useful in this respect, but also the concept of secrecy, disclosure, and trust can be of interest as suggested by Kerr, Stattin, and Trost (1999). Finkenauer, Engels, & Meeus (2002) propose, for example, that secrecy might have developmental functions that bear particular importance in the way adolescents deal with parents, and should be associated with adolescents' feeling of emotional autonomy. This idea can contribute to

the explanation of the complex nature of bidirectionality of communication and the influence of adolescent disclosure of personal matters on subsequent parenting.

Fifth and finally, more empirical evidence is warranted with regard to other forms of a no-smoking agreement. If, for example, a very short interval in which the adolescent receives a reward for not smoking appears to be effective, as is applied in some school prevention programs, then the same mechanism might be fruitful for parents to apply as well. It can therefore be useful to investigate in school populations whether there is variation in time between a no-smoking agreement and the reward. If empirical support is found for the suggestion that short intervals may be an effective deterrent or at least postpones initiation of smoking, then the implications can be substantial. It has been suggested in the literature that even delaying the onset of smoking contributes to later age of regular use, lower intensity, and fewer difficulties with attempting to quit (e.g., Chassin, Presson, Sherman & Edwards, 1990; Fagerstrom, 1991; Stanton, 1995). Furthermore, the inconsistencies between the cross-sectional and longitudinal findings with regard to the effects of establishing a no-smoking agreement need to be addressed.

### **Implications for Prevention Programs**

Findings discussed in this dissertation clearly show that parental smoking as well as parental smoking history plays a role in early adolescent smoking behavior. Thus, in terms of prevention efforts, parental cessation can make a difference. A proposition towards prevention made by Chassin et al. (2002) is to alter parental smoking (i.e., in cessation interventions) to test the impact of parents' successful quitting on their adolescent children to determine whether parental smoking treatment can function as a form of preventive intervention. This is no reason, however, to assume that non-smoking parents do not have to worry about whether their adolescent will experiment with smoking, because this is something that is very likely to happen. Non-smoking parents clearly have the benefit of being an adequate role-model with respect to smoking. Nevertheless, a lack of involvement, parental control, or confidence in the ability to deal with adolescent smoking are still risk factors that might jeopardize their adolescent when smoking is concerned. Furthermore, instead of implementing a no-smoking agreement with a substantial reward far in the future, both the importance of high quality of communication as well as the observation that frequent communication about smoking issues is devastating holds for them as well. Prevention programs designed for parents with adolescents, therefore, should concentrate on both smoking and non-smoking parents. Moreover, not only should prevention be targeted to the mother but also to the father. According to our findings the focus should be upon improvement of communication skills, explaining the effects of modeling and advice to reduce modeling by not smoking in the presence of children and adolescents. Because it is imperative to also reach parents with very young children, health care institutions focusing on babies and infants could be appropriate channels to implement this kind of prevention program.

While nowadays the importance of parental involvement in prevention programs is acknowledged by experts in the field of prevention, one of the major problems today is to reach parents that are not interested in the topic of adolescent smoking (Spruijt, R. D., personal communication June 2006). By law adolescents in the

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Netherlands attend school until at least the age of 16 years, and as previously mentioned, most schools are engaged in some sort of prevention program dealing with substance abuse. Schools should be informed about the impact parents can have with regard to adolescent smoking within the design of the prevention program itself. For schools it can be difficult to reach uninterested parents, and they might not consider it their task either. Other channels might be more suited to reaching parents indirectly, for example, mass media campaigns, such as television, news papers, and magazines as well as health care institutions, to make parents conscious of their responsibilities as parents as well as role models.

A further suggestion towards prevention which is related to the macro-level of influence is that while the Dutch government has forbidden smoking in all governmental (operated-)buildings, smoking at schools is still allowed! Important social events that adolescents participate in, such as sport clubs, pubs, discos, or restaurants are still not, by law, designated as smoke-free. Since the Dutch government has repeatedly stated that prevention of smoking in the young population is one of their major responsibilities, they should seriously consider implementing no-smoking laws in places frequently attended by young children and adolescents.

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## Chapter 7

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Samenvatting  
(Summary in Dutch)

Sinds het bekend is dat roken uitermate schadelijk is voor de gezondheid - na een publicatie van de Surgeon General of the United States in 1964 - is rookgedrag zowel voor de gezondheidszorg als preventieprogramma's een belangrijk thema geworden. In enkele decennia tijd zijn de opvattingen over roken en hoe het te voorkomen veranderd. Aanvankelijk werd roken als een probleem van volwassenen gezien en werd er primair onderzoek gedaan naar de gezondheidseffecten van roken. In de laatste 20 jaar is er veel aandacht voor onderzoek naar factoren die verantwoordelijk zijn voor het beginnen met roken. Inzicht in deze factoren kan immers bijdragen aan de benodigde kennis om een reductie van individuen die gaan beginnen met roken mogelijk te maken en zo op langere termijn een reductie van het aantal rokers te realiseren. Experimenteren met roken begint bij de meeste personen namelijk al op het einde van de basisschool of op de eerste jaren van het middelbaar onderwijs. In de adolescentieperiode is er dan ook een sterke stijging van het rookgedrag te zien. Terwijl op 9 à 10-jarige leeftijd nog maar zeer weinigen ooit hebben gerookt, loopt het percentage dat ooit gerookt heeft sterk op tot 41% bij 12-13 jarigen en 72% bij 18-jarigen. Individuen die juist op jonge leeftijd met roken beginnen lopen een groter risico om in de volwassenheid een dagelijkse roker te worden. Dat een rookcarrière start in de tienerjaren leidt tot aandacht voor de sociale context van hun gebruik. Aanvankelijk was er veel aandacht voor de invloed van vrienden. Preventie richtte zich onder andere op het weerbaarder maken van jongeren om negatieve druk van vrienden te weerstaan maar programma's die geënt waren op invloed van leeftijdgenoten bleken niet enorm effectief te zijn.

Jongeren groeien in de regel op met een of twee ouders, en daarom is er in de laatste decennia een rijke traditie gekomen aan studies naar de relatie tussen het 'rookklimaat' thuis en het rookgedrag van jongeren. De meeste onderzoekers kijken vooral naar hoe op het moment van afname van het onderzoek ouders staan ten opzichte van het onderwerp roken en of ze zelf roken of niet. Echter, Bauman, Foshee, Linzer en Koch (1990) geven aan dat het niet alleen belangrijk is om te bepalen of ouders momenteel roken maar ook om gedegen aandacht te besteden aan de geschiedenis van hun rookgewoonten. In dit proefschrift gaan we na in hoeverre de geschiedenis van de rookgewoonten van ouders van invloed is op het huidige rookgedrag van (vroeg)adolescenten. Daarnaast wordt onderzocht of de meer specifieke antirook socialisatie, zoals het hebben van huisregels ten aanzien van roken of het voeren van gesprekken die gericht zijn op de nadelige effecten van roken, effectief zijn. Vervolgens wordt onderzocht in welke mate ouderlijke opvoedingsstijlen bijdragen aan voorkomen van roken bij adolescenten. Ook wordt onderzocht of de 'niet-roken afspraak' die veel Nederlandse ouders met hun kinderen hebben gemaakt effectief is om roken te voorkomen. Daarnaast wordt in dit proefschrift aandacht besteed aan diverse aspecten van ouderlijke communicatie over roken en welke positieve en negatieve gevolgen dat kan hebben.

### Ouders als Rolmodel

In hoofdstuk 2 zijn we nagegaan of de rookgeschiedenis van ouders een rol speelt bij het beginnen met roken door voegadolescenten. Dit hebben we gedaan door

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bij een grote steekproef van 2402 10-14 jarigen na te gaan hoe het rookgedrag van de ouders samenhangt met hun eigen rookgedrag. Verder hebben we gekeken in hoeverre het moment van stoppen met roken door ouders de kans bepaalt dat het kind gaat roken. De veronderstelling is dat ouders als rolmodel fungeren. Als ouders stoppen veranderen ze ook als rolmodel. Kinderen nemen ouderlijk gedrag over als dit gedrag bewust of onbewust wordt gestimuleerd. Of dit gedrag wordt overgenomen door het kind hangt onder andere af van de waargenomen voor- en nadelen die aan het gedrag kleven en de waargenomen voor- en nadelen die aan alternatieve gedragingen kleven.

Allereerst komt naar voren dat de rookgeschiedenis van ouders een rol speelt bij het beginnen met roken door jongeren. Niet alleen blijkt dat kinderen in een gezin waar beide ouders roken het kind vier keer zo veel kans heeft te roken dan in een gezin waar geen van de ouders ooit heeft gerookt. Verder blijkt dat kinderen zelfs meer kans hebben om te roken als een of beide ouders ex-rokers zijn. Als ouders stoppen met roken heeft dit duidelijk een preventief effect op het rookgedrag van het kind. Het is goed te vermelden dat hoewel de kans dat het kind gaat roken kleiner is wanneer de ouder(s) met roken is (zijn) gestopt, die kans altijd nog groter is dan wanneer de ouders helemaal nooit gerookt hebben. Het behoorlijk vernieuwende aan deze studie is dat aangetoond wordt dat stoppen met roken door ouders zin heeft: het vermindert de kans dat kinderen gaan roken. De boodschap in voorlichting kan dan ook eenduidig zijn. Het is goed voor ouders om te stoppen met roken, niet alleen vanwege de evidente gezondheidsconsequenties die langdurig roken voor ouders en hun kinderen met zich mee brengen, maar ook vanwege de kans dat kinderen zelf gaat roken. Ten tweede is het moment waarop rokende ouders stoppen van belang. Des te eerder in het leven van het kind ze stoppen met roken, des te kleiner is de kans dat het kind gaat roken. Voorlichting over stoppen met roken door ouders zou dan ook niet alleen moeten plaatsvinden in het kader van primaire preventie voor adolescenten. Omdat primaire preventie voornamelijk plaatsvindt in de laatste klassen van de basisschool en op de eerste klassen van het middelbaar onderwijs, is dit eigenlijk te laat. In onze optiek zou het goed zijn om al in een vroeg stadium ouders hierover in te lichten. Dit zou bijvoorbeeld kunnen in het kader van voorlichting aan zwangere vrouwen of via consultatiebureaus. Het is wel belangrijk om deze aandacht niet alleen te richten op de moeder aangezien onze studie het evidente belang van stoppen door de vader aantoonde.

### Ouderlijke Antirook Socialisatie

In hoofdstuk drie is onderzocht in welke mate ouders invloed uitoefenen op zowel het beginnen met roken van hun adolescent als het doorgaan met roken. Zeshonderd ouders van brugklasleerlingen hebben een vragenlijst ingevuld waarvan in vijftig gevallen sprake was van een één ouder gezin. De adolescenten hebben zowel in de brugklas als in het begin van het tweede schooljaar informatie verstrekt over hun eigen rookgedrag. Er is middels de oudervragenlijst gemeten hoe ouders vorm geven aan het anti-rookbeleid ten aanzien van hun kinderen. We gebruiken hiervoor de term anti-rook socialisatie die bestaat uit het hebben van huisregels, regelmatige communicatie over roken, het geven van waarschuwingen, kennis hebben over rookgedrag van vrienden en het eigen kind, vertrouwen hebben in het eigen vermogen

om om te gaan met roken van het eigen kind, het uitoefenen van psychologische controle (controle die inspeelt op de emoties van het kind), beschikbaarheid van rookwaren, het goedkeuren van roken door jongeren en volwassenen en drie reactiepatronen die ouders kunnen hebben na het ontdekken van roken door hun kind, namelijk: (1) boosheid en straf, (2) *laissez faire* houding en (3) teleurstelling bespreken. Er is vervolgens onderzocht of er verschillen bestaan in anti roken socialisatie tussen gezinnen met en zonder rokende ouders. Ten aanzien van het beginnen met roken vonden we dat ouders die kennis hebben over het rookgedrag van hun kind en zijn of haar vrienden of vriendinnen een lagere kans hebben dat hun kind is gaan roken. Ouders die veel vertrouwen hebben in hun eigen vermogen om invloed uit te oefenen en ouders die boosheid tonen en adequaat straffen na ontdekking van het roken door hun kind hebben een gunstige invloed op het doorgaan met roken door hun kind. Het hebben van één of twee rokende ouders bleek in dit laatste geval ongunstig te zijn. We vonden geen verbanden tussen het beginnen of doorgaan met roken en manipulatieve manieren van controle uitoefenen of de meer concrete ouderlijke anti rook strategieën zoals regelmatige communicatie over roken, huisregels, het geven van waarschuwingen en de aanwezigheid van sigaretten.

Ten aanzien van het eigen rookgedrag van ouders vonden we aanzienlijke verschillen tussen rokende en niet rokende ouders en de manier waarop zij vorm geven aan anti rook socialisatie. Rokende ouders zijn weliswaar vaak geneigd de boodschap uit te dragen dat roken slecht voor je is maar ondersteunen deze boodschap niet met hun eigen beleid en gedrag door bijvoorbeeld huisregels op te stellen, de beschikbaarheid van rookwaar in huis te verminderen of kennis te vergaren over het rookgedrag van hun kind en zijn of haar vrienden of vriendinnen. Gemiddeld hebben rokende ouders ook minder vertrouwen in hun eigen vermogen om invloed op het roken door hun kinderen uit te oefenen en hebben ze ruimere opvattingen over roken door jongeren. Nadere analyse van het gunstige effect van boosheid en straf na ontdekking van roken door hun kind toonde aan dat het effect van deze strategie op het doorgaan met roken voornamelijk optreedt bij niet rokende ouders. Ook laten niet rokende ouders meer hun teleurstelling blijken in geval van ontdekking.

De bevindingen van deze studie geven aan dat ook rokende ouders invloed uit kunnen oefenen op het roken door hun kind. Hoewel rokende ouder minder vertrouwen in hun eigen kunnen lijken te hebben en minder geneigd zijn tot een actieve houding om met het probleem om te gaan zouden ze toch gesteund en aangemoedigd mogen worden om vorm te geven aan een anti rook beleid binnen het gezin.

## De Opvoedingsdimensies Steun en Controle

In hoofdstuk vier is onderzocht in welke mate de ouderlijke opvoedingsdimensies controle en ondersteuning bijdragen aan het beginnen met roken, het er mee doorgaan, de toename in gebruik en het stoppen na een periode van experimenteren. Daarnaast is onderzocht of het rookgedrag van de ouders zelf ook een rol speelt. Er hebben 1012 brugklasleerlingen meegedaan die drie keer een vragenlijst hebben ingevuld met een interval van een half jaar. De veronderstelling die aan het onderzoek ten grondslag ligt is dat de manier en stijl waarop een kind opgevoed wordt invloed hebben op probleemgedrag, van adolescenten en in dit geval rookgedrag. Ondanks dat de diversiteit aan gedragingen van ouders ten opzichte van hun kinderen groot is, wordt

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opvoedingsgedrag vaak getypeerd met behulp van twee centrale dimensies, namelijk *ondersteuning* en *controle*. Deze twee dimensies sluiten aan bij de belangrijkste functies die ouders vervullen, namelijk het bieden van een verzorgende, beschermende omgeving waarin het kind zich kan ontwikkelen en ten tweede, overdracht van kennis, waarden en normen en het bieden van structuur. Ten aanzien van de ondersteuningsdimensie kan gesteld worden dat de emotionele betrokkenheid van ouders kan variëren van warm en betrokken naar koel en afwijzend. De controledimensie kan variëren van autoritaire machtsuitoefening naar onverschilligheid. Controle verwijst naar gedrag van ouders dat er op gericht is het gedrag van het kind te veranderen, bijvoorbeeld door het kind te wijzen op de gevolgen van zijn daden, het kind naar zijn kamer te sturen of door iets leuks te verbieden.

Met behulp van logistische regressie analyse werd onderzocht in welke mate door de adolescent gerapporteerde ouderlijke controle en steun voorspellende waarde hebben om zowel continuïteit als verandering in rookgedrag bij adolescenten te onderzoeken. Adolescenten met ouders die in hoge mate controle uitoefenen bleken minder geneigd met roken te beginnen. Zowel het doorgaan met roken als een toename werden niet voorspeld door de opvoedingsdimensies. Echter het rookgedrag van de ouders zelf was wel voorspellend in het geval dat adolescenten door gingen met roken. Ten aanzien van het stoppen met roken bleek dat adolescenten met rokende ouders die veel steun rapporteerden meer kans hadden gestopt te zijn. Voor adolescenten van niet rokende ouders bleek dit te gelden in het geval ze een hoge mate van ouderlijke controle rapporteerden.

## De Niet-roken Afspraak en Communicatie

In hoofdstuk vijf worden bevindingen van cross-sectioneel en longitudinaal onderzoek gebruikt om te onderzoeken of de niet-roken afspraak een effectieve methode is voor ouders om het roken van hun kinderen te ontmoedigen. De prevalentie van de niet-roken afspraak in Nederlandse gezinnen varieert tussen de 27.6% en 36.4% tussen de drie studies. Er wordt apart gekeken naar adolescenten die ooit gerookt hebben en degene die regelmatig roken, dat wil zeggen minstens een keer per maand. Vervolgens wordt onderzocht of de niet-roken afspraak gemaakt wordt als reactie op experimenteergedrag van de adolescent. De veronderstelling die aan het onderzoek ten grondslag ligt is de gedachte dat het maken van de niet-roken afspraak een relatief eenvoudig communicatiemiddel is. Door simpelweg de afspraak te maken en vervolgens het kind te belonen als die zich aan de afspraak houdt is er mogelijk ook geen reden meer om uitvoerig over het onderwerp roken te praten. Daarom wordt tevens onderzocht of de kwaliteit en frequentie van ouderlijke communicatie over het onderwerp roken een rol speelt.

In de cross-sectionele studie die in hoofdstuk vijf beschreven wordt, is gebruik gemaakt van een representatieve sample van 4501 adolescenten tussen de tien en negentien jaar oud. Het hebben van de niet-roken afspraak hangt voor zowel rokende als niet-rokende ouders samen met regelmatig roken; jongeren; met wie een afspraak is gemaakt hebben namelijk een lagere kans om regelmatig roker te zijn. Deze bevindingen mogen echter niet causaal geïnterpreteerd worden. Ze werden namelijk niet gerepliceerd in de eerste longitudinale studie bij 595 ouders met een kind in de

brugklas; daar vonden we geen relatie tussen maken van een niet roken afspraak en roken van jongeren. Wel werd in de tweede longitudinale studie bij 428 gezinnen waarbij twee adolescenten uit hetzelfde gezin deelnamen, gevonden dat bij de oudere groep de kans juist groter was dat ze ooit gerookt hadden in het geval er sprake was van een niet-roken afspraak. Een mogelijke verklaring hiervoor is dat ouders meer geneigd zijn om het oudere kind als gelijkwaardige gesprekspartner te behandelen en de wens voor meer autonomie te honoreren. Er werd overigens geen ondersteuning gevonden voor de gedachte dat de niet-roken afspraak pas gemaakt wordt op het moment dat er sprake is van experimenteren met roken door de adolescent.

Naast de niet-roken afspraak werd in de derde studie van hoofdstuk vijf ook onderzocht in welke mate de kwaliteit en frequentie van ouderlijke communicatie over roken bijdragen aan de verklaring van ooit en regelmatig roken. Voor beide kinderen uit het zelfde gezin gold dat als ouders op een ondersteunende en constructieve manier over het onderwerp roken praten dit een sterk preventief effect heeft op zowel ooit als regelmatig roken. Indien ouders vaak praten over roken heeft dit echter een tegenovergesteld effect.

### Ouderlijke Communicatie en het Roken door Adolescenten

In hoofdstuk zes wordt longitudinaal onderzocht wat de wederzijdse effecten zijn van de frequentie van communicatie tussen ouders en hun kinderen die specifiek over roken gaat. Er wordt ook onderzocht of de frequentie van communicatie veranderd als de adolescent is begonnen met experimenteren. Het verband tussen de frequentie en het doorgaan met roken wordt vervolgens getoetst op de mogelijk modererende effecten van: (1) de kwaliteit van de communicatie, (2) de algemene kwaliteit van de relatie tussen de ouders en adolescenten, (3) het rookgedrag van de ouders. Er is gebruik gemaakt van data van de longitudinale studie 'Familie en Gezondheid' waaraan 428 tweeouder gezinnen met twee adolescenten deelnamen. De ouders waren getrouwd of samenwonend en de biologische ouders van de twee adolescenten. Er zijn drie metingen verricht met een tussentijd van een jaar.

Er werden verschillen gevonden tussen de jongere en oudere groep adolescenten uit dezelfde gezinnen. Communicatie over roken met de ouders had geen effect op het roken door de oudere groep adolescenten terwijl voor de jongere groep een jaar later een toename van het rookgedrag te zien was. Een mogelijke verklaring hiervoor is dat ouders beschermend willen optreden naar het jongere kind toe door meer over roken te praten, in tegenstelling tot het oudere kind waar veeleer de wens tot autonomie gehonoreerd wordt. Er werd ook gevonden dat, indien de adolescent rookt, er een jaar later juist meer over roken gecommuniceerd wordt. Ten aanzien van het beginnen met roken werd gevonden dat frequente communicatie geen preventieve werking heeft. De kwaliteit van de communicatie, de algemene kwaliteit van de relatie tussen de ouders en adolescenten en het rookgedrag van de ouders, bleken het verband tussen de frequentie en het rookgedrag van jongeren niet te beïnvloeden. In andere woorden, zelfs in gezinnen waar de relatie goed is, de kwaliteit van de communicatie hoog en waar de ouders niet roken blijft het gevonden ongunstige verband tussen frequente communicatie over roken en het rookgedrag van de jongste adolescent bestaan.

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### Conclusie

Ouders spelen een rol in de ontwikkeling van rookgedrag van hun kinderen. Enerzijds door hun eigen voorbeeld als roker of niet-roker anderzijds door de wijze waarop ze met het probleem omgaan. Voor ouders is het ook zinvol om zo vroeg mogelijk met roken te stoppen in het leven van hun kind. Als ouders stoppen met roken heeft dit namelijk duidelijk een preventief effect op het toekomstig rookgedrag van het kind

Ouders die kennis hebben over het rookgedrag van hun kind en zijn of haar vrienden en vriendinnen reduceren met deze houding het risico dat hun kind zich met roken in laat. Dit heeft meer uitwerking dan het opstellen van strikte huisregels over roken of het maken van een niet-roken afspraak met de beloning ver in de toekomst. Dit laatste is geen adequate strategie om het roken te voorkomen. Of het kind door gaat met roken hangt naast het vertrouwen in eigen kunnen van de ouders om met het probleem om te gaan ook af van het vermogen om op gedoseerde wijze boosheid te laten merken en adequaat te straffen.

Het onderwerp roken te vaak aan de orde brengen kan nadelige gevolgen hebben. Communicatie over roken kan het beste op een manier gebeuren die getuigt van wederzijds vertrouwen en respect zodat de ouders ook daadwerkelijk hun opvattingen en gevoelens kunnen uitdragen. Kinderen die deze communicatie als open en respectvol ervaren trekken zich de boodschap van hun ouders ook aan door minder snel te gaan roken .



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Als het met iemand klikt dan gaan de dingen vanzelf. Bill, ik ben erg blij dat mijn eerste keuze voor een dagelijkse begeleider door alle partijen ondersteund werd en dat jij het wilde aanpakken. Vanaf de eerste dag heb je laten merken dat je niet alleen deskundig bent op onderzoeksgebied maar dat je ook een goede en betrokken docent bent. Je hebt meegedacht, meegeschreven en meegeanalyseerd met het hele onderzoekstraject. Volgens mij ben je inmiddels ook 'expert in the field' geworden. Als een kip op het ei heb je al die jaren het proces in de gaten gehouden en je wilde precies weten wat er elke vrijdag aan nieuw werk gedaan was. Zonder dat het opviel heb je eigenlijk ontzettend veel werk gemaakt van je taak als dagelijks begeleider en daarmee beslist flink bijgedragen aan mijn ontwikkeling -want als het klikt gaan de dingen vanzelf. Net zoals een verbouwing in huis best lang kan duren, op een gegeven moment is het werk af, een taak is afgerond, een samenwerking komt tot een einde en een nieuwe situatie is ontstaan. Die nieuwe situatie voor ons is dat we niet meer direct samenwerken. Bill, bedankt voor al die fijne gesprekken die soms ook erg 'smeuig' waren, ik zal ze missen.

Beste Wim, een academicus pur sang zoals jij als voorbeeld te mogen hebben, zowel als leidinggevende die sturing geeft aan het proces van veldwerk en dataverzameling als promotor die de kunst van wetenschappelijk werk vanaf het in kaart brengen van complexe vraagstellingen tot en met het op papier zetten van de bevindingen beheerst, is een voorrecht. 'Modeling' van alle academische taken en vaardigheden is je handelsmerk en je blijft vooral 'leraar' in alles wat je doet. Toen ik in 2000 op de Universiteit Utrecht kwam werken wist ik van het bestaan van deze academische wereld niets af. Jij hebt me niet alleen veel geleerd over deze wereld maar ook hoe je daarnaast in het dagelijkse leven genuanceerd naar de werkelijkheid kan kijken alvorens met een mening of opvatting te komen. Dingen zijn vaak minder vanzelfsprekend dan ze lijken en als onderzoeker heb je vervolgens de taak om de complexiteit en richting van verbanden boven tafel te krijgen. Zoals je wel eens gezegd hebt is het uiteindelijk de kunst om deze ingewikkeldheid in eenvoudige woorden uit te leggen. Deze vaardigheid beheers je als geen ander en heeft voor mij als kompas gediend om de juiste richting in het onderzoekswerk te bepalen. Dit proefschrift is daarvan het concrete eindresultaat. Dat ik elk moment even bij je aan kon kloppen en dat je altijd de tijd nam een vraag te beantwoorden is iets wat ik zeer in je waardeer. Sturing geven en ondersteunen zijn wellicht niet alleen kenmerken van de meest gunstige 'authoritative parenting style' maar ook van 'authoritative promotorship' en om

mijn gevoelens in een theoretisch kader te plaatsen geef ik een vrije interpretatie op basis van mijn afstudeerscriptie: *De autoritatieve promotorenstijl*: promotoren met deze stijl zijn warm en betrokken, ondersteunen de behoefte aan autonomie en nemen rekenschap van de standpunten van de promovendus. Op de controledimensie scoren zij hoog en verwachten ook 'volwassen gedrag' van hun promovendus, de nadruk ligt hier echter op ontplooiing, onafhankelijkheid en verantwoordelijkheidsgevoel. Beste Wim, het moge duidelijk zijn dat ik deze kwaliteiten erg in je waardeer, bedankt dat je me de afgelopen vijf jaar met je prettige stijl door het soms moeilijke proces van dit proefschrift hebt geloodst.

Soms heb je in het leven gewoon veel geluk. In mijn geval was dat tijdens de laatste fase van de studie ontwikkelingspsychologie. Omstandigheden leidden er toe dat ik in plaats van een praktijkstage een afstudeeronderzoek moest gaan doen en aan Rutger werd gevraagd of hij de begeleiding op zich wilde nemen. Dat deze ontmoeting verregaande gevolgen zou gaan hebben kon ik toen nog niet vermoeden. Rutger, je legt de lat hoog maar je hebt het vermogen te motiveren en te inspireren zodat zelfs onmogelijke zaken een haalbaar doel worden. Het is voor een student een eer als je begeleider vindt dat je in staat bent naar een buitenlands congres te gaan om je studiebevindingen te gaan presenteren, daarover een 'echt' artikel te schrijven en zelfs te publiceren. Ik ben je erg dankbaar voor het vertrouwen wat je in me had toen je me vervolgens vroeg of ik het veldwerk voor een studie naar rookgedrag onder jongeren wilde gaan doen. De stap van psychiatrisch verpleegkundige naar Universitair medewerker is groot maar door jouw enthousiasme voor onderzoek een uitdaging die ik graag aan wilde gaan. Dat je me na afloop van het veldwerk vroeg een promotiestudie te gaan doen waarbij wederom een onmogelijke opdracht op mijn bord kwam leek me derhalve niet echt een probleem. Natuurlijk krijgen we het voor elkaar om in vijf jaar tijd een proefschrift te schrijven met een aanstelling van 1 dag per week!? .....Toch? Ik denk wel dat het zonder de geweldige werkweken in Frankrijk niet gelukt was en betreur het wat dat betreft dat het proefschrift ten einde is. Ik heb daar ook veel over statistiek geleerd: de statistiek laat zien dat je uiteindelijk toch een moordenaar blijkt te zijn ook al lijkt je een brave burger. Rutger, ik ben je erg dankbaar voor alles en hoop dat we samen in de toekomst nog een keer, als het kan tijdens het zeilen, een artikel schrijven waarbij we natuurlijk, zoals Geert-Jan dat zo mooi weet uit te drukken: "een wetenschappelijke doorbraak forceren".

## **Curriculum Vitae**

Endy den Exter Blokland was born in Nieuwer Amstel, the Netherlands on March 24, 1960. Shortly after secondary school (VWO) at the Herman Jordan Lyceum in Zeist he started a study of psychiatric nursing at the Willem Arntsz Foundation in den Dolder between 1981 and 1984, where he was also employed as a psychiatric nurse in training. He remained working part-time as a psychiatric nurse until September 2000, mainly on the special wards for acute crisis, short-term treatment, long stay and the special adolescent unit for first psychosis. After successfully finishing a training to become a Yoga-teacher between 1984 and 1986 he began his part-time study of psychology at the University of Utrecht in 1987. After four year break in his study due to fatherhood, he graduated as a Masters in Developmental Psychology in 2000. He started working at the Department for Child and Adolescent Studies at the University of Utrecht after graduation to coordinate the fieldwork of a longitudinal study about adolescent smoking, and commenced his dissertation in 2001 using data of this study. In 2001 he also started to coordinate the fieldwork of a longitudinal study (CONAMORE) of 1,300 adolescents followed over five years, and in 2005 he started to coordinate the fieldwork of another longitudinal study (RADAR) of 750 families followed over five years, while working part time on his dissertation.