



**Adolescents smoking behavior:  
A comparison study of Indonesia and The Netherlands**

**Author: Devi Wulandari  
Supervisor: Winnie Gebhardt, Ph.D  
A Thesis submitted for the degree of Master of Science in Health Psychology at the  
Faculty of Social Sciences  
Universiteit Leiden  
December 2003**

**ABSTRACT**

Smoking has become an epidemic since several decades ago. Global smoking trend nowadays shows that the number of youth smokers from developing countries is bigger than developed countries. However, most of researches of adolescents smoking behavior were conducted in developed countries. Therefore, it is important to examine adolescents smoking behavior from developing countries. The present study attempted to examine determinants of adolescents smoking behavior from Indonesia as a sample of developing country. Gender, peer smoking behavior, attitudes toward smoking and subjective norms were indicated as significant predictors of Indonesian adolescents smoking behavior. For smoking experienced adolescents, attitudes toward smoking was indicated as a significant predictor of intention to smoke whereas for nonsmoking adolescents, their intention to smoke was predominantly governed by subjective norms. The study also made comparison of adolescents smoking behavior from developing country (i.e. the Netherlands) and developed country (i.e. Indonesia). The result showed that For Indonesian adolescents ( $N = 301$ ), adolescents smoking behavior was more likely to be determined by peer smoking behavior and subjective norms. As for Dutch adolescents ( $N = 298$ ), their smoking behavior was more likely to be governed by attitudes towards smoking. This phenomenon can be explained by the terms of culture. The Netherlands is considered to have an individual culture, which view the self as personal and independent from each other. As for Indonesian adolescents, who were in collective culture, social norms were more valued than personal attitudes. Indonesian adolescents tended to seek harmony with their surrounding norms.

**Adolescents smoking behavior:  
A comparison study of Indonesia and The Netherlands**

**Chapter 1  
Introduction**

**1. 1. Impacts of smoking on health**

Research on smoking has been started since 1950s because of the growing concern over the impact of smoking on health. From that time, the evidence on smoking as causal or precipitating factor in many kinds of diseases has been increasing. Several examples of diseases that caused by smoking are lung cancer, bronchitis, chronic obstructive pulmonary disease (COPD), cardiovascular diseases emphysema, low birth weight in offspring and retarded fetal development (Center for the Advancement of Health, 2000). It was concluded that smoking is the most preventable cause of disease and premature death (Taylor, 2003). Smoking itself and in interaction with other risk factors, may also be the chief cause of death in the developed countries (McGinnis et al., 1992). For example smoking and cholesterol interact to produce even higher rates of morbidity and mortality due to heart disease (Perkins, 1985).

There are many chemicals, which are contained in cigarettes that cause these diseases. Tar, nicotine and carbon monoxide are the well-known components of cigarette smoke. Tar is known for its co-carcinogenic (tumor growth increasing) effect. In the 1970s studies on animal proved that long term inhalation of fresh cigarette smoke can lead to cancer of the larynx; a proof of the cancer causing activity of cigarette smoke (Feron & De Vrijer, 1984).

Nicotine affects the central and autonomous nervous system. It also has stimulating effects and paralyzing effects, depending on dose. Nicotine is responsible for the addictive effects of smoking because it causes a discharge of epinephrine from the adrenal cortex. This stimulates the central nervous system and other endocrine glands, which causes a sudden release of glucose. Stimulation is then followed by depression and fatigue, leading the abuser to seek more nicotine (National Institute on Drug Abuse, 2003)

Carbon Monoxide (CO) can reduce the capacity of the blood to carry enough oxygen to all organs. This mechanism can damage the heart, the central nervous system and also limit the amount of oxygen for fetus in pregnant women. CO was also concluded to be responsible for many cardiovascular diseases (National Institute on Drug Abuse, 2003)

**1. 2. Smoking in Adolescents**

Smoking often begins in adolescence, between the ages of 12-18 years. It is often reported as a part of experimentation that is common in adolescence (Taylor, 2003). Smoking among adolescents becomes a major concern because the sooner one becomes addicted to smoking the more likely one is to obtain fatal or debilitating diseases caused by smoking.

Explanations about determinants and patterns underlying this behavior are important to understand why adolescents take up smoking. A longitudinal study conducted by Soldz and Cui (2002) on 852 participants indicated that there were six patterns (clusters) of smoking behavior in adolescents, namely: nonsmokers, quitters, experimenters, early escalators, late escalators and continuous smokers. Nonsmokers constituted the largest group of the participants with 557 participants. They held the most negative attitudes towards smoking. Quitters ( $n = 37$ ) are adolescents who initiated and had stopped or reduced their smoking. These adolescents had also used other substances (alcohol and marijuana). Apparently, the use of substances in this stage was a part of the experimentation with risky behaviors in early adolescents before settling down toward the end of their school careers. Experimenters ( $n = 54$ ) and late escalators ( $n = 77$ ) showed similar pattern to each other. These groups started the experimentation of substances at the end of their school careers. Their attitudes towards alcohol were becoming more pro-smoking in the later grades. Early escalator ( $n = 76$ ) started to smoke earlier than late escalators and rapidly smoked a lot at the end of the later grades. Use of other substances was also increasing, parallel with their smoking behavior. Truancy, low self esteem, low life satisfaction and low social connectedness (religious involvement and spending time with parents) were common in this group. Continuous smokers ( $n = 51$ ) smoked the earliest among other groups. These adolescents had the lowest GPAs, the highest truancy rates, the highest use of other substances, the most pro-smoking behavior and the lowest social connectedness.

Other factors that should be taken in to account in investigating smoking behavior in adolescence are negative life events and negative affects (Wills, Sandy & Yaeger, 2002). As such 1,364 adolescents were followed for 3 years. Results of the study showed significant relation of stress, which was induced by negative affect and negative life events, with increase over time in smoking. Another study which was conducted by Novak & Clayton (2001) indicated that low self-regulation, teacher discipline and faculty involvement were associated with smoking initiation. Apparently, there was an interaction between self-regulation and school context. The study which included 25,186 participants from 38 public schools in Kentucky showed that students who possessed low emotional regulation were more likely to initiate experimental smoking in schools with poor levels of discipline and involvement. A meta analytic study conducted by Conrad, Flay and Hill (1992) concluded that gender and socioeconomic status were also important predictors in adolescents smoking behavior. The study reviewed 27 perspective studies of the onset of cigarette smoking conducted since 1980. Female gender and lower socioeconomic status were associated with the onset of smoking behavior.

Smoking among adolescents has become worldwide epidemic. According to Hanan (2001) each day 80,000 up to 100,000 adolescents start smoking worldwide especially in the developing countries. As can be seen from Table 1, the percentage of adolescents who smoke in developing countries was higher than in the developed countries. Gender was found to influence this behavior: there was a big discrepancy between the number of girls who smoked (7%) compared to boys (48%) in developing countries. The number of girls who smoked in developed countries was more than half of the number of boys who smoked. However, little is known about youth smoking behavior in developing countries because most of the studies were conducted in developed countries.

**Table 1.**  
**Prevalence of youth smokers worldwide (above age 15)**

	Country	Percentage of youth smokers (2001)
1	Developing Countries	Male: 48% Female: 7%
2	Developed Countries	Male: 42% Female: 24%
3	Total	Male: 47% Female: 12%

Source: *World Health Organization, 2001*

Besides the large number of youth smokers in developing countries, the increase of the number of youth smokers is also of great concern. Each year the percentage of youth smokers in the developing countries is increasing, which makes smoking to become a growing health problem (Taylor, 2003). The number of youth smokers in developed countries since 1990 has shown an unstable pattern. For example in The Netherlands in 1998 more than 26% of Dutch adolescents smoked and the number of youth smokers has increased up to 29% by the year 2000. Apparently, there was no difference between genders. It was shown that 27% of the male adolescents smoked whereas 26% of female adolescents smoked (Dutch Foundation on Smoking and Health, 2000). In summary, smoking continues to be a formidable problem all over the world.

### 1. 3. Health behavior models in smoking behavior

Since smoking in adolescence has become an epidemic all over the world, it is important to know its determinants and the underlying mechanism and behind this behavior in order to be able to construct an appropriate intervention.

Several theories have been applied to explain smoking behavior in adolescence. For example, prototype/willingness model (Gibbons & Gerrard, 1995), the health belief model (Rosenstocks, 1974), the social learning theory (Bandura 1977) and the theory of planned behavior (Ajzen, 1985) are all theories which have been frequently applied to explain and predict smoking behavior in adolescence. From several health behavior theories mentioned above, the study would only be focusing on two theories to examine Indonesian adolescents smoking behavior: social learning theory and the theory of planned behavior. There were two rationales for choosing these theories. First, people cannot be separated from society. People influence and being influenced by other people. Therefore, human behavior cannot be seeing as isolation from other people influence. The health belief model, which assumes that health behavior is determined by perception of health threat and perceived threat reduction, has neglected this important factor. Second, the prototype/willingness model assumes that favorableness of prototype perception may lead to people's willingness to engage to health behavior. However, willingness is not always lead to behavioral engagement. To do a certain behavior, people at least should have a belief that they able to conduct the behavior.

Social learning theory (Bandura, 1977) is one of the theories that succeeded in explaining adolescents smoking behavior (Conrad, Flay & Hill, 1992; Rowe, Presson, Chassin & Sherman, 1996; Swaim, Oetting & Casas, 1996; Wills & Cleary, 1999;

Engels, Knibbe, De Vries, Drop & Breukelen, 1999; Chassin, Presson, Pitts & Sherman, 2000; Andrews, Tildesley, Hops & Li, 2002). In social learning theory, social influence is an important factor in youth smoking behavior, especially in initiation. Through the concept of modeling, social learning theory explains that smoking behavior of adolescents was derived from modeling of family (i.e. parents), peers and environment. For example smoking peer may display smoking as a way to look mature and be socially accepted. One who sees smoking in this way may imitate this behavior in order to get desirable effects. Adolescents' affiliation with their peer who smoked may cause initiation or an increase of tobacco use. This influence is especially strong within good dyadic relationships, i.e. close friends. Apparently one tends to model behavior from someone who is valued (Wills & Cleary, 1999).

The parent's influence has been concluded in number of studies as important factors on adolescents smoking behavior. Adolescents whose parents were smoking were more likely to start experimentation with smoking because the parents may serve as a model of smoking behavior. The parents may communicate, intentionally or not, that smoking is a pleasurable behavior and a way to handle stress and tension (Rowe, Chassin, Presson & Sherman, 1996). However the influence of peer and parents in adolescents smoking behavior is only important in initiation. Nicotine tolerance and mood regulation were concluded as important factors in continuation of smoking (Rowe, Presson, Chassin & Sherman, 1996; Engels, Knibbe, De Vries, Drop & Breukelen, 1999).

Smoking can also be associated with rewarding experiences (Leventhal & Cleary, 1980). For example, an adolescent who wants to be socially accepted may start smoking in order to be accepted. Every time he smokes, in which nicotine level is high; he may feel accepted by his friends. If this mechanism continues to happen, thus he associates high nicotine level with acceptance or secure feeling. So every time the nicotine level drops he or she tends to smoke in order to get secure feeling.

Another approach in predicting and understanding people's behavior that has had a good deal of success is theory of planned behavior (TPB). The TPB was developed by Ajzen (1985) as an extension of theory of reasoned action (Fishbein & Ajzen, 1975). TPB is widely used to explain many behaviors, for example cervical cancer screening (Sheeran & Orbell, 2000), diet (Armitage & Conner, 1999), condom use among students (Sutton, McVey & Glanz, 1999) and recycling behavior (Terry, Hogg and White, 1999).

According to the theory of planned behavior, behavior can be predicted by the behavioral intention. Behavioral intention itself consists of three components: attitudes towards the specific action, subjective norms regarding the action and perceived behavioral control. Attitudes towards the specific action are derived from beliefs about outcomes of the behavior (e.g. if I smoke, I will look mature) and an evaluation of the outcomes (e.g. looking mature is preferable). Subjective norms are normative beliefs (e.g. my parents don't want me to smoke) and combination with motivation to comply with the subjective norms. Perceived behavioral control refers to the expectancies regarding someone's capability of performing the action (e.g. I can quit smoking).

A meta analytic study which included 185 studies conducted by Armitage and Conner (2001) concluded that perceived behavioral control accounted for a significant amount of variance in all intention and all behaviors whereas subjective norms were regarded as the weakest predictor of intention. There are two rationales that describe the relationship between perceived behavioral control and behavior. First, the greater

perceived behavioral control the greater the likelihood that a behavior will be carried out. Second, since perceived behavioral control works in parallel with attitudes and subjective norms in forming intention, thus positive attitudes, perceived social acquiescence and perceived ease of behavioral performance would increase the intention.

Several studies have been done in order to examine contribution of each variable in predicting behavior. Perceived behavioral control was found to be a significant predictor in predicting intention and behavior in smoking cessation after coronary artery bypass graft surgery (Burse & Craig, 2000). The study concluded that there was a significant relationship between the intention to quit smoking after CABG, attitude, and perceived behavioral control. A study which examined predictors of adolescents smoking behavior indicated that perceived behavioral control, attitudes and subjective norm were explaining intention, whereas perceived behavioral control was an important predictors of behavior (Godin, Valois, Lepage & Desharnais, 1992).

#### 1.4. Goals in health behavior

Although health behavior models which are mentioned before can explain the underlying mechanism behind human health behaviors, the concepts behind the models may offer limited perspectives. The concepts behind those models seem to view health targets in isolation. The models do not consider that health targets (quitting smoking, reducing weight, avoid snacking between each meal etc) are indeed specific goals which serve higher order goals in one's personal goal structure.

Higher order goals are abstract and complex goals which have a personal meaning and optimization of one's self concept (Maes & Gebhardt, 2000). Higher order goals has many different facets from goals concerning health (e.g. being healthy), social (e.g. being accepted by peers), to well being (e.g. to enjoy goodness in life). These higher order goals are attained by lower order goals which are more concrete and specific (e.g. studying, exercising, enjoying tasty meals). Approximation of lower order goal however, can lead to conflict. Two studies on exercise behavior showed that activities concerning self development (e.g. studying), social (e.g. going on a visit), activities in the home (e.g. reading a book) and activities outside of the home (e.g. going to a movie) were tended to compete with exercise behavior. This conflicting activities can in turn hampered the exercise behavior (Gebhardt & Maes, 1998; Gebhardt, van der Doef & Maes, 1999). People are more likely to conduct activities which facilitate or in line with higher order goals whereas people usually tend to avoid activities which conflicting higher order goal (Barone, Maddux & Snyder, 1997).

Research on goals showed that goal attainment has played an important role on psychological well-being (Elliot, Sheldon & Church, 1997; Sheldon & Kasser, 1998; Brunstein, Schultheiss & Grassmann, 1998; Sheldon & Elliot, 1999; ter Doest, Maes, Gebhardt & Koelewijn, 2000), affective well being (Harris, Daniels & Briner, 2003) and physical symptom (Elliot & Sheldon, 1998). These research showed that facilitating goals were associated with more activated affect (Harris, Daniels & Briner, 2003) and high psychological well being (Brunstein, Schultheiss & Grassmann, 1998; Sheldon & Kasser, 1998; Sheldon & Elliot, 1999; ter Doest, Maes, Gebhardt & Koelewijn, 2000).

## 1. 5. Goals of the study

Goal conflict, goal facilitation, TPB and social learning theory will be used in the study to examine youth smoking behavior of developing country (i.e. Indonesia) and developed country (i.e. The Netherlands) by means of a questionnaire. The reason to conduct the cross-cultural study was to get a description of adolescents' smoking behavior from each country and to compare adolescents' smoking behavior from a developed country and a developing country.

Indonesia was used as an example of a developing country because of several reasons. First is the number of new smokers is increasing rapidly each year (Department of Health, Republic of Indonesia, 2003). Second is the high percentage of youth smokers in Indonesia. From the total population who smoked by 2002, 44% were adolescents with a range from 10-19 years old (Department of Health, Republic of Indonesia, 2002). According to the Global Youth Tobacco Survey (2000) 20.8% of adolescents were smoking, with the biggest percentage coming from boys (69.3%) and the lowest percentage coming from girls (5%). The Netherlands was included as a comparison country because of the availability of data.

The study was a cross-sectional study which included adolescents as participants. There were two rationales for choosing this sampling. The first reason is because the adolescence period is a window of vulnerability (first exposed by their peers and older siblings) for smoking and drug use (Taylor, 2003). The second reason is that smoking in late adolescence is mostly determined by nicotine dependence and mood regulation (Rowe, Presson, Chassin & Sherman, 1996; Engels, Knibbe, De Vries, Drop & Breukelen, 1999). Therefore it is important to conduct research to find out the antecedents of smoking behavior early in life.

There were three main goals in the study: The first main goal of the study was to compare Indonesian regular smoking adolescents, occasional smoking adolescents and non-smoking adolescents regarding the goal theory (goal facilitation and goal conflict), the social learning theory (parents' smoking behavior, sibling smoking behavior and peers' smoking behavior) and the theory of planned behavior (attitudes toward smoking, subjective norms, perceived behavioral control and intention to smoke). It was assumed that there would be significant differences between the three groups with respect to each predictor mentioned before.

The second goal was to examine whether the goal theory would contribute substantially to the variance explained in smoking behavior (i.e. smoking experienced adolescents and non-smoking adolescents) and intention to smoke of Indonesian adolescents over and above the variance explained by TPB and social learning theory. For intention to smoke, two separate analyses for both non-smoking adolescents and smoking experienced adolescents were conducted to observe the contribution of the predictor which are exclusive for each group. The study was also aimed to examine the roles of the covariates (i.e. age, gender, religion and socioeconomic status) in intention to smoke.

Since the study was also a cross-cultural study, the third goal of the study was aimed to compare predictors of adolescents' smoking behavior from Indonesia and the Netherlands. It was assumed that each country would have its own significant predictors for adolescents' smoking behavior. The study also examined the association between covariates and intention to smoke in both Indonesian and Dutch adolescents.



## Chapter 2 Method

### 2.1. Participants and Procedure

This study included one junior high school and two high schools. They were located in East of Jakarta. The participants were between 12 and 18 years of age. The schools were included in the survey because of the accessibility.

Questionnaires in *Bahasa Indonesia* (Indonesian language) were distributed to the students during school hours. The cover letter which stated assurances of the confidentiality of participants' responses were distributed together with the questionnaire. The researcher was present in the classes to introduce the study briefly and to explain that the answers to the questionnaire would be kept confidential from parents and teachers. The teachers were present during the first ten minutes of the process to introduce the researcher to the students.

Preliminary analyses regarding demographical data from Indonesian adolescents showed that of the 301 participants 52% were male ( $n = 157$ ) and 48% were female ( $n = 144$ ). The mean age was 14.6 ( $SD = 1.64$ ). Over 50% of the participants had never smoked at all whereas only 5% of the respondents smoked regularly. 9% of the respondents had quit smoking and 29% of the respondents had tried one puff. Of 301 participants, 80% identified themselves as non-smokers, 15% as occasional smokers and only 2% as regular smokers.

Data regarding participants from The Netherlands were acquired from a study conducted by Vitale, Sweeney and Gebhardt (2000). As can be seen from Table 3, of the 248 respondents 44% were male ( $n = 109$ ) and 56% were female ( $n = 139$ ). The mean age of the Dutch participants was 13.9 ( $SD = 5.17$ ). 59% ( $n = 147$ ) of the respondents had never smoked at all and only 9% ( $n = 22$ ) of the total respondents smoked regularly. 8% of the respondents ( $n = 18$ ) had stopped smoking and 24% of the total respondents ( $n = 61$ ) had tried one puff. Of the respondents, 86% ( $n = 213$ ) considered themselves as non-smoker, 8% ( $n = 21$ ) as occasional smokers and 6% ( $n = 14$ ) as regular smokers.

**Table 2.**  
**Indonesian Sample characteristics**

Variable	Category	%	<i>M</i>	<i>SD</i>
Gender	Females	47.8	1.48	.50
	Males	52.2		
Socioeconomic status	Low	7	2.17	.53
	Middle	68.4		
	High	23.9		
Smoking behavior	Smoking daily	5.3	4.20	1.10
	Smoking weekly	3.7		
	Have quit smoking	9.3		
	Have tried one puff	29.1		
	Have never smoked	52.2		

**Table 3.**  
**Dutch Sample characteristics**

Variable	Category	%	<i>M</i>	<i>SD</i>
Gender	Females	56.3	1.56	.50
	Males	43.7		
Smoking behavior	Smoking daily	5.3	4.32	1.07
	Smoking weekly	2.5		
	Have quitted smoking	7.4		
	Have tried one puff	25		
	Have never smoked	59.8		

## 2. 2. Measures

The questionnaire used in this study was the same questionnaire which was used in study conducted by Vitale, Sweeney and Gebhardt (2000) to investigate Dutch youth smoking behavior. The original questionnaire was in Dutch. For the purpose of the study the questionnaire was translated into *Bahasa Indonesia*. After being translated into *Bahasa Indonesia*, the questionnaire was translated again into Dutch to make sure the original content of the questionnaire.

### 2. 2. 1. Socio-demographic characteristics

The first part of the questionnaire contained questions about demographic data of participant. There were four aspects of socio-demographic which were asked in the study: gender, age (11 years or younger – 17 years or older), academic year (1<sup>st</sup> – 3<sup>rd</sup>), religion (Moslem, Buddha, Catholic, Protestant and Hindu) and socioeconomic status. For socioeconomic status participants were asked about their parents' educational level (Elementary school – University), their parents' job (participants filled the blanks) and the number of siblings (no sibling – 3 or more siblings).

### 2. 2. 2. Smoking behavior

Smoking behavior was assessed by two questions. The first question concerned with participants smoking behavior ("which option describe you best?"). Answers were given in five options: "I smoke everyday, approximately... (number) of cigarette per day", "I smoke every week instead of everyday, approximately... (number) of cigarette per week", "I used to smoke, but I already stop", "I have never really smoked, but once I tried one puff", "I have never smoked a cigarette, not even one puff". To simplify the data, the variable then categorized into two variables namely: smoking experienced adolescents and non-smoking adolescents. Non-smoking adolescents were participants who answered the last option (i.e. I have never smoked a cigarette, not even one puff) and smoking experienced adolescents were participants who answered any of the options. The second question asked how the respondents would describe themselves: as "a non-smoker", as "an occasional smoker" or as "a regular smoker".

### 2. 2. 3. Social Learning Theory

Social learning theory was assessed by asking participants about smoking behavior of their closest environment ("Who is smoking in your close environment..."). The answer was given in seven options (mother, father, brother, sister, close friend and classmate). The participants could give more than one answer. Parents smoking behavior scale was based on two categorical answers: none of the parents smoked and one of or both parents smoked. Sibling smoking behavior scale was also based on two categorical answers: none of the siblings smoked and having at least one sibling who smoked. The influence of friend in smoking was measured by asking the number of their friend who smoked. This question then followed by five options from 1 (*I have no friends who smoke*) until 5 (*all of my friends smoke*).

### 2. 2. 4. The theory of planned behavior

The questionnaire assessed four components of TPB: attitude, social norm and perceived behavioral control, intention to smoke. Attitude toward smoking ( $\alpha = .89$ ) was assessed by asking what the participant think about smoking. Seven point scales then followed this question with negative adjective at the left side (*bad, not fun, unhealthy, not useful, boring, unprofitable, dangerous*) and positive adjective at the right side (*good, fun, healthy, useful, interesting, profitable, safe*). Attitudes toward smoking scores were derived from averaging the seven items scores.

There were six questions which measured social norm ( $\alpha = .60$ ). The first three questions assessed normative beliefs of friends, parents and environment regarding smoking (e.g. "My parents think that I?"). Answers were given on a scale from 1 (*certainly shouldn't smoke*) to 7 (*certainly should smoke*). The other three question referred to participants motivation to comply to normative references i.e. parents, friends and environment (e.g. "Regarding smoking, how important is it for you of what your parents think?"). Responses ranged from 1 (*very little*) to 7 (*a great deal*). The first step to obtain subjective norm score was to multiply scores from normative belief by motivation to comply. The second step to obtain the final scores is summing the combined item scores.

The third components of TPB ( $\alpha = .74$ ) namely perceived behavioral control was measured with three 7-point scales. The first question was: "Do you think it is easy or difficult to not smoking?". The answer option given in the questionnaire ranged from 1 (*very difficult*) to 7 (*very easy*). The next question was posed: "To what extent do you have influence on your self in deciding between to smoke or not?", which could be answered on a seven points scale (*very little – a great deal*). The last question was: "If you want to smoke, how easy is it for you?". Answer option given on a scale ranged from 1 (*very difficult*) to 7 (*very easy*). Scale scores were formed by averaging the item scores.

Intention to smoke ( $\alpha = .57$ ) was measured by two questions (e.g. "How strong is your plan to smoke in the next six month?"). A seven-point scale (*not strong – very strong*) followed. Another question asked how probable it was that for them to smoke within the next six months. Responses ranged from 1 (*very unlikely*) to 7 (*very likely*). Scores for intention to smoke were derived by averaging over item scores.

### 2.2.5. The goal theory

The goal theory was consisted of two scales i.e. goal conflict ( $\alpha = .77$ ) and goal facilitation ( $\alpha = .66$ ). To assess the goal conflict and goal facilitation, the respondents were given sixteen daily activities which most of the adolescents do (e.g. go to a movie, studying, do some sport). The questionnaire included importance ratings for each item. The participants were asked: "To what extent do you find the following activities important?. Sixteen five-point scales were followed for each item (1 = *not at all important* to 5 = *extremely important*). To find out about the goal facilitation and goal conflict the respondents were asked to report about the effects of becoming a smoker on those activities. Respondents provided their answers, separately for each item, on a 3-point scale (1 = *smoking makes the activity better*; 2 = *no influence*, 3 = *smoking makes the activity worse*). Participants who mentioned that the activity was important to them (answer option 3 to 5) and that being a smoker makes the activity better were categorized as having goal facilitation whereas participants who mention being a smoker makes the activity worse were categorized as having goal conflict. Scores for each scale were obtained from summing up over item scores.

### 2.3. Statistical analyses

The first step in analyzing data is to conduct descriptive analyses to get an overview of the data. To answer the first hypothesis ANOVA test was conducted. However ANOVA test could not be conducted because there were not enough participants who were categorized as regular smokers ( $n = 6$ ). T-test instead of ANOVA test was used to examine the differences between smoking experienced adolescents ( $n = 142$ ) and non-smoking adolescents ( $n = 157$ ) in seven independent variables namely: goal facilitation, goal conflict, peers smoking behavior, attitudes toward smoking, subjective norms, perceived behavioral control and intention to smoke. Variable perceived behavioral control, intention to smoke, attitudes toward smoking, subjective norms goal conflict and goal facilitation showed non normal distribution. Square root transformations were conducted for variable subjective norms and goal facilitation and to transform variable intention to smoke, attitudes toward smoking, log 10 transformations were conducted. With respect to variable perceived behavioral control, first the distribution was reflected then it was transformed with square root transformation. Chi square test was used to examine the differences in the two groups for variable parents smoking behavior and sibling smoking behavior since both variables were categorical variables.

To test whether goal facilitation and goal conflict contributed substantially to the explained variance in smoking behavior (smoking experienced adolescents and non smoking adolescents), over and above the variance accounted for the components of social learning theory (parents smoking behavior, sibling smoking behavior and peer smoking behavior) and TPB (attitude, subjective norm and perceived behavioral control), logistic regression using forced entry regression analysis were conducted. The reason to conduct logistic regression is because the outcome variables were categorical dichotomy. In the first block, four covariates were entered: gender, age, socioeconomic status and religion. In the second block parents smoking behavior, sibling smoking behavior and

peer smoking behavior were entered; in the third block three predictors from TPB namely: attitudes towards smoking, subjective norms and perceived behavioral control were entered; in the fourth block, goal facilitation and goal conflict were entered. To analyze roles of the covariates in intention to smoke, t-test and ANOVA test were used. For variable gender, t-test was used to examine the difference between boys and girls in their intention to smoke. Association between intention to smoke and each covariate namely: religion (Moslem, Catholic, Protestant, Hindu and Budha) and socioeconomic status (low, middle and high) were analyzed using ANOVA test.

It was expected that there would be a different significant predictors of intention to smoke for smoking experienced adolescents and non smoking adolescents<sup>1</sup>, therefore to examine contribution of each predictor to the variance explained in intention to smoke of Indonesian adolescents for both smoking experienced adolescents and non-smoking adolescents, two separate hierarchical linear regression analysis were conducted. In the first block, four covariates were entered: gender, age, socioeconomic status and religion. In the second block the three scales measuring parents smoking behavior, sibling smoking behavior and peer smoking behavior were entered. In the third block three predictors from TPB namely: attitudes towards smoking, subjective norms and perceived behavioral control were entered. In the fourth block, goal facilitation and goal conflict were entered.

Cross-cultural comparison was derived from t-tests and logistic regression analyses. Regarding covariates, there were only two covariates in common for both Dutch and Indonesian data i.e. gender and age. Two separate t-tests for Indonesian and Dutch data were analyzing association between the covariates (as independent variables) and intention to smoke (as a dependent variable). To examine predictors of adolescents smoking behavior for both countries, another logistic regressions analysis for Dutch adolescents was conducted in addition to the logistic regression for Indonesian adolescents smoking behavior which was mentioned above. For Dutch adolescents smoking behavior, in the first block, four covariates were entered: gender, age, nationality and type of school. In the second block parents smoking behavior, sibling smoking behavior and peer smoking behavior were entered; in the third block three predictors from TPB namely: attitudes towards smoking, subjective norms and perceived behavioral control were entered; in the fourth block, goal facilitation and goal conflict were entered.

---

<sup>1</sup> Intention to smoke showed non normal distribution, it was transformed with  $1/(x)$  transformation

## CHAPTER 3

### Results

#### 3. 1. Differences in determinants between smoking experienced and non-smoking adolescents

T-tests were used to examine mean differences between smoking experienced and non smoking adolescents with respect to seven independent variables namely: goal facilitation, goal conflict, peers smoking behavior, attitudes towards the smoking, subjective norms and perceived behavioral control. However the two groups differed in variance with respect to subjective norms, goal conflict, intention to smoke and perceived behavioral control. Since there were several violations against assumptions of parametric test thus the results should be interpreted with caution.

As can be seen from Table 4, t-tests showed a significant result for variable attitude ( $t(292) = 8.70, p < .001$ ). Smoking experienced group showed higher attitudes toward smoking ( $M = .25$ ) than the non-smoking group ( $M = .008$ ). A significant result was also found for the variable subjective norm ( $t(281) = 6.46, p < .001$ ). It was shown that smoking experienced group ( $M = 4.3$ ) perceived a higher subjective norm than the non-smoking group ( $M = 3.2$ ). There was also a significant result for the variable intention to smoke ( $t(292) = 7.8, p < .001$ ). Smoking experienced adolescents showed a higher intention to smoke ( $M = 2.75$ ) than non-smoking adolescents ( $M = 1.41$ ). With regard to perceived behavioral control, t-test yielded a significant result ( $t(290) = 7.7, p < .001$ ). Nonsmoking adolescents ( $M = 1.26$ ) showed a higher perceived behavioral control than smoking experienced adolescents ( $M = 1.66$ ). For variable peer smoking behavior, t-test showed a significant result ( $t(297) = 6.4, p < .001$ ). Smoking experienced adolescents ( $M = 2.73$ ) had more friends who smoke compared to the non-smoking adolescents ( $M = 1.80$ ). As for goal conflict and goal facilitation significant results were also found. Non-smoking adolescents perceived more conflict in their goals if they became a smoker whereas smoking experienced adolescent perceived more goal facilitation if they remain to be a smoker or became a regular smoker.

Chi square tests were used to examine associations between smoking behavior (i.e. smoking experienced group and non-smoking group) and family smoking behavior (i.e. parents smoking behavior and sibling smoking behavior). Early inspection on assumptions for chi square showed that all of the assumptions were met by the data. As can be seen from Table 4, however, the two variables were not significantly associated with adolescents smoking behavior.

**Table 4.**  
**Results of t-test and chi square tests in determinants of smoking behavior between smoking-experienced adolescents and non-smoking adolescents**

	Variable	<i>M</i>	<i>SD</i>	%	<i>t</i> value	<i>X</i> <sup>2</sup> value	<i>df</i>	<i>P</i> value
<i>t</i> -test	<b>Attitude toward smoking</b>				8.7		292	<i>P</i> < .001
	<i>Smoking experienced adolescents</i>	.25	.20					
	<i>Non-smoking adolescents</i>	.08	.11					
	<b>Subjective norm</b>				6.46		281	<i>P</i> < .001
	<i>Smoking experienced adolescents</i>	4.30	1.46					
	<i>Non-smoking adolescents</i>	3.20	1.42					
	<b>Intention to smoke</b>				8.3		234	<i>P</i> < .001
	<i>Smoking experienced adolescents</i>	.33	.30					
	<i>Non-smoking adolescents</i>	.08	.20					
	<b>Perceived behavioral control *</b>				7.53		243	<i>P</i> < .001
	<i>Smoking experienced adolescents</i>	1.66	.51					
	<i>Non-smoking adolescents</i>	1.26	.36					
	<b>Goal conflict</b>				-6.4		271	<i>P</i> < .001
	<i>Smoking experienced adolescents</i>	6.67	4.80					
<i>Non-smoking adolescents</i>	10.44	4.96						
<b>Goal facilitation</b>				3.84		277	<i>P</i> < .001	
<i>Smoking experienced adolescents</i>	1.20	2.47						
<i>Non-smoking adolescents</i>	.31	1.29						
<b>Peer smoking behavior</b>				8.8		297	<i>P</i> < .001	
<i>Smoking experienced adolescents</i>	2.73	1.03						
<i>Non-smoking adolescents</i>	1.80	.77						
Chi square test	<b>Parents smoking behavior</b>					0.76	1	n.s
	<i>Smoking experienced adolescents</i>							
	None of the parents smoked (%)			23.7%				
	One or both parents smoked (%)			23.7%				
	<i>Non-smoking adolescents</i>							
	None of the parents smoked (%)			27.1%				
One or both parents smoked (%)			25.4%					

(Table continues on next page)

<b>Sibling smoking behavior</b>		2.24	1	n.s
<i>Smoking experienced adolescents</i>				
Have no sibling who smoked (%)	30.9%			
At least have one sibling who smoked (%)	16.4%			
<i>Non-smoking adolescents</i>				
Have no sibling who smoked (%)	38.6%			
At least have one sibling who smoked (%)	14%			

Note. \* Means after transformation. High values = low values whereas low values = high values

### 3.2. Determinant of adolescents smoking behavior

Table 6 shows the results from logistic regression analysis for adolescents smoking behavior. Adolescents smoking behavior was categorized into non-smoking adolescents and smoking experienced adolescents. Assumptions for logistic regression i.e. goodness of fit criterion, multicollinearity, outliers and independence of errors were tested before the analysis was done and the results showed that the data met all of the assumptions. In the first block, four covariates were entered: gender, age, socioeconomic status and religion. In the second block parents smoking behavior, sibling smoking behavior and peer smoking behavior were entered. In the third block three predictors from TPB namely: attitudes towards the specific action, subjective norms regarding the action and perceived behavioral control were entered. In the fourth block, goal facilitation and goal conflict were entered. The result indicated that the second model, which included three measures concerning social learning theory, contributed significantly (38%) of the variance explained in smoking behavior above that explained by the covariates. The third model, which enclosed the three predictors from TPB also contributed significantly (50%) to the variance explained in smoking behavior. However, the last block which included goal facilitation and goal conflict did not contribute significantly to the variance explained in smoking behavior. The model as a whole explained 51% of the explained variance in smoking behavior. Table 6 also shows Wald statistics value for each predictor, which conclude that smoking behavior was significantly associated with gender, peer smoking behavior, attitudes toward smoking, and subjective norm. Wald statistic also showed that peers smoking behavior was the highest contributor of adolescents smoking behavior. The results of the analysis showed that boys were more likely to become a smoker. Adolescents who had more peers who smoked were also more likely to become a smoker. Indonesian adolescents who have higher attitudes towards smoking and higher subjective norms were more likely to become smokers compare to those who have lower attitude towards smoking and lower subjective norms.



**Table 6.**  
**Logistic Regression results of Indonesian adolescents smoking behavior**

	Model test		Explained Variance (Nagelkerke $R^2$ )	Wald Statistics	Exp (B)	P value
	$X^2$ value	P value				
<i>Covariates</i>	51.70	< .001	.24			
Gender				5.71	.43	< .05
Age				.42	1.08	n.s
Socioeconomic status				.20	1.14	n.s
Religion				.92	1.20	n.s
<i>Social learning theory</i>	34.40	< .001	.38			
Parents smoking behavior				.06	.97	n.s
Peer smoking behavior				14.17	2.35	< .001
Sibling smoking behavior				.06	1.09	n.s
<i>Theory of planned behavior</i>	34.24	< .001	.50			
Attitude toward smoking				7.20	2.52	< .01
Intention to smoke				1.70	1.20	n.s
Subjective norms				4.14	1.03	< .05
Perceived behavioral control				1.83	1.84	n.s
<i>Goal conflict &amp; facilitation</i>	1.87	n.s	.51			
Goal conflict				1.17	.96	n.s
Goal facilitation				1.17	.85	n.s

### 3. 3. Analysis for intention to smoke

#### 3. 3. 1. Associations of demographic variable with intention to smoke

Intention to smoke was a dependent variable for analyses which included covariates (i.e. gender, age, socioeconomic status and religion) as independent variables. For variable gender, t-test was used to examine the difference between boys and girls in their intention to smoke. To analyze relationship between age and intention to smoke, a Pearson correlation test was used. Assumptions for parametric test were tested before the data were analyzed. Levene's test for equality of variance showed that the two groups (i.e. boys and girls) differed in variance with respect to intention to smoke. This result was a violation against assumptions of parametric test. Thus the results of the analysis should be interpreted with caution. Religion (i.e. Moslem, Catholic, Protestant, Hindu and Budha) and socioeconomic status (low, middle and high) were analyzed using ANOVA tests.

Table 5 shows the result for the ANOVA test and t-test for each covariate. There was a significant result for gender ( $t(294) = 4.40, p < .001$ ). Boys ( $M = .27$ ) showed a higher intention to smoke than girls ( $M = .13$ ). There was also a significant result for age ( $r = .27, p < .01$ ). The older the adolescents the more likely they have intention to smoke. However there were no significant difference for variable religion and socioeconomic status.

**Table 5.**  
**Result of t-test and ANOVA for covariates in intention to smoke**

	Variable	<i>M</i>	<i>SD</i>	<i>t</i> value	<i>r</i> value	<i>F</i> value	<i>df</i>	P value
<i>t</i> -test	<i>Gender</i>			4.40			294	$P < .001$
	Boys	.27	.30					
	Girls	.13	.24					
Pearson correlation	Age				.27			$P < .01$
ANOVA test	<i>Socioeconomic status</i>					.28	2	n.s
	Low	.17	.24					
	Middle	.20	.28					
	High	.18	.27					
	<i>Religion</i>					.39	4	n.s
	Moslem	.21	.28					
	Catholic	.18	.28					
	Protestant	.19	.28					
	Hindu	.38	.30					
	Budha	.25	.32					

### 3. 3. 2. Determinants of intention to smoke in non-smoking adolescents

After controlling for the four covariates, parents smoking behavior, sibling smoking behavior and peer smoking behavior were entered in the second block; in the third block three predictors from TPB namely: attitudes towards the specific action, subjective norms regarding the action and perceived behavioral control were entered; in the fourth block, goal facilitation and goal conflict were entered.

Assumptions for linear regression analysis were tested before the data analysis. There were several violations against assumptions of linear regression in the data namely: normality of errors and homoscedasticity. Therefore, the results of the analysis should be interpreted with caution. As can be seen from Table 7, in addition to the first model only the third model which included variables of TPB that contributed significantly (22%) to the variance explained in intention to smoke for non-smokers. The overall model for the whole variables explained 23% of the variance in intention to smoke. Beta values of the last model showed that gender, attitudes toward smoking, subjective norms contributed significantly to the intention to smoke. Higher attitudes towards smoking were associated with higher intention to smoke. Adolescents who perceived higher subjective norms were more likely to had higher intention to smoke. Beta values also showed that the highest contribution to intention to smoke was coming from subjective norms.

**Table 7.**  
**Results of hierarchical regression analysis of intention to smoke for smoking for non-smoking adolescents**

	Model test		Adjusted $R^2$	Change test		Beta	P value
	F	P value		F	P value		
<i>Covariates</i>	3.60	< .01	.07	3.60	< .01		
Gender						-.20	< .05
Age						-.11	n.s
Socioeconomic status						-.05	n.s
Religion						-.11	n.s
<i>Social learning theory</i>	2.40	< .05	.06	.83	n.s		
Parents smoking behavior						-.11	n.s
Peer smoking behavior						.07	n.s
Sibling smoking behavior						.11	n.s
<i>Theory of planned behavior</i>	5.00	< .001	.22	10.00	< .001		n.s
Attitude toward smoking						-.23	< .01
Subjective norms						-.30	< .001
Perceived behavioral control						-.01	n.s
<i>Goal conflict &amp; facilitation</i>	4.30	< .001	.23	.83	n.s		n.s
Goal conflict						.05	n.s
Goal facilitation						-.07	n.s

*Note.* Linear regression analyzed values of intention to smoke after transformation. Negative Beta values = positive Beta values, positive Beta values = negative Beta values

### 3. 3. 3. Determinants of intention to smoke in smoking experienced adolescents

Assumptions for linear regression analysis were analyzed before the data run. However, assumption for homoscedasticity and normality of errors were violated, thus the results of the analysis should be interpreted with caution.

Table 8 shows the results for the hierarchical linear regression for intention to smoke. It was shown that only the first model and the third model that contributed significantly to the variance explained in intention to smoke for smoking experienced adolescents. The first model which included covariates contributed significantly (5%) to variance explained in intention to smoke. The third model which included variables of TPB that contributed significantly (29%) to the variance explained in intention to smoke for smoking experienced group. The overall model for the whole variables explained 28% of the variance in intention to smoke. Beta values of the last model showed that intention to smoke for smoking experienced group was significantly associated with

attitudes toward smoking. Higher attitudes towards smoking were associated with higher intention to smoke.

**Table 8.**  
**Results of hierarchical regression analysis of intention to smoke for smoking experienced adolescents**

	Model test		Adjusted $R^2$	Change test		Beta	P value
	F	P value		F	P value		
<i>Covariates</i>	2.62	< .05	.05	2.62	< .05		
Gender						.09	n.s
Age						.11	n.s
Socioeconomic status						.08	n.s
Religion						.05	n.s
<i>Social learning theory</i>	2.52	< .05	.08	2.27	n.s		
Parents smoking behavior						.07	n.s
Peer smoking behavior						-.05	n.s
Sibling smoking behavior						-.09	n.s
<i>Theory of planned behavior</i>	5.77	< .001	.29	11.66	< .001		n.s
Attitude toward smoking						.44	< .001
Subjective norms						.04	n.s
Perceived behavioral control						-.10	n.s
<i>Goal conflict &amp; facilitation</i>	4.75	< .001	.28	.16	n.s		n.s
Goal conflict						-.05	n.s
Goal facilitation						.07	n.s

### 3.4. Comparison study between Dutch and Indonesian adolescents

Two separate t-tests for Indonesian and Dutch data were conducted to analyze associations between covariates (i.e. gender) and intention to smoke. To analyze association between age and covariates, two separate Pearson correlation tests were conducted. There were several violations against the assumptions for parametric test. The two groups (i.e. Indonesian adolescents and Dutch adolescents) differed in variance. Thus the results should be interpreted with caution. As can be seen from Table 9, age and gender in Indonesian adolescent were significantly associated with intention to smoke. Older age was associated with higher intention to smoke. However there was no significant association between covariates (i.e. age and gender) and intention to smoke for Dutch adolescents.

**Table 9.**  
**Result of t-test of age and gender in intention to smoke for both Dutch and Indonesian adolescents**

	<i>M</i>	<i>SD</i>	<i>t value</i>	<i>r value</i>	<i>df</i>	<i>P value</i>
<i>Indonesian Adolescents (M = 301)</i>						
Age				.27		<i>P</i> < .01
Gender			4.40		294	<i>P</i> < .001
Boys	.27	.20				
Girls	.13	.34				
<i>Dutch Adolescents (M = 248)</i>						
Age				-.05		n.s
Gender			.832		241	n.s
Boys	3.99	.69				
Girls	3.92	.68				

To examine predictors of adolescents smoking behavior (i.e. smoking experienced and nonsmoking adolescents) for both countries, another logistic regressions analysis for Dutch adolescents was conducted in addition to the logistic regression for Indonesian adolescents smoking behavior which was mentioned above. For Dutch adolescents smoking behavior, in the first block, four covariates were entered: gender, age, nationality and type of school. In the second block parents smoking behavior, sibling smoking behavior and peer smoking behavior were entered; in the third block three predictors from TPB namely: attitudes towards smoking, subjective norms and perceived behavioral control were entered; in the fourth block, goal facilitation and goal conflict were entered.

As can be seen in Table 10, for Indonesian adolescents, gender, peer smoking behavior, attitudes toward smoking, and subjective norm were significant predictors of adolescents smoking behavior. Wald statistic value showed that peers smoking behavior was the highest contributor of adolescents smoking behavior. As for Dutch adolescents, the significant predictors of adolescents smoking behavior were attitudes toward smoking, and peer smoking behavior with attitudes toward smoking as the highest contributors of Dutch smoking behavior. It should be noted that a trend was found for variable perceived behavioral control.

**Table 10.**  
**Results of Logistic regression analysis of predictors of Indonesian and Dutch adolescents smoking behavior**

Variable	Wald Statistics	Exp (B)	P value
<i>Covariates</i>			
<i>Gender</i>			
Indonesian adolescents	5.71	.43	< .05
Dutch adolescents	1.31	1.50	n.s
<i>Age</i>			
Indonesian adolescents	.42	1.08	n.s
Dutch adolescents	.20	1.04	n.s
<i>Socioeconomic status</i> ◇	.20	1.14	n.s
<i>Religion</i> ◇	.92	1.20	n.s
<i>Nationality</i> *	.65	.37	n.s
<i>Type of school</i> *	.05	1.01	n.s
<i>Social learning theory</i>			
<i>Parents smoking behavior</i>			
Indonesian adolescents	.06	.97	n.s
Dutch adolescents	1.52	.64	n.s
<i>Peer smoking behavior</i>			
Indonesian adolescents	14.17	2.35	< .001
Dutch adolescents	5.33	1.78	< .05
<i>Sibling smoking behavior</i>			
Indonesian adolescents	.06	1.09	n.s
Dutch adolescents	.06	1.13	n.s
<i>Theory of planned behavior</i>			
<i>Attitude toward smoking</i>			
Indonesian adolescents	7.20	2.52	< .01
Dutch adolescents	7.80	2.10	< .01
<i>Intention to smoke</i>			
Indonesian adolescents	1.70	1.20	n.s
Dutch adolescents	.02	1.04	n.s
<i>Subjective norms</i>			
Indonesian adolescents	4.14	1.03	< .05
Dutch adolescents	2.11	1.03	n.s
<i>Perceived behavioral control</i>			
Indonesian adolescents	1.83	1.84	n.s
Dutch adolescents	3.00	.72	0.084
<i>Goal conflict &amp; facilitation</i>			
<i>Goal conflict</i>			
Indonesian adolescents	1.17	.96	n.s
Dutch adolescents	1.57	.92	n.s
<i>Goal facilitation</i>			
Indonesian adolescents	1.17	.85	n.s
Dutch adolescents	1.06	1.07	n.s

Note. \* = only for Dutch sample analysis ◇ = only for Indonesian sample analysis

## CHAPTER 4 DISCUSSION

### 4.1. Differences in determinants between smoking experienced and non-smoking adolescents

The present study was aimed at mapping the determinants of smoking behavior in Indonesian adolescents, since little is known for the predictors of smoking in developing countries. In addition to mapping the determinants of smoking behavior in Indonesian adolescents, the study also aimed to compare the role of smoking behavior predictors between Indonesian and Dutch adolescents.

To examine the role of the predictors of smoking behavior in Indonesian adolescents, the study was divided into two main goals. The first goal was to compare smoking experienced adolescents with non-smoking adolescents regarding the goal theory (goal facilitation and goal conflict), the social learning theory (parents smoking behavior, sibling smoking behavior and peers smoking behavior) and the theory of planned behavior (attitudes toward smoking, subjective norms, perceived behavioral control and intention to smoke). The second goal was to examine whether the goal theory would contribute substantially to the variance explained in smoking behavior (i.e. smoking experienced adolescents and non smoking adolescents) and intention to smoke of Indonesian adolescents over and above the variance explained by TPB and social learning theory. With regard to the first goal of the study, statistical analyses of the study yielded significant associations of smoking behavior (i.e. smoking experienced adolescents and non smoking adolescents) with attitudes towards smoking, intention to smoke, peer smoking behavior, goal facilitation, subjective norms and perceived behavioral control.

Smoking experienced adolescents reported higher attitudes towards smoking, higher subjective norms, higher intention to smoke, had more friends who smoked, higher goal facilitation and lower perceived behavioral control. An association of adolescents smoking behavior with attitudes towards smoking is consistent with research by Soldz and Cui (2002) who found that adolescents who smoked regularly and adolescents who were experimenting with smoking had more positive attitudes towards smoking than non-smoking adolescents.

With regard to intention to smoke, the result of the study yielded a similar result with a longitudinal study conducted by Stein, Newcomb and Bentler (1996) who found intention to smoke was positively correlated with smoking of 461 students. Students who had a higher intention to smoke were more likely to smoke. An association between intention and behavior can be explain by the theory of planned behavior which stated behavioral intention has a significant role in predicting health behavior.

With regard to subjective norm, it appears that smoking experienced adolescents were more likely to have environments which had more lenient social norms toward smoking than non smoking adolescents. The result of the study was seemed to replicate a meta analytic study of Conrad, Flay and Hill (1992) which indicated that family approval and friends approval, which have a similar meaning with subjective norm, were significant predictors of smoking initiation. It appears that Indonesian adolescents were

more likely to start experimenting with smoking or become a regular smoker if they had a perceived environment with relatively high tolerance toward smoking.

Smoking experienced adolescents reported lower perceived ability to control their smoking behavior than nonsmoking adolescents. This result was similar with a study conducted by Bursey and Craig (2000) who found that patients with low perceived behavioral control were more likely to start smoking again coronary artery bypass surgery. Apparently high PBC is needed to reduce the likelihood of potentially health damaging behaviors e.g. substances abuse, smoking.

Smoking experienced adolescents were more likely to have friends who smoked than nonsmoking adolescents. This result was consistent with research by Ennet and Bauman (1994) who found that nonsmokers who were in a smoking clique were more likely to initiate smoking than those who were not in a smoking clique. A clique was considered a smoking group if it contained one or more smokers. It seems that an adolescent who was in a group of friends who smoked may start smoking in order to be accepted by his/her friends. Another explanation for this association can be found in social learning theory in term of social selection. Adolescents who are experimenting tobacco may chose a friend or a group of friends who are also smoking. Apparently, there were two mechanisms for this phenomenon namely social influence and social selection. However, a longitudinal study conducted by Wills and Cleary (1999) indicated that adolescents smoking behavior was more likely to be governed by social influence instead of social selection.

With regard to goal facilitation, smoking experienced adolescents had higher goal facilitation than nonsmoking adolescents. By looking at the items in the goal theory, apparently smoking experienced adolescents perceived that becoming a smoker was facilitating their daily activities, or in other words to become a smokers was in line with their higher order goals. This finding was consistent with a study conducted by Gebhardt and Maes (1998) who found that people tend to be physically active when the activities did not hamper a number of important personal goals.

#### **4. 2. Determinants of smoking behavior**

The study was also aimed at examining whether goal theory would contribute substantially to the variance explained in smoking behavior (i.e. smoking experienced adolescents and non smoking adolescents) adolescents over and above the variance explained by TPB and social learning theory.

The result indicated that gender, peer smoking behavior, attitudes toward smoking, and subjective norm were significant predictors of smoking behavior with peer smoking behavior as the highest predictors. However, the goal theory (i.e. goal facilitation and goal conflict), parents smoking behavior, perceived behavioral control, intention to smoke were not significant predictors of smoking behavior. The results, however, was not consistent with results of a meta analytic study by Armitage and Conner (2001) which included 185 studies to examined TPB. The study indicated that perceived behavioral control and intention accounted for a significant amount of variance in all behaviors, including smoking behavior. Another study which examined predictors of adolescents smoking behavior also yielded similar results. The study concluded that perceived behavioral control, attitudes and subjective norm were explaining intention, whereas



perceived behavioral control was an important predictor of behavior (Godin, Valois, Lepage & Desharnais, 1992).

There were two explanations for this phenomenon. First, the studies mentioned above only assessed the predictive ability of TPB. In the present study, however, the aim of the study was to examine adolescents smoking behavior by using several theories (i.e. the social learning theory, the TPB and the goal theory), not using the TPB alone. Thus combination of those theories may yield different result from other studies which only use TPB as predictor. To check the assumption above, another logistic regression was conducted which only include covariates and elements of TPB as predictors. The result showed a similar result with studies conducted by Armitage and Conner (2001) and Godin, Valois, Lepage and Desharnais (1992) which showed that perceived behavioral control and intention were significant predictors of smoking behavior.

Second, all of the studies mentioned above were conducted in western countries. Different results might be found if those studies had been applied to other setting, for example eastern countries. Apparently, the relative influence of predictors in predicting a behavior might be sensitive to culture or respondents' way of thinking. From the result of the present study, it was shown that Indonesian adolescent smoking behavior was predominantly governed by social influence from environment (i.e. subjective norms and peer smoking behavior). It seems that Indonesian adolescents tended to conform to their surrounding which have a more lenient attitudes toward smoking. Type of culture can explain this condition. Indonesia, like the most of the eastern countries has a collective type of culture (Hofstede, 1980). What is meant by collective culture is people in that culture tend to define themselves as a collective, which are dependent to each other. They tend to seek harmony with the group that they are identified with. Thus, in the collective culture social norms is more important than personal attitudes in a person's behavior (Triandis, 1995).

Attitudes towards smoking was indicated as one of the significant predictors of smoking behavior. This finding is consistent with a longitudinal study conducted by Chassin, Presson, Pitts and Sherman (2002) who found that among 8,556 students, attitudes was a significant predictors of smoking behavior. Students who had high attitudes towards smoking were more likely to become smokers at the end of the study.

Parents smoking behavior was not indicated as one of the significant predictors of Indonesian adolescents smoking behavior. This result was supported by the results of a study which conducted by Chassin, Presson, Pitts and Sherman (2002). The study indicated that parental smoking was not associated with adolescents' smoking experimentation. A meta analytic study conducted by Conrad, Flay and Hill (1992) indicated that parental smoking was found as a significant predictor of smoking initiation in 69% of 27 prospective studies whereas peer smoking behavior was found as a significant predictor in 84 % of the studies. Apparently, peer influence was stronger than parental influences in adolescents smoking behavior, especially in initiation.

Goal facilitation and goal conflict were not indicated as significant predictors of Indonesian adolescents smoking behavior. This result might be related to social influence as significant predictors of smoking behavior. It was concluded that for Indonesian adolescents, social influence (i.e. subjective norms and peer smoking behavior) had a significant role in smoking behavior. It appears that for Indonesian adolescents, seeking

harmony with their surrounding and become a part of the group is more important than their own consideration whether becoming a smoker would facilitate or conflicting their goals.

#### 4.3. Determinants of intention to smoke

The second goal of the study was to examine whether the goal theory would contribute substantially to the variance explained in intention to smoke of Indonesian adolescents over and above the variance explained by TPB and social learning theory. For intention to smoke, two separate analyses for both non-smoking adolescents ( $N = 157$ ) and smoking experienced adolescent ( $N = 142$ ) were conducted to find out the significant predictors of intention to smoke from each group. The study was also aimed to examine roles of the covariates in intention to smoke.

Early inspection on the role of demographic variable on 301 adolescents yielded significant results for the variable gender and age. Boys reported a higher intention to smoke than girls. An explanation mentioned by Chatrou (1992) is that the influence of cultural and family tradition may be responsible for the gender differences in smoking for developing countries. For Indonesian people, smoking usually associated with male gender. The social norms among Indonesian people tend to view female smoking as an appropriate activity. This condition is accumulated with high conformity among Indonesian people to the social norms. Again, social norms seemed to play an important role in Indonesian adolescents smoking behavior.

A positive correlation was found for the variable of age and intention to smoke. The older the adolescents the higher their intention to smoke. This finding was consistent with results of a study conducted by Chassin, Presson, Pitts and Sherman (2000) who also found a positive correlation between age and intention to smoke.

Two separate hierarchical linear regression analyses for smoking experienced adolescents and nonsmoking adolescents yielded different results. Intention to smoke for nonsmoking adolescents was more likely to be directed by environmental influences (i.e. subjective norms). Nonsmoking adolescents tended to have a higher intention to smoke if they perceived lenient norms towards smoking from their environment. As for smoking experienced adolescents, their intention to smoke was more likely to be governed by their own attitudes. Apparently, nonsmoking adolescents were more likely to have high conformity to social norms than smoking experienced adolescents whereas smoking experienced adolescents seemed more independent and their personal attitudes are more important than the social norms.

#### 4.4. Cross cultural study of Indonesia and The Netherlands

The third goal of the study was aimed to compare the adolescents from Indonesia and the Netherlands in terms of variables of goal facilitation, goal conflict, TPB and social learning theory. The study also examined association between covariates and intention to smoke in both Indonesian and Dutch adolescents.

With regards to the association between covariates and intention to smoke, significant associations between covariates (i.e. age and gender) and intention to smoke were only found in Indonesian sample. Boys and older age were associated with higher

intention to smoke. With respect to gender, social norms seemed to play an important role for the differences between the two countries. For Indonesian adolescents, boys were more likely to have more lenient norms toward smoking whereas for Dutch adolescents, there was no difference in perceived social norm toward smoking for both genders.

Apparently, social norms among Indonesian adolescents tended to forbid female smoking while male smoking was considered more accepted. This situation did not happen in The Netherlands. Both genders experienced the same perceived social norms. This condition might be responsible for similar number of youth smokers in both genders. It was shown that 27% of the male adolescents smoked whereas 26% of female adolescents smoked (Dutch Foundation on Smoking and Health, 2000).

With respect to predictors of adolescents smoking behavior, two logistic regression analyses showed different result for each Indonesian and Dutch adolescents smoking behavior. For Indonesian adolescents, gender, peer smoking behavior, attitudes toward smoking, and subjective norm were significant predictors of adolescents smoking behavior. Peers smoking behavior was the highest contributor of Indonesian adolescents smoking behavior. As for Dutch adolescents, the significant predictors of adolescents smoking behavior were attitudes toward smoking, and peer smoking behavior with attitudes toward smoking as the highest contributors of Dutch smoking behavior. A trend was found for variable perceived behavioral control. Apparently Indonesian youth smoking behavior was predominantly governed by social influences (i.e. peer smoking behavior and subjective norms) while for Dutch adolescents, their smoking behavior was predicted by their own attitudes toward smoking. This phenomenon can be explained by the terms of culture. The Netherlands, just like most of the western countries is considered to have an individual culture. As the opposite of the collective culture, individual culture tends to view the self as personal which is independent from each other. In this kind of culture personal goals have a priority over group goal and personal attitudes is more important in a person's behavior than social norms. Thus, Dutch adolescents seemed more independent in their decision to smoke or not. They were more likely to decide to smoke if they have high attitudes towards smoking regardless their environmental norms. As for Indonesian adolescents, who were in collective culture, social norms were more valued than personal attitudes. Indonesian adolescents tended to seek harmony with their surrounding norms.

#### **4. 5. Limitations of the study**

The present study had several limitations. The first limitation was homogenous of sample in this study. The study was using two Catholic schools and one public school with relatively high discipline and located in a capital city of Indonesia (i.e. Jakarta). As mentioned by several studies, students from schools which have high level of discipline and faculty involvement are less likely to start experimentation with cigarettes. Apparently, those schools may act as a buffer against social influences (Rountree & Clayton, 1999; Novak & Calyton, 2001). The present study's sample may limit the ability of the study to capture the real condition of Indonesian adolescents. Thus the generalizability of these findings to other Indonesian adolescents who are not in those schools cannot be assumed. A more heterogenous sample from a variety of school types from rural as well as urban areas can increase the generalizability of a study.

The second limitation was the relatively low reliability of several scales namely: subjective norm and intention to smoke. Intention to smoke only consisted of two items and subjective norm was only consisted of three sets of combined items (i.e. perceived norms combined with motivation to comply). The limited number of items may cause the low reliability of the scales, which may produce biases in analyses. One of the solutions for this situation can be done by adding any items that are homogenous which can increase the overall reliability of a scale (Rosnow and Rosenthal, 2002).

The present study was a cross-sectional study, thus a causal relationship of predictors of smoking and smoking behavior cannot be drawn from this study. This study only reveals associations between predictors of smoking behavior with adolescents smoking behavior. To determine to what extent these predictors of smoking behavior causes adolescents smoking behavior; prospective and experimental studies will be needed.

#### **4. 6. General conclusions and implication of the study**

From the discussion above, it could be concluded that social norms had an important role in Indonesian adolescents smoking behavior. Adolescents smoking behavior were more likely to be governed by peer influence and lenient norms toward smoking. These influences were especially sensitive to gender differences. Female smoking was viewed as an unfavorable activity and male smoking tended to be more accepted in Indonesian adolescents.

With regard to cross cultural differences, it was concluded that conformity to social influences might be responsible for adolescents smoking behavior in Indonesian adolescents while Dutch adolescents tended to be more independent from social norms and their behavior were more likely to be directed by their own personal attitudes.

Even though there were several limitations from the study, the study has succeeded in shed more lights to Indonesian adolescents smoking behavior. Most of the studies conducted before were only survey studies which only mentioned statistical number of Indonesian adolescents who smoked at that time. Those studies did not try to investigate predictors of Indonesian youth smoking. Above all, this study is the first study which compared adolescents smoking behavior between Indonesian adolescent and the Dutch adolescents.

In the development of health education interventions aimed at decreasing cigarette consumption, the conformity towards social influences needs to be addressed. The present study suggests several recommendations for adolescents smoking behavior intervention. First, peer smoking behavior and lenient norms toward smoking should be targeted as important determinants of smoking behavior in adolescents. Second, interventions can be used to counter the likelihood of conformity to social influence in smoking. Open discussions with trained counselors as moderator can guide the adolescents so that they can be more sensitive to their own attitudes. Knowing exactly about their own attitudes is not enough to counter peer influence. Self-efficacy training is also needed since it is difficult not to conform to surrounding norms for Indonesian adolescents. Through role-playing exercises, the adolescents can practice behavioral responses that will guide their behavioral responses to encounters peer pressures to

smoke in their daily life. Setting of intervention is also important. Adolescents spend most of their time in school. Thus, intervention during school hours is more practical.