YOUNG SINGAPOREAN SMOKERS:
FACTORS INFLUENCING SMOKING BEHAVIOUR

CHEONG LEI YIN, KAREN
(M.Soc.Sc. (Applied Sociology), NUS)

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ACKNOWLEDGEMENTS

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Karen Cheong
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Annex 3: Structural equation model (with standardised estimates) of risk and protective factors influencing smoking among Singaporean adolescent girls (Full model)
Annex 4: Profile of Participants from Qualitative Study
This thesis researched on the social factors influencing young Singaporeans’ decision to smoking. Smoking among young people is a re-emerging epidemic in Singapore despite a social context of strong anti-smoking norms. The prevalence of smoking has increased by about 5 percent among Singaporeans in the past three years (Ministry of Health 2009) amidst a strong social context of non-smoking. Why do young Singaporeans smoke? What puts young Singaporeans “at risk for risk”? This thesis examined the associations between social factors and smoking behaviour.

This research comprised of two research methodologies. A quantitative analysis on structural equation modelling was conducted to examine the associations and interplay of social structural factors, social environmental factors (for example, family, school and peer bonding), social influence and social cognitions on smoking behaviour of adolescents. Further to this, a qualitative study was conducted to explore the meaning of smoking from young smokers’ perspectives and to uncover the social processes leading to smoking.

The pathways from various social factors to smoking behaviour are mapped out in the structural equation models. Direct and indirect social factors influencing adolescent smoking behaviour are shown in the structural equation models. Social environmental factors are distal factors influencing behaviour but play an important role in shaping adolescents’ cognitions. Adolescents who are disengaged from prosocial establishments
such as family and schools are at risk of taking up smoking. Adolescents with family members and friends who smoke tend to have pro-smoking cognitions and are more likely to pick up smoking. The likelihood of smoking thus increases when adolescents are detached from prosocial establishments and have a wide social network of smoking friends. These adolescents deviate from prosocial norms and are drawn to alternative paths which provide them with a better sense of belonging.

The qualitative study provided interesting insights on young smokers’ perceived meaning of smoking. Smoking is a socially learnt behaviour. From the perspectives of young smokers, cigarette smoking is not an at risk health behaviour, it is a key to the social world of friends from similar background and similar interests. Young smokers are well-integrated in their network of smoking friends. This social network of smokers provides them with social support and smoking bonds them tightly to this network. In justifying their decision to smoke, young smokers practise lay epidemiology to make sense of their observations of smokers in their everyday lives and their personal experiences. They rationalise away the health risks of smoking with their own set of risk reduction method which is based on social sources of information. In addition, young smokers also downplay the risks of smoking by cherry-picking prescriptions of healthy lifestyle.

Based on these research findings, a social ecological approach which encompasses interventions at multi-levels (intrapersonal level, interpersonal level,
organisational/environmental level, community level and policy level) to smoking prevention is proposed.
CHAPTER 1

THE SOCIAL CONTEXT OF SMOKING IN SINGAPORE

1.1 INTRODUCTION

This thesis researched on the factors which put young Singaporeans at risk of smoking. The problem of adolescent smoking warrants our attention because the proportion of Singaporeans aged between 18 years and 29 years who smoke has increased by about 5 percent from 12.3 percent in 2004 to 17.2 percent in 2007 (Ministry of Health 2009). These young smokers experimented with smoking during their adolescence at the age of 12 years and established the habit of daily smoking by the age of 17 years. They take up smoking despite the strong evidence of health risks from cigarette smoking, and the normative culture of non-smoking in Singapore. Social norms and rules exert external constraints on individuals and guide the way people behave (Durkheim 1951), yet young Singaporeans are still taking up smoking. Why do young Singaporean adolescents deviate from the larger normative culture of non-smoking? What puts them at risk of smoking?

This thesis seeks to contribute to the understanding of the epidemiology of smoking by using a sociological approach to examine the root cause of smoking in Singapore. Using a multidisciplinary approach from sociology and public health, this research aims to examine how the social environment influences smoking behaviour.

Apart from providing details on the research aim, this chapter will show the significance of this research by providing readers with insights on the social context of
smoking in Singapore. The smoking epidemic in Singapore will be highlighted to provide readers with a clearer picture of the social patterning of smoking. Additionally, the smoking control programme which has been in place in Singapore for more than two decades will provide readers with insights on the normative culture of non-smoking in Singapore.

1.2 AIM OF RESEARCH

This research seeks to examine the underlying social mechanisms which influence adolescent smoking behaviour. The first part of this research examines the associations between social structures, social environment, social network, social cognitions and smoking. Using data from a cross-sectional survey among Singaporean adolescents in secondary schools, a structural equation model linking the various dimensions of social environment and adolescent smoking is derived. Further to this, a second study will be conducted among young Singaporeans to explore in-depth meanings on the motivations for smoking despite going against the social norm of non-smoking. A qualitative method, which allows for exploration of the meaning of smoking from the participants’ perspectives and viewpoints, is used to derive first hand accounts from young smokers on their smoking experiences and processes. While the quantitative study seeks to provide an understanding of the effects of broad social factors on adolescents’ at risk behaviour, the qualitative study plays a complementary role by providing insights on social relationships and situations (Cockerham 2007).

1.3 THE SMOKING EPIDEMIC IN SINGAPORE
1.3.1 Health outcome of smoking: smoking-related mortality and lung cancer incidence

Smoking is the greatest cause of avoidable mortality and morbidity (U.S. Department of Health and Human Services 2004). It has both direct and indirect adverse effects on diseases and diminishes the health of smokers. It is a risk factor of many diseases and is the second leading risk factor contributing to all-cause global mortality (Ezzati et al. 2006). In addition, smoking is also the leading and fourth risk factor contributing to the burden of diseases in high-income countries and low income countries respectively (Ezzati et al. 2006). Smoking causes harm to almost every organ in the body and is associated with a substantial number of diseases such as cardiovascular diseases, respiratory diseases, cancers, reproductive effects and other effects (U.S. Department of Health and Human Services 2004). The Surgeon General’s Report in 2004 (U.S. Department of Health and Human Services 2004) further expanded the list of diseases associated with smoking to include diseases such as cancer of the stomach, uterus, cervix, pancreas and kidney; acute myeloid leukaemia, pneumonia; cataract and others. Apart from these known consequences of diseases which usually occur during adulthood, the short-term adverse health consequences of smoking have also been demonstrated among children (Lando et al. 2010). A school-based survey conducted among 137 countries revealed that close to half of the children who have never smoked are exposed to second hand smoke (Warren et al. 2000).

In terms of the health outcome of smoking in Singapore, statistics showed an upward trend in the total number of deaths caused by cancers of trachea, bronchus and
lung since 1969 (Figure 1). The total number of deaths as a result of trachea, bronchus and lung cancer is higher among males than females.

Figure 1: Total deaths by malignant neoplasm of trachea, bronchus and lung, 1969 to 2002

The rate of lung cancer incidence has also been higher among males than females (Figures 2 and 3) since 1970. A comparison by ethnicity shows that while lung cancer incidence is decreasing among Chinese, there appears to be an upward trend in lung cancer incidence among Malays and Indians. A similar pattern is observed among males and females.
Figure 2: Age-standardised incidence of lung cancer in males, by ethnicity, 1970 to 2004

Source: The Singapore Cancer Registry, National Disease Registries Office, Health Promotion Board, Singapore

Figure 3: Age-standardised incidence of lung cancer in females, by ethnicity, 1970 to 2004

Source: The Singapore Cancer Registry, National Disease Registries Office, Health Promotion Board, Singapore
1.3.2 Prevalence of smoking

1.3.2.1 Among adult population

The prevalence rate of smoking among Singaporean adults aged between 18 to 64 years has decreased significantly over the years (Figure 4) against the rising trend in mortality of trachea, bronchus and lung cancer. This is in line with the smoking epidemic model (Lopez, Collishaw and Piha 1994) which shows a time lag of between 20 to 30 years between smoking prevalence and mortality attributable to smoking. While the downward trend in smoking prevalence in Singapore suggests that the number of deaths attributable to smoking is likely to decrease in future, the higher and rising trend in smoking prevalence among sub-populations is likely to result in higher rates of lung cancer incidence and mortality attributable to smoking among these sub-populations.

Figure 4: Smoking prevalence (crude rates) among Singaporean adult population, 1975 to 2007

Source: Lee et al. 1977; 1979; Ministry of Health 1997; Emmanuel et al. 1988a; 1988b; Emanuel 1997 ; Ministry of Health 1993; 1997; 1999; 2002; 2005; 2009
Smoking prevalence is highest among Malays, followed by Chinese and Indians in Singapore (Figure 5). A comparison of smoking prevalence by gender shows that the prevalence of smoking is higher among males than females across all age groups and ethnic groups (Tables 1 and 2). A recent National Health Surveillance Survey found that among Singaporeans aged 18 to 29 years, smoking prevalence has increased from 12.3 percent in 2004 to 17.2 percent in 2007 (Ministry of Health 2009). One quarter (25.4 percent) of the males in this age group smokes daily while close to one in ten (9.1 percent) of the females in the same age group are daily smokers (Ministry of Health 2009). It is also noteworthy that the rate of smoking prevalence has been increasing among young females since 1998 (Table 2).

Figure 5: Prevalence rate (crude rates) of smoking by ethnicity, 1977-2007

Source:
Lee et al. 1979; Emmanuel et al. 1988a; 1988b; Emanuel 1997; Ministry of Health 1993; 1997; 1999; 2002; 2005; 2009
Table 1: Smoking prevalence* by gender and ethnicity, percent (%)

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*Daily smoking

Source:
Ministry of Health 1999; 2005; 2009

Table 2: Smoking prevalence* by gender and age groups, percent (%)

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*Daily smoking

Source:
Ministry of Health 1999; 2005; 2009

In a nutshell, among the adult population, smoking prevalence is higher among
Malays and rising among smokers below the age of 30 years. The gradual increase in
smoking prevalence among females below age 30 years since 1998, requires attention.
An interesting pattern between socio-economic status and smoking prevalence is
observed. As compared to their Chinese and Indian counterparts, Malays have the highest
smoking prevalence, the lowest educational attainment, lowest median monthly income
and are more likely to work as blue collar workers (Table 3). This implies that lower life
Table 3: Educational attainment, occupational status and median monthly household income by ethnicity in 2000 and 2005

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<td>Indian</td>
<td>Others</td>
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<tr>
<td>Non Student Population by Highest Qualification Attained (Aged ≥15 years) (%)</td>
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<td></td>
<td></td>
<td></td>
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<tr>
<td>Below secondary</td>
<td>42.1</td>
<td>38.7</td>
<td>50.1</td>
<td>44.3</td>
<td>38.4</td>
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<td>23.7</td>
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<tr>
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<td>20.0</td>
<td>32.1</td>
<td>30.8</td>
<td>26.4</td>
<td>22.1</td>
<td>25.2</td>
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<tr>
<td>Upper Secondary</td>
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<td>12.9</td>
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<td>3.8</td>
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<tr>
<td>University</td>
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<td>17.7</td>
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<td>3.4</td>
<td>16.5</td>
<td>25.1</td>
<td>27.5</td>
<td>38.9</td>
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</tr>
<tr>
<td>Workforce by Occupation* (%)</td>
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<td></td>
<td></td>
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<td></td>
<td></td>
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<td></td>
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<tr>
<td>Professional, Technical &amp; Managerial</td>
<td>46.2</td>
<td>47.3</td>
<td>23.4</td>
<td>21.2</td>
<td>43.3</td>
<td>46.8</td>
<td>63.5</td>
<td>69.2</td>
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<tr>
<td>Clerical, Sales &amp; Services</td>
<td>25.2</td>
<td>27.4</td>
<td>36.2</td>
<td>38.9</td>
<td>29.2</td>
<td>28.7</td>
<td>24.7</td>
<td>20.9</td>
<td></td>
</tr>
<tr>
<td>Production workers, Cleaners &amp; Labourers</td>
<td>24.8</td>
<td>21.8</td>
<td>38.2</td>
<td>36.9</td>
<td>23.3</td>
<td>20.5</td>
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<tr>
<td>Others</td>
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<td>2.3</td>
<td>3.0</td>
<td>4.3</td>
<td>4.0</td>
<td>2.2</td>
<td>1.8</td>
<td></td>
</tr>
<tr>
<td>Median Monthly Income from Work ($)</td>
<td>2340</td>
<td>2500</td>
<td>1790</td>
<td>1800</td>
<td>2170</td>
<td>2480</td>
<td>3020</td>
<td>3250</td>
<td></td>
</tr>
</tbody>
</table>

* Among those in the workforce
Source: Ministry of Trade and Industry 2005
chances\textsuperscript{1} as a result of lower socioeconomic status are associated with at risk health behaviour such as smoking. However, as suggested by Link and Phelan (1995), being in a particular social condition does not necessarily put individuals at risk although their life circumstances shape their exposure to risk factors. Hence, it is necessary to examine what puts “people at risk for risks”.

Comparatively, a different pattern is observed among the young females in Singapore. Among Singaporean females, both educational level (Ministry of Trade and Industry 2000a; 2005a) and smoking prevalence is highest among those aged 30 years and below (Ministry of Health 2005). Better life chances as a result of higher educational level seem to be associated with at risk health behaviour among this subpopulation of Singaporeans. This suggests that socio-economic status is insufficient to explain the underlying reasons for the rising smoking prevalence among Singaporean young females.

\textit{1.3.2.2 Among adolescents}

A landmark study among Singaporean adolescents in 1987 (Emmanuel, Ho and Chen 1990) found that 2 percent of school-going population smoke at least one cigarette a week. Smoking prevalence increases with age and is more prevalent among boys, Malay students and the less academically inclined.

In 2000, 9.1 percent of the adolescents aged 13 to 15 years smoke at least one day of the 30 days preceding the survey (The Global Youth Tobacco Survey Collaborating Group 2002). Smoking prevalence is higher among boys than girls. One

\textsuperscript{1} The probability of acquiring a particular lifestyle; that is, a person must have the financial resources, status, rights and social relationships that support the chosen lifestyle (Cockerham et al, 1997).
in ten percent of the boys and 7.5 percent of the girls smoke at least one day in the last 30 days (Global Youth Tobacco Survey Collaborating Group 2003). The most recent survey among secondary school-goers from Secondary 1 to 4 shows that the proportion of youths who smoke at least one day in the last 30 days has decreased from 9 percent in 2006 to 6 percent in 2009 (Health Promotion Board, 2010).

A cross-country comparison of prevalence reveals that while the wide gender difference in smoking prevalence among adult Singaporean population (Table 4) mirrors that observed in Asian countries, the gender-specific prevalence rate of smoking among adolescents (Table 5) seems to reflect that observed in Western countries where there is smaller difference in smoking prevalence between males and females.
Table 4: Cross country comparisons of smoking prevalence rate among adult population

<table>
<thead>
<tr>
<th>Country</th>
<th>Year</th>
<th>Male (%)</th>
<th>Female (%)</th>
<th>All (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Asian countries</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>China</td>
<td>1998</td>
<td>53.4</td>
<td>4.0</td>
<td>28.9</td>
</tr>
<tr>
<td>Japan</td>
<td>2003</td>
<td>48.3</td>
<td>13.6</td>
<td>30.3</td>
</tr>
<tr>
<td>Republic of Korea</td>
<td>1996</td>
<td>64.8</td>
<td>5.5</td>
<td>-</td>
</tr>
<tr>
<td>Singapore</td>
<td>2004</td>
<td>24.2</td>
<td>3.5</td>
<td>12.6</td>
</tr>
<tr>
<td>Hong Kong</td>
<td>2003</td>
<td>26.1</td>
<td>3.6</td>
<td>14.4</td>
</tr>
<tr>
<td>Thailand</td>
<td>2001</td>
<td>39.3</td>
<td>2.2</td>
<td>20.6</td>
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<tr>
<td>Malaysia</td>
<td>1996</td>
<td>49.2</td>
<td>3.5</td>
<td>24.8</td>
</tr>
<tr>
<td>Indonesia</td>
<td>2001</td>
<td>69.0</td>
<td>3.0</td>
<td>33.8</td>
</tr>
<tr>
<td>Cambodia</td>
<td>1999</td>
<td>66.7</td>
<td>10.0</td>
<td>35.0</td>
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<tr>
<td>India</td>
<td>1999</td>
<td>29.4</td>
<td>2.5</td>
<td>-</td>
</tr>
<tr>
<td>Sri Lanka</td>
<td>2001</td>
<td>25.7</td>
<td>1.7</td>
<td>-</td>
</tr>
<tr>
<td>Iran</td>
<td>2000</td>
<td>22.2</td>
<td>2.1</td>
<td>10.6</td>
</tr>
<tr>
<td>Kuwait</td>
<td>1996</td>
<td>29.6</td>
<td>1.5</td>
<td>-</td>
</tr>
<tr>
<td><strong>Other countries</strong></td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Germany</td>
<td>2000</td>
<td>38.9</td>
<td>30.6</td>
<td>34.5</td>
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<tr>
<td>United Kingdom</td>
<td>2003</td>
<td>25.0</td>
<td>24.0</td>
<td>24.5</td>
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<tr>
<td>New Zealand</td>
<td>2001</td>
<td>25.1</td>
<td>24.8</td>
<td>24.9</td>
</tr>
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<td>Finland</td>
<td>2000</td>
<td>27.0</td>
<td>20.0</td>
<td>23.0</td>
</tr>
<tr>
<td>United States of America</td>
<td>2002</td>
<td>24.8</td>
<td>20.1</td>
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<tr>
<td>Canada</td>
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<tr>
<td>Australia</td>
<td>2001</td>
<td>21.1</td>
<td>18.0</td>
<td>19.5</td>
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<td>Sweden</td>
<td>2001</td>
<td>17.4</td>
<td>20.4</td>
<td>16.7</td>
</tr>
</tbody>
</table>

Source: Shafey, Dolwick and Guindon 2003
Table 5: Cross country comparisons of smoking prevalence rate among adolescents

<table>
<thead>
<tr>
<th>Country</th>
<th>Year</th>
<th>Male (%)</th>
<th>Female (%)</th>
<th>All (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Asian countries</strong></td>
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<td></td>
<td></td>
</tr>
<tr>
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<td>11.1</td>
<td>6.4</td>
<td>8.6</td>
</tr>
<tr>
<td>Japan</td>
<td>1999</td>
<td>25.9</td>
<td>9.2</td>
<td>-</td>
</tr>
<tr>
<td>Korea</td>
<td>1998-1999</td>
<td>29</td>
<td>13</td>
<td>-</td>
</tr>
<tr>
<td>Singapore</td>
<td>2000</td>
<td>13.4</td>
<td>8.8</td>
<td>9.1</td>
</tr>
<tr>
<td>Hong Kong</td>
<td>1999</td>
<td>17</td>
<td>13</td>
<td>-</td>
</tr>
<tr>
<td>Thailand</td>
<td>2001</td>
<td>-</td>
<td>-</td>
<td>6.3</td>
</tr>
<tr>
<td>Malaysia</td>
<td>1996</td>
<td>25.1</td>
<td>0.6</td>
<td>-</td>
</tr>
<tr>
<td>Indonesia</td>
<td>2000</td>
<td>36.7</td>
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<td>22.0</td>
</tr>
<tr>
<td>Cambodia</td>
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<td>8.1</td>
<td>1.1</td>
<td>4.5</td>
</tr>
<tr>
<td>India</td>
<td>2000</td>
<td>8.0</td>
<td>5.3</td>
<td>4.8</td>
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<td>Sri Lanka</td>
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<td>9.9</td>
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<tr>
<td>Iran</td>
<td>1997-1998</td>
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<tr>
<td>Kuwait</td>
<td>2001</td>
<td>31.0</td>
<td>15.5</td>
<td>24.4</td>
</tr>
<tr>
<td><strong>Other countries</strong></td>
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<td></td>
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<td>Canada</td>
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<td>Australia</td>
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<tr>
<td>Sweden</td>
<td>2001</td>
<td>26.0</td>
<td>25.0</td>
<td>25.0</td>
</tr>
</tbody>
</table>

**Definition**
- China: Currently used any tobacco product
- Japan: Smoked one or more cigarettes in the past 30 days among students aged 15-18 years
- Korea: Regular smokers in 10-12 grade students
- Singapore: Current smokers among secondary 1-4
- Hong Kong: Current smoking among youths aged 15 years
- Malaysia: Current smoking among 16 year students
- Indonesia: Current users of tobacco product among students grade 1-3
- Cambodia: Students aged 15-19 year olds
- India: Current users of any tobacco products among standard 8-10 students in Tamil Nadu
- Sri Lanka: Current users of any tobacco products among standard 8-10 students
- Iran: Current smoking based on serum cotinine levels aged 14-18 years
- Kuwait: Current users of any tobacco products
- Germany: Regular and occasional smoking among youths aged 14-15 years
- UK: Lifetime use of cigarettes, 40 times or more among youths aged 15-16 years
- New Zealand: Daily or at least weekly smoking among youths aged 14-15 years
- Finland: Lifetime use of cigarettes, 40 times of more among youths aged 15-16 years
- USA: Current users of tobacco products among students in grade 6-12.
- Canada: Current smokers among youths aged 15-17 years
- Australia: Daily smokers among youths aged 14-19 years
- Sweden: Lifetime use of cigarettes, 40 times or more among youths aged 15-16 year

**Source:**
Shafey, Dolwick and Guindon 2003
A similar pattern is observed for alcohol drinking, an at risk health behaviour which is often associated with smoking (U.S. Department of Health and Human Services, 1994). Gender difference in alcohol consumption is smaller among adolescents than adults (Waldron 1997; Room and Selin 2005). Some studies found that gender difference in alcohol drinking among adult population may be due to power\textsuperscript{2}, risks\textsuperscript{3} and social responsibilities\textsuperscript{4} (Wilsnack, Wilsnack and Obot 2005). Global comparisons of alcohol drinking among young people suggest that a culture of binge drinking may be spreading from the developed to the developing countries (Jernigan 2001). As noted by Turner (2004: 200) “as social status of women begins to approximate those of men (especially in employment, education and welfare), the social behaviour of men and women will converge. Hence, their health characteristics will show similar patterns of development.” The association between gender-specific difference in alcohol drinking and social status of women may be similar to the reasons for the rising trend in smoking prevalence among Singaporean young females.

In addition, research has shown that there is a dose-response relation between exposure to cigarette promotions and uptake of smoking among adolescents (Sargent, Dalton and Beach 2000). The tobacco industry attempts to create a tobacco culture among young Asians through music entertainment (including nightclubs, discos and movies), adventure, sports (including motor sports, soccer and tennis) and emphasises glamour (beauty and fashion) and independence with smoking (Knight and Chapman

\textsuperscript{2} Alcohol consumption symbolises and enhances men’s greater power relative to women, thus prevalence of alcohol drinking is higher among males and females (McClelland et al. 1972).

\textsuperscript{3} Men drink more than women because men are generally more willing or motivated to take risks than women (Weber et al. 2002).

\textsuperscript{4} Men and women have different social responsibilities. Men drink heavily as it helps them to ignore responsibilities and role obligations while women are bounded by their gender role responsibilities from drinking (Ahlstrom et al. 2001; Armeli et al. 2000).
Tobacco products are associated with the lifestyle of youths through the industry’s emphasis on smoking as a sign of independence, self-confidence, freedom and comfort (Anderson and Burns 2005; Hafez and Ling 2005). Specific marketing efforts have also been made by the tobacco industry to reach out to young female smokers in Asia (Anderson, Glantz and Ling 2005; Amos and Haglund 2000; Bansai, John and Ling 2005; Knight and Chapman 2004; Toll and Ling 2005). In addition, although tobacco advertisements and promotions are prohibited in Singapore (Attorney-General’s Chamber Chapter 309), British American Tobacco and Philip Morris continue to reach out to Singaporeans by promoting cigarettes to Singaporeans via Malaysian television channels - RTM 1 and 2 which are received by most households in Singapore (Assunta and Chapman 2004). In their effort to reach out to more young and health conscious Singaporeans, the industry has also attempted to develop prototype cigarettes using aroma and sweet tipping papers.

With ease of access to new media such as internet, cigarette advertisements and promotion are likely to reach out to young Singaporeans via the cyberspace. Additionally, the increasing affluence of the population and affordability of air travel leads to higher chances of travelling out of the country, and these further increase Singaporeans’ exposure to cigarette advertisements and promotions in other countries.

The epidemiology of smoking, reasons for gender-specific trends in alcohol drinking, tobacco industries’ marketing strategies, a more mobile population and advancement of communication tools therefore suggest that the difference in smoking
prevalence between boys and girls in Singapore is likely to be smaller and eventually converge in the absence of effective interventions on smoking control.

1.4 SMOKING CONTROL PROGRAMME IN SINGAPORE

The low smoking prevalence in Singapore suggests a strong social norm of non-smoking. This section provides a brief overview of some of the policies and programmes put in place to create and sustain a non-smoking environment in Singapore.

Singapore’s smoking control policies in the form of legislative measures started in the early 1970s. In 1986, a comprehensive National Smoking Control Programme was launched. This is a long-term programme which seeks to reduce smoking prevalence in Singapore through a range of strategies such as public education, inter-sectoral collaboration, community mobilisation, setting up of non-smoking areas, tobacco taxation, legislation and smoking cessation services (Tan et al. 2000). In 2004, Singapore signed the Framework Convention on Tobacco Control (FCTC), an international treaty negotiated under the auspices of the World Health Organisation. The FCTC calls for joint efforts to combat smoking globally and allows for signatories to share best practices internationally. Ratifying the FCTC further demonstrates Singapore’s commitment towards smoking control.

In an effort to discourage non-smokers from picking up smoking and to encourage smokers to quit smoking, tobacco taxes in Singapore are reviewed and increased regularly since 1987 (HPB 2009a). The two main legislative measures in
Singapore are The Smoking (Control of Advertisements and Sale of Tobacco) Act (Attorney-General’s Chamber Chapter 309) and the Prohibition of Smoking in Certain Places Act (Attorney-General’s Chamber Chapter 310). Revisions have been made regularly to these legislations to ensure its effectiveness in combating smoking in Singapore (Tan et al. 2000). The Smoking Control Act includes prohibition of tobacco advertisements and promotion; mandatory rotation of graphic health warnings on tobacco products; limiting tar and nicotine levels of cigarettes sold locally; prohibiting the use of tobacco products by persons below the age of 18 years of age; and prohibiting the sale of tobacco to these underage youths. The Prohibition of Smoking in Certain Places Act prohibits smoking in public places. This Act has been extended to include all public transport, air-conditioned indoor workplaces and restaurants, non-air-conditioned indoor places, hospitals and educational facilities, pubs and bars and some outdoor places.

Public education is also conducted with the purpose of disseminating information to both smokers and non-smokers across all ages. As shown in Table 6, the mass media campaigns in the past two decades since 1986, were targeted at various groups of the Singapore population. Various themes ranging from encouraging loved ones to motivate smokers to quit smoking, to scare approach to drive home the message of adverse health effects of smoking were used in the past 2 decades of public education. With a proportion of at least seven in ten of the target population being aware of the campaign messages (Health Promotion Board 2001; 2002; 2007/2008), the mass media campaigns have reached out to almost all of the entire target population over the years. These mass media campaigns were usually supported by a series of school, workplace and community initiatives.
<table>
<thead>
<tr>
<th>Year</th>
<th>Campaign slogan/message</th>
<th>Target group</th>
<th>Campaign objectives/ focus</th>
</tr>
</thead>
</table>
| 1986 | "Towards a nation of non-smokers" | General population | Theme: "Towards a nation of non-smokers" represented a long term goal to be attained through prevention of smoking initiation in the young, encouragement of smoking cessation and the provision of a social climate not conducive for smoking. There were 4 phases in this campaign:  
Phase 1 of campaign: Motivation phase  
• To increase awareness on harmful effects of smoking  
Phase 2 of campaign: Helping phase  
• To encourage non-smokers to help their smoking friends to give up smoking  
Phase 3 of campaign: Smoke-free phase  
• To encourage smoking cessation among smokers  
Phase 4 of campaign: Consolidation phase  
• Follow-up activities |
| 1987 | Follow-up activities to 1986 campaign | | |
| 1988 | Campaign message not found in records | | • To encourage the public to ask for non-smoking sections when eating out; and  
• To highlight the less known yet serious consequences of smoking |
<p>| 1989 | No mass media campaign | Doctors/ house officers | A seminar was conducted among house officers with the objective of getting doctors to encourage their patients to quit smoking |</p>
<table>
<thead>
<tr>
<th>Year</th>
<th>Campaign slogan/message</th>
<th>Target group</th>
<th>Campaign objectives/ focus</th>
</tr>
</thead>
<tbody>
<tr>
<td>1990</td>
<td>&quot;Feel good, look good, don't smoke&quot;</td>
<td>Youths</td>
<td>To discourage smoking by portraying non-smoking as glamorous, trendy and healthy</td>
</tr>
<tr>
<td>1991</td>
<td>&quot;Get smart- Don't smoke&quot;</td>
<td></td>
<td>To discourage smoking</td>
</tr>
<tr>
<td>1992</td>
<td>&quot;Smoking puts us all at risk&quot;</td>
<td>General population</td>
<td>To increase awareness on harmful effects of passive smoking</td>
</tr>
<tr>
<td>1993</td>
<td>&quot;Choose life. Not smoking&quot;</td>
<td>Youths</td>
<td>To prevent smoking initiation and encourage smokers to quit smoking</td>
</tr>
<tr>
<td>1994</td>
<td><em>Message not found in records</em></td>
<td>Smokers</td>
<td>To increase awareness on the consequences of smoking and encourage smokers to stop smoking</td>
</tr>
<tr>
<td>1995</td>
<td>&quot;Cigarettes are addictive. Before you know it, you are hooked.&quot;</td>
<td>Youths</td>
<td>To increase awareness on nicotine addiction and encourage young people not to experiment with cigarette smoking.</td>
</tr>
<tr>
<td>1996</td>
<td>&quot;I choose living, not smoking.&quot;</td>
<td></td>
<td>To prevent smoking initiation among youths by using role models to promote a smoke-free lifestyle</td>
</tr>
<tr>
<td>1997</td>
<td>&quot;When you care, they'll quit smoking&quot;</td>
<td>Non-smokers</td>
<td>To encourage non-smokers (family members and friends) to help their loved ones to quit smoking</td>
</tr>
<tr>
<td>1998</td>
<td>&quot;Show you care, help them stop smoking.&quot;</td>
<td></td>
<td>To encourage non-smokers (family members and friends) to help their loved ones to quit smoking</td>
</tr>
<tr>
<td>Year</td>
<td>Campaign slogan/message</td>
<td>Target group</td>
<td>Campaign objectives/ focus</td>
</tr>
<tr>
<td>--------</td>
<td>----------------------------------------------------------------------------------------</td>
<td>-----------------------------------</td>
<td>------------------------------------------------------------------------------------------</td>
</tr>
</tbody>
</table>
| 1999-  | • "Your next cigarette could cause lung cancer"  
| 2000   | • "Get this in your head. Smoking could lead to a stroke"  
|        | • "Something close to every smokers' heart: Blocked blood vessels"                      | Smokers                           | • To increase awareness on harmful effects of smoking (stroke, lung cancer and heart disease by using scare approach  
|        |                                                                                       |                                   | • To encourage smokers to call QuitLine                                                    |
| 2001   | “The amount of tar a smoker inhales will take your breath away”                         | Smokers                           | To increase awareness on the harmful effects of tar on smokers' lungs by using scare approach and emotional appeal |
|        | • Testimony by a lung cancer patient  
|        | • Straw advertisement [featuring a lady drinking a cup of tar]                         | Smokers Female smokers aged 18-24 years |                                                                                         |
| 2002   | • Stay free: "Because it's ugly"  
|        | • Stay free: "I wouldn’t be able to catch my breath"  
|        | • "Because your breath smells"  
|        | • "Because it's a waste of money"                                                     | Youths aged 13-18 years            | To discourage smoking initiation among youths                                             |
| 2003   | "Because you smoke, they suffer"                                                      | Male smokers aged 25 to 69 years   | To encourage smokers to quit smoking by highlighting the harmful effects of their smoking habits on their loved ones |


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<th>Year</th>
<th>Campaign slogan/message</th>
<th>Target group</th>
<th>Campaign objectives/ focus</th>
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<tr>
<td>2004</td>
<td>Harmful effects of smoking</td>
<td>Smokers</td>
<td>To encourage smokers who are contemplating to quit smoking to seek online resources and assistance in their attempt to give up smoking through iwanttoquitsmoking.com.sg</td>
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| 2004 | • "Smoking robs you of your baby"  
      • "Smoking robs you of your looks"  
      • "Smoking robs you of your health" | Female smokers | To increase awareness on female-specific risks of smoking (reproductive health, fertility and beauty) |
| 2005 | Young adults | | To encourage smoking cessation by offering positive reinforcements to help smokers quit smoking. Emphasised the benefits of quitting smoking- more energy, more money and better sex |
| 2005 | • "Smoking robs you of your baby"  
      • "Smoking robs you of your looks"  
      • "Smoking robs you of your health" | Female smokers | Focused on increasing awareness and encourage female smokers to use support services for quitting smoking |
<p>| 2006 | &quot;Progress for life when you quit!&quot; | Smokers | To encourage smoking cessation by highlighting the health and financial benefits of smoke-free lifestyle |
| 2006 | &quot;Get Fresh!&quot; | Female smokers aged 18-29 yrs | Focused on increasing awareness and encourage female smokers to use support services for quitting smoking |</p>
<table>
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<th>Year</th>
<th>Campaign slogan/message</th>
<th>Target group</th>
<th>Campaign objectives/ focus</th>
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| 2007 | • "Quitting is hard. Not quitting is harder."  
• "Ready to quit? Give it a try?"  
• "Quitline makes it easier" | Smokers | • To increase awareness of smoking-related disease; oral cancer by depicting the suffering of a smoker stricken with oral cancer on television commercials and print advertisements.  
• To encourage smoking cessation through positive testimonies from ex-smokers to encourage smokers to quit smoking.  
• To increase awareness on the health risks of smoking and encourage smokers to call Quitline for help in quitting smoking |
| 2008 | • Smoking is addictive  
• Smokers are not cool  
• Smoking is an undesirable and anti-social activity  
• Say no to cigarettes (with tips on how to refuse cigarettes)  
• "Chronic Obstructive Lung Disease Robs you of your breath" | Youths  
Adult population aged 30-49 yrs | To discourage smoking  
To increase awareness on the association between chronic obstructive lung disease and smoking |

**Note:** Smoking Control Programme, which comprised of legislation on smoking control and health education/promotion programme was launched in 1986

**Source:**
Smoking control programmes are also in place for specific groups of at-risk adults. The Fresh Air for Women Programme is an example of an integrated marketing programme targeted at young female smokers aged between 18 and 29 years (HPB 2009a). This programme aims to discourage smoking initiation and encourage smoking cessation among young females by providing them with relevant information and social support network (HPB 2009b). Some initiatives of this programme in 2008 included the “Do It All for Love Valentine’s Day Challenge”. Using the concept of incentive-based smoking cessation programme (Cahill, Kate and Perera; 2008a, 2008b), participants of this Challenge were expected to abstain from smoking for two weeks. The participants received quit tips and advice from smoking cessation counsellors as well as support from their loved ones. Prizes were given to two of the participants who abstained from smoking at the end of the Challenge.

Apart from this Challenge, there was another campaign in 2008 which featured a smoker who contracted lung cancer. The smoker spent her last days sharing smoke-free messages (HPB 2009a). This campaign served to remind female smokers of the magnitude of the loss and pain which their loved ones would experience as a result of their smoking habit.

In a bid to encourage more female smokers to quit smoking, a “Glass House” event which showcased a three-day quit process of a celebrity was conducted in 2009 (HPB 2009a). The three-day quit process showcased a celebrity who tried to overcome her urge of smoking by engaging in activities such as pilates, stretching and make-up sessions.
Malay smokers form another specific target group of the smoking control programme. An annual incentive-based programme, conducted in conjunction with the Awal Muhamram- the Muslin New Year, the Muharram Challenge aimed to encourage Malay smokers to quit smoking (HPB 2009a). Through attending workshops and activities on quitting smoking, the participants of this Challenge were equipped with knowledge and skills to cope with their withdrawal symptoms. Family members and supporters of these participants also learnt techniques to help them overcome their cravings. The participants were expected to abstain from smoking for a month and those who managed to do so stood a chance to win attractive prizes.

School-based activities were organised to raise adolescents’ awareness on the adverse effects of smoking (HPB 2009b). Some activities conducted in 2008 include interactive programmes such as “Clear the Smoke”, an interactive theatre programme for primary schools, the “Too Tuff to Puff” physical activity programme and the “To Puff or Be a Buff” interactive theatre programme which focused on the adverse health effects of smoking on one’s fitness. In addition to these programmes, a series of workshops were conducted to assist young smokers to quit smoking by dispelling misconceptions of smoking such as “I can quit smoking anytime”, “Smoking helps me to lose weight”; and equipping them with skills on quitting smoking.

Other than school-based programmes, smoking control messages were also disseminated to the adolescents via youth-centric media platforms (HPB 2009b). For example, messages on the harmful effects of smoking were woven in artwork exhibited along the Esplanade tunnel. Health-related messages were also included in
videos which were used as educational tools in smoking prevention workshops and programmes.

Strict enforcement is in place among the young smokers below 18 years of age. Second and third time underage smokers who are caught smoking are required to attend smoking cessation counselling so as to have their offences compounded (Health Sciences Authority 2007). In 2008, resources were also developed to equip tobacco retailers with skills and strategies to refuse tobacco sales to persons under 18 years old (HPB 2009a).

Besides fiscal policies such as taxation and legislative measures, and public education programmes, affordable and accessible smoking cessation services are also provided at primary healthcare settings such as hospitals and polyclinics as well as non-government organizations (HPB 2009a).

In summary, Singapore has a long history of smoking control policy which goes all the way back to the 1970s. She has a strong social context of non-smoking as evident from her low smoking prevalence and comprehensive smoking control programme. Smoking prevalence has decreased since 1970s although smoking is more prevalent among subpopulations such as Malays and rising among young Singaporeans (Ministry of Health 2009). The next chapter will shed light on the issues associated with adolescent smoking in Singapore which has been classified as being in stage two of the smoking epidemic (Lopez, Collishaw and Piha 1994). Chapter 2 will close with a detailed outline of the research objectives and methodology, and provide a theoretical justification of the proposed structural equation model of
smoking influence. This proposed model will be used to guide quantitative data analysis.

Findings of the structural equation modelling will be presented in the third chapter of this thesis. This chapter will shed light on the associations between social factors and smoking. In chapter 4, the qualitative study will provide readers with insights on the social processes influencing young people’s decisions to smoke. Chapter 4 will provide a better understanding of the pathways linking social factors to smoking behaviour. The concluding chapter, chapter 5, will sum up research findings and will end with recommendations to prevent smoking initiation among the adolescents.
2.1 OVERVIEW OF CHAPTER

Smoking among young Singaporeans is a re-emerging epidemic in a social context of strong anti-smoking norms. What contributes to adolescents’ decision to smoke and how do determinants of smoking work to influence smoking behaviour? This chapter draws insights from literature review on adolescent smoking and theoretical perspectives in an attempt to understand the motivators for adolescent smoking. Gaps between literature review on determinants of smoking and existing local data on adolescent smoking will be identified and the research objectives of this thesis will be outlined. A model based on literature review will be proposed to examine the link between social factors and smoking.

2.2 LITERATURE REVIEW: WHAT DO WE KNOW ABOUT ADOLESCENT SMOKING?

2.2.1 Global trends in adolescent smoking

Using almost 100 years of observations of countries with the longest history of cigarette use, Lopez, Collishaw and Piha (1994) proposed a four-stage model of cigarette consumption and subsequent mortality attributed to smoking. The first stage is characterised by low smoking prevalence and smoking is predominantly among the males. The second stage of the epidemic marks a sharp increase in smoking prevalence among males, an early increase in female smoking and a shift towards
smoking at younger ages. The burden of lung cancer and smoking-attributable diseases among men increases at this stage. In stage three of the epidemic, smoking prevalence decreases sharply among men and more gradually among women. This leads to a convergence of smoking prevalence among men and women. The burden of lung cancer, smoking-attributable diseases and death continue to increase among men in this stage. The fourth stage of the epidemic is characterised by a marked decrease in smoking prevalence in both men and women. Deaths attributable to smoking peak among men and decline subsequently at this stage while among women, smoking-attributable deaths continue to rise. This epidemic model allows countries to chart their smoking epidemic in relation to the larger pandemic. Relevant interventions could then be conducted to arrest the problem of smoking.

The daily smoking trends among European and Canadian adolescents from 1990 to 2002 show that the various countries are at different stages of the tobacco epidemic (Hublet et al. 2006). Among boys in Nordic countries such as Finland, Sweden, Norway, Austria and Hungary, a downward or stabilising trend in daily smoking is observed. In western countries such as United Kingdom, Belgium and Canada, an initial increase in daily smoking prevalence followed by a decreasing trend in daily smoking is also noted among boys. In Eastern European countries such as Poland and Latvia, daily smoking prevalence increased between 1990 and 1994 and stabilised between 1998 and 2004 among boys. Some differences are observed among girls. An upward trend is noted in the daily smoking prevalence among Austrian and Hungarian girls although a stabilising trend is observed among boys. Smoking prevalence among girls has not decreased in any of the countries included in Hublet and colleagues’ study. The findings from this study show that most countries are at
stage three of the smoking epidemic where smoking prevalence among males decreases and stabilises among females.

In general, a downward trend in smoking prevalence is observed in some western countries such as United States of America (Centers for Disease Control and Prevention 2008; Substance Abuse and Mental Health Services Administration 2009), United Kingdom (National Centre for Social Research 2009; SALSUS 2009), Australia (Scollo and Winstanley 2008) and Canada (Health Canada 2005). For instance, the National Youth Risk Behavior Survey (Centers for Disease Control and Prevention 2008) among high school students in United States between 1991 and 2007 shows that the proportion of students who smoke at least one day in the past one month has increased from 27.5 percent in 1991 to 36.4 percent in 1997, declined to 21.9 percent in 2003 and remained stable at 20.0 percent in 2007. A similar trend is observed by gender. Findings from the annual National Survey on Drug and Health among American youths (Substance Abuse and Mental Health Services Administration 2009) aged between 12 and 17 years shows a downward trend in the prevalence of cigarette use from 13.0 percent in 2002 to 9.1 percent in 2008. In addition, an increase in the proportion of Californian adolescents who have never smoked is also observed among adolescents of this age group from 1990 to 1999. The proportion of never smokers has increased from 60 percent for boys and 66 percent for girls in 1990 to around 70 percent for both boys and girls respectively (Chen et al. 2003).

United Kingdom has one of the lowest smoking prevalence among European countries (Centers for Disease Control and Prevention 2006). In England, smoking
prevalence among adolescents aged between 11 and 15 years has increased in the early 1990s and stabilised thereafter (National Centre for Social Research 2009). Since 2000, smoking prevalence has fallen to 9 percent among adolescents aged between 11 years and 15 years who smoke at least once a week and maintained at 6 percent since 2002. The proportion of 15 year old girls who smoke has decreased from 33 percent in 1996 to 17 percent in 2007. Among the boys, a steeper decrease in smoking prevalence is observed from 28 percent to 11 percent in the same period. In Scotland, a similar decline in smoking prevalence is noted (SALSUS 2009).

A downward trend in smoking prevalence is also evident among Australian adolescents (Scollo and Winstanley 2008). The proportion of adolescents who smoke at least once in the past week has decreased between 1983 and 1993, stabilised between 1993 and 1996 and decreased since then till 2005. A similar pattern is observed among Canadian adolescents (Health Canada 2005). More than 40 percent of Canadian adolescents aged between 15 and 19 years were smoking in the 1980s. The prevalence rate of smoking decreased to just over 20 percent by early 1990s. The rates increased since then and peaked at 28 percent in 1999. The rates decreased thereafter and stabilised since 2003. The prevalence of smoking among girls has also decreased from 20 percent in 2003 to 18 percent in 2004.

An almost similar trend in smoking prevalence is also observed among Asian countries such as Japan (Osaki et al. 2008) and Hong Kong (Tobacco Control Office 2008). The prevalence of current smoking among Japanese high school students increased between 1996 and 2000 and decreased in 2004 for both boys and girls and in every grade. The magnitude of decrease is higher among boys than girls. For
instance, among boys in junior grade, smoking prevalence was 5.1 percent in 2004
and 10.3 percent in 1996. Among girls of the same grade, smoking prevalence has
decreased from 4.6 percent in 1996 to 3.6 percent in 2004. In senior high school,
smoking prevalence among boys is lower at 15.9 percent in 2004 as compared to 30.7
percent in 1996. Similarly, a lower proportion (8.2 percent) of the girls in the same
grade smoked in 2004 than 1996 (12.6 percent). In Hong Kong, a downward trend in
daily smoking prevalence is observed between 2000 and 2007/2008 (Tobacco Control
Office 2008). Daily smoking prevalence has decreased from 4.5 percent in 2000 to 2.4
percent in 2007/2008. A similar pattern is observed by gender.

It is evident from the trend data of these developed Western and Asian
countries that there has been a rise in adolescent smoking in the early 1990s, followed
by a decline thereafter. Other than a decline in smoking trend among adolescents,
these countries also have a set of comprehensive tobacco control policy. They have
ratified the Framework Convention on Tobacco Control and are committed to the
work of tobacco control (World Health Organisation 2007). The social context of non-
smoking is becoming stronger in these countries over the years. The proportion of
non-smokers has increased over the two decades and Asian country such as Japan has
also observed a decrease in the proportion of young smokers with family members
and friends who smoke (Osaki et al. 2008).

In general, the trends in smoking prevalence in Singapore are similar except
for a subpopulation aged between 18 and 29 years old. While Singapore’s smoking
epidemic was in early stage 2 in the early 1970s, its early stage 2 intervention has
prevented smoking prevalence from escalating (Lopez, Collishaw and Piha 1994).
Smoking prevalence among general population has decreased from 27.5 percent in 1975 (Lee et al. 1977) to 13.6 percent in 2007 (Ministry of Health 2009). However, the proportion of young smoking Singaporeans aged between 18 years and 29 years has increased over the years (Ministry of Health 2009). Smoking experimentation and initiation usually takes place during adolescence (Samet and Yoon 2001; U.S. Department of Health and Human Services 1994; 2001). The Surgeon General’s Report highlighted that young adults are unlikely to pick up smoking if they do not do so by the age of 25 years (U.S. Department of Health and Human Services 1994). In order to understand the underlying reasons for the rising trend of smoking among young people as well as differences in gender-specific smoking prevalence, it is necessary to explore various social factors influencing smoking initiation among adolescents.

Why do adolescents pick up smoking? What are some of the determinants of adolescent smoking? A review of the literature from the late 1990s reveals a myriad of factors associated with smoking among adolescents. A vast number of studies have noted that smoking is more prevalent among ethnic minority groups and those of lower socioeconomic status (Samet and Yoon 2001; Tyas and Pederson 1998; U.S. Department of Health and Human Services 1994; 2001). Social factors ranging from normative influence from parents, siblings and friends to social environmental factors such as family attachment or connectedness, parenting style, school connectedness and school commitment, have been shown to be associated with smoking (Tyas and Pederson 1998; U.S. Department of Health and Human Services 1994; Wiefferink et al. 2006). Smokers are more likely than non-smokers to have more positive perceptions of smokers and smoking (Cheong et al. 2003; Crisp et al.1999; Honjo
2003; Tyas and Pederson 1998); they tend to associate smoking with their aspired image and downplay the risks of smoking (Amos et al. 1997; Brynin 1999; Cheong et al. 2004). Smokers and those with an intention of smoking are likely to be of a certain personality, have lower self-esteem and less likely to have good coping skills (Samet and Yoon 2001; Tyas and Pederson 1998; U.S. Department of Health and Human Services 1994; 2001). The following section will elaborate on these determinants of adolescent smoking.

2.2.2 Socio-demographic determinants of adolescent smoking

2.2.2.1 Socioeconomic status

Educational and socioeconomic levels have been shown to contribute to smoking among adolescents (Tyas and Pederson 1998; U.S. Department of Health and Human Services 1994; 2001). A large amount of research has concluded that educational level is directly associated with smoking (Anderson and Burns 2000; Coleman 2004; Epstein Griffink and Botvin 1998; Markham et al. 2001; Samet and Yoon 2001; Unger et al. 2000; Wallace et al. 2003). As compared to non-smokers, smokers have lower educational attainment (Bosanquet and Magee 1999; Cavelaars et al. 2000; Jefferis et al. 2003; Knutsson et al. 1996; Morrow et al. 2002; Schiaffino et al. 2003; Tyas et al. 1998; Wiefferink et al. 2006) and are of lower socioeconomic levels (Jefferis et al. 2003; Federico, Costa and Kunst 2007; Knutsson et al. 1996).

The association between educational attainment and smoking is also observed in the Singapore data (Emmanuel, Chen and Phe 1988; Emmanuel, Ho and Chen 1990). A study by Emmanuel and colleagues (1990) among 33,100 Singaporean students found that smoking is more prevalent among the academically less inclined
students. The difference in smoking prevalence across various academic abilities is statistically significant for students in every grade ranging from primary school level to pre-university level. The link between educational attainment and at risk health behaviours (smoking, regular alcohol consumption and physical inactivity) is also observed among Singaporean adult population (Fong et al. 2007). As compared to the more highly educated Singaporeans aged between 19 and 69 years, the lower educated Singaporeans are more likely to smoke and drink alcohol regularly but exercise less frequently.

These findings suggest that smoking is associated with social class of individuals. People of lower social class usually have fewer resources over and above what they need to make ends meet, and yet given the rising cost of cigarettes (Mackay, Eriksen and Shafey 2006) these people could afford cigarettes. These evidence indicate that other than financial means, social conditions may be more important determinants of smoking behaviour.

Interestingly, recent findings show that smoking prevalence is higher among European females from the higher socioeconomic group in the earlier phase of the smoking epidemic (Graham 1996; Pampel 2003). Similar findings are also found in Burrow and Nettleton’s (1997) study which show that smoking prevalence is higher among British females who have higher level of educational attainment and those in the higher occupational rungs. These research studies show that smoking is a reflection of status among female smokers as females of better life circumstances are more likely to smoke. These studies suggest that the reasons for smoking may differ by gender and it will be important to see if this is so in Singapore.
2.2.2.2 Ethnicity

Some studies have shown that smoking is more prevalent among ethnic minority groups (Anderson and Burns 2000; Coleman 2004; Epstein, Griffink and Botvin 1998; Markham et al. 2001; Samet 2001; Tyas et al. 1998; U.S. Department of Health and Human Services 1994; 2001; Unger et al. 2000; Wallace et al. 2003). For example, among Americans, smoking prevalence is higher among African Americans and Hispanics (Anderson and Burns 2000; Coleman 2004; Unger et al. 2000; Wallace et al. 2003). Another study conducted by the Centers for Disease Control and Prevention (2004) noted that Native American/ Alaskan Native adolescents have the highest rate of current smoking at 27.9 percent, over 10 percent higher than white adolescents. While socioeconomic status appears to be a stronger predictor of health behaviour of ethnic minorities in relation to the majority population (Cockerham 1997), research has shown several other possible reasons for ethnic-specific differences in smoking prevalence. For instance, a study by Maddahian, Newcomb and Bentler (1986) found that among Californian students, difference in ethnic-specific smoking prevalence is due to the availability of cigarettes and the ease of cigarette acquisition from friends. In another study by Sussman and colleagues (1987), differences in ethnic-specific prevalence of smoking is a result of the availability of cigarettes, difficulty in refusing cigarettes as well as youth’s intention to smoke. However, the study also found that there are different factors influencing smoking among adolescents of different ethnic groups. For example, peer and adult smoking are predictors of smoking initiation among the whites while among the Hispanics, predictors of smoking are self image, adult and peer approval. Among the blacks, risk taking behaviour is a predictor of smoking while lack of general self-
esteem and school-related self-esteem are correlates of smoking among Asian adolescents. These findings suggest that individual’s ethnicity per se do not put them at risk of smoking, it is other social factors which motivates smoking behaviour.

In Singapore, smoking is also more prevalent among a particular ethnic group. Smoking prevalence is the highest among Malays as compared to Chinese and Indians across all age groups (Ministry of Health, 2005). In addition, a longitudinal study among Singaporeans concluded that ethnicity and educational level predict health behaviour (including smoking) better than constructs of the Health Belief Model (Quah, 2007). The association between ethnicity and smoking could be due to social class issues as Malays tend to be from the lower social class (Ministry of Trade and Industry 2005).

2.2.3 Social network determinants of adolescent smoking: Parents, siblings and peer influence

2.2.3.1 Parental smoking

When examining the influence and processes of smoking among adolescents, it is important to consider the influence of important individuals such as parents and siblings in adolescents’ social environment. This is because individuals observe, model and imitate behaviour of important people in their environment (Bandura 1977). The presence of smokers in adolescents’ environment is an important contributor to smoking behaviour. Consistent across a significant number of studies (Avenevoli and Merikangas 2003; Barret and Turner 2006; Brynin 1999; Bricker et al. 2006; Harakeh et al. 2007; de Vries et al. 2006; Li, Pentz and Chou 2002; Mayhem, Flay and Mott 2000; Otten et al. 2007; Samet and Yoon 2001; Shamsuddin
and Harris 2000; Tyas and Pederson 1998, U.S. Department of Health and Human Services, 1994; 2001; Wen et al. 2003; Wiefferink et al. 2006), the smoking status of parents has been shown to be a strong predictor of adolescent smoking. This is particularly evident in late childhood and early adolescence where behavioural modelling is the strongest (Bandura 1977; Jacobson et al. 2000). For instance, a survey among 1807 American students shows that adolescents with both parents smoking are 2.5 times (95% CI: 1.8, 3.6) as likely to smoke as their counterparts whose parents are non-smokers. In addition, in another longitudinal study among American students, Flay and colleagues (1994) explored the influence of smoking parents on adolescent smoking behaviour and concluded that parental smoking has an indirect effect on adolescent smoking.

Apart from these findings, a Singapore cross-sectional survey in 2001 found that proportionately (53 percent) more adolescent smokers than non-smokers (30 percent) has family members who smoked in their presence at home (Cheong et al. 2003). The same study also concluded that as compared to non-smokers with no intention of picking up smoking, non-smokers with intention to smoke are 1.5 times (95% CI: 1.1, 2.10) more likely to have family members who smoke. These findings suggest that familial influences play a significant role in shaping adolescent behaviour. Among family members, fathers play a major role in the development and continuation of smoking among the adolescents who ever experimented with smoking (Emmanuel, Ho and Chen 1991). Adolescents from families where fathers smoke are more likely to pick up smoking; slightly more than half of the boys and girls who reported to be smoking have fathers who smoke.
Some studies have also shown that maternal smoking is a biological correlate of smoking (Samet and Yoon 2004; U.S. Department of Health and Human Services 2001). A 30-year prospective study found that offspring of mothers who smoked a pack or more of cigarettes during pregnancy are at elevated risk of developing nicotine dependence (Buka, Shenassa and Niaru 2003).

2.2.3.2 Sibling smoking

Having an older sibling who smokes is associated with smoking initiation among adolescents (Bricker et al. 2006; U.S. Department of Health and Human Services 1994; 2001, Samet and Yoon 2001; Tyas and Pederson 1998; Wiefferink et al. 2006; Wilkinson and Abraham 2004). In Bricker and colleagues’ study (2006), the probability of an older sibling’s smoking behaviour leading to a younger sibling’s attempt to smoke is 29 percent (95% CI: 17%, 39%). A recent study among Taiwanese college students found that as compared to non-smoking students, those who smoke are 1.25 times (1.06, 1.49) more likely to have siblings who also smoke (Gau et al. 2009). Similarly, in Singapore, young smokers have a higher proportion of sibling smokers as compared to their counterparts who are non-smokers (Cheong et al. 2003). These findings suggest a strong imitation of smoking behaviour among siblings and that older sibling set the trend for their younger siblings to follow.

2.2.3.3 Peer influence/peer smoking

Friends play a major role in adolescents’ perceptions of what is acceptable and unacceptable behaviour within peer groups (Jacobson et al. 2000). A vast body of research has identified peer influence as a determinant of smoking (Erbaydar et al. 2005; Li, Ma and Chou 1999; Lucas and Lloyd 1999; Lundborg 2006; Poulsen et al.
The smoking status of friends is the strongest and most consistent predictor of the smoking status of most adolescents. It is a proximal factor of adolescent smoking (Flay et al. 1994). Friends are important members of adolescents’ social network. The more smoking friends there are in their social network, the stronger is the social norm of smoking (Redmond 1999; Lucas and Lloyd 1999). The number of smoking friends thus contributes to the likelihood of adolescent smoking (Li Ma and Chou 1999).

The association between peer influence and adolescent smoking is confirmed in local studies on adolescent smoking (Emanuel, Ho and Chen, 1991; Cheong et al. 2003; 2004). Friends are one of the main sources of first cigarette among all adolescents who have ever smoked (Emanuel, Ho and Chen, 1991). Peer influence is cited as one of the reasons for cigarette experimentation (Cheong et al. 2003; 2004). Smokers have a wider social circle of smoking friends as compared to non-smokers. Eighty-one percent of Singaporean adolescent female smokers have friends who smoke while only 42 percent non-smoking Singaporean females have friends who are smokers (Cheong et al. 2004).

Qualitative studies (Ioannou 2003; Johnson et al. 2003) provide further insights on the associations between peer influence and adolescent smoking. For instance, a study by Johnson and colleagues (2003) found that adolescents continue to smoke to fulfill several needs such as social needs to get to know more friends and expand their social circle.
2.2.4 Social environmental determinants of adolescent smoking: Family and school

2.2.4.1 Family structure

An association is found between family structure and adolescent smoking (Otten et al. 2007; Samet and Yoon 2001; Tyas and Pederson 1998; Wiefferink et al. 2006). A cross-sectional study among 1760 adolescents reveals that those from single-parent families reported a significantly higher level of problematic substance use than those from father-mother families (Barret and Turner 2006). Negative family circumstances may promote smoking uptake. This could be due to several possible reasons such as weaker parental bonds, lower level of social support from family, less time spent with family, weaker parental monitoring, lack of supervision by parents and more frequent family conflicts. Not having sufficient support from their family, adolescents may turn to their peers for emotional support and this increases their chance of associating with friends of negative influence and higher likelihood of engaging in deviant behaviour.

2.2.4.2 Family attachment and parenting style

Family processes such as social bonding between adolescent and their parents (e.g. family connectedness, family attachment, family bonding) and parenting style have been identified as distal factors associated with smoking (Eisenberg et al. 2000; Huver et al. 2007; Otten et al. 2007; Samet and Yoon 2001; Tyas and Pederson 1998; U.S. Department of Health and Human Services 1994; 2001; Wiefferink et al. 2006). A study by Wills and Cleary (1996) among 1702 students shows that parental support is associated with smoking indirectly. Adolescents with weak parental support are less
likely to excel in their studies and less able to cope with their negative emotions. These adolescents tend to depend on smoking to cope with their emotions. In another one-year follow-up survey among 2300 American adolescents aged 14-18 year olds, authoritative parenting style is found to inhibit risk behaviour while neglectful parenting style promotes risk behaviour (Laurence et al. 1994). Similarly, a study by Hill and colleagues (2005) concluded that strict family monitoring and rules and stronger family bonding predict a lower risk of daily smoking initiation.

These findings are in line with the social development theory (Catalano and Hawkins 1996) which postulates that positive family environment is important for preventing risk behaviour among adolescents. Parent-child communications and relations influence their adolescents’ development. Although family is a distal factor of adolescent smoking (Flay et al. 1994), the family environment sets the stage for adolescents’ risk behaviour. However, in Singapore, apart from research on parental smoking and adolescent smoking, there is no research which examines the effect of family environment (parenting styles and family bonding) on adolescent smoking.

2.2.4.3 School attachment/commitment

School plays a major role in the provision of positive socialisation among adolescent school-goers. The social development process in school is influenced by the various ways in which schools and teachers provide opportunities for children to engage themselves in school activities. As noted by Catalano and Hawkins (1996), these opportunities include academic tasks, non-academic activities and interactions within the school environment. The more schools provide such opportunities, the more engaged adolescents will be in school activities and this will prevent adolescents
from engaging in at risk or anti-social behaviours. Associations between school bonding factors such as school connectedness and school commitment; and health risk behaviour (including smoking) have been established in several studies (Bond et al. 2007; Bonny et al. 2000; Cleveland et al. 2008; Lloyd-Richardson et al. 2002; McNeely and Falci 2004; Rasmussen et al. 2005; Tyas and Pederson 1998). A study among 1537 Danish adolescents concluded that those with low levels of school connectedness are likely to take up smoking (Rasmussen et al. 2005). Another longitudinal school-based study of 2678 secondary school Australian students found that relative to those with high school connectedness, those with low school connectedness are two times (95% CI: 1.4, 2.9) more likely to smoke regularly (Bond et al. 2007). Similarly, it is detailed in Sampson and Laub’s longitudinal study among Ontario adolescents that strong school attachment will inhibit risk-taking behaviours such as consumption of tobacco, alcohol, drugs and others (Wade and Brannigan 1998). However, in Singapore, the association between school environmental factors and smoking behaviour has not been ascertained.

2.2.5 Cognitive and attitudinal determinants of adolescent smoking

2.2.5.1 Social image

Young smokers tend to describe smokers in positive light and perceive smokers as people who are popular, cool, slim and sociable (Crisp et al. 1999; Honjo 2003; Tyas et al. 1998). Studies among Singaporean adolescents show similar findings; smokers are perceived as being cool and more popular among friends (Cheong et al, 2003; 2004). Young smokers have favourable perceptions of smoking because they do not share the norms of the mainstream status quo. Instead, smokers
assimilate the group norm of their smoking subculture (Sutherland and Cressey 1984). When mainstream norms and subculture norms counteract against each other, individuals in their respective group tend to uphold their group norms. Therefore, smokers tend to view smokers favourably.

Smoking as a weight control or weight reduction strategy is especially relevant among girls (U.S. Department of Health and Human Services 1994; 2001, Samet and Yoon 2001). Findings from Honjo’s (2003) study show that as compared to girls who value thinness least, girls who value thinness most strongly are 4.5 times more likely to smoke. In addition to smoking as a strategy to maintain weight, Amos and colleagues (1997) as well as Denscombe (2001) reported that smokers are likely to embrace certain aspired images such as being macho, tough, mature and others.

2.2.5.2 Knowledge and perceived risks of smoking

Several studies have shown that smoking is more common among those who are unaware of the ill-health effects of smoking as well as those who do not perceive the health risks of smoking (Brynin 1999; Emmanuel, Ho and Chen 1991; Redmond 1999; Samet and Yoon 2001; Tyas et al. 1998; Redmond 1999; U.S. Department of Health and Human Services 1994; 2001; Wiefferink et al. 2006). For instance, a lower proportion of Singaporean current smokers (69.4 percent) than non-smokers (89.3 percent) are aware of the harmful effects of smoking (Cheong et al. 2004). In addition, non-smokers who intend to smoke have a lower level of perceived vulnerability to ill-health effects of smoking as compared to those who have no intention of smoking (Cheong et al. 2003). These findings are in line with the health belief model (Glantz et al. 2004) which postulates that people who lack awareness of
the consequences of their behaviour and who do not perceive themselves to be susceptible to the consequences of their behaviour, are less likely to change their behaviour.

However, there are some adolescents who are aware of the health consequences of smoking but went ahead to smoke. For example, it is detailed in Stjerna, Lauritzen and Tillgren (2004)’s study that despite being informed of the health hazards of smoking, adolescents continue to smoke because they see a value in risk taking.

2.2.5.3 Coping skills

Coping skills and skills to refuse smoking are determinants of smoking (U.S. Department of Health and Human Services 1994; 2001, Samet and Yoon 2001). A study conducted among American adolescents shows that those with higher refusal assertiveness are less likely to smoke (Epstein, Griffink and Botvin 2000). Findings suggest that smokers tend to give in to temptations to smoke and succumb to peer pressure and influence.

In addition, smoking has been perceived as a mechanism for coping with stress. The study by Emmanuel and colleagues (1991) shows that one of the main reasons which Singaporean students pick up smoking is “to feel relax”. Such findings are also observed in a more recent survey among Singaporean adults (Ministry of Health, 2005). This survey reveals that the main reason for cigarette experimentation among Singaporean smokers aged 18-29 years is due to “the need to relieve stress”.

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These findings suggest that smokers lack coping skills and are dependent on nicotine to cope with emotional distress.

In summary, literature has suggested that socio-demographic factors such as socioeconomic status and ethnicity, social network factors such as the presence of smokers among family members and friends, and social cognitive factors such as awareness of the adverse effects of smoking, perceived risks of smoking, perceived positive consequence of smoking as well as lack of coping skills, are related to smoking. However, how do these factors work to influence adolescents’ smoking behaviour? The next section will focus on literature review of sociological theories which will help us to better understand the social processes motivating smoking behaviour.

2.3 GLEANINGS FROM SOCIOLOGICAL THEORIES

It is evident from literature review that behaviour is influenced by social factors as well as cognitive factors. Social factors shape individuals’ cognitions and behaviour. It is therefore necessary to examine the association between social factors and adolescent smoking.

When we try to understand adolescent smoking behaviour from a broader social structural level, sociological theories and concepts provide explanatory models for making sense of adolescents’ decisions with regards to smoking. Concepts such as social integration, social bonding and attachment generally refer to social ties or connectedness to the various units of society. They have been used interchangeably in the literature and are used to investigate the influence of social relations on health.
behaviours. These concepts, together with the concept on social determinants of health, provide insights on the social causation of diseases.

2.3.1 Social integration

As reflected in the smoking epidemic trends in Singapore, health behaviours are socially patterned with some subpopulations having a higher risk profile than others (Ministry of Health 2005; 2009). Such epidemiologic trends lend support to Emile Durkheim’s work which provides insights on the impact of social environment on health behaviour. Durkheim’s seminal work on *Suicide* (1951) sheds light on the importance of social integration and social cohesion on mortality. Durkheim hypothesised that the social patterning of suicidal rates could be due to the level of social integration in each subgroup of people. He believed that individuals are bonded to society through attachment and regulation; in which he defined attachment as firstly, the extent to which individual maintains ties with society and secondly, regulation as the extent to which individuals are assimilated into society by the rules, beliefs and norms (Berkman and Glass 2000).

Durkheim applied his theoretical concept and empirical evidence to the study of differences in suicidal rates by religion. He noted that unlike Catholicism, Protestantism is less integrated in its social organisation. Suicidal rates in Catholic countries were thus lower as social bonding among Catholics was comparatively stronger than Protestants. Similarly, he observed that the difference in suicidal rates between married and singles is due to the level of family attachment. Apart from this,
he also observed that erosion of social cohesion occurs during economic or political turbulence which in turn leads to suicides.

Durkheim contributed to the lay understanding of health behaviours and highlighted the influence of social conditions and environment on health. His seminal work shows that differences in health behaviours across subgroups of populations are likely a result of the differences in the social context or social milieu in which individuals lived in.

He argued that social integration is positive and has protective effect on health behaviours. However, this may not be true in the context of smoking. As evidenced in studies on adolescent smoking, smoking is a learnt behaviour (Akers and Lee 1996). The pleasures of smoking are socially learnt and such behaviour necessarily lodges individuals within social networks. Smokers are socially integrated in social groups with strong pro-smoking sentiments. Integration within social groups may not necessarily be positive all the time. It is the prevailing norms within social groups which determine if individuals are protected against anti-social behaviours. Smokers are integrated within social network of strong anti-social behaviours whereas non-smokers are socially integrated in networks of prosocial behaviour. Hence, what differentiates smokers from non-smokers is the type of social network which they are bonded with.

2.3.2 Social bonding and attachment
In the field of sociology of deviance, the social control theory (Hirschi, 1969; Gottfredson and Hirschi 1990; Sampson and Laub 1993) and social development theory (Catalano and Hawkins 1996) are often used to examine the underlying causes of deviant behaviour. The main focus of these theories is on social bonding and attachment to the various agents of socialisation in society.

Hirschi (1969) emphasised sources of social bonding and attachment as key in the understanding of deviants and reasons for deviant behaviour. Individuals are bonded to society through four interrelated elements: (1) attachment to others in the social unit, (2) commitment in conventional lines of action consistent with the socialising unit, (3) belief in the values of the unit and (4) involvement in conventional activities. Hirschi’s social control theory postulates that weak bonds to social units in society will increase the likelihood of deviant behaviour.

The social control theory has been used as the guiding theoretical framework in research on adolescent smoking. Krohn and colleagues’ (1983) longitudinal study is an example of a research which uses social control theory as the theoretical model to investigate social factors related to adolescent smoking behaviour. The authors found that adolescent ties to society are important in constraining deviant behaviour such as cigarette smoking. The study concluded that beliefs and commitment to education have the strongest constraining effect on adolescent smoking behaviour.

However, although the social control theory has provided useful insights on deviant behaviour, Hirschi underestimated the role of negative social influence in his

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5 Deviants are those who engage in behaviour that deviates from norms in a disapproved direction in sufficient degree to exceed the tolerance limits of a discernible social group, such that the behaviour is likely to elicit a negative sanction if detected (Jennes and Goodman 2006).
social control theory. He did not explore the relationship between delinquent peers, family members and individual’s delinquent behaviour though he recognised that these factors would have some amount of influence on deviant behaviour (Hirschi 1969).

Following the classic work on *Causes of Delinquency* in 1969, Gottfredson and Hirschi (1990) provided a theoretical baseline for studies on delinquency by defining the characteristics of crime and the personality traits of the offender (Wade and Brannigan 1998). Gottfredson and Hirschi (1990)’s self-control theory extends beyond criminal acts to other forms of risk behaviour which included smoking, drinking, gambling, premarital sex and substance abuse. The authors attributed delinquent behaviour to a lack of self control and emphasised the importance of parental supervision over other social units such as schools and peer groups on the development of internal self control. The authors concluded that family is the key institution in producing or inhibiting deviance.

Gottfredson and Hirschi’s (1990) views were however, in contrast with Sampson and Laubs’ (1993) reanalysis of the Glueck and Glueck (1950; 1968) data on delinquency. Sampson and Laub (1993) found that in addition to family background and family processes, school and peer attachments are also predictors of delinquent behaviour. The authors argued that family background influences family processes (supervision, attachment) which in turn determines adolescents’ commitment to school. Apart from these factors, delinquent peer attachment also plays a significant role in influencing delinquent behaviour.
Comparatively, the social development theory (Catalano and Hawkins 1996) provides a more holistic understanding of delinquent behaviour in the various developmental phases of adolescence. Synthesising social control and social learning theories, the social development theory emphasises the role of bonding, attachment and positive socialisation to prosocial family, school and peers as a form of protection against substance use and anti-social behaviours (Hawkins, Catalano and Miller 1993). It recognises that different social contexts or units (e.g. family, schools) vary in importance at different stages of adolescence. For instance, family will be the most important socialising unit before a child enters school while school and peer group may be more important or have equal importance during adolescence.

The social development theory has been used in several studies (Bond et al. 2007; Cleveland et al. 2008; Fleming et al. 2002; Hill et al. 2005; Skinner, Haggerty and Catalano 2009; Tilson et al. 2004) to examine the association between adolescent smoking and different units of society. These studies found that family attachment, parental monitoring and school connectedness predict a lower likelihood of smoking while parental smoking increases the chance of adolescent smoking.

Hirschi (1969), Catalano and Hawkins’ (1996) social control and social development theory build on Durkheim’s concept of social integration and identify prosocial units in the social environment. The social control and social development theories supported by empirical evidence, show that family and school indeed have positive effects on adolescent behaviour.

2.3.3 Social determinants of health
Durkheim’s work on social integration (1851), Hirschi’s social control theory (1969) and Catalano and Hawkin’s social development theory (1996) focus on the impact of individuals’ social environment on their health behaviours. These theoretical perspectives are different from the approach taken in most behavioural medicine and epidemiology research. In the field of behavioural medicine and epidemiology, greater weight is placed on social cognitive factors than social structural and social environmental factors. Social structural and social environmental factors are often interpreted as distal factors. The results of most epidemiology research usually lead to interventions which target risk factors of health behaviours at the individual level (Syme 2000). Such approach tends to look for solutions and causes of problems in the individuals and ignore social situations which are often the root causes of illnesses (Conrad 1975).

While this victim blaming approach (Ryan 1988) may be effective at the individual level, the long-term impact of these interventions may be negligible at group level (Syme 2000). This is because new cohort of people continues to enter the risk population since social determinants (e.g. social structural and social environmental factors) of risk behaviours are not addressed at individual level interventions (Kelehar and Murphy 2004). Having an in-depth understanding of the associations between social conditions and health is therefore of predominant importance for planning effective health interventions. As put forth by Link and Phelan (1995), in order to identify the root causes of diseases and risk behaviours, it is essential to examine the social environment and social structural factors. Link and Phelan (1995) argued that social conditions such as stratification variables – race,
class and gender, and stressful life events and stress process variables such as social support, are fundamental causes of diseases and that social conditions cause diseases and mortality in various ways. This perspective is the key health promotion principle in the Ottawa Charter for health promotion (Ottawa Charter 1986). The Ottawa Charter shifted principles for health promotion from health education models of individual behaviour towards a social ecological (Breslow 1996) model of health promotion which addresses structural determinants of health. The social ecological model includes multi-level approaches; it integrates individual-level with environmental-level interventions to effect and encourage health promotion behaviour (Stokols 1996).

However, although social structures and social environment are important factors in explaining health behaviours, it does not tell the whole story about adolescent smoking. There is a whole range of factors which influence adolescents’ decision on smoking. Recognising the importance and relevance of various social factors on health outcomes, Berkman and Glass (2000) developed a comprehensive framework (Figure 6) which examines the effects of social structural conditions, social networks and psychosocial mechanisms on a broad range of health outcomes. They adopted the Durkheimian approach to examine the pathways in which social structural conditions and social network influences health behaviour. They were of the view that social networks are embedded in the larger social and cultural contexts. By adopting such an approach, the various pathways from social structural and social environmental factors to health are taken into consideration when examining the root cause of health outcomes.
Figure 6: Conceptual framework linking social network to health

Adapted from:
In their framework, social structural factors such as cultural factors (e.g. race) and socioeconomic factors condition the extent, shape and nature of social networks. Social networks are embedded in the larger socio-cultural context where upstream forces condition network structure (Berkman and Glass 2000). Social network members influence individuals’ behaviour, psychological and physiological well-being via various ways such as (1) provision of social support; (2) social influence; (3) social engagement and attachment; and (4) access to resources and material goods. Individuals’ health behaviours, psychological and physiological well-being in turn impact on their health outcomes.

By integrating classical theoretical work on sociology and psychology to examine the associations between social conditions, social network, health behaviours and health outcomes, this theoretical framework provides a holistic view of the causes of diseases. It is noteworthy that this framework value-adds to current research through its emphasis on upstream factors such as social conditions and social network factors which are often neglected in behavioural sciences and epidemiologic research. This framework is in line with Link and Phelan’s arguments on the need to identify fundamental cause of diseases (1995). Downstream factors such as health behaviours and health outcomes could only be better understood by identifying the upstream factors which put individuals at risk of negative health outcomes (Kelehar et al, 2004).

2.4 KNOWLEDGE GAPS

How does literature review on adolescent smoking and sociological theories help us to make sense of adolescent smoking in the Singapore context? Do the present
local data provide sufficient information to help us understand the motivators for adolescent smoking in Singapore?

Literature review has shown that smokers are generally less attached or integrated within protective social units in the social environment. However, the social norm of smoking is stronger within the social network of smokers than non-smokers as smokers tend to have more family members and friends who smoked as compared to non-smokers. Young smokers are more connected or bonded within their social network of smoking friends. Social network can be either positive or negative and influence behaviour in either directions. Hence, social integration on its own does not explain adolescent smoking adequately. The nature of social network and background social conditions has to be taken into consideration when examining adolescent risk behaviours.

The section on literature review of determinants of adolescent smoking as summarised in Table 7 and sociological theories show that there are missing pieces of puzzle in our present data on Singaporean adolescent smoking. There are some aspects of the social environment and social network which require further exploration when examining factors influencing adolescents’ decisions to smoke in the local context. Specifically, the gaps between our present local and international data pertain to (a) lack of data on social environment and smoking; and (b) lack of data on the interplay of social factors and adolescent smoking.
Table 7: Determinants of adolescent smoking

<table>
<thead>
<tr>
<th>Determinants</th>
<th>International data</th>
<th>Local data</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Social structural factors</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Socioeconomic status</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Ethnicity</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td><strong>Social environmental factors</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Family structure</td>
<td>✓</td>
<td>●</td>
</tr>
<tr>
<td>Family attachment and parenting style</td>
<td>✓</td>
<td>●</td>
</tr>
<tr>
<td>School attachment/ commitment</td>
<td>✓</td>
<td>●</td>
</tr>
<tr>
<td><strong>Social network factors</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Parental smoking</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Sibling smoking</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Peer influence/ peer smoking</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td><strong>Social cognition</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Social image</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Coping with stress and negative emotions</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Knowledge and perceived risks of smoking</td>
<td>✓</td>
<td>✓</td>
</tr>
</tbody>
</table>

✓: Associations found in research studies
●: Unknown association

2.4.1 Lack of data on social environmental factors: Social bonding and interpersonal attachment

There are a few studies among adolescents in Singapore but these studies explored different aspects of smoking behaviour. The first landmark study on smoking among school-goers was conducted in 1987 (Emmanuel, Ho and Chen 1990). Apart from determining the prevalence of smoking, this study examined reasons as well as attitudes on smoking. Another study conducted 13 years later among adolescents aged 13 to 15 years concluded that gender-specific difference in prevalence is small and that there is no difference in attitudes on smoking between boys and girls (Global Youth Tobacco Survey Collaborating Group 2003). The study also found that the majority of smokers want to quit smoking while less than one in 10 of the non-smokers express a likelihood of smoking (The Global Youth Tobacco
Survey Collaborating Group 2002). Subsequently, another study in 2002 concluded that more smokers than non-smokers have family members and friends who smoked (Cheong et al. 2003; 2004). Having family members who smoked is a significant predictor of intention to smoke (Cheong et al. 2003).

Schools and family provide positive socialisation (Catalano and Hawkins 1996; Berns 2007). Social integration within these units of society is likely to protect adolescents from risk behaviours. Previous studies among Singaporean adolescents examined prevalence, cognitive and social factors of smoking and non-smoking, but little is known about the relationship between attachment with the various dimensions in the social environment and adolescent smoking.

2.4.2 Lack of data on the interplay of various social factors to adolescent smoking

A public health problem such as smoking is too complex to be understood from one perspective. A comprehensive approach integrating the whole spectrum of social factors is necessary to address the root cause of health risk behaviour (Gochman 1997; Kelehar and Murphy 2004). Different social factors affect behaviour differently, thus resulting in different pathways to health behaviour. Some social factors influence behaviour directly while the others are related to behaviours indirectly. The various studies (Emannuel, Ho and Chen 1990; Global Youth Tobacco Survey Collaborating Group 2002; 2003; Cheong et al. 2003; 2004) on adolescent smoking in Singapore did not explore the complex relationship between social factors and health.
Apart from the lack of data on the interplay of social determinants of smoking, there are also differing theoretical views on the effects of social influence on behaviour. For example, social influence has direct effects on behaviour according to the social learning theory (Bandura 1977) which emphasises on modelling of behaviour. However, outcome expectation and self-efficacy were later included in the extended version of social learning theory to better explain behaviour (Bandura 1986). Social cognitive theory, the extended version of social learning theory postulates that social influence has both direct and indirect effects on behaviour according to the social cognitive theory. Comparatively, the importance of social influence is downplayed in the other social cognitive theories like the Theory of Reasoned Action, Theory of Planned Behaviour and the Health Belief Model (Glantz, Lewis and Rimmer 2004; Gochman 1997; Nutbeam 2004). These theories postulate that social influence affects behaviour indirectly and influences behaviour only through shaping of cognitive constructs.

Hence, in view of the limited number of studies on the direct and indirect effects of determinants of smoking and differing theoretical views on the effects of social influence on smoking behaviour, a study which examines the interplay of social determinants of smoking is needed.

2.5 RESEARCH OBJECTIVES AND THEORETICAL FRAMEWORK
The overarching objective of this research is to examine factors influencing adolescent smoking. Specifically, this research seeks to provide a better understanding of

- the associations among social factors and adolescent smoking; and
- the way social factors shape adolescents’ perceptions of smoking and their behaviour.

This study comprises of two components: a quantitative analysis of smoking influences among Singaporean adolescents and a qualitative research to further explore reasons for adolescent smoking and uncover social processes leading to smoking.

Berkman and Glass’s (2000) conceptual framework which uses a Durkheimian approach to investigate the links between social network to health, will be adapted in the quantitative analysis to explore the complex relationships among a wide range of social factors and smoking. This will provide us with a holistic view of the effects of various levels of social factors on behaviour, without neglecting the broad social environmental factors which are often the root causes of behaviour. The following broad groups of concepts will be used in the proposed model:

1. social structural conditions (gender, ethnicity, age and socioeconomic status);
2. social environmental factors (family factors: parental management and family attachments, school factors: academic performance and school commitment, peers: peer attachment);
3. social network factors (social influence of smoking: proportion of of parent, siblings and friends who smoked);
The proposed model of risk and protective social factors influencing smoking (Figure 7) is based on empirical evidence from literature review and sociological theories. This proposed model will be used to guide quantitative analysis to examine the various pathways to adolescent smoking. In this model, social network factors are embedded in the broader social cultural context. Social network factors in turn impact on social cognitive factors. Social environmental and social network factors shape and influence cognitions, hence are hypotthesised to have direct impact on social cognitions in the proposed model. The proposed model will test if social structural, social environmental and social network factors have direct effects on behaviour.

Within social environmental factors, family factors condition school and peer factors. Family processes such as parental management style has a direct influence on the number of sibling smokers in the family and adolescents’ association with peer smokers. This is based on the empirical evidence which shows that stricter parental management style results in fewer sibling smokers in the family and fewer friends who smoked (Skinner et al. 2009).

The results of quantitative verification of this proposed model are discussed in the next chapter.
Figure 7: Proposed model of risk and protective social factors influencing adolescent smoking

Social environmental factors
- Parental management
- Family attachment
- School commitment

Social structural factors
- Age
- Ethnicity (Chinese vs Non-Chinese)
- Ethnicity (Malays vs Non-malays)
- Socioeconomic status

Social network factors
- Sibling smoking
- Parental smoking
- Peer smoking

Social cognitive factors
- Smoking is harmful to my health
- It is wrong of someone of my age to smoke
- My parents will object if I smoke
- It is difficult to get cigarettes in my neighbourhood

Smoking status
3.1 OVERVIEW OF CHAPTER

The prevalence of smoking among young adult smokers is rising (Ministry of Health 2009) against a backdrop of an on-going comprehensive smoking control programme in Singapore since the mid 1980s. Why do young people smoke knowing that they are putting themselves at risk of the negative consequences of smoking? Literature review on determinants of smoking has shown that factors such as socio-demographic, social network, social environmental and social cognitive factors are related to smoking. However, how do these factors work to influence adolescents’ decision to smoke? This research aims to provide a better understanding of the social factors associated with adolescent smoking behaviour. A structural equation model of risk and protective social factors is proposed to explore the direct and mediating factors associated with adolescent smoking. This chapter presents a quantitative justification of the proposed model.

3.2 PURPOSE

The main purpose of the quantitative analysis is to examine the influence of the various dimensions of social factors on adolescent smoking. With reference to Hirschi (1969)’s social control theory, Catalano and Hawkins’ (1996) social development theory, Berkman and Glass’s (2000) conceptual model on social
network and health, and literature on adolescent smoking (U.S. Department of Health and Human Services 1994; 2001; Tyas et al. 1998), a structural equation model of risk and protective factors of smoking is derived to better understand the associations between social structural factors, social environmental factors, social network factors, social cognitions and health behaviour.

While the overarching objective of this quantitative analysis is to examine the link between various dimensions of social factors to smoking behaviour, the structural equation model hypothesise that higher level of attachment with prosocial establishments such as family and schools will lead to a lower likelihood of smoking. With reference to the proposed structural equation model as shown in Figure 7 of Chapter 2, the following hypotheses will be tested:

(1) **Association between social structural factors and smoking**
   
   (1a) Adolescents of higher socioeconomic status are less likely to smoke;

(2) **Association between school and smoking**

   (2a) Adolescents with stronger school commitment are less likely to smoke;

(3) **Association between family and smoking**

   (3a) Adolescents with more stringent parental management style are less likely to smoke;
   
   (3b) Adolescents with stronger family bonds are less likely to smoke;

(4) **Associations between social network and smoking**

   (4a) Adolescents with parent smokers are more likely to smoke;
   
   (4b) Adolescents with sibling smokers are more likely to smoke;
   
   (4c) Adolescents with friends who smoked are more likely to smoke; and

(5) **Associations between cognitions and smoking**

   (5a) Adolescents with stronger pro-smoking sentiments are more likely to smoke.
3.3 **METHOD**

3.3.1 **Data source and survey processes**

This research on adolescent smoking analysed relevant data from a survey (Health Promotion Board 2007) conducted by the Health Promotion Board among secondary school students in 2006. The objectives of this survey were to determine the prevalence of health behaviours (physical activity, dietary practices, mental wellness, suicide attempts, bullying, binge drinking, smoking and sexual practices) and the social determinants (school, family, peer and neighbourhood) of these health behaviours. As the focus of this thesis is on smoking, only relevant data on smoking and social factors such as socioeconomic status, family, school and peers, would be analysed.

The author of this thesis was responsible for designing, planning and conducting this study. She was involved in study design, questionnaire design, data collection, data analysis and reporting of survey findings. She was also responsible for engaging and reporting survey findings to the various stakeholders such as the Ministry of Education, coordinators from various schools selected for this survey as well as relevant departments in the Health Promotion Board.

3.3.1.1 **Sampling**

Sample size computation and sampling of students were undertaken by the Psychological Assessment and Research Branch from the Ministry of Education
(Ministry of Education 2005). A two-stage cluster sampling method was used in this survey for reasons such as feasibility of conducting fieldwork (Levy and Lemeshow 2008). Additionally, the expected variation between clusters and within clusters is unlikely to have any effect on data analysis as these issues were taken into consideration in the computation of sample size for this study. Participants for this survey were selected from the Ministry of Education’s sampling frame of secondary school students as at January 2006 (Ministry of Education 2005). Secondary schools were first stratified according to the type of schools (government schools, government-aided schools, independent schools). Thereafter, the same number of schools was randomly sampled from each strata of government, government-aided and independent schools. Students were then randomly sampled by academic level across the three strata of schools selected for this survey.

The number of schools and students required in this study was determined based on the need for subgroup analysis by academic levels (lower and upper secondary level), student demographics such as gender, a non-response rate of 20 percent, a margin error of 5 percent and an interclass correlation of 0.05 (Levy and Lemeshow 2008). Based on these criteria, fifty-one schools and 4959 students were required for this survey. The minimum number of students needed for this survey was about 3600, of which 1600 students from lower secondary level (secondary one and two) and 2000 students from upper secondary level (secondary three, four and five) were required.

3.3.1.2 Procedures
Prior to the commencement of fieldwork, informed consent letters were sent to parents of students selected for this survey. Parents who did not agree to their child’s participation in this survey were required to submit an opt-out form which was enclosed in the letter.

A self-administered, structured questionnaire was used in this study. Study participants were informed of the administrative procedures of this survey before the commencement of the survey. Participants were not required to indicate any form of identification on their survey questionnaire. Steps were taken to assure the participants of the confidentiality and anonymity of their responses so as to encourage honest feedback from the participants.

On average, participants completed the survey in 30 minutes. Each participant who completed the survey was given a ‘Post-It’ pad with health messages as a small token of appreciation for participating in the study.

In order to achieve a high response rate and to conduct this survey at the convenience of the schools and students, fieldwork was conducted over an average of five to eight sessions at each school among different respondents.

3.3.1.3 Response rates

All schools selected for this study participated in the survey. The overall response rate of this survey was 87 percent. Seven percent of the selected students opted out from the survey, 4 percent were absent from school on the days which the
survey was conducted and 3 percent had dropped out of school at the time of fieldwork.

A total of 4324 students participated in this survey. As there were insufficient respondents of ‘other ethnicity’ in this study for subgroup analyses, respondents of ‘other ethnicity’ were excluded in data analysis. In addition, as the focus of this analysis is on comparisons of smoking and non-smoking behaviour, ex-smokers were excluded in the analysis. Hence, after excluding 440 participants of other ethnicity and ex-smokers, the effective sample for data analyses in this thesis was 3884.

While it has been universally agreed by researchers that the bigger the sample size, the more stable free parameter estimates are, there are no absolute standards on the relation between sample size and structural equation modelling (Kline 2004). There is no agreement as to what constitutes a large sample size in structural equation modelling due to the amount of complex issues such as psychometric properties of variables, strength of relations between variables among variables, size of model, distributional characteristics of variables and amount of missing cases (Raykov and Marcoulides 2006). A conservative rule of thumb has been suggested for sample size needed for structural equation modelling; a desirable goal is to have a sample size of at least more than 10 times the number of free model parameters (Kline 2004; Raykov and Marcoulides 2006). The effective sample size in this quantitative analysis is thus sufficient for structural equation modelling to be conducted.

3.3.1.4 Questionnaire
The questionnaire was designed with reference to the social control (Hirschi 1969) and social development theory (Catalano and Hawkins 1996) as well as the Adolescent Health and Well-Being Survey conducted in Australia (Bond et al. 2000).

Discussions were conducted with school health promoters of Health Promotion Board to better understand the health issues of school-goers before the design and planning of this study (Health Promotion Board 2004b). Thereafter, several phases of pretesting of survey questionnaire were conducted before its actual implementation. Pretesting included (1) discussions with students to explore if students understood the survey questions, (2) testing of questionnaire format, and (3) pilot testing of the administrative procedures such as time taken to complete the survey, and others. The questionnaire was fine tuned based on feedback and suggestions solicited from pretesting.

The final questionnaire comprised of questions on sociodemographic profile, various health behaviours and practices (e.g. physical activities, dietary practices, mental well-being, suicide attempts, bullying, smoking, binge drinking and sexual practices) as well as items measuring social factors (family, school and peer attachment). Only items pertaining to smoking and social factors were analysed in this research. A copy of the relevant questions used in this thesis is appended in Annex A.

3.3.1.5 Ethics

The final questionnaire and study method were approved by the Health Promotion Board Ethics Committee. Audits were conducted by members of this
committee in order to ensure that appropriate processes were in place without violating the code of research ethics.

3.3.2 Analysis

Mplus version 5.2 (Muthén and Muthén 2007) was used in the data analysis. Clustering effect as a result of cluster sampling was analysed using the “type=complex” function. Using this function, standard errors were adjusted taking into account non-independence of observations due to cluster sampling (Asparouhov 2005; 2006). Missing data were handled using full information maximum likelihood estimation (Schafer and Graham 2002). As there were ordinal dependent variables in the model, the weighted least square (WLSMV) parameter estimate which used a diagonal weight matrix for standard errors and means- and variance- adjusted chi-square statistic (Muthén and Muthén 2007), was used. The WLSMV estimation method also corrected for non-normality of variables in the analysis.

When conducting bivariate analyses, differences in proportions of sibling and parent smokers by smoking status were assessed using tetrachoric and polychoric correlations while analysis of variance (ANOVA) was used to ascertain differences in mean levels between age by smoking status. Differences between means of latent variables6 (“socioeconomic status”, “parental management”, “family attachment”, “peer attachment” and “school commitment”) by smoking status were assessed using structural equation modelling approach (Raykov 2001).

---

6 Latent variables are constructs of interest in a study. Such variables are not measured directly as they are not directly observable (Raykov & Marcoulides, 2006).
At the multivariate level, structural equation modelling which takes into account measurement errors while testing the complex relationship among variables simultaneously (Raykov and Marcoulides 2006) was conducted to test the proposed model of adolescent smoking influences. Gender-specific analysis was conducted by running structural equation modelling separately by gender. A two-step approach was used in the multiple group structural equation modelling (Anderson and Gerbing 1988). In the first step, a confirmatory factor analysis was conducted to determine the validity of latent variables such as “socioeconomic status”, “parental management”, “family attachment”, “school commitment” and “peer attachment”. Reliability coefficients were also computed for each of these latent variables to assess how well the latent variables are measured by the factor items. Latent variables with reliability estimates of around 0.7 were considered acceptable (Lance, Butts and Michels 2006). Tests of measurement invariance were also conducted to assess if latent variables were measured in the same form and to the same extent for boys and girls. In the second step, the proposed model was assessed. The chi-square test was used to determine how well the data fitted the proposed model. However, as chi-square test is contingent on sample size (Hoyle and Panter 1995), other indicators used in this analysis to evaluate model fit were also used. The comparative fit index (CFI), the Tucker-Lewis index (TFI) and the root mean squared error of approximation (RMSEA) were used. CFI assesses the improvements in fit in the proposed structural equation model compared with a baseline model/ null model which assumes zero population covariance among observed variables (Raykov and Marcoulides 2006). TFI compares the lack of fit of the proposed model to that of a baseline model. Its value estimates the relative improvement per degree of freedom of the proposed model over a baseline model (Hoyle and Panter 1995). RMSEA measures the error of
approximation which concerns the lack of fit of the proposed SEM to the population covariance matrix (Raykov and Marcoulides 2006). As recommended by Hu and Bentler (1999), CFI and TFI of 0.95 and above and RMSEA value of below 0.05 are considered indicators of good model fit.

3.3.3 Measurement

3.3.3.1 Demographic variables

Data on gender, age, ethnicity, type of housing and parents’ educational level were collected. Data on ethnicity was a nominal three-category variable which includes Chinese, Malays and Indians. This variable was coded into two dummy variables, namely “Chinese vs non-Chinese” and “Malays vs non-Malays” in this data analysis.

Data on housing type was a five-category variable ranging from “1-3 room flats” to “condominiums/ private flats/ apartments/ terrace/ semi-detached houses/ bungalows” while parents’ educational level was a six-category variable ranging from “no schooling” to “postgraduate degree”. As the socioeconomic status of parents influences the type of environment which children and adolescents grow in, learn and develop (Lynch and Kaplan 2000), data on housing type and parents’ educational level were grouped as a composite measure of respondents’ socioeconomic status. Scores ranged from three to fifteen. Higher scores indicate higher socioeconomic status. The reliability of this variable was 0.7.

3.3.3.2 Smoking status
Self-reported smoking status was coded as a binary variable. Participants who reported ever smoking but have not stopped smoking were classified as smokers while those who had never ever smoked were grouped as non-smokers.

3.3.3.3 Smoking influence

As adolescents’ main sources of smoking influence were their family members and friends (Tyas et al. 1998; U.S. Department of Health and Human Services 1994; 2001), this study measured risk factors of smoking through respondents’ self report of parental, sibling and peer smoking. Parental smoking was measured by a question, “Do your parents smoke?” and the reply response was coded as a continuous variable with “0” indicating none of the parents smoke, ‘1’ indicating either one of the parent smoke and ‘2’ being both parents smoke. Another question, “Do/ does any of your older brother(s) or sister(s) smoke?” was asked to assess if respondents have any siblings who smoke. The reply response was binary coded as “1” indicating “brother(s) and/ or sister(s) smoked” and “0” indicating “no sibling smoked”. Peer smoking was measured by a question, “Do any of your close friends smoke cigarettes?” on a five-point Likert scale, with “1” representing “none of them” to “5” being “all of them”.

3.3.3.4 Parental management

In this study, parental management measured adolescents’ perceptions of their parents’ awareness of their activities, whereabouts and their friends. This measure was fine tuned based on Li, Pentz and Chou’s (2000) parental management scale. This construct was a composite of four statements measured on a four-point likert scale, ranging from “1” indicating “strongly disagree” to “4” representing “strongly
agree”. The four statements were: (1) my parents expect me to call home if I am going to be late in going home; (2) when I am not at home, at least one of my parents will know where I am; (3) when I am not at home, at least one of my parents will know who I am with; and (4) my parents would know if I didn’t come home on time. Scores ranged from four to sixteen, with higher scores representing stricter parental control. The reliability coefficient of this construct was 0.8.

3.3.3.5 Family attachment

In this study, participants with strong family attachment are assumed to be well integrated within their family. Family attachment measured family bonding which was operationalised through the extent to which adolescents viewed their parents as being supportive and themselves as being close to their parents. Five items measured family attachment on a four-point likert scale ranging from “1” disagree to “4” strongly agree. The items were: (1) I am close to my father; (2) I am close to my mother; (3) I enjoy spending time with my family; (4) if I have a personal problem I could ask my mother or father for help; and (5) I feel that my parents are always available to listen to me. Scores ranged from five to twenty, with higher scores indicating higher family attachment. The reliability coefficient for this construct was 0.8.

3.3.3.6 School commitment

Hirischi (1969) hypothesised that strong attachment with prosocial establishments will lead to commitment in conventional lines of action of those prosocial establishments. School commitment measured adolescents’ engagement in school which was also translated into their commitment to academic learning. This
construct was measured by four questions. These questions include: (1) how interesting are most of your school subjects to you?; (2) how important do you think the things you are learning in school are going to be for your future?; (3) thinking back over the past year, how often did you enjoy being in school?; and (4) thinking back over the past year, how often did you try to do your best in school? Response fell along a five-point likert scale, ranging from “1”= strongly disagree to “5”= strongly agree. Higher scores represent higher level of school commitment. The reliability of this scale is 0.7.

3.3.3.7 Academic performance

Academic performance was self-reported by respondents in this study. This was measured by a question, “how would you rate your school results in the past year?”, in a five-point likert scale from “1”= very good to “5”=very poor.

3.3.3.8 Peer attachment

Peer attachment measured adolescents’ perceived level of peer support. This construct was measured by two statements: (1) my friends seem to understand my problems; and (2) my friends help me as much as I need. These statements were measured on a four-point likert scale with “1” representing “never” and “4” representing “always”. Total scores ranged from three to twelve, with higher score indicating higher level of peer attachment.

3.3.3.9 Smoking-related social cognitions

In this study, social cognitions comprised of attitudes on smoking, perceived social norm of smoking, perceived parental approval and perceived availability of
cigarettes. These items were: (1) smoking is harmful to my health; (2) how wrong do you think it is for someone of your age to smoke; (3) how wrong do your parents feel it would be for you to smoke cigarettes; and (4) I can get cigarettes easily in my neighbourhood. Each of these four items was measured and assessed separately on a four-point likert scale with higher score representing higher level of agreement. The last item was reversed coded such that higher score indicates strong agreement that it is not easy to get cigarettes in their neighbourhood.

3.4 RESULTS

3.4.1 About the sample

There are more boys than girls in this sample. More than half (52.7 percent) of the participants are boys while 47.3 percent of the participants are girls. The ethnic distribution of participants reflects the ethnic composition of the general population (Ministry of Trade and Industry, 2005). Seven in ten (70.4 percent) of the participants are Chinese, more than one-fifth (21.4 percent) are Malays and less than one-tenth (8.1 percent) are Indians. The distribution of participants by ethnicity is similar between boys and girls (Table 8). Male and female participants are of the same mean age. As shown in Table 8, the mean scores measuring socioeconomic status are similar by gender, indicating that the socioeconomic status is comparable among boys and girls.
Table 8: Profile of respondents

<table>
<thead>
<tr>
<th>Characteristics</th>
<th>Gender</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Girls n=1839</td>
<td>Boys n= 2045</td>
<td>All n=3884</td>
</tr>
<tr>
<td>Ethnicity (n,%)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Chinese</td>
<td>1273 (69.2%)</td>
<td>1463 (71.5%)</td>
<td>2736 (70.4%)</td>
</tr>
<tr>
<td>Malay</td>
<td>391 (21.3%)</td>
<td>441 (21.6%)</td>
<td>832 (21.4%)</td>
</tr>
<tr>
<td>Indian</td>
<td>175 (9.5%)</td>
<td>141 (6.9%)</td>
<td>316 (8.1%)</td>
</tr>
<tr>
<td>All</td>
<td>1839 (100.0%)</td>
<td>2045 (100.0%)</td>
<td>3834 (100.0%)</td>
</tr>
<tr>
<td>Age (mean, SE)</td>
<td>14.6 (0.03)</td>
<td>14.7 (0.03)</td>
<td>14.7 (0.02)</td>
</tr>
<tr>
<td>Socioeconomic status (mean, SE)†</td>
<td>7.2 (0.07)</td>
<td>7.2 (0.07)</td>
<td>7.2 (0.05)</td>
</tr>
</tbody>
</table>

Scores for socioeconomic status ranged from 3 to 15, higher scores indicate higher socioeconomic status.

More than one-tenth (13.9 percent) of the participants are smokers. The prevalence of smoking is higher among boys (16.9 percent) than girls (10.5 percent) (Figure 8). Table 9 shows that the distribution of participants by ethnicity and smoking status are somewhat similar among boys and girls. There appears to be a higher proportion of Malays than Chinese or Indians among the smokers. Smokers have a higher mean age but lower socioeconomic status than non-smokers. A similar pattern is observed by gender.
Figure 8: Distribution of respondents by gender and smoking status
Table 9: Characteristics of respondents by smoking status, n (%)

<table>
<thead>
<tr>
<th>Gender</th>
<th>Characteristics</th>
<th>Smoking status</th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>Smokers</td>
<td>Non-smokers</td>
<td>All</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Girls n=1839</td>
<td>Ethnicity* (n,%)</td>
<td>Chinese</td>
<td>82 (42.3%)</td>
<td>1191 (72.4%)</td>
<td>1273 (69.2%)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Malay</td>
<td>91 (46.9%)</td>
<td>300 (18.2%)</td>
<td>391 (21.3%)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Indian</td>
<td>21 (10.8%)</td>
<td>154 (9.4%)</td>
<td>175 (9.5%)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>All</td>
<td>194 (100.0%)</td>
<td>1645 (100.0%)</td>
<td>1839 (100.0%)</td>
</tr>
<tr>
<td></td>
<td>Age (mean, SE)*</td>
<td></td>
<td>15.2 (0.10)</td>
<td>14.6 (0.04)</td>
<td>14.6 (0.03)</td>
</tr>
<tr>
<td></td>
<td>Socioeconomic status† (mean, SE)*</td>
<td>Chinese</td>
<td>147 (42.5%)</td>
<td>1316 (77.5%)</td>
<td>1463 (71.5%)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Malay</td>
<td>174 (50.3%)</td>
<td>267 (15.7%)</td>
<td>441 (21.6%)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Indian</td>
<td>25 (7.2%)</td>
<td>116 (6.8%)</td>
<td>141 (6.9%)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>All</td>
<td>346 (100.0%)</td>
<td>1699 (100.0%)</td>
<td>2045 (100.0%)</td>
</tr>
<tr>
<td></td>
<td>Age (mean, SE)*</td>
<td></td>
<td>15.5 (0.07)</td>
<td>14.5 (0.03)</td>
<td>14.7 (0.03)</td>
</tr>
<tr>
<td></td>
<td>Socioeconomic status† (mean, SE)*</td>
<td>Chinese</td>
<td>6.1 (0.15)</td>
<td>7.3 (0.07)</td>
<td>7.2 (0.07)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Malay</td>
<td>6.6 (0.15)</td>
<td>7.3 (0.07)</td>
<td>7.2 (0.07)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Indian</td>
<td>6.1 (0.15)</td>
<td>7.3 (0.07)</td>
<td>7.2 (0.07)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>All</td>
<td>6.2 (0.14)</td>
<td>7.4 (0.07)</td>
<td>7.2 (0.07)</td>
</tr>
</tbody>
</table>

†Scores for social class ranged from 3 to 15, higher scores indicate higher social class

*p<0.001

3.4.2 Who are at risk?

Adolescents at risk of smoking tend to have a bigger social network of smokers (Table 10) and are less connected to their family and schools (Table 11). A similar pattern is observed by gender. There is a higher proportion of smokers than non-smokers with siblings or parents who smoke. Smokers also have proportionately more smoking friends than non-smokers. Collectively, 6.2 percent of the participants (6.5 percent of female participants and 6.0 percent of male participants) have one or both parents, at least one sibling and a friend who smoke. As compared to male
smokers, female smokers have more family members who smoke. A higher proportion of female smokers than male smokers have at least one sibling who smokes. Similarly, female smokers also have a higher proportion of parents who smoke (Table 10).

Table 10: Peer, sibling and parental smoking by smoking status, n (%)  

<table>
<thead>
<tr>
<th>Gender</th>
<th>Characteristics</th>
<th>Smoking status</th>
<th>Smoking status</th>
<th>Smoking status</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Smokers</td>
<td>Non-smokers</td>
<td>All</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(n,% )</td>
<td>(n,% )</td>
<td>(n,% )</td>
</tr>
<tr>
<td>Girls</td>
<td>Sibling smoking‡</td>
<td>No sibling smoke/ No brothers or sisters</td>
<td>98 (51.9%)</td>
<td>1426 (89.3%)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Brother(s) or sister(s) smoke</td>
<td>91 (48.1%)</td>
<td>170 (10.7%)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>All</td>
<td>189 (100.0%)</td>
<td>1596 (100.0%)</td>
</tr>
<tr>
<td></td>
<td>Parental smoking (n,% ) †</td>
<td>None of parents smoke</td>
<td>66 (34.7%)</td>
<td>1087 (67.1%)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>One parent smoke</td>
<td>100 (52.6%)</td>
<td>487 (30.1%)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Both parents smoke</td>
<td>24 (12.6%)</td>
<td>45 (2.8%)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>All</td>
<td>190 (100.0%)</td>
<td>1619 (100.0%)</td>
</tr>
<tr>
<td>Boys</td>
<td>Sibling smoking‡‡</td>
<td>No sibling smoke/ No brothers or sisters</td>
<td>204 (63.4%)</td>
<td>1485 (90.3%)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Brother(s) or sister(s) smoke</td>
<td>118 (36.6%)</td>
<td>159 (9.7%)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>All</td>
<td>322 (100.0%)</td>
<td>1644 (100.0%)</td>
</tr>
<tr>
<td></td>
<td>Parental smoking (n,% ) ††</td>
<td>None of parents smoke</td>
<td>153 (45.8%)</td>
<td>1160 (69.7%)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>One parent smoke</td>
<td>158 (47.3%)</td>
<td>472 (28.3%)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Both parents smoke</td>
<td>23 (6.9%)</td>
<td>33 (2.0%)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>All</td>
<td>334 (100.0%)</td>
<td>1665 (100.0%)</td>
</tr>
<tr>
<td></td>
<td>Peer smoking (mean, SE)*</td>
<td></td>
<td>2.7 (0.08)</td>
<td>1.4 (0.01)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Boys</td>
<td>3.0 (0.06)</td>
<td>1.5 (0.02)</td>
</tr>
</tbody>
</table>
Tetrachoric correlation coefficient between sibling smoking and smoking status = -0.589. There is a significant relationship between sibling smoking and smoking status.

Polychoric correlation coefficient between parental smoking and smoking status = -0.413. There is a significant relationship between sibling smoking and smoking status.

Apart from having more family members and friends who smoke, male and female smokers alike, have lower scores on “parental management”, “family attachment” and “school commitment” than non-smokers (Table 11). This suggests that in comparison to non-smokers, parents of smoking adolescents are less likely to be aware of their activities, whereabouts and friends. Smokers are also less attached to their family and less engaged to their school as compared to non-smokers. However, smokers are as attached to their peers as non-smokers (Table 11).
Table 11: Scores on parental management (mean, SE), family attachment (mean, SE), peer attachment (mean, SE) and school commitment (mean, SE)

<table>
<thead>
<tr>
<th>Gender</th>
<th>Smoking status</th>
<th>All</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Smoking status</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Smokers</td>
<td>Non-smokers</td>
</tr>
<tr>
<td>Girls</td>
<td>n=1839</td>
<td>Parental management† (mean, SE)*</td>
</tr>
<tr>
<td></td>
<td>Family attachment†† (mean, SE)*</td>
<td>12.4 (0.28)</td>
</tr>
<tr>
<td></td>
<td>Peer attachment††† (mean, SE)</td>
<td>5.7 (0.12)</td>
</tr>
<tr>
<td></td>
<td>School commitment†††† (mean, SE)*</td>
<td>14.4 (0.22)</td>
</tr>
<tr>
<td></td>
<td>Academic performance††††† (mean, SE)</td>
<td>3.1 (0.08)</td>
</tr>
<tr>
<td>Boys</td>
<td>n=2045</td>
<td>Parental management† (mean, SE)*</td>
</tr>
<tr>
<td></td>
<td>Family attachment†† (mean, SE)*</td>
<td>13.5 (0.19)</td>
</tr>
<tr>
<td></td>
<td>Peer attachment††† (mean, SE)</td>
<td>5.2 (0.08)</td>
</tr>
<tr>
<td></td>
<td>School commitment†††† (mean, SE)*</td>
<td>14.6 (0.16)</td>
</tr>
<tr>
<td></td>
<td>Academic performance††††† (mean, SE)</td>
<td>3.2 (0.06)</td>
</tr>
</tbody>
</table>

*p<0.001
†Scores for parental management ranged from 4 to 16. Higher scores indicate stricter parental control.
††Scores for family attachment ranged from 5 to 20. Higher scores indicate higher level of family attachment.
†††Scores for peer attachment ranged from 3 to 12. Higher scores indicate higher level of peer attachment.
††††Scores for school commitment ranged from 5 to 20. Higher scores indicate higher level of school commitment.
†††††Self-reported academic performance. Scores ranged from 1 to 5. Higher scores indicate better level of academic performance.

Girls are more bonded to non-smoking parents than smoking parents (Table 12). Further analysis by smoking status among smoking girls show that their parents’ smoking status does not have any effect on their level of family attachment.
Conversely, non-smoking girls are more bonded to non-smoking parents. A different pattern is observed among the boys (Table 12). Parents’ smoking status does not have an effect on boys’ level of family bonding.

**Table 12: Associations between family attachment (mean, SE) and parental smoking**

<table>
<thead>
<tr>
<th>Gender</th>
<th>Parental smoking</th>
<th>Family attachment scores among…</th>
<th>All</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Smokers</td>
<td>Non-smokers</td>
</tr>
<tr>
<td>Girls</td>
<td>Parents do not smoke</td>
<td>12.8 (0.47)</td>
<td>14.5 (0.10)*</td>
</tr>
<tr>
<td></td>
<td>At least one parent smoked</td>
<td>12.2 (0.35)</td>
<td>13.8 (0.16)</td>
</tr>
<tr>
<td>Boys</td>
<td>Parents do not smoke</td>
<td>13.9 (0.27)</td>
<td>14.4 (0.10)</td>
</tr>
<tr>
<td></td>
<td>At least one parent smoked</td>
<td>13.2 (0.28)</td>
<td>14.3 (0.15)</td>
</tr>
</tbody>
</table>

*p<0.05; Reference group: at least one parent smoked (among female non-smokers)

**p<0.001; Reference group: at least one parent smoked (among female participants)**

Findings from bivariate analyses concur with literature review which shows that social conditions have an association with smoking status. Why does an individual’s socioeconomic background, ethnicity and social environment predispose him to at risk behaviour? The following section presents findings on structural equation modelling which provides a better understanding of the associations between social factors and smoking status. Structural equation modelling was conducted separately by gender as bivariate analyses suggest that there is a gendered path for smoking. Structural equation modelling by ethnicity was also conducted to examine if there are ethnic cultural differences in factors associated with smoking status.
3.4.3 A model of smoking influence

Two structural equation models by gender, with smoking status (smokers versus non-smokers) as the outcome variable and four sets of social factors as independent variables were conducted. The broad social factors include (1) social structural factors such as ethnicity, age and socioeconomic status; (2) social environmental factors which includes three main socialising units for adolescents: school, family and friends; (3) social network factors which measures social influence to smoking: parental smoking, sibling smoking and peer smoking; and (4) social cognitions on smoking.

Structural equation modelling which takes into account cluster sampling and missing observations, was subsequently conducted to determine mediating and direct factors associated with smoking. Data analyses were conducted in two stages. Firstly, a multiple-group structural equation modelling was conducted to assess measurement invariance (van der Vijver and Leung 1997) by gender. This was done to examine if the latent variables measure the same concept (form invariance) to the same extent (factorial invariance) among male and female participants. In assessing form invariance, findings show that the model fits the data well at CFI=0.99, TFI=0.99 and RMSEA=0.04. The chi-square test for assessing factorial invariance shows that p=0.0037. As chi-square tests are sensitive to big sample sizes, the goodness of fit indices were also used as references to determine if the model is factorial invariant. At CFI=0.99, TFI=0.99 and RMSEA=0.04, the model is factorial invariant; it measures the latent constructs to the same extent in both groups. Next, the structural
The model was assessed. The data fits the model well at CFI=0.97, TFI=0.97, RMSEA=0.04.

The above analysis was repeated by ethnicity. Findings show that direct and mediating factors associated with smoking status by ethnicity are not different from gender-specific analysis. In addition, as an individual’s ethnicity does not predispose him to at risk behaviour, it is his socio-economic status and social environment which puts him at risk, this chapter will focus on findings by gender, of which ethnicity effects are included in gender analysis. The full structural equation models are annexed in ANNEX 2 and 3. Structural equation models shown in Figure 9 and 10 in this chapter are simplified version.

Before going into detailed description of the results from structural equation modelling, this paragraph will provide readers with a short overview of the results of analysis. Although age has a direct association with boys’ smoking status, social structural factors such as socioeconomic status and ethnicity do not influence smoking status directly. It conditions adolescents’ social environment and social network of smoking influence. Adolescents from lower socioeconomic status have less strict parents and a bigger social network of smokers than those of higher socioeconomic status. Social environmental factors shape adolescents’ cognitions on smoking. Among all the social environmental variables examined in this analysis, school has the most consistent direct effect on cognitions. School is an anti-smoking establishment. By attaching and engaging themselves in activities of such an establishment, students are embracing anti-smoking sentiments. Therefore, attachment to establishments with anti-smoking norms will influence adolescents’
perceptions and prevent them from taking up smoking. On the contrary, adolescents
with a bigger social network of smokers tend to have pro-smoking sentiments.
Findings show that smoking friends exert a stronger smoking influence on
adolescents than parent smokers. Some gender-specific differences in pathways to
smoking status are observed and will be highlighted in the next section.

3.4.3.1 Structural equation model of smoking influence among girls

Figure 9 shows the standardised estimates of the structural equation models
among girls. All paths shown in the figures are statistically significant except for
paths from dummy variables on ethnicity. All other statistically insignificant paths
(p>0.05) are not shown.
Figure 9: Structural equation model (with standardised estimates) of risk and protective factors influencing smoking among Singaporean adolescent girls.
Social structural factors in this analysis have indirect effects on smoking status among girls. There are ethnic cultural influences on parenting style. The effects of “ethnicity” on “parental management” and social network factors are mediated by “socioeconomic status”. “Socioeconomic status” in turn has positive association with “parental management” but negative associations with “parental, sibling and peer smoking”. Girls of higher socioeconomic status have parents with more stringent parental management style. Comparatively, those from lower socioeconomic status are more likely to have parents, siblings and friends who smoke. Malay students tend to have parents, siblings and friends who smoke as compared to non-Malay students.

The effect of age on smoking status is mediated by “parental management”, “peer attachment”, “sibling smoking” and “peer smoking”, as well as cognitive factors. This indicates that parents are less strict with older girls and older girls are more attached to their friends. Chances of them having siblings and friends who smoke also increase with age. In addition, age has a positive association with “smoking is harmful to health” and this suggests that girls who are older are more likely to be aware of the adverse health effects of smoking.

As hypothesised, “school commitment” has direct associations with “parental management”, “family attachment”, “peer attachment” and “academic achievement”. Findings suggest that girls who are more attached to their family have stronger bonds with their friends, better academic performance and stronger engagement in school. While social environmental factors do not have direct effects on smoking status, factors such as “parental management” and “school commitment” have direct positive associations with cognitive factors. Girls with stricter parents and those who are
committed to their academic studies tend to have anti-smoking sentiments. “Peer attachment” is negatively associated with cognitive variable such as “it is wrong for someone of my age to smoke”. Girls with strong peer bonding are less likely to feel that it is wrong for them to smoke. In addition, “parental management” impacts on sibling and peer smoking directly, indicating that girls with parents of strict parental management style have fewer siblings and friends who smoke.

Girls with siblings and friends who smoke are likely to smoke too. However, parental smoking has indirect influence on participants’ behaviour. Its effects on smoking status are mediated by “sibling smoking” and cognitive factors. Findings show that girls with parents who smoke are also likely to have siblings who are smokers. Girls with parents, sibling and peers who smoke have favourable perceptions of smoking.

Only two of the four cognitive factors supported the hypothesis on associations between cognitive factors and smoking status. “Smoking is harmful to health” and “it is wrong for someone of my age to smoke”, are negatively associated with smoking status. Girls who agree strongly that smoking is harmful and that it is wrong for someone of their age to smoke are less likely to smoke.

3.4.3.2 Structural equation model of smoking influence among boys

The structural equation model among boys is shown in Figure 10. Social structural factors have both direct and mediating effects on smoking status among boys. There are cultural effects on parenting style. Ethnic differences on socioeconomic status are also observed. Malays have lower socioeconomic status
Figure 10: Structural equation model (with standardised estimates) of risk and protective factors influencing smoking among Singaporean adolescent boys

* p<0.05, ** p<0.01, *** p<0.001
than non-Malays. Malays are more likely than non-Malays to have parents, siblings and friends who smoke. Boys of lower socioeconomic status have a bigger social network of smokers and feel that it is difficult to get cigarettes in their neighbourhood. Age has both direct and indirect associations with boys’ smoking status. As their age increase, boys’ parents are less strict about their whereabouts, activities and who they go out with. However, they are less attached to their family as they are older. The likelihood of their sibling and friends picking up smoking increases with age and so is the likelihood of them smoking.

“Parental management”, “family attachment”, “peer attachment” and “academic achievement” have direct effects on “school commitment”. Thus when boys are close to their family, they tend to have close bonding with their friends. They perform better in their studies and are more committed to their schools. “School commitment” in turn has positive associations with cognitive factors. Participants who are involved in school activities and committed to academic learning tend to have negative perceptions of smoking. Boys who are bonded to their families feel that “it is wrong to for someone of my age to smoke”.

Boys with sibling and parent smokers tend to smoke and have positive perceptions of smoking. However, friends’ smoking status influences boys’ perceptions of smoking and their smoking status directly.

The hypothesis on associations between cognitive factors and smoking status is supported. Cognitive factors are the most proximal factors to smoking status. All four cognitive factors are negatively associated with smoking status, suggesting that
boys who think that smoking is harmful to their health, that it is wrong for someone of their age to smoke, that parents will object to their smoking and that it is difficult to get cigarettes in their neighbourhood, are less likely to smoke.

3.4.3.3 Gender-specific differences in pathways to smoking

Some differences in the various pathways from social structural, social environmental, social network and social cognitions to smoking status are observed by gender. This also results in varying effects of these factors by gender. Family influence has stronger influence on smoking status among the girls than boys. As shown in Table 13, the total effects of sibling and parental smoking on smoking status seems to be higher among girls than boys, suggesting that negative smoking influence from siblings and parents are stronger on girls than boys. Girls are more likely to smoke if someone in the family smokes. However, girls are more strictly monitored by their parents as compared to boys. On the contrary, the total effect of school commitment on smoking status was two times higher among boys than girls. Thus, school has a higher protective effect on boys than girls. In terms of cognitive factors, parental approval and accessibility of cigarettes are associated with smoking status only among boys. As for social structural factors, age has a stronger effect on smoking status among boys than girls. Boys are at higher risk of smoking as their age increase. Comparatively, socioeconomic status has a stronger association with smoking status among girls than boys.
Table 13: Total standardised effects of social structural, social environmental, social network and social cognitive factors on smoking status

<table>
<thead>
<tr>
<th>Social factors</th>
<th>Gender</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Boys</td>
<td>Girls</td>
<td></td>
</tr>
<tr>
<td>Social network factors</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Peer smoking</td>
<td>0.44</td>
<td>0.40</td>
<td></td>
</tr>
<tr>
<td>Sibling smoking</td>
<td>0.32</td>
<td>0.38</td>
<td></td>
</tr>
<tr>
<td>Parental smoking</td>
<td>0.11</td>
<td>0.13</td>
<td></td>
</tr>
<tr>
<td>Social environmental factors</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>School commitment</td>
<td>-0.32</td>
<td>-0.16</td>
<td></td>
</tr>
<tr>
<td>Family attachment</td>
<td>-0.10</td>
<td>-0.04</td>
<td></td>
</tr>
<tr>
<td>Parental monitoring</td>
<td>-0.19</td>
<td>-0.27</td>
<td></td>
</tr>
<tr>
<td>Peer attachment</td>
<td>-0.04</td>
<td>-0.13</td>
<td></td>
</tr>
<tr>
<td>Academic achievement</td>
<td>-0.10</td>
<td>-0.06</td>
<td></td>
</tr>
<tr>
<td>Social cognitive factors</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>“Smoking is harmful to my health”</td>
<td>-0.18</td>
<td>-0.16</td>
<td></td>
</tr>
<tr>
<td>“It is wrong for someone of my age to smoke”</td>
<td>-0.31</td>
<td>-0.26</td>
<td></td>
</tr>
<tr>
<td>“My parents will object if I smoke”</td>
<td>-0.16</td>
<td>NA</td>
<td></td>
</tr>
<tr>
<td>“It is difficult to get cigarettes in my neighbourhood”</td>
<td>-0.17</td>
<td>NA</td>
<td></td>
</tr>
<tr>
<td>Social structural factors</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Age</td>
<td>0.33</td>
<td>0.10</td>
<td></td>
</tr>
<tr>
<td>Ethnicity (Chinese vs non-Chinese)</td>
<td>-0.12</td>
<td>-0.06</td>
<td></td>
</tr>
<tr>
<td>Ethnicity (Malays vs non-Malays)</td>
<td>0.19</td>
<td>0.21</td>
<td></td>
</tr>
<tr>
<td>Socioeconomic status</td>
<td>-0.18</td>
<td>-0.24</td>
<td></td>
</tr>
</tbody>
</table>

NA: The pathway from this factor to smoking status is not statistically significant among girls.

3.5 DISCUSSION

The intention of this quantitative analysis is to examine the ways which social factors impact on smoking behaviour of adolescents. Results from structural equation modelling show that Singaporean adolescent smoking behaviour is in line with the theoretical viewpoints of sociologists (Durkheim 1951; Hirischi 1969; Catalano and Hawkins 1996; Link and Phelan 1995; Berkman and Glass 2000). An individual’s attachment to his social environment is key to determine his engagement in health promoting or health risk behaviour. While social structural factors determine his life circumstances and exposures to risk factors, the social environment influences social cognitive factors directly and shapes his health behaviour (Link and Phelan 1995; Berkman and Glass 2000). Family and school play social policing roles and influence...
adolescents’ anti-social smoking sentiments. Influence from friends may be ambiguous and could go either direction in influencing adolescent smoking. The effects of various social factors examined in this study will be discussed at length in the following paragraphs. Discussion will begin with the social factor which has the strongest effect on smoking behaviour.

This study shows that friends have the strongest smoking influence on adolescents. The likelihood of adolescents taking up smoking increases directly with the number of friends who smoke. This is because friends take on greater importance during adolescence (Sherman, De Vries and Lansford 2000). As time spent with friends increases at this stage of adolescent development (Gavin and Furman 1989), friends become adolescents’ preferred social network members over their families (Berns 2007) because interaction with friends are more enjoyable, and less restrictive and controlling (Adams 1986). Friends, thus, exert more influence on adolescents than family members (Berns 2007; Mercken, Candel and Willems 2009).

Adolescents tend to mix with like-minded friends (Berns 2007; Byrne and Griffitt 1973). In the process of doing so, they share common activities with their friends in their transitions from the stages of preadolescence to adolescence and from adolescence to young adulthood. For instance, the level of school involvement such as academic aspirations, academic performance, time spent on school work, frequency of truancy and others have been found to be similar among close friends (Gullota, Adams and Markstrom 1999). Similarly, those who engage in risk behaviours tend to have friends who share the same behaviour. Young smokers identify with friends
from the same background and social environment where social conditions put them at risk of smoking.

Adolescents are more likely to learn smoking from friends who are like themselves (Berns 2007; Byrne and Griffitt 1973; Mercken, Candel and Willems 2009) than parents because they perceive parents as social policemen even if their parents are smokers. Adolescents acquire the smoking behaviour through socialisation mechanisms such as observing and learning from their smoking friends (Bandura 1977). The next chapter will present findings from the qualitative study which will show how smoking is a socially learnt behaviour especially in the initial stage before addiction sets in.

Smoking brings about several social benefits to the smokers and these are positive reinforcements which motivate them to continue smoking. For instance, firstly, smoking has symbolic meanings to the adolescents; it signifies maturity or an expression of being anti-conventional, cool, macho and others (Allbutt, Amos and Cunningham-Burley 1995; Amos et al. 1997; Amos and Bostock, 2007). Secondly, association with smoking friends is not confined within physiological addiction or smoking habit. Smoking with friends brings along a whole package of sociability; opportunities to meet new friends, building friendships and sharing of problems with like-minded friends (Fry et al. 2008). Thirdly, smoking symbolises acceptance and conformity to peer groups (Taylor, Peplau and Sears 2006). Sharing a similar behaviour or habit brings about a new identity which adolescents desire and provides them with a sense of belonging to their peer group. Fourthly, smoking and drinking at social contexts such as clubbing and partying may be perceived as a desired youth
culture (Fry et al. 2008; Poland, Frohlich and Haines 2006). In addition, smoking may be perceived as a way to relieve negative emotions and stress even though it is a physiological effect of the addictive properties of cigarette.

Friends influence and shape adolescents’ social cognitions and psychological developments. Adolescents’ pro-smoking perceptions increase with the number of smoking friends. The number of smoking friends has the strongest association with adolescents’ perception that smoking is not wrong for someone of their age. This is because the number of smoking friends reflects the prevalence of smoking and the social norm of smoking within their social circle. The more smoking friends an adolescent has, the stronger the social norm of smoking in his or her social circle. Hence, from the adolescents’ perspective, it is not wrong to smoke since the act of doing so conforms to the prevailing social norm in their social network.

However, friends can have negative or positive impact on adolescents’ behaviour, depending on the preponderance for risk and non-risk behaviours among the peer group (Catalano and Hawkins 1996). Friends provide companionship and social support, and these have important implications on adolescents’ psychological and social development (Townsend, McCracken and Wilton 1988). Adolescents are dependent on friends for basic needs such as sense of belonging to a group, social interaction and development of personal identity (Berns 2007). They turn to their friends with regard to decisions such as social activities, dating, clothings, grooming and others (Sebald 1992). Therefore, with good peer support and positive influence, adolescents are likely to engage in conventional activities such as schooling and less likely to engage in at risk behaviours. A study conducted by Cauce (1986) concluded
that adolescents’ perceived emotional support from friends is associated with their school performance. The present study also found that the more closely bonded adolescents are with their peers, the higher likelihood of commitment and engagement to their schools.

Apart from friends, family members also play an important role in influencing adolescents’ smoking behaviour. Among the family members, sibling smokers have greater influence than parent smokers on adolescent smoking. This is because siblings play dual role; they are family members as well as friends to their co-siblings (Berns 2007). Siblings have significant influence over their co-siblings (Harakeh et al. 2007). They are role models for smoking and provide opportunities for siblings to learn smoking and shape their siblings’ social cognitions on smoking. In addition, the presence of a sibling smoker may result in adolescents’ perceived parental permissiveness for smoking and their perceptions that smoking is not wrong for someone of their age.

While bivariate analyses show that participants with parents who smoke are more likely to take up smoking, consistent with Flay and colleagues’ (1993) study, this research shows that parental smoking influences adolescent smoking indirectly. This is in line with the social development theory (Catalano and Hawkins 1996) which postulates that parents are the earliest models for smoking but friends are more important and most influential models during adolescence. Even though parents are smokers, they may continue to set up anti-smoking norms in the family. However, their smoking habit weakens their moral authority as gate keepers.
Although parent smokers do not have direct influence on adolescents’
behaviour, they exert their influence on adolescents’ cognitions directly. Among all
the four cognitive factors assessed in this study, parental smoking has the strongest
influence on “my parents will object if I smoke”. Boys and girls alike are less likely to
feel that their parents will object to them smoking if their parents are smokers.
Parents’ smoking behaviour creates a perception of parental permissiveness on
adolescent smoking behaviour.

Family is important for socialisation and kinship development (Duvall 1971;
Belsky 1981; Fingermann and Bermann 2000). Family is a child’s first reference
group for values (Bandura 1977) and plays a dominant role in socialising the child.
Families continue to exert strong influence on adolescents’ personality development
and social competence (Gullota, Adams and Markstrom 1999) even when friends are
more important agents of socialisation than parents during adolescence. Socialisation,
attachment to parents and families, and social development of children are associated
with parenting style. Baumrind (1991), Steinburg and colleagues (1994) found some
associations between child-rearing patterns and developmental outcome in middle
childhood and adolescence. They concluded that parents who use permissive
parenting method rarely monitor their children’s activities and seldom exert control
over their children’s behaviour. These parents are likely to have children who have
low cognitive social competencies, low self control and low academic achievement
and more likely to use drugs during their adolescence than children whose parents are
authoritative.
Baumind (1991), Steinburg and colleagues (1994)’s research findings are evidenced in this study. As shown in Figures 9 and 10, strict parental management style reduced the chances of having sibling smokers as well as association with friends who smoke. In addition, adolescents are more attached to parents who monitor their activities, friends and whereabouts. Being attached to the family in turn has positive effects on academic achievement, and school commitment. As family functions to support other dimensions of the social environment (Smart 2006) and has protective effects on non-smoking behaviour, family education and parental smoking cessation programmes are essential in preventing smoking initiation and encouraging smoking cessation among adolescents.

The structural equation modelling shows that family protective factors such as family attachment and parental management, and peer attachment, have positive associations with school commitment. As schools are “settings for intellectual and social experiences from which children develop the skills, knowledge, interest and attitudes that characterize them as individuals and that shape their abilities to perform adult roles” (Berns 2007:250), school is an extension of positive parental influence (Adams 1986).

School imparts knowledge, values, skills and transmits societal norms. It provides students with the knowledge and values so as to keep them within the boundary of societal values. Schools foster adherence to the social order (Berns 2007) and are of predominant importance in the social and personal development of adolescents.
What determines adolescents’ commitment and engagement in school? Adolescents’ involvement in schools is dependent on the opportunities structured by school teachers and the school management. The more adolescents are engaged in school activities such as academic tasks, non-academic activities, interaction with classmates and schoolmates, the more likely that they will commit themselves to school activities (Catalano and Hawkins 1996). As reflected in the findings, adolescents’ level of commitment to schools is positively associated with their academic achievement as well as peer and family attachment. The higher academic achievement, the more likely adolescents will relish the importance of schooling and develop a sense of commitment to their schools. This may be because adolescents feel a sense of satisfaction and achievement with their academic results and that motivates them to participate in school activities and learning. On the other hand, those who cannot keep up with the academic expectations in school, tend to feel a sense of anomie. These adolescents are demoralised by their academic achievements. They are likely to have a low sense of attachment to their schools. They feel bored as they are unable to achieve pro-establishment goals and are susceptible to negative smoking influence.

Schools play a direct role in shaping the social cognitions of students. Adolescents who enjoy going to school and who appreciate the importance of schooling are more likely than those who are not committed to their school, to have anti-smoking perceptions. Schools could modify anti-smoking social cognitions and prevent smoking initiation. Schools are therefore, appropriate settings to reach out to the school-goers as the school enrolment rate is very high in Singapore (Ministry of Education 2008).
Cognitive factors are proximal factors to behaviour. Adolescents’ cognitions will influence their behaviour directly. Among the cognitive factors examined in this research, “it is wrong for someone of my age to smoke” has the strongest effect on smoking status and this is consistent by gender. Findings suggest that smokers rationalise smoking behaviour by finding reasons to convince themselves that it is not ‘wrong’ to smoke. Thus, there could be substantial changes to behaviour if participants believed that it is wrong to smoke.

The association between smoking and adverse health effects is another cognitive factor which has significant effect on smoking behaviour. This is line with theories such as the health belief model (Janz, Champion and Strecher 2002), the theory of planned behaviour (Montaño and Kaspryzk 2002) and the transtheoretical model (Prochaska, Redding and Evers 2002) which postulate that awareness on negative effects of smoking will motivate behaviour change. Thus, messages on adverse consequences of smoking is likely to have some effects in encouraging smoking cessation or preventing smoking initiation if adolescents are convinced of the associations between negative health effects and smoking.

How do social structural factors, the least modifiable social factors, influence smoking status of adolescents? Adolescents’ social structural factors condition their social environment and their social network (Berkman and Glass 2000). Social structural factors are upstream factors influencing behaviours and are fundamental causes of risk behaviours (Link and Phelan 1995). Socio-demographic and cultural factors are distal factors which may be either protective or risk factors associated with
adolescent smoking. For instance, the structural equation modelling shows that as adolescents’ age increase, their social network of smokers expand over time since the likelihood of their siblings and friends picking up smoking increase with time. This in turn increases their likelihood of smoking.

As suggested by Link and Phelan (1995), it is important to look beyond individual’s life circumstances to examine his social environment in order to determine what puts the “at risk for risk”. This study shows that while socioeconomic status may not have a direct effect on behaviour, it impacts behaviour via social environment and social network. Adolescents of lower socioeconomic status tend to have less stringent parental control and a wider social network of smokers, and this in turn put them at risk of smoking.

Ethnic differences were observed in adolescents’ social environment and social network. Malays have more smoking family members and friends. This is reflective of the ethnic distribution of smokers in the population (Ministry of Health 2004; 2009). However, the effect of ethnicity is also mediated by socioeconomic status. Malays have lower socioeconomic status as compared to non-malays. These findings indicate that as individual’s ethnicity does not predispose him to risk behaviours, it is his socioeconomic status and social environment which determine his exposure to risk factors of smoking. An individual’s social class has greater effect on his health behaviour than personal identity (Cockerham 2007). As argued by Phelan and Link (1995), the level of socioeconomic resources an individual has or does not have either protects his health or brings about sickness and premature mortality.
3.5.1 Gender-specific differences in pathways to smoking

Some gender differences are noted in the pathways within social environmental factors as well as pathways from social environmental factors to social cognitive factors. The family, in terms of smoking influence from family members and protective family factors, exerts a stronger influence on girls than boys.

Sibling smokers influence smoking behaviour of boys and girls differently. The presence of a sibling smoker in the family not only promotes pro-smoking sentiments among girls but also influences their smoking status directly. In contrast, sibling smokers do not have a direct influence on boys’ smoking status. Instead, the presence of sibling smokers influences boys’ cognitions on smoking.

There are several possible reasons for such observations. Firstly, female smokers tend to have more family members who smoke as compared to male smokers. This suggests that the norm of smoking is stronger among girls’ than boys’ family. Thus, girls are more likely to smoke when the norm is set. They are less likely to be trend-breakers.

Secondly, these findings support Bard and Rodgers’ (2003) longitudinal study among American adolescents. The authors concluded that female siblings provide more opportunities for smoking among co-siblings. These findings tie in well with Cole and Kerns’ (2001) research which found that mixed gender siblings and girl-girl siblings report higher levels of positive relationship qualities such as caring, intimacy and conflict resolution than boy-boy siblings. These differences are associated with
differences in gender socialisation. For instance, girls tend to be more empathetic and are better at discerning emotions from non-verbal cues (Block 1983). Such personalities thus enable girls to better communicate and express social emotional relationships with their siblings. Therefore, gender differences in sibling relationships may be due to female friendships and openness in sharing of personal feelings with siblings (Buhrmester 1996). In the context of smoking, girls are thus more likely than boys to share their smoking experiences with their siblings. The presence of a girl in a sibling dyad hence affects the quality of sibling relationship; the likelihood of sharing social emotional feelings increases in girl-girl and mixed gender sibling relationships, this in turn leads to increasing opportunities for smoking among adolescents with female siblings. Hence, while data on the gender of sibling smokers are not collected in this study, the presence of a sibling smoker has greater influence among female than male adolescents’ smoking status.

The effect of parental smoking on adolescent smoking behaviour differs by gender. Among the girls, the likelihood of having a sibling smoker increases with the number of parents who smoke. Conversely, among the boys, the likelihood of having sibling smokers is independent of parental smoking. This further suggests that the social norm of smoking will be stronger among girls’ than boys’ families.

As found in other studies (Hill and Atkinson 1988; Singer and Leveine 1988), the effect of parental monitoring is stronger among girls than boys. Such gender difference may be a reflection of gender traits. Girls are usually given less autonomy and freedom as parents tend to be more concerned about their daughters’ safety outside home (Blackemore, Berenbaum and Liben, 2009; Dishion and Mamahon,
1998). On the contrary, parents are less likely to restrict their sons’ activities as they tend to encourage independence in their sons.

Family where parents do not smoke has a strong protective effect on girls’ smoking behaviour as non-smoking girls are strongly bonded to non-smoking parents. The anti-smoking norm is likely to be very strong in such family especially if no other family member smokes. On the contrary, parents’ smoking status do not have much influence on boys’ attachment to their family. Boys are as bonded to their parents regardless of their smoking status. Therefore, smoking influence on boys may be stronger if they are closely bonded to smoking parents.

As adolescents are older, parents impose fewer constraints on them. However, boys are less bonded to their family when they are older while girls are as bonded to their family regardless of their age. Comparatively, girls are more closely bonded to their friends as they are older while boys’ age has no effect on their level of peer bonding. These findings suggest that family play a consistent and influential role throughout girls’ adolescent development. For boys, friends play a more consistent role than family members.

Further, families of higher socioeconomic status are more concerned about their daughters’ whereabouts, friends and activities. Girls of higher socioeconomic status are more strictly monitored by their parents than girls from lower socioeconomic background. Girls at risk are in family conditions which predispose them to further risks, since socioeconomic status and parental management are associated with smoking behaviour.
While “it is wrong for someone of my age to smoke” and “smoking is harmful to my health” are the main modifiable cognitive factors among girls, the boys are also concerned about parental approval of their smoking behaviour and accessibility of cigarettes. Parental approval is important in boys’ smoking behaviour and not girls’ smoking behaviour, and this may be because smoking is more likely to be a social norm in girls’ than boys’ families. Boys are also more concerned about the accessibility of cigarettes. This may be because girls are less likely to purchase their cigarettes than boys (Robinson, Klesges and Zbikowski 1998).

Age has different gender-specific effects on adolescents’ social cognitive and smoking status. Age is both a protective and risk factor of smoking among boys. On the one hand, older boys are more likely to agree that smoking is harmful to their health and this may deter them from smoking, but on the other hand, older boys also perceive an ease of getting cigarette and this may motivate them to smoke. Additionally, younger boys tend to agree that it is not right for them to smoke. This indicates that the younger the boys are, the more likely that they will perceive smoking as illegal. Therefore, younger boys who smoke are likely to be rebels.

Age is a stronger determinant of smoking among boys than girls as age is an indirect factor to smoking status among girls but it is both an indirect and direct factor among boys’ pathways to smoking. Smoking prevention programmes for adolescents, in particularly for boys, should therefore start early, preferably before their age of cigarette experimentation.
3.5.2 Limitations

The findings of this study are applicable to adolescents in secondary schools only. As different settings may have different effects on individuals, the findings from this study should not be generalised to adolescents in other educational and social settings.

Some factors such as workplace attachment, attachment to religious institutions and other non-school related institutions may have an effect on smoking behaviour but are not examined in this study. For instance, participants who hold part-time jobs especially in environments where smoking prevalence is high may be exposed to negative smoking influences and opportunities to smoke. In the same vein, those who are attached to religious organisations or activities may be exposed to positive influences which are not examined in this study. However, as this study measured peer influence and peer attachment generally, it is likely that peer influence from various sources such as workplaces or religious organisations and others are captured in this research.

This study measured risk factors through adolescents’ perceptions of their parents’, siblings’ and friends’ smoking status. While there may be under-reporting of risk factors as participants might not be fully aware of their family members and friends’ smoking status, under-reporting of peer smoking is however, believed to be minimal in this study. This is because studies have shown that perceived peer smoking is reliable, valid and the best proxy predictor of adolescent smoking (Iannotti and Bush 1992).
This study is based on self-reported smoking status of participants and that biochemical tests are not conducted to verify participants’ smoking status. In order to reduce the likelihood of underreporting of smoking status in this study, steps were taken to ensure that validity problems which usually arose from external environment were reduced. Environmental factors which influence the validity of survey responses include the presence of others while answering survey questions and participants’ perception of the level of privacy or confidentiality of survey responses (Brener et al. 2003). Participants were assured of the confidentiality of their survey responses and were reminded not to indicate their names or any form of personal identification on the survey questionnaire before they answered the survey questions.

Another limitation of this study pertains to its study design. Causality of findings could not be ascertained due to temporal issues associated with cross-sectional studies (Aschengrau and Seage III 2008). However, the strength of structural equation modelling is on theory testing based on theoretical models and evidence (Kline 2005). The quantitative verifications of the proposed model in this thesis is evidence-based; it is based on theoretical models which synthesise classical sociological concepts, literature review of research on adolescent smoking and tested using data collected from local population.

In a nutshell, this study shows an association between social factors and smoking behaviour. Specifically, the findings show that:

(1) Social structural factors are associated with smoking status of adolescents. Socioeconomic status and ethnicity are distal factors to smoking status. Age has
a direct effect on boys’ smoking status but indirect effect on girls’ smoking status.

(2) Adolescents who are more engaged in school activities and are committed to their school are less likely to smoke. School commitment is a distal factor to smoking status but it is associated with social cognitions directly.

(3) Family is a distal factor influencing adolescent smoking. Stringent parental control and strong family bonding inhibits smoking among adolescents.

(4) Having friends, siblings and parents who smoke increase the likelihood of adolescent smoking. Smoking friends have a direct effect on adolescents’ smoking status while parent smokers influence adolescent smoking indirectly. Sibling smokers influence girls’ and boys’ smoking status differently. Having siblings who smoke influenced girls’ smoking behaviour directly but boys’ smoking behaviour indirectly.

(5) Social cognitions have a direct effect on behaviour. Adolescents with favourable perceptions of smoking are more likely to smoke.

This study shows that the social norm of smoking is stronger within smokers’ than non-smokers’ social network. Smokers are attached to their social network of smoker friends. This suggests that young smokers are well integrated within their social network of smoker friends. Young smokers are likely to be influenced by the predominant health behaviours of members within their social network. Thus, social
integration does not buffer against risk behaviours all the time. Instead, social integration within negative social network promotes risk behaviours.

Differences in pathways to smoking behaviour are observed by gender. Family has tremendous impact on girls’ behaviour. Girls tend to conform to the social norm in their families. If someone in their family smoke, they are likely to follow suit. The effects of parental and sibling smoking are stronger among girls than boys and so are the protective effects of family such as parental monitoring. In addition, boys are at higher risks of smoking due to non-modifiable demographic factor such as age. These are the likely gender-specific differences in smoking prevalence.

This quantitative analysis maps out the pathways from the various social factors to adolescent smoking behaviour. It also identifies points of intervention in adolescents’ social environment. For instance, school has a consistent positive effect on cognitions, it is not only an appropriate setting to reach out to school-going adolescents but also a social environment which could buffer adolescents from risk behaviours by engaging adolescents in school activities. Interventions at the family setting are also needed to promote the social norm of anti-smoking in adolescents’ family environment.

After examining the associations among social factors and adolescents’ smoking behaviour, we now move on to further explore the reasons motivating young people to smoke. The next chapter will present findings from a qualitative study conducted among young Singaporean smokers.
CHAPTER 4
QUALITATIVE STUDY: RATIONALISING ADOLESCENT SMOKING BEHAVIOUR

4.1 OVERVIEW OF CHAPTER

The previous chapter on structural equation modelling shows the quantitative verification of the paths from various social factors to smoking behaviour. It provides a clearer picture of the direct and indirect factors influencing smoking behaviour. Some social factors such as social cognition and social network influence adolescents’ behaviour directly while social structural and social environmental factors impact on adolescent smoking behaviour indirectly. This chapter on qualitative study shows the social processes leading to smoking behaviour. Through young smokers’ first hand account of their smoking experiences, this chapter provides a descriptive insight into the social meanings which young people attach to smoking and their rationale for smoking.

4.2 PURPOSE

This qualitative study seeks to augment findings from the quantitative analysis. Findings from the quantitative study show that family and friends influences adolescents’ smoking behaviour. The main objective of this qualitative research is to further explore how social factors such as family and friends impact on young people’s smoking behaviour, what it means for young smokers to smoke and the salient factors influencing their decision to smoke. From young smokers’ accounts of
their personal experiences, this study also attempts to better understand the way social environment shapes their perceptions and behaviour.

4.3 METHOD

A qualitative approach was taken for this study as qualitative research methods allow for exploration of the meaning of smoking through participants’ perspectives, subjective viewpoints and personal description of their smoking experiences (Flick, 2006). It also allows researchers to probe in-depth into the factors which motivate young people to take up smoking. This study comprised of a mixture of focus group discussions and individual interviews. Focus group discussions were used for data collection as it allowed a relatively large number of participants to be included in the qualitative study and provided a supportive environment for young smokers to discuss and share their perceptions on smoking (Morgan and Krueger 1998). Individual interviews were conducted to further explore young smokers’ rationale for smoking. This qualitative method enables participants to share with their experiences in more details with the interviewer.

The inclusion criteria for this qualitative research were confined to current Singaporean smokers aged between 18 and 21 years old. Unlike the quantitative study which was conducted among adolescents aged between 13 and 17 years, the participants of qualitative study were from the older age group. There was an age group difference among participants of the quantitative and qualitative study because firstly, in self-administered surveys, participants are not required to indicate any form of identifiers on their survey questionnaire and this makes it easier for adolescents to report their smoking status truthfully. It will be difficult for young adolescents to
discuss and share their smoking experiences in a face-to-face qualitative study as smoking is illegal for adolescents below the age of 18 years. Secondly, young smokers experimented with cigarette smoking when they were young adolescents at an age of 12 years old (Health Promotion Board, 2007b). They picked up smoking when they were in secondary schools and continued smoking when they entered tertiary institutions, served national service or started working. It will be important to conduct the qualitative study among young smokers aged between 18 and 21 years so as to find out how they progress from being experimenters of cigarette smoking to habitual smokers. It will be useful to have young smokers’ perspectives on the reasons which motivate them to continue smoking.

Participants were screened for their age, nationality and smoking status before they were invited for the study. All participants were recruited via the snowballing method. A cash payment of S$50 was given to each participant, in recognition of their time taken to participate in the study as well as to cover their transport costs. For audit purposes, all participants were required to sign on a form for acknowledging receipt of the payment.

Fifty Singaporean smokers participated in this study between October and December 2008. Focus group discussions and individual interviews were conducted at an office premise. There was a good mix of participants by gender, ethnicity and occupation (Table 14). A total of seven focus group discussions with an average of six participants in each group were conducted. Focus group discussions were segmented by gender and age groups. This was because groups of more homogeneous characteristics would have better group dynamics. Older girls were more hesitant to
discuss about their smoking behaviour and experiences in focus group discussions because smoking is perceived as a socially undesirable behaviour among females. Therefore, in order to explore to find out more about the social experiences and motivators of smoking among the older participants, individual interviews were conducted among participants aged between 20 and 21 years old. The profile of participants in focus group discussions and individual interviews is shown in Table 15.

Table 14: Profile of participants

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<thead>
<tr>
<th>Characteristics</th>
<th>Gender</th>
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<td>Males n=25</td>
<td>Females n=25</td>
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<td>Age groups</td>
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<td>Full-time National Service Men</td>
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This research complied with guidelines from the Department Ethics Review Committee, Sociology Department, National University of Singapore. Prior to the focus group discussions and interviews, all participants were given a consent form and participant information sheet on the objectives of this study and administrative details such as steps taken to anonymise data. Such information was repeated by the moderator at the beginning of each discussion and interview session so as to assure participants of the confidentiality of their responses.

<table>
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<tr>
<th>Methodology</th>
<th>Gender</th>
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<td>Focus groups</td>
<td>Group 1</td>
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<td>Group 7</td>
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<td>Interviews</td>
<td>Interview 1</td>
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<td>Interview 7</td>
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A topic guide was developed to generate discussions for both the focus group discussions and individual interviews on several themes: (a) perceived consequences of smoking; (b) perceived risks of smoking; (c) strategies to manage perceived risks of smoking; and (d) participants’ first smoking experience. The average duration of each focus group discussion and interview was about 1 hour 30 minutes and 1 hour respectively. All discussions and interviews were conducted in English. Refreshments were provided at the beginning of the focus group discussions and individual interviews. These were used as a form of icebreaker session before the commencement of discussions and interviews. Smoking was prohibited during the sessions. Permission was obtained from the participants to audio record the focus group discussions and interviews. The audio-recordings were transcribed for data analysis purposes.

The author of this thesis was responsible for designing, conducting and analyzing data of this study. She recruited the participants for this survey, moderated the focus group discussions and in-depth interviews, audio-recorded the sessions, transcribed the scripts and analysed the findings.

The results of this study were based on a content analysis of the transcripts of audio-recording. Identifiers were not tagged to individuals in the process of transcribing so as to protect the identification of participants in the analysis. Instead, denotations were used in this chapter. ‘M’ denotes moderator while participants are denoted as ‘P1’ (Participant 1), ‘P2’ (Participant 2) and so on. Details on profile of individual participants whose verbatim are cited in the analysis are appended in the Annex 2.
4.4 FINDINGS

This study provides insights into the social processes leading to young smokers’ decision to smoke. From the content analysis, these social mechanisms influencing smoking behaviour are illustrated in Figure 11. The presence of smokers in social network influences young people’s perceptions of smoking. It normalises smoking behaviour, impact on lay beliefs about health and smoking-related diseases. Based on these beliefs, young people rationalise away the risk of smoking before taking up smoking. As shown in Figure 12, the broad mechanisms influencing behaviour are grouped as (a) social influence; (b) misconceptions of smoking; and (c) lay epidemiology. Findings based on these broad themes are detailed in the following:
Figure 11: A model of social processes leading to smoking behaviour
4.4.1 Social influence

4.4.1.1 Family influence

This study shows that family plays an important role in young smokers’ decision to smoke. Family influences young people’s smoking behaviour in various ways. For instance, young smokers’ first encounter with cigarettes is usually through their parents if parents are smokers. Parents discourage their children from smoking even though some of them also smoke. However, their advice often fall on deaf ears and young smokers try to cope with their parents’ disappointment by hiding and lying about their smoking status.

Family influence to smoke is very strong especially among the girls as most have brothers who also smoke. Female smoking-related stigma is prevalent but female smokers continue to smoke despite recognising and contributing to these female smoking-related stigma. These findings will be discussed at length in the following paragraphs.

Family members play a major role in arousing young smokers’ curiosity about smoking as someone is a smoker in young smokers’ families most of the time. Negative family influence and estranged family relations, coupled with other social influences, lead some of them to experiment with cigarette smoking and continue with smoking eventually.
The following participant shared that even though he smokes regularly now as a result of peer influence, observing his father’s smoking behaviour aroused his curiosity about what it is like to smoke when he was young:

“(Learnt smoking) indirectly through my dad. He kept saying “no good” but he smoked. I was curious so took one to try. Then later saw my friends smoked and I smoked with them for fun and eventually got addicted.” (P1)

Male, 20 years old

Another participant cited various reasons for picking up smoking. She recalled that she was offered cigarettes by her cousin but did not enjoy the first puff of cigarettes. However, she started to smoke regularly because of defiance and rebelliousness against her mother:

“I started when I was 13 and never stopped at all. The first puff sucks. My cousin gave me cigarettes. He started when he was 12 years. I can’t go out when I was young because my mum was very protective, she hates smokers and the more she hates it, the more I want to try. I could only go out with my brother and cousin. So I smoke.” (P2) Female, 20 years old

4.4.1.1.1 Parents as social policemen

Interestingly, even though some parents are smokers themselves, parents are often perceived by the participants as social policemen against smoking. As a result, young smokers smoke without parental knowledge. For instance, a female participant commented that she did not smoke initially knowing that her father is against his children smoking. However, now that she smokes, she has to hide her smoking habit from her father because her father will disapprove of her smoking:
“My dad is the reason why I don’t want to smoke at first because he is very against me smoking. So if I get caught then I don’t know (what the consequences will be) but I think he is like ‘I can do it, but you can’t because you are my daughter’, so the world can do it, it’s their problem kind. So he didn’t influence me to smoke but influence me not to smoke.” (P3) Female, 20 years

Despite showing disapproval for their children’s smoking behaviour, parents do not have much clout when getting their children to stop smoking. One participant shared that he continues to smoke but does not smoke at home, especially in the presence of his parents:

“I don’t smoke in front of my parents. If they are at home, I just go outside to smoke. The first time I told my father I smoke, it was already about 5-6 years after I started smoking. He told me not to smoke too much and told him I smoke a few sticks only, just to stop him from nagging. He is a smoker too, but didn’t want me to smoke.” (P4) Male, 20 years old

Young smokers’ parents provide them with various reasons for quitting smoking. However, health and financial-related factors do not have much impact on the young smokers’ decision to continue smoking:

“They would ask me to quit smoking when they see cigarette box on the table. They said that it’s no good for my health. My mum even asked me to see a doctor to get medication. They just kept asking me to stop smoking and said that since my dad can do it, why can’t I do it.” (P5) Female, 20 years old
“My mum is understanding only because I am a social smoker. She is a little ok with it because she understands that when you are with friends, these are the kinds of things you do. But my dad is against it, he thinks that it’s pointless, he is a very pragmatic man and thinks that it’s pointless and a waste of money, why do something that doesn’t benefit you anyway. So I am not angry to hear that he is angry with something that makes sense.” (P6) Female, 19 years old

4.4.1.1.2  Coping with parents’ disappointment

Young smokers cope with parents’ disappointment by lying and hiding evidence of smoking. These young smokers will push the blame to other family members or friends who smoke when their parents find cigarettes or evidence of their smoking behaviour. However, there is nothing very much parents can do in such instances as there are smokers in their social network:

“My mum caught me in action a couple of times before. But the common excuse will be, if they found cigarettes in your bag, ‘oh, my friends left it in my bag’.” (P6) Female, 20 years old

“I kept cigarettes in my pocket in my pants, mum washed my pants with the cigarettes, then discovered that I smoked. The cigarettes were in the washing machine when I realised that I left it in my pants. Before that, I would push the blame to my father when my mum smelt smoke in toilet. My mum shouted at me when she found out. My mum was an ex-smoker and told me that since she can quit, I can too. Now I (am) try(ing) to reduce the number of cigarette smoked. I will stop one fine day.” (P18) Male, 19 years old
4.4.1.3  Gender difference in social influence

Female smokers have brothers who also smoke. This makes it difficult for their family to police them as differential rule for girls no longer works. This is especially so as their brothers set an example for smoking:

“My brother smokes but didn’t know that I smoke. My parents didn’t know too, I go out, then smoke.” (P7) Female, 18 years old

“My brother smokes but he does not have enough influence for me (not) to get addicted to smoking. More (influence) from my friends” (P8) Female, 21 years old

The female smokers continue to smoke even though they expressed that female smoking-related stigma is prevalent. Interestingly, they themselves contribute to such form of stigma and agree that smoking is socially undesirable for females. For instance, the following female participant commented that smoking tarnishes girls’ image:

“Once I was outside and saw a very pretty girl like model. But when she stepped out of the shopping centre, she started to smoke, it really spoiled her appearance and image.” (P9) Female, 20 years old

Another participant felt that smoking is an inappropriate behaviour for females but not for males:
“Sometimes I do care about my image because personally, I think that girls who smoke are very ugly...... girls who smoke really spoil their image. But for guys, it’s perfectly fine.” (P10) Female, 20 years old

The female participants shared the prevailing perception of smoking being a masculine behaviour and because of such perception, male smokers are more socially accepted than female smokers:

“The way people look at girls is different from that of a guy. They feel that a girl who smokes is much worse than a guy who smokes.” (P11) Female, 20 years old

“Some Chinese, especially those from the older generation, are very traditional. They don’t think that smoking is a good thing. I have two (female) students who just finished their PSLE. I overheard two different parents telling their children the same thing at different times that if they caught them smoking, they will beat their children until they dare not smoke again. So it’s the image that smoking is not good for girls.” (P12) Female, 20 years old

The perception of smoking being a masculine trait is so strong that a female participant felt that she is playing the role of a man whenever she smokes in front of a non-smoking male:

“It makes me feel insecure especially if I am with a guy and that guy doesn’t smoke and I smoke, I feel weird, I feel like ‘I am the man’.” (P13) Female, 19 years old
4.4.1.2 Peer influence

Family members arouse the curiosity of smoking among the young smokers but do not have strong influence on young smokers’ smoking continuation. Who is this person who exerts such strong smoking influence on the vulnerable youths? Young smokers usually pick up smoking under the influence of their friends. Some of them smoke because of the desire to belong to peer groups. In order to join the group, young people conform to the peer groups’ prevailing norms and activities which include smoking. Smoking is thus perceived as a means to enter certain peer groups. It is a learnt behaviour as smokers learn about smoking from friends and practise the correct way of inhaling cigarette smoke when socialising with friends.

From the perspectives of all participants, smoking brings about several social benefits. They widen their social circle because of the common habit of smoking. They get to know more smokers when they smoke together during pockets of their free time in school or at work. In addition, the culture of sharing cigarettes forges and strengthens friendship bonds among smokers. Smoking is a way which helps smokers to ease their boredom and to get away from their routine lifestyle and work. Findings from this research also show that among girls, there is an association between smoking and socialisation with the opposite sex. Smoking is perceived as part and parcel of dating. These findings will be elaborated in greater detail in the following paragraphs.

4.4.1.2.1 Smoking is a learnt behaviour

It is apparent from the participants’ description that cigarette experimentation usually takes place in the company of friends and under intense pressure due to verbal
encouragement and teasing from friends. When asked about her first smoking experience, one female participant shared that she learns smoking from her friends. It takes her several trials before she learns to smoke correctly, but by then, she is already addicted to smoking:

“… my friends all smoked except me. They said ‘Try, try…’. They all laughed when I first smoked because I was just blowing out (smoke), I wasn’t smoking properly. Then it became a motivation to (keep) trying and eventually I got hooked on to it.” (P19) Female, 19 years old

As highlighted by some of the participants, they pick up smoking because they are influenced by the group norm within their peer group. For example, the following participant smokes because of peer influence and succumbing to temptations to smoke:

“Smoking is not about whether I want to or not. It is usually because friends ask me to do so and make me curious. It’s all because I know someone who smokes.” (P20) Male, 20 years old

Another participant shared that although parents’ smoking behaviour arouses her curiosity to try smoking, it is friends’ positive reinforcements about smoking and offers which lead her to smoke eventually. She continues to smoke because she enjoys the social activities which come along with being a smoker:

“My first puff, I was coughing like crazy. I was in Secondary 2. Both my parents smoke and there were cigarettes lying around at home. I was trying to get my parents to stop and was also curious at what it was like to smoke. So I just took one puff. Then after that, I have friends who smoke and kept asking
me to smoke, I can tolerate the smell of smoke but some of my other friends can’t. So I just accompany them outside to smoke at times and soon or later they just gave me one puff; one puff and then (I) started social smoking.

It was a few years in between first puff and social smoking. I started smoking when I was 17-18 years, started drinking, having fun and party and all that.” (P21) Female, 19 years old

The group norm of peer groups is often so strong that it leads those who want to be included in the group to conform to the group beliefs and behaviour. Some young smokers pick up smoking because everyone in the peer group smokes and if they do not do so, they risk the likelihood of being outcast by the group. A male participant shared that his first puff of cigarette is not driven by his curiosity to smoke but because he wants to be part of the peer group:

“My first cigarette was with my friends because I wanted to be in the group. I was in Secondary 1. He asked me if I smoked. I told him I don’t but I just wanted to be in the group. I was just blowing and puffing, didn’t know how to smoke. I didn’t like it but still continue. I coughed the first time. But I just want to be in the group, everyone is smoking. If you don’t, you feel out of the group. I become a regular smoker after that.” (P22) Male, 18 years old

4.4.1.2.2 Smoking facilitates socialisation and bonding among smokers

The introduction to first cigarette often leads to social exchange between smokers. Smoking is a social behaviour and facilitates social interactions among smokers. It provides opportunities for smokers to share, offer and accept cigarettes,
converse and build friendships. Therefore, as a result of smoking, young smokers develop a strong sense of identity and special bonding; they meet and gather at places where smoking is permitted or not detected easily and become friends with the strongest subculture.

For example, when asked about the positive consequences of being a smoker, the participants readily replied that since they start smoking, they tend to make friends easily:

“My school friends. The whole group of us make friends through smoking. We smoke together, ask for lighter, and we randomly talk while smoking. The whole group of us are so close now because of the fact that we go outside of school to smoke.” (P6) Female, 19 years old

“(A positive effect of smoking) is socialising. …. when I meet my friends, I will ask if they want to smoke so that we can smoke together. It’s like bonding. We just stand there, smoke and then talk. It’s like over a cup of coffee.” (P23) Male, 20 years old

Smoking is a way for female smokers to socialise with friends of the opposite sex; it is a way to maintain and cope with their relationship. For instance, some female participants smoke as a result of their engagement in relationships. The following is a quotation from a female participant who revealed that smoking is a common activity with her boyfriend and she perceives smoking as part and parcel of companionship:
“(My boyfriend) didn’t smoke last time. He smoked just recently. When he smokes, I (will) follow him. (We do things) together, (smoking is about) togetherness….” (P22) Female, 20 years old

Other female participants however, shared that they smoke to cope with the aftermath of their relationship. One female participant commented that she starts to smoke when her relationship with her boyfriend ends:

“For me, it was a really crap reason (to take up smoking). I broke up (with my boyfriend) and a few of us were going out then. I thought may as well try, and then I started smoking during that period, the break-up period. It seems like everybody thought that I smoke from then onwards, and whenever we go out, they will offer me cigarettes. Then I thought may as well. I was 16 years old then.” (P3) Female, 20 years

4.4.1.2.3 Cost sharing among smokers

Cost sharing is a norm among the participants. It allows them to satisfy their cravings for cigarettes without having to spend too much money and in the process of sharing cigarettes, smokers forge friendship bonds with fellow smokers. The following is a conversation between two female participants on the rationale for sharing of cigarettes:

{(P35) Female, 19 years old}: Share with friends, can save money.

{(P6) Female, 19 years old}: I don’t agree. I have a friend and we will both buy one pack and smoke together. That makes no difference because we will
smoke the pack faster in half the time. Then we buy another pack to share again. So it’s the same, you buy your pack, I buy a pack.

{(P35) Female, 19 years old}: It makes a difference in a way because at that moment you only pay $5. So you don’t need to think of anything because all you have is $5 and you just buy cigarettes. Of course, practically you finish faster and you need to buy more frequently but for that instance it’s okay because all I have is $5 and I want a pack now.

A female participant shared how she manages the financial burden of smoking. She shares cigarettes with her friends when she does not have sufficient money to purchase cigarettes and likewise, her friends do the same too, when they cannot afford cigarettes. Sharing of cigarettes thus forges friendship bond in such instances:

“Monetary-wise, I can smoke other people’s cigarettes (laugh). I don’t do that all the time, only from those who took cigarettes from me…… sometimes I give them cigarettes too. We share, give and take. No money buy, I take my friends’ cigarettes, they no money buy, I give them mine…” (P15) Female, 21 years old

As a result of sharing of cigarettes, the high cost of cigarettes may not be an effective barrier to entry for cigarette smoking since cigarettes are free most of the time especially for the girls. They are often offered cigarettes by their friends:
“Many people buy me cigarettes. Like they buy a packet for themselves and get a pack for me. Some guys buy me cigarettes almost everyday. And since it’s free, I will just keep smoking.” (P33) Female, 20 years old

“….. I don’t buy cigarettes, people usually offer me. If they offer, I usually won’t reject. So I don’t smoke at home or by myself or in school. That’s why I say I am a social smoker because someone must offer me.” (P34) Female, 20 years old

4.4.1.3 Working environment

There is a group of “at risk for risk” young smokers who are working class youths at the fringe of society. Their choices of jobs are limited by their lower educational level and they end up with jobs in the entertainment outlets which require them to work night shifts. Work conditions are undesirable and many of them smoke to ease boredom and stress from the shift work routines. Smoking is therefore a means to help them stay awake and pass time at their routine work.

Adverse working condition is a factor influencing young smokers to smoke. In addition, the job is so mundane that it leaves the young people with very little options. These are evident from a female participant’s account of how she picks up smoking again at her workplace:

{(P15) Female, 21 years old}: Until I am 16 then started to pick up smoking. I was working as banquet waitress at Swiss Hotel, then always smoked. After that I went to work at a handphone shop and at those shops, people all smoked. Then I discontinued until 18 years old.
M: Do you smoke in your current work environment?

{(P15) Female, 21 years old}: I recently just got this job. I used to work in this job two years back in another company. Now they opened another branch and called me back. Just started working for three days. I told my friend I don’t want to smoke already. Then she said that I will definitely smoke when I work at night club. She knows that I can’t take *sian* (boredom) and need to do something. Because during work, cannot bring handphone, cannot talk, just serve customers. This company just started, so very strict, cannot talk.”

Another participant shared that she started smoking when she worked part time at a coffee-joint:

“I was in Secondary 4, working part time at Starbucks, all my colleagues were smoking. During their break times and when they were going home, they started smoking outside of the Starbucks. So they all smoked outside and I was the only one staying inside to do my work and would see all of them smoking. So one day, I tried smoking also, I sat outside and smoked with them.” (P24) Female, 19 years old

Some participants felt that smoking makes it easier for them to communicate with fellow smokers and they smoke as part and parcel of their job. This is evident from the following conversation:

{(P15) Female, 21 years old}: “When I talk to my friends, it’s very natural for us to each have a cigarette and just smoked. Previously, I was working as a car
dealer and when I talked to my customers, I felt more relaxed when we
smoked and talked, rather than just talking. Of course to the smokers only lah,
to the non-smokers, I won’t smoke in front of them.”

M: “Is it easier to talk to your customers while smoking?”

{(P15) Female, 21 years old}: Yes, much easier because both parties feel that
it’s more relaxed in a way. Friend-friend like that, you smoke, I also smoke,
then talk about the car, then smoke again and talk about the price.”

4.4.2 Misconceptions of smoking

Smoking is perceived as a social activity which has direct association with
cosmopolitan night life. It is part of a lifestyle which consists of a social circle and
patterned leisure activities such as drinking and clubbing. Such activities and lifestyle
enable the young smokers to be socially connected to their fellow smokers. The young
smokers prefer to be identified as social smokers as smoking is an inclusive activity
among their group of friends. However, as a result of their occasional and infrequent
smoking habit, they tend to undermine the addictive nature of cigarettes.

In addition, smoking is also perceived as a coping mechanism for negative
emotions. However, some smokers noted that because of their constant reliance on
smoking to cope with their emotions, they have become dependent on smoking and
have not been able to find another alternative to cope with stress. These findings are
described at length in the following section:
4.4.2.1 Smoking as part of a cosmopolitan lifestyle

Smoking is associated with a social lifestyle where there is a social circle with night life activities such as drinking and clubbing. The participants’ accounts of their smoking and drinking behaviour at social settings suggest that these behaviours are part of their youth culture. For instance, the participants explained that they change their lifestyle ever since they started smoking. They patronise entertainment outlets such as pubs more often:

“When I was young, I do play sports but since I started smoking, I started going to pubs, played billards and exercise less.” (P29) Male, 20 years old

“If you smoke, you do different things. Tend(s) to hang out at night, clubbing, more often when I smoke…” (P30) Male, 20 years old

4.4.2.2 It is easy to quit smoking

The participants do not consider themselves as smokers but describe themselves as social smokers. They define social smoking as smoking only when they are with friends. There is a prevalent view among participants that they have absolute control over their smoking habit. These smokers under-estimate the addictive properties of nicotine and believe that they can stop smoking anytime they want to do so. As explained by the following participants, they smoke for a social reason and they believe that they will not be addicted to smoking because of their infrequent smoking:

“I don’t regard myself as a smoker. I smoke only occasionally and I can go without smoking for a week if I don’t go out.” (P31) Female, 20 years old
“It’s ok to be a social smoker rather than being a chain smoker. I smoke only when I am with my friends. For some people, it became a habit already. They need to smoke regularly, can’t live without it. Social smoker can control their smoking and they smoke occasionally.” (P6) Female, 19 years old

“The biggest risk is getting addicted. I am still under control. I only smoke when my friends smoke, any other days, I don’t think of smoking.” (P32) Male, 21 years old

4.4.2.3 Smoking as a way to cope with negative emotions

Smoking is perceived as a way to cope with negative emotions such as anger, anxiety, agitation, stress and others. These young smokers are triggered to smoke during stress-inducing situations such as preparation with examinations. According to some participants, smoking diverts their attention from their problems, “slowed down their pace” and provides them with a legitimate reason to take a break from their stressful problems.

The process of deep inhaling forces the smokers to slow down their pace and creates a perception of smoking as a way to relieve stress. As elaborated by a female participant, smoking allows her to slow down her pace of work:

“I feel sometimes like especially when I am studying, when I am stressed, it helps me to think clearly and kind of slow down my pace. I am not in a rush when smoking, it’s quite easy to just stand there (and smoke). I get less agitated after a puff.” (P22) Female, 20 years old
Smokers hold strong beliefs about the positive effects of smoking. The following participant gave examples of various situations where smoking can help to relieve negative tensions and stress:

“In a way (smoking) can really help distress. Rather than just sit down there and stare, you feel more stress, but go for a smoke, you feel much better. It really helps to distress. Like if you just got a scolding from your sergeant or during exam period you need a break, then go for a smoke every hour, or when you are reading, you feel eyesight strain, you can go for a smoke, everything can be related to smoking, even when driving, just smoke to take a break. It’s quite positive. You run away. Just take time-off when you have nothing to do. That is positive for me.” (P26) Male, 21 years old

Smoking has become a habit for some of the participants unknowingly; they feel good when they smoke because holding and inhaling cigarettes keeps them busy. As a result, they tend to smoke whenever they are bored:

“I smoke only if I feel like it now. I smoke everyday now when I started working. It has been three years already. I picked up smoking regularly. (I smoke) when I have a break (or when) I feel bored. So after eat(ing) I just go out to smoke to kill the one hour’s time. Better than sit around and have nothing to do.” (P27) Male, 21 years old

“Smoking is just another alternative to doing nothing because when I chill out, I just want to do something.” (P28) Female, 20 years old
However, there are participants who noted that ever since they start smoking, they have become dependent on cigarettes to cope with their negative emotions. The following interaction is between two female smokers who shared that they are dependent on cigarettes because they have not found an alternative to smoking:

{(P11) Female, 19 years old}: I started relying on smoking as an alternative. For example, when I was bored, I needed to smoke. When I was stressed, I needed to smoke. It wasn’t like that before I started smoking.

{(P6) Female, 19 years old}: Maybe because smokers probably have not found an alternative to smoking. But what are the other alternatives? I don’t know.”

4.4.3 Lay epidemiology

In their attempts to make sense of smoking-related diseases, smokers construct lay theories based on their observations of social reality and their personal experiences. This process in which lay persons try to understand and interpret health risks is referred to as lay epidemiology (Davidson, Smith and Frankel 1991). Thus, lay epidemiology is at work when young smokers attempt to understand smoking-related diseases. In addition, young smokers tend to downplay the adverse effects of smoking by rationalising away the risks of smoking. For example, they make attempts to mask the physical effects of smoking, use filters to filter the deposits of tar from cigarettes when they are smoking and attempt to alleviate the negative effects of smoking by making dietary changes or engaging in physical activities more regularly.
Female smokers also try to rationalise away the risks of smoking on pregnancy by citing examples of smoking mothers in their social network. Smokers generally do not understand public health messages as these messages are contradictory to their observations of smokers in their everyday life. This results in a sense of perceived invulnerability and perceived irrelevance of public health messages. They develop a sense of fatalism when they cannot make sense of the mystification of the occurrences of smoking-related diseases. These findings are described in more detail in the following sections.

4.4.3.1 Rationalising smoking behaviour: Lay beliefs on smoking-related effects

When asked about the negative consequences of smoking, the participants were quick to identify some visible external effects of smoking. The female participants, in particular, observe that some smokers experience the negative effects of smoking on their finger nails, teeth, complexion, lips and others. However, instead of stopping smoking, these participants attempt to mask the adverse visible effects of smoking. They will hold cigarettes with different fingers, brush their teeth more regularly, and use cosmetics to cover up the external effects of cigarette smoking. Some participants attach filters to their cigarettes. The tar deposits are filtered in these filters and this creates a perception that the harmful substances of cigarettes are not internalised in their body; hence the adverse effects of smoking are alleviated in this process.

For instance, one female participant shared that she observes the effects of smoking on her face. Ever since she starts smoking, her lips have darkened and the condition of her complexion has worsened:
“Lips will become a bit black too among smokers. I observe that on my lips too. (Smoking) affects face complexion too. Not sure if it is also because I used a lot of make-up too. But (my) complexion has deproved and a bit yellowish now too. Some people who smoke too much will have yellowish eyes too.” (P36) Female, 20 years old

Another female participant commented that she tries to prevent her fingers and nails from turning yellowish by alternating different fingers when holding cigarettes:

“(Smokers) have very yellowish fingers and nails. It’s very obvious if they used the same fingers to hold cigarettes. Their nails are very yellowish. Not on myself yet because I use different fingers to hold cigarettes.” (P37) Female, 20 years old

Young smokers rationalise away the risk of smoking by using a filter to filter the amount of tar present in the cigarettes when they are smoking. Such preventive action has cognitive impact on these young smokers. They believe that by doing so, the risks of smoking are reduced. This is evident from the following:

“I only believe that your lungs will become black when you smoke. Because cigarettes contain tar and when you smoke, the filter which you attached to the cigarettes will filter out all the tar. So can see the tar from that equipment. Not sure what it is called. You can buy it from any mama shop. It’s in a box and there are different brands. You just put cigarettes in and smoked through it. It helped to release tar and not so much tar will go into your body. That thing can be used for three cigarettes. It’s a plastic tube. There are 10 in a box for about $1 to $2 plus. My friends introduced me to it. It’s different from smoking
directly. It’s a bit light. It doesn’t affect the smoke but not that heavy.” (P36)

Female, 20 years old

Young participants hold lay beliefs about the various ways to reduce the negative effects of cigarette smoking. They cherry-pick prescriptions of healthy lifestyle and believe that by exercising regularly or adhering to certain dietary prescriptions, their risks of smoking will be minimised. Young smokers derive their risk reduction prescriptions from their social network and observations.

For example, there is a lay belief that engaging in regular exercise will offset the adverse effects of smoking, thus smoking will have minimal, if not, no effects on their fitness level. Young people who hold such lay beliefs tend to dismiss the scientific evidence of the association between smoking and fitness level:

“It depends on whether they exercise or not. Smoking will cause your stamina to lower down, it’s your mentality only. Exercise will get it back.” (P38) Male, 19 years old

“Not much difference on me because if you keep training everyday, you maintain your stamina.” (P39) Male, 20 years old

Apart from engaging in physical activities more regularly, some participants also attempt to reduce the risks of smoking by making changes to their dietary habits:

“My friends said that if you eat more apples, it will help in the lungs. Your lungs will become better.” (P40) Male, 18 years old
“I have a friend who drinks Chinese tea to strengthen his lungs.” (P41) Male, 20 years old

These smokers construct their beliefs from social sources such as information from friends or their personal experiences. These social sources often challenge scientific evidence on the negative effects of smoking:

“My friends who smoke for a very long time already tried to quit smoking but kept falling sick. I think the immune system has slowed down a lot after you have smoked for a long time.” (P42) Female, 19 years old

“One thing I observe on myself is my health (now) is not (as) good (as) when I started smoking. I am not a regular smoker, that’s why some people said that if you want to smoke, you must consistently smoke, you don’t smoke, start, smoke then stop. They said you will feel tired and very shack.” (P15) Female, 21 years old

4.4.3.2 Perceptions of health risks of smoking and perceived vulnerability to smoking-related diseases

The participants exhibit a sense of perceived invulnerability to smoking-related diseases. This may be due to their lack of understanding on the association between smoking and smoking-related diseases. Additionally, some participants feel a sense of invincibility to smoking-related diseases as these diseases are more commonly observed among older smokers. As a result, young smokers query the validity of public health messages.
Some participants feel that the health risks of smoking have been exaggerated while others do not understand the association between smoking and some smoking-related diseases depicted on some health communication tools such as graphic health warning labels and television commercials. For example, the following participant felt that health warning labels on cigarette packets are photo-shopped and exaggerated:

“….Some people say that the pictures (on cigarette packs) are photo-shopped and fake.” (P43) Male, 18 years old

“That miscarriage one is very disgusting. The pictures (on cigarette packets) are all very exaggerated. It’s very extreme. One chunk gone. So exaggerating.” (P44) Male, 20 years old

Another participant did not understand the messages on health warning labels:

“There was an advertisement on TV about this girl with ugly teeth. I was told that it was fake, wasn’t real. There are pictures on the cigarette packs too.. how can baby smoke?” (P45) Male, 19 years old

There are participants who feel that the ill-health effects of smoking are irrelevant because these are long-term effects of smoking. They feel that they are young and since they have not experienced any adverse health effects of smoking, they are not concerned about it:
“For smoking, it doesn’t mean smoking one stick (of cigarette) and you will have lung cancer. We don’t really feel the effects, so don’t really care.” (P46) Male, 20 years old

“… I just don’t find it important now because I am still young.” (P47) Female, 20 years old

Interestingly, although female participants exhibit a sense of perceived invulnerability to the adverse health effects of smoking and have vague understandings about the effects of smoking on reproductive health, they are concerned about the effects of smoking on pregnancy and fertility. However, these female participants seem to undermine the difficulty of quitting smoking and are confident that they can stop smoking easily when they are pregnant.

For instance, when asked about motivators for quitting smoking, female participants cited pregnancy and concerns about infertility as a motivating factor:

“I don’t know if smoking will affect fertility but I am concerned about not being able to have baby.” (P14) Female, 19 years old

“Pregnancy. If I am pregnant, I need to take care of a baby in my tummy. I need to quit smoking so that the baby will turn out to be healthy.” (P15) Female, 19 years old

However, some participants also added that they are unsure if they will continue to refrain from smoking after pregnancy:
“I will stop (smoking) when I am pregnant but after that don’t know…” (P3) 
Female, 20 years old

“Aafter that (pregnancy) I don’t know what will happen, may think and then smoke again.” (P16) Female, 19 years old

It is noteworthy that not all female participants share the same motivator to quit smoking. One female participant tried to rationalise away the risk of smoking on pregnancy by quoting some examples from observations of her siblings. It is evident that this participant does not think that smoking will have much effects on pregnancy:

“For now, I still haven’t found my motivation. I tried quitting before. I have seen how my siblings smoke when they were pregnant. They smoked, drink, took pills to kill the child, but the child is still big and healthy and bubbly all the time. So for now, I am not really sure. Maybe if I don’t have enough money to buy cigarettes?” (P17) Female, 18 years old

4.4.3.3 Social construction of smoking-related diseases

The participants try to understand the underlying reasons for the occurrences of smoking-related diseases based on social reality from their everyday lived experiences and observations of smokers around them. Contradictions arise when their observations do not gel with public health messages. As a result of such contradictions, they develop a sense of fatalism; and believe that death is beyond an individual’s control and that individuals will die eventually.
There is a general lack of satisfactory explanations firstly, for the occurrence of smoking-related diseases among non-smokers and secondly, for smokers who survive their lifetime without contracting smoking-related diseases. Their beliefs are reinforced with examples which often contradict with epidemiologic evaluations of the health consequences of smoking.

For instance, the following participant quoted his grandmother as an example of someone who smoke her lifetime without contracting lung cancer:

“….smoking causes lung cancer but it’s also heng sway (dependent on luck). I (have) heard of people’s grandmothers (who) smoke until 90 years plus but didn’t have lung cancer. So smoke also never die.” (P48) Male, 19 years old

The following participants commented that death is inevitable, they are not afraid of contracting cancer, especially when non-smokers are likely to contract cancer too:

“I don’t care about cancer and stuff. You survive in this society, one day you will surely die. Not afraid of cancer.” (P49) Male, 19 years old

“Some people never smoke also kena cancer.” (P50) Male, 19 years old

4.4.3.4 Fatalism

The mystification of the occurrence of smoking-related diseases seems to result in a sense of fatalism among the participants. They believe that it is usually due to luck or fate if someone has cancer. They feel that diseases and death are beyond
their control and everyone will die eventually, be it from diseases or other causes of death:

“'I believe that if it’s fate for you to die of cancer, you just die. You can get sick in so many other ways. Some people smoke very heavily but still didn’t die, why?’” (P6) Female, 19 years old

“Everyone will die, depends on when. Some people were very healthy but they met with an accident and die.” (P2) Female, 20 years old

4.5 DISCUSSION

This study sheds light on what it means to smoke from young smokers’ perspectives. By using the qualitative method, this study assesses young smokers’ perceptions of smoking and provides rich data on their smoking experiences. These findings provide researchers with a better understanding of epidemiological data on adolescent smoking (Health Promotion Board, 2008, The Global Youth Tobacco Survey Collaborative Research Group, 2002) and complements results from the structural equation modelling of adolescent smoking in the previous chapter. The broad themes— (a) social influence; (b) misconceptions; and (c) lay epidemiology, are constantly repeated throughout the study and there is an obvious interplay of these themes in young smokers’ decision making process.

4.5.1 Social influence
The participants’ misconceptions, smoking-related attitudes and cognitions are influenced by people in their social network. This study reinforces results from the structural equation model presented in the previous chapter. Structural equation models shed light on the operational effects of social environmental and social network factors on smoking status. It shows that family and school influence adolescents’ behaviour indirectly via their cognitions while friends have a direct influence on behaviour. The qualitative study complements the quantitative analysis by providing insights on the process between social influence and social cognitions. It sheds light on how young smokers, based on their observations of smokers in their social network, convince themselves to take up smoking.

Young smokers learn smoking from their family members and friends who smoke. These family members and friends are important reference groups in their process of experimenting and establishing the smoking habit, although the reference groups in their decision to take up smoking may differ across different stages of adolescence (Catalano and Hawkins 1996). At the pre-adolescent stage, family members are the primary source of children’s social learning (Bandura 1977). Children form their attitudes and perceptions of smoking from observing the smokers in their family. Those with favourable perceptions of smoking will subsequently model their family members’ smoking behaviours. Their initial experience with smoking provides them with either cognitive reinforcement on the positive aspects of smoking or physiological reactions (Kobus 2003). They will start smoking more regularly when their exposure to smoking models and the rewards of smoking outweigh the negative sanctions of smoking.
While parents may be the study participants’ earliest smoking model, parents are often perceived as social policemen against smoking. However, parents may not be able to exert their positive normative influence on adolescents because there is usually someone in the family who smoke; be it parents, siblings or someone else. These smoking family members set an example for smoking and results in young smokers’ perceived permissiveness to smoke. Further, young smokers’ relations with their parents may be estranged. As shown in the quantitative analysis, adolescents with parents who smoke are not as bonded to their family as compared to adolescents whose parents are non-smokers. Young smokers usually pick up smoking at the stage of adolescent development where they are negotiating with the boundaries of adulthood. Young smokers from families where parents or siblings smoke, viewed smoking as a rite of passage. For those from non-smoking families, smoking is an act of rebellion; a way to affirm their independence from the norms set by their parents.

Although parental and peer smoking are common predictors of experimentation and continuation of smoking (Tyas and Pederson 1998; U.S. Department of Health and Human Services 1994; 2001), as shown in the quantitative analysis and other studies, parental smoking is a distal factor while peer smoking is a direct factor associated with smoking (Eisenberg et al 2000; Flay et al 1994; Otten et al. 2007; Wiefferink 2006). Adolescents usually spend more time with their friends than family members; friends are thus more important source of socialising agents than family members (Catalano and Hawkins 1996). Findings from this study highlight the process by which young smokers pick up smoking and help to contextualise findings from the structural equation models. Research findings concur with other studies which show that it is usually friends who facilitate young smokers’
smoking continuation (Flay et al 1994). Smoking is a social norm within their social network as the quantitative analysis shows that young smokers usually have a higher proportion of smokers in their families and they have more friends who smoke as compared to the non-smokers. Smoking is normalised in such instances where a large proportion of social network members smoke. By conforming to the prevailing norm in their social network, young smokers seek social approval and acceptance (Taylor, Peplau and Sears 2006) from their social network. In addition, this study also shows that the female participants tend to succumb to smoking influence from their boyfriends easily. Thus, girls are likely to pick up smoking if their boyfriends are smokers.

Young smokers and their friends are partners-in-crime and are strongly bonded through their learnt behaviour. Smoking pulls their friendship bonds together in a tight-knitted fashion as smoking itself is an exclusion which leads to many shared activities among smokers. These exclusive activities provide several social benefits to the young smokers (Allbutt, Amos and Cunningham-Burley 1995; Denscombe 2001a; 2001b; Evans and Anne 2006; Pearson and Mitchell 2000; Stewart-Knox 2005; Nichter et al. 1997). Smoking is part and parcel of young smokers’ everyday life; it is part of their social and cultural world (Allbutt, Amos and Cunningham-Burley 1995) in several ways: (a) smoking is part of youth culture specific to the smokers. For example, participants associate smoking with cosmopolitan lifestyle where there is a social circle and a leisure lifestyle involving drinking and clubbing. Some of the youth culture activities are context-driven (Fry et al. 2008; Lupton 1995; Poland et al. 2006) and provide several advantages such as expanding social network and establishing friendships (Fry et al. 2008); (b) smoking is a form of distraction; it keeps smokers
busy in times of loneliness; and (c) smoking provides smokers with a legitimate reason to take a break from their emotional problems. It helps them to regain composure so as to manage their negative emotions. As put forth by Lupton (1995: 154):

“Smoking is pleasurable and relaxing not merely because tobacco is a drug, but because it represents, albeit briefly, a space to sit down, gather one’s thoughts, take stock, indulge oneself, engage in hedonism and experience the thrill of danger. Participation in smoking or alcohol use enables the self to escape from the constraints of civility and the management of the body, into release, bodily pleasure, self-indulgence.”

These young smokers are dependent on cigarette smoking for these unmet needs — friendship and companionship with like-minded friends and coping with boredom and negative attitudes, despite emphasising the importance of autonomy and being in control of their smoking habits. It is difficult to pull young smokers away from smoking because of their friendship ties and physiological needs. Findings suggest that even if an individual smoker quits smoking, as long as he is in the same smoking peer group, he may smoke again.

While literature has shown that tobacco taxes reduced cigarette consumption (Mackay, Eriksen and Shafey 2006), this study reveals that the high cost of cigarettes may not be a barrier for smoking experimentation. The high cost of cigarettes does not deter the experimenters and occasional smokers from smoking because firstly, they do not smoke frequently and the financial burden of cigarette smoking has not set in yet. Secondly, cigarettes are either provided by other smokers or smokers share the cost of
cigarettes. This culture of sharing cigarettes strengthens friendship bonds among the smokers. The more expensive cigarettes are, the more likely smokers will share cigarettes and in that process, they forge stronger social bonds. This thus makes it harder to break their friendship bonds.

Additionally, as a result of cost sharing and being offered cigarettes, young smokers do not realise the long term cumulative costs of cigarettes when they first started smoking. By the time they feel the pinch in their pockets, it is often too late as they are already addicted to smoking. This is especially so among the girls as they are more likely to receive cigarettes than boys (Robinson, Klesges and Zbikowski 1998) and this facilitates their dependence on nicotine without any financial impact on them if there are a lot of cigarette offers and opportunities for smoking. Girls may be addicted to smoking at a faster pace than boys as physiologically, girls tend to develop symptoms of nicotine dependence much faster than boys (DiFranza et al. 2002).

4.5.2 Misconceptions of smoking

There is a strong prevailing belief among the participants that cigarettes have a calming effect and help smokers to relieve their tension and stress. These participants are unaware that cigarettes contain nicotine which releases mediator substances such as noradrenaline, acetylcholine, dopamine, 5-hydroxytryptamine (5-HT), γ-aminobutyric acid (GABA) and β-endorphins (Knut-Olaf 2003). These substances create behaviour arousing and behaviour reinforcing effects. Studies have shown that the symptoms of nicotine dependence included cravings, depressed moods, frustration, anger, anxiety, difficulties in concentrating and restlessness (US

The participants in this study who smoke to cope with their emotions and frustrations rely on their addictions to manage their situations. However, they do not realise that their dependence on smoking to cope with negative emotions is a symptom of nicotine dependence and that they are addicted to smoking. Findings from this research show that young smokers underestimated the addictive nature of cigarettes.

In addition, it appears that the participants of this study have the misconception that by smoking occasionally, they have autonomy over their smoking behaviour. However, studies have shown that nicotine dependent symptoms develop soon after smoking initiation, before the onset of daily smoking (DiFranza et al. 2007; Gervais et al. 2006; Kande et al. 2007) The first Development and Assessment of Nicotine Dependence in Youth (DANDY) study found that adolescents show the first symptoms of nicotine dependence within days to weeks from the onset of their occasional use of cigarettes (DiFranza et al. 2000). The same study also shows that half of the study participants develop nicotine dependence symptoms by the time they are smoking two cigarettes in a day each week. The development of a single symptom strongly predicts continued use of cigarettes. A recent study by Doubeni, Reed and DiFranza (2010) confirmed that occasional tobacco use will trigger nicotine dependence. These symptoms escalate the frequency of tobacco use and in turn promote the development of additional dependent symptoms in a mutually reinforcing vicious cycle.
Young smokers’ perceptions of social smoking and misconceptions about the effect of social smoking need to be addressed. A review of the mass media campaign messages on smoking control reveals that the main focus have been on smoking-related diseases since the 1990s (Table 6 in Chapter 1). The last mass media campaign with a strong focus on addictive nature of cigarettes was in 1995 (Ministry of Health 1996). There is a need to educate adolescents on the addictive properties of cigarettes as well as to convince them that there are healthy alternatives to cope with stress.

The health consequences of smoking are disregarded by the participants in this study. This is because there is a 20 to 30 years of time lag between the onset of smoking and manifestation of smoking-related disease such as lung cancer (Lopez, Collishaw and Piha 1994). Smokers who contract smoking-related diseases are usually in their more advance ages, thus the young smokers in this study perceive that smoking-related diseases only occur among older smokers and that young smokers are invincible to smoking-related diseases because of their age.

The more immediate negative effects of smoking are usually noticeable on smokers’ fingers, teeth, lips, complexion and others. Such negative effects of smoking are unlike lung cancers or other smoking related diseases such as heart disease which does not present any visible effect. A local study among smokers found that smoking-related diseases which are highly noticeable are more likely to motivate smoking cessation thoughts while diseases which are deemed as unnoticeable and can be covered up, are less likely to trigger any thoughts about quitting smoking (Choo et al. 2009). However, this study found that female smokers tend to hide the negative
outward manifestations of smoking effects and disregard adverse physical effects of smoking as an important motivator to quit smoking.

The negative physical effects of smoking do not result in as much attention and concern to the smokers as that of being obese or overweight. Being obese or overweight creates a stronger fear especially among the weight conscious individuals (Nowak 1998; Wills et al. 2006). This is because the effects of obesity are highly noticeable and there is very little which individuals could do to mask their body fats. In addition, the “thin ideal” body shape (Lupton 1994) as perpetuated by the media (Morris, Cooper and Cooper 1989), and weight-related stigma (Puhl and Latner 2007; Puhl and Heuer 2009), create a fear of being fat and a strong desire for thinness (Ryan, Gibney and Flynn 1998; Sweeting and West 2002). This motivates even those with normal body weight to attempt to lose weight (Nowak 1998; Wills et al. 2006). Unlike obesity, the negative effects of smoking are not as conspicuous and there is also a lack of an equivalent fear as that of being fat. The adverse effects of smoking generally do not motivate smokers to quit smoking as spontaneously as that of obesity.

4.5.4 Lay epidemiology

The young smokers in this study do not subscribe to scientifically defined risks of smoking. They practise lay epidemiology (Davison, Smith and Frankel 1991) and conceptualise smoking-related diseases and death based on social and personal information. Their understandings of smoking-related diseases are often dynamic and incoherent as it changes in response to their personal experiences and circumstances
Young smokers whose social network comprise of smokers who survived their unhealthy lifestyle, do not believe in the association between smoking and health risks. However, as health is not the young smokers’ priority concern, they tend to downplay the health risks of smoking and attempt to manage their risks based on social sources of information.

The participants’ constructions of smoking-related diseases and perceptions of smoking are often not in tandem with public health discourses. There are discrepancies between their observations and public health information on health consequences of smoking. As a result, they tend to discredit public health messages and are resistant to official-related messages on anti-smoking. In order to effect behavioural change, lay knowledge should not be neglected in the understanding of health (Popay and Williams 1996) and formulation of public health interventions. This is of predominant importance to public health as individuals construct lay theories in order to help them understand health and well-being (Furham 1988).

In justifying their perceptions of invulnerability, luck and notions of predestination are used by young smokers to understand and demystify the occurrence of diseases (Davison, Frankel and Smith 1992). Smokers privilege such explanations over scientific sources of information when they cannot explain the occurrence of diseases among the seemingly healthy people or those who survive unhealthy lifestyles without any illness (Lupton 1994). Contrary to the view that avoidance of health risks should be a personal responsibility of rational individuals (Peterson and Lupton 1996), the young smokers in this study are fatalistic and adamant that health,
illness and death are beyond their control because they believe that illnesses are externally controlled.

How different are girls and boys in terms of their smoking behaviour? This study reinforces the quantitative analysis which shows that there is a gendered path to smoking. Social influence plays a predominant role in young girls’ uptake of smoking. There is strong smoking norm in their social network because as shown in the quantitative analysis, a higher proportion of female smokers than male smokers have family members who smoke. For instance, close to half (48.1 percent) of the female smokers have siblings who smoke and close to two-thirds (65.2 percent) of the female smokers have at least one parent smoker. Among male smokers, 36.6 percent have siblings who smoke and 54.2 percent have parents who smoke. Girls are easily influenced by their boyfriends to smoke and tend to use smoking as a way to maintain their relationship. Additionally, the findings reveal that girls are also more likely to be offered cigarettes. This results in even more opportunities for them to smoke. Although pregnancy has been cited as one of their motivator for quitting smoking, with a trend of increasing age for first marriage and low fertility rate in Singapore (National Population Secretariat et al. 2009), this motivator is unlikely to result in much change to the female smoking prevalence.

Among the boys, social influence to smoke is very strong. Their fathers are usually smokers. This suggests that fathers are not good role models for anti-smoking efforts if fathers are smokers. This is because fathers’ smoking habit will contradict with their anti-smoking expectations on their children. The boys, in particular, are
aware of the costs of smoking. However, they are usually addicted to smoking by then and realise that it is not as easy to quit smoking as they had thought.

This study is limited by the small sample of young smokers which is not representative of the general population. However, several focus group discussions and interviews were conducted across various groups of smokers in a bid to obtain comprehensive and consistent opinions. Thus, while this study lacks external validity, it has high internal validity.

Despite this limitation, this study has provided useful insights on the salient factors influencing smoking among Singaporean young smokers. The presence of smokers in the family normalises smoking. The norm for smoking was further reinforced when there are smoking friends or colleagues in their social network. It does not help when youths have positive impressions of smokers and undermine the addictive properties of nicotine. Further, contradictions arise when they cannot reconcile their social construction of realities from everyday life experiences and observations of smokers with public health messages. As a result, they form lay beliefs and begin to rationalise their behaviour in their own ways. In a social environment where smoking is highly prevalent, young people are at risk of picking up smoking as social environment and significant others plays important role in shaping and influencing their cognitions and behaviour. In order to effect behaviour change among adolescents, a social ecological approach (Macintyre and Ellaway 2000) which addresses the root cause of the problem is needed. This will be highlighted in greater depth in the following chapter.
CHAPTER 5
CONCLUSION: WHERE DO WE GO FROM HERE?

5.1 OVERVIEW OF CHAPTER

This thesis researched on the factors influencing young Singaporeans to smoke. Findings from quantitative analysis show the pathways from social factors to smoking behaviour. Direct and mediating factors are identified in the structural equation models. Qualitative study complements findings from quantitative analysis and sheds light on the social processes leading to smoking. It helps us to understand the association among social factors and smoking behaviour. This chapter will sum up these research findings with a proposed model of smoking influence. A social ecological approach to smoking prevention is proposed based on the findings.

5.2 SYNOPSIS

Singaporean adult smokers picked up smoking during their teens (Ministry of Health 2007) when anti-smoking policies and programmes were not in place in Singapore yet. Having smoked for a long period of time, these smokers are addicted to smoking. For these smokers who are nicotine dependent, smoking has become a habit and cigarette smoking is an integral part of their life (DiClemente 2003). These smokers require determination and commitment to break the physiological, psychological and social ties that bind them to the smoking behaviour. They will also require alternative outlets to replace their smoking habit. The young smokers born in the 1990s are picking up smoking amidst a different social environment as compared
to the adult smokers. It is more challenging for young smokers to find a place to smoke and to purchase cigarettes as legislation on prohibition of smoking at certain public areas, prohibition on sales of cigarettes to minors and prohibition of smoking among minors below the age of 18 years are in place by 1990s. Public education on smoking control is also more established by then. However, despite the comprehensive smoking control programme, smoking among young people still persists and is increasing among the young adults aged between 18 and 29 years (Ministry of Health 2007).

There are several possible reasons which motivate young people to smoke. Firstly, although the smoking control programmes such as mass media campaigns, have reached out to the population, they have failed to counter subculture deviation. Some youths fail to find meanings in their lives and, rather than being a poor cousin, are drawn to alternative paths which give them a better sense of belonging.

Secondly, the problem of smoking persists among young people partly because of mixed messages. For instance, on one hand, there are strong anti-smoking campaigns on how smoking is detrimental for the well-being of smokers and even non-smokers, yet cigarettes are easily available. The sale of cigarettes is prevalent in shops at the neighborhoods such as coffee shops, provision shops, 7-eleven outlets, supermarkets and others. When young people see that the sale of cigarettes is prevalent, they perceive the ease of access to cigarettes and doubt the severity of the negative effects of cigarette smoking as promoted by the state. They could not understand the rationale for sale of cigarettes especially when the state has acknowledged that cigarettes are harmful and has promoted the ills of smoking. A
parallel analogy will be that of drugs. Drugs are propaganded by the state as harmful addictive substances and therefore, sales, possession and consumption of drugs is a serious offence in Singapore (Attorney General’s Chambers 2010 Chapter 185). Sales of drugs are prohibited in Singapore, drug traffickers face death penalty, drug abusers are sent to rehabilitation centre for treatment and recalcitrant abusers of certain drugs are sent for long term imprisonment.

In addition, another possible reason for the uptake of smoking among young people is due to the high prevalence of smokers in their social network. Young smokers tend to come from families where there is a high prevalence of smokers. As shown in the quantitative analysis, 36.6 percent of the male smokers and 48.8 percent of the female smokers have siblings who smoke, 54.5 percent of the male smokers and 65.2 percent of the female smokers have at least one parent who smoked. Further, young smokers also have more smoking friends. Hence, young smokers are exposed to strong social influences to smoke. As smokers who are seemingly healthy and well are prevalent in their everyday lives, it is hard for adolescents to understand the reason for which smokers within their social circle are able to survive the adverse effects of smoking, when epidemiologically, cigarette smoking is associated with numerous smoking-related diseases and smokers have high chance of contracting these diseases. Thus, young smokers are not able to reconcile public health messages on adverse effects of smoking with their observations of smokers in their everyday life. With parents and siblings smoking, the norms within the family directly challenge health promotion messages on anti-smoking. To build it even closer, even friends smoke.
At the larger societal level, non-smoking is the norm, as only slightly more than one-tenth (13.6 percent) of the adult population (Ministry of Health 2009) and 13.9 percent of the adolescents smoke, and prosocial establishments such as schools promote the ills of smoking and discourage smoking. However, within young smokers’ social network, smoking is highly prevalent and social network members seem to survive the ills of smoking and enjoy the benefits of smoking. Norms are inconsistent between the larger social environment and young smokers’ social network. When norms are inconsistent, young people tend to choose. Mainstream norms are not preferred by youths who are marginalised from schools and families. As a result of their differential association, they tend to share with others their counter establishment norms. When the two important policing institutions- family and school, lose its significance and are not able to police effectively, young people become vulnerable. Then when they are exposed to the norms of their subgroups, they will prefer subgroup norms as subgroups have a lot in common with them. For those who do not subscribe to societal values and norms, smoking is an alternative norm. Smoking is also socially motivated by a whole range of factors. The following paragraphs will provide a synopsis of findings from this research.

The survey data from Health Promotion Board provided an opportunity to examine the complex relationship between social factors and smoking. The structural equation models map out the various pathways from social factors to behaviour. It helps us to make sense of the way social factors influence health behaviour. Social structural factors such as socioeconomic status determine individuals’ life circumstances and life chances. While bivariate analysis shows a direct association between socioeconomic status and smoking status, the structural equation models
provide important evidence on the indirect effects of socioeconomic status on smoking status. The findings show that socioeconomic status as a social determinant works through social environmental and social network factors. Social environmental factors such as family and school, and social network factors in turn shape adolescents’ cognitions and behaviour.

Social support has positive influence on health behaviour (Straughan 1992). Family, being the basic unit of society (Berns 2007), has positive effects on adolescents’ social development. It provides adolescents with various forms of social support such as informational support, instrumental support, social companionship and motivational support (Wills 1985). Adolescents from families where parental support is strong have strong social ties and good quality interactions with their parents. They could go to their parents for advice and instrumental help. Those with strong family support are strongly embedded in their family and this protects them from negative social influence.

In addition, care and concern from parents as demonstrated through their knowledge about their children’s friends and activities, not only strengthens family embeddedness but also reduces chances of their children picking up smoking and lowers the likelihood of their children’s associations with friends of negative influence. Apart from playing a vital role in maintaining close knitted family relationships, parents are also role models for their children. Thus, anti-smoking influence from the family is weakened if one of the parents is a smoker.
The family has positive influences on adolescents’ engagement with other social establishments in society. For instance, adolescents have positive gains from family in their academic pursuits. Adolescents with strong family bonds perform better in their academic studies, they tend to be well anchored in their schools and are better able to appreciate and relish the importance of academic studies. Attachment with prosocial establishments buffers adolescents against risk behaviours as adolescents assimilate norms of these prosocial establishments. School being an establishment which imparts knowledge and moulds students’ character is an important prosocial establishment in adolescents’ social development process. Adolescents who are well integrated in their schools have anti-smoking sentiments. However, those who are less committed to their school activities and less appreciative of the importance of academic studies are likely to find solace in their friends of similar background and social conditions. These adolescents are exposed to higher risk of smoking because they are likely to mix with subgroups which have strong smoking norms. Schools should therefore, not be viewed as just another venue for conducting health promotion programmes, but as institutions which engage students in learning, help students to develop their potential to the fullest and inculcate prosocial and healthy behaviours. Keeping and integrating adolescents within prosocial units in society prevents them from engaging in anti-social activities.

Young smokers are from the lower social class and are less attached to their families and schools. Their parents are less strict with them and they have weak family bonding. Schooling is not meaningful for these young smokers and they are not committed to their school work or activities. As a result of their detachment from prosocial establishments, they tend to seek acceptance from their peer groups. Friends
in their peer groups are often like-minded people of the same social background. Smoking is a norm in these peer groups as most of their friends smoke. As most of these young smokers may have already been introduced to smoking from a young age if someone in their family smokes, they tend to pick up smoking readily if they are offered cigarettes from friends or encouraged by their friends to experiment with cigarettes. Further, smoking is normalised when a large proportion of their social network members, public figures especially those in the media (Charlesworth and Glantz 2005; Tanski et al. 2009), and popular culture smoke.

Cigarette smoking is a learnt behaviour from peer groups because young smokers experiment and learnt from friends the correct way of inhaling cigarette smoke. Smoking requires adolescents to experiment with cigarette smoking and keep trying in order to appreciate the pleasure of smoking. From the perspective of smokers, smoking behaviour is not just a habit which has adverse health effects as indicated by public health. Rather, the act of smoking especially when adolescents first initiate smoking, is embedded in very strong social meanings because it facilitates social bonding. Smoking encompasses more than just physiological pleasure, it includes a whole spectrum of youth aspired lifestyle and a social support group in which like-minded friends are interconnected. Smoking is perceived as a key to the social world of friends with similar interests and leisure activities. It is a form of social gratification.

This is especially so for adolescents holding routine jobs which have non-fix schedules and shift work requirements. These adolescents are often disempowered and require an outlet to ease their boredom and to relieve stress. Smoking is a good
alternative outlet for these adolescents as it helps them to pass time at their boring routine work and to stay awake on late-shifts. In addition, they get to smoke together with colleagues and make new friends while taking time to smoke, and this facilitates bonding.

It is evident from the qualitative study that smoking is not only a subgroup culture but also a form of emotional support when symptoms of nicotine dependence set in. Not having an in-depth understanding of the addictive properties and effects of nicotine, young smokers hold strong beliefs that they have full autonomy over their occasional smoking habit.

Lay epidemiology is found to be at work when young smokers attempt to make sense and reconcile public health messages on anti-smoking with their observations of smokers in everyday life. As not many young smokers have smoking family members or friends who contract smoking-related diseases, young smokers tend to dismiss public health claims about the negative effects of smoking. Young smokers are unable to make sense of public health messages on negative effects of smoking because they have not experienced any of the long-term adverse effects of smoking given their short duration of smoking. They are also unable to project the long-term negative effects of smoking at this point of their lifecourse and are unable to identify with images of ailing smokers. Further, there is a sense of invulnerability to diseases and non-concerns about engaging in healthy lifestyles because of the prevailing perception that “youth is a time when the body is in peak condition” (Backett and Davison 1995: 633) and that it is boring to be too future-oriented about health.
Young smokers attribute smoking-related diseases to chance and probability when they are unable to explain the occurrence of smoking-related diseases among non-smokers. They construct their own set of strategies to reduce the adverse effects of smoking and cherry-pick healthy lifestyle prescriptions to suit their needs. They hold lay beliefs about smoking-related diseases based on their social construction of health and illness. Apart from their own set of healthy lifestyle practices, smokers disregard negative outward manifestation of smoking-related effects as these effects are deemed as invisible to the naked eye and could be disguised easily. Hence, a whole set of lay beliefs and lay theories are at work in young smokers’ rationalisation of smoking behaviour.

5.2.1 A model of smoking influence

The structural equation models test the hypothesis of this research and confirm theoretical links among social factors and smoking behaviour. Structural equation models provide the paths from social factors to smoking status. These models show how social establishments are connected or interconnected to impact on behaviour. The qualitative study helps to uncover what goes on in the paths and provide a clearer picture of the process leading to the uptake of smoking. It shed light on how social conditions in family and workplaces influence their opinions on smoking and behaviour. It also shows how young people are drawn to smoking as a result of peer influence. Based on consolidated findings from the analysis on structural equation models and qualitative study, a model of smoking influence is illustrated in Figure 12. It is the first ever model which attempts to provide a holistic understanding of social
Figure 12: Proposed model of smoking influence among young Singaporeans

Social environmental factors
- Parental management
- Family attachment
- Peer attachment
- School commitment

Academic performance

Social structural factors
- Age
- Ethnicity
- Socioeconomic status

Social network factors
- Sibling smoking
- Parental smoking
- Peer smoking
- Colleagues smoking

Social cognitions
- Smoking is harmful to my health
- It is wrong of someone of my age to smoke
- My parents will object if I smoke
- It is difficult to get cigarettes in my neighbourhood

Lay epidemiology

Normalisation of smoking

Rationalising smoking-related risks

Smoking status
factors influencing adolescent smoking behaviour in Singapore. By mapping out the
pathways from various social factors to smoking behaviour, this model provides a
novel approach to understand how different levels of social factors impact on smoking
behaviour.

This model draws heavily on Durkheim’s concept and shows that social
process such as social integration charts health behaviours. Young smokers’ social
constructions on the effects of smoking are based on their observations of members in
their social network and everyday life reality. Social environment and social network
shape social norms and these contribute to lay epidemiology. Lay epidemiology
creeps in when adolescents try to make sense of the effects of smoking in their
everyday life.

Smokers in their social network not only influence adolescents’ perceptions of
smoking but also normalise the smoking behaviour. With strong beliefs that smoking
may not necessarily result in adverse effects, favourable perceptions as well as
perceived norm about smoking, adolescents begin to rationalise smoking behaviour
by engaging in lay evidence-based strategies to alleviate the negative effects of
smoking.

5.2.2 Gendered pathways to smoking

There are gendered pathways to adolescent smoking behaviour. Parents are
generally more strict and protective over their daughters than sons. Family has a
greater influence on girls than boys. Unlike boys, girls’ level of family attachment
does not decrease with age and because there are also more smokers in girls’ family, girls from families where there are smokers are exposed to greater risk of smoking. Girls from non-smoking family have strong anti-smoking norms in their family environment and these girls are likely to be buffered from negative smoking influence.

In addition to family influence, girls tend to succumb to smoking influence from their boyfriends. Smoking is used as a way to maintain and manage their relationship. Girls are also exposed to greater temptation to smoke because cigarettes are free most of the time. Thus, unlike boys who may have concerns about the cost of cigarettes, this is not likely to be a strong barrier to smoking among the girls. Young girls have a long term goal of quitting smoking when they are pregnant, but given the strong social trend of delayed first marriage and low birth rates (National Population Secretariat et al. 2009), this may not be a strong motivator for them to quit smoking after all.

In the family, father plays a strong influential role in smoking experimentation among the boys as most have fathers who smoke. Boys are concerned about the high cost of cigarettes but it is often difficult for them to quit smoking as they are physiologically dependent on smoking by the time they feel the pinch in their pockets.

5.3 CONTRIBUTIONS OF THESIS

5.3.1 Theoretical contribution
The quantitative component of this research is an application of Durkheim’s concept of social integration to examine adolescent smoking behaviour. This research advances our understanding of the concept on social integration as well as other sociological theories such as social control theory and social development when applied to the study of smoking behaviour. Being socially integrated with social networks may not always lead to positive health outcomes. Health behaviour of individuals is dependent on the prevailing norms of the social network. In other words, social integration works both ways; it either prevents individuals from engaging in health risk behaviour or promotes risk behaviour. Additionally, social structural factors such as individuals’ socioeconomic status or ethnicity do not predispose individuals to risk behaviour directly; it is the social environment which plays a predominant role in determining individuals’ exposure to risk behaviour.

5.3.2 Contribution to public health

This study is an example of how sociology contributes to the understanding of public health. Examining a public health problem from sociological lens provides new insights on the role of ‘social’ in health behaviours. Smoking is deemed by young people as a social behaviour; the perceived meaning of smoking is socially constructed. Neglecting the ‘social’ in public health interventions may render interventions futile or lead to limited long term effectiveness.

This research provides a holistic understanding of the root cause of smoking. It enables public health specialists to better understand the epidemiology of smoking and to better address the root cause of smoking among young Singaporeans. It
provides data for planning evidence-based health promotion programme on smoking prevention. Appropriate points of interventions could be identified from the structural equation models. Proximal and distal determinants of smoking are identified in the model and this enables public health specialists to target specific determinants for interventions. For instance, schools will be an appropriate point of intervention for influencing anti-smoking cognitions.

Additionally, the general framework of this study may be applicable to other at risk health behaviours which are closely associated with smoking, for example, alcohol drinking. This study provides important findings on the operational effects of adolescents’ immediate units of socialisation (family, school and friends) on their behaviour and this may be applicable to other aspects of social development in adolescence.

5.4 STRENGTHS AND LIMITATIONS

5.4.1 Strengths

Smoking is a complex issue which encompasses a whole range of factors ranging from an individual’s social structural factors such as socio-economic factors, ethnicity and age to social environmental factors such as family attachment, school commitment and influence from smokers in their social network. This thesis examines the interconnectedness of these factors and provides a better understanding of the factors associated with smoking. It helps to identify key points of interventions which will be of paramount importance in prevention of smoking initiation.
Additionally, the structural equation model of smoking influence is enhanced by rich qualitative data on lay perceptions of smoking. Such triangulation of both quantitative and qualitative data provides a better understanding of how young Singaporeans, based on their observations of smokers in their everyday life, make sense and downplay the risks of smoking and rationalise their smoking behaviour.

5.4.2 Limitations

The limitations of quantitative method and qualitative method have been highlighted in chapter 3 and 4 respectively. This section highlights the key limitation of mixed methodology as used in this study. While the main purpose of using a mixed methodology is to enable researchers to triangulate research findings so as to derive a deeper understanding of the issue of smoking among youths, some methodological issues arise in the process. For instance, in attempting to explore how social influence impacts on youth smoking behaviour and how young smokers rationalise smoking behaviour in the qualitative study, concept such as lay epidemiology which is not tested in the quantitative study, emerges as an important concept in the understanding of the processes linking social influence (for example, parental smoking, peer smoking, sibling smoking), social cognition and smoking behaviour. As the concept has not been tested and validated in the model of smoking influence, further research on this concept in the context of smoking is needed.

This research is also limited by the differences in age range of participants in quantitative study and qualitative study. The participants of the quantitative study were of a younger age than the participants of quantitative study. The quantitative
study was conducted among secondary school students, aged between 13 and 17 years in 2006 while the qualitative study was conducted among Singaporeans aged between 18 and 21 years old in 2008. However, the differences in age group of participants are not likely to have much impact on the study. This is because retrospective approach was taken in the qualitative study and participants were required to provide an account of what how they progress from being experimental smokers to habitual smokers. Furthermore, having young smokers of the legal age of smoking in the qualitative study will encourage more truthful and honest sharing of their smoking experiences.

5.5 RECOMMENDATIONS

5.5.1 A social ecological approach

As argued by Link and Phelan (1995), it is essential to identify the fundamental causes of health conditions so as to plan sustainable and effective interventions. However, behavioural interventions do not consider social contextual factors (Emmons 2000) which may be critical for health behaviour change especially among the socio-economically less advantaged target group. Behavioral-focused interventions often have limited effectiveness as issues related to the social environment which individuals live are not taken into consideration and these issues have profound impact on health behaviours.

Furthermore, health-related anti-smoking messages are not effective for adolescents in their subgroups because health concerns are not a priority for them.
From these adolescents’ perspectives, there is no linkage between smoking and health. The social construction of health behaviour embraces a whole basket of notions which health promotion has not been able to adequately address. The structural equation models show that detachment from family and school are main trips for adolescents because once they are detached from their families and schools, they are alienated from mainstream norms. In addition, engagement in healthy lifestyle is a forward looking investment. The rewards for leading a healthy lifestyle are in the long term in adulthood. Adolescents in the mainstream group embrace such deferred gratification because they are likely to have enjoyed such form of rewards, probably in their academic pursuits or other aspects of life. On the contrary, public health messages are not likely to get any buy-in from marginalised adolescents because these adolescents feel that they are unable to enjoy the rewards which correspond to deferred gratification. These adolescents are likely to find it hard to accept public health messages.

Additionally, the cumulative effects of cigarette smoking in the body are invisible to the naked eye and such effects are non-concerns to the adolescents because they have not experienced any physical discomfort from these effects. The more immediate physical effects of smoking also do not much impact on the adolescents as they are able to mask these effects easily. Furthermore, young people do not subscribe to the faith in medicine, and are also unable to identify with images of ailing smokers. Hence, messages on negative health effects of smoking are unlikely to have much effect to motivate them to stop smoking.
Findings from the qualitative study provide another set of information about adolescent smoking. It tells us what smoking means to the adolescents. In public health, smoking means destroying individuals’ health and reducing chances of long term good health. However, for participants in the qualitative study, smoking is a key to the membership of a social network which provides comradeship because these members share and provide a sense of belonging. Smoking also provides a break from the mundane for those who are disempowered at work. It is also evident from the qualitative research that it is difficult to break free from subgroup norms. The identity within subgroup is very strong because firstly, subgroups are the minority in the population and they are dependent on one another. Secondly, there are other meanings attached to smoking behaviour. It is not just about endangering one’s life but among smokers, smoking represents rebellion, maturity, adulthood and bonding. Messages on health and smoking are not likely to go down well with adolescents. Hence, interventions should provide adolescents with the opportunity and platform to bond with members from prosocial establishments so that they do not have to turn to smoking for social support. There is a need to provide youths with alternatives to meet their unmet needs.

A social ecological model (Emmons 2000) which addresses multiple levels of social influence on behaviour will be appropriate to discourage smoking initiation. This model is viewed as an overarching framework with a set of theoretical principles for understanding the interrelationships among diverse personal and environmental factors in health and illness (Emmons 2000). Such an approach aims to create a social milieu which is conducive for healthy behaviours (Breslow 1996). It integrates person-focused efforts to modify individuals’ health behaviour with environmental-
focused interventions to enhance or improve individuals’ physical and social surroundings. Thus, attention is given to the interplay among personal and environmental factors and ensures that “conceptual blindspots” as a result of exclusive individual level analyses are covered (Stokols 1999). The social ecological model proposes interventions at intrapersonal level, interpersonal level, organizational/environmental level, community level and policy level.

The social ecological perspective is in line with the key strategies identified in the Ottawa Charter for Health Promotion which calls for attention to be focused on structural determinants of health (Ottawa Charter 1986). Based on reviews of health promotion programmes which had been conducted since 1999, Jackson and colleagues (2007) found that the Ottawa Charter’s health promotion strategies have been effective in addressing the issues faced in the late 20th century. In another review of 47 health promotion programmes, Kok and colleagues (2008) concluded that health promotion programmes in the past decade have included more multilevel programmes as outlined in the social ecological model. Social ecological approach is not new to areas of tobacco control. In her call for more focus to be placed on social context, Emmons (2000) detailed several successful tobacco control programmes based on the social ecological model.

Based on the large body of evidence on the effectiveness of using social ecological approach in public health programmes, this research proposes to use the social ecological model to guide programmes on prevention of smoking initiation among adolescents. The overarching objective of smoking prevention programme is to strengthen non-smoking norms among adolescents. This objective will be achieved
by having multi-prong interventions and to prevent the development of negative peer groups. The proposed broad strategies for smoking prevention programmes among youths are outlined in Table 17. The strategies are divided into five broad levels: intrapersonal level; interpersonal level; organisational/environmental level; community level; and policy level.

Table 17: Proposed smoking prevention strategies using social ecological approach

<table>
<thead>
<tr>
<th>Levels of intervention</th>
<th>Broad strategies</th>
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| Intrapersonal Level     | ⇒ Dispel misconceptions of smoking  
⇒ Increase awareness on addictive properties of cigarettes  
⇒ Increase awareness on adverse outward manifestations of smoking  
⇒ Equip adolescents with refusal skills to resist temptations |
| Interpersonal Level     | ⇒ Encourage family cohesion for overall development of adolescents  
⇒ Strengthen social norm of non-smoking  
⇒ Encourage smoking cessation among parents |
| Organisational/Environmental Level | ⇒ Engage adolescents in school activities  
⇒ Inculcate a school culture and environment which provides alternatives for adolescents whose strengths are not in academic studies |
| Community Level         | ⇒ Provide alternatives for adolescents in the community  
⇒ Encourage the growth of positive youth groups in the community  
⇒ Provide social space in the environment for adolescent development |
| Policy Level            | ⇒ Strengthen enforcement |

5.5.1.1 Intraperisonal Level

On the intrapersonal level, individual behavioural change is the main goal (Emmons 2000). Interventions at intrapersonal level can be drawn up using various theoretical models such as health belief models, social learning theories. As behaviour change is a result of a change in attitudes, perceived
norms and perceptions of individuals’ ability to initiate change, intrapersonal interventions are targeted at individuals with the aim of equipping them with knowledge and essential skills, as well as to increase their motivations and self-confidence to achieve the desired behavioural change. Findings from this study show that smoking-related myths are prevalent among young people. Young people tend to undermine the addictive properties of nicotine and hold strong beliefs that their occasional smoking will not lead to addiction. They feel that they have full autonomy over their smoking habit and that they can stop smoking easily. Additionally, they are also unaware that by relying on cigarette smoking to cope with their negative emotions, they are already experiencing symptoms of nicotine dependence. In view of these findings, there is a need to better equip adolescents with knowledge on various aspects of smoking so as to dispel their misconceptions and myths about smoking.

Proposed interventions at interpersonal level include:

(a) Educating adolescents on addictive properties of cigarettes

The objective of educating adolescents on the properties of nicotine in cigarettes and the symptoms of tobacco dependence is to convince adolescents that even social or occasional smoking can lead to nicotine dependence. They should also be educated on the symptoms of nicotine dependence. It is envisaged that with knowledge on addictive properties of nicotine and symptoms of addiction, adolescents will be mindful of the consequence of occasional smoking and abstain from picking up smoking.
A way to convince adolescents of the addictive effects of cigarette smoking is via testimonies from ex-smokers. Hearing from someone who has experienced the addictive effects of smoking will better drive home the message that even occasional smoking is addictive.

Stories of successful quit attempts from young ex-smokers could also raise young smokers’ beliefs that they too have the ability to quit smoking successfully. However, although messages should also highlight the reality of the difficulties in quitting smoking, such messages should not be over emphasised so as to prevent young smokers from losing motivation to stop smoking. This will also prevent discrepancies between interpretation of public health messages and the reality of quitting smoking because when messages are contradictory, gaps are created for lay epidemiology.

(b) Educating adolescents on adverse effects of smoking

It is essential to convince adolescents on the whole range of adverse effects of smoking ranging from immediate negative effects to long term adverse effects of smoking. This will enable adolescents to better understand the epidemiology of smoking. However, as long-term health effects of smoking are non concerns to adolescents, more emphasis should be placed on short-term consequences of smoking.
The main elements of the proposed interventions for on educating adolescents on addictive properties of smoking and adverse effects of smoking have been include in the Health Promotion Board’s current smoking prevention programme for youths. The effectiveness of this programme will be monitored at national level in the next Students’ Health Survey which tracks changes in health behaviours of students.

(c) Equipping adolescents with coping skills and increase their self-efficacy in abstaining from cigarette smoking

Findings from the qualitative study suggest that adolescents tend to give in to temptations to smoke. They are not assertive in rejecting offers to smoke and lack refusal skills to resist temptations to smoke. Adolescents in environments of strong smoking norms are presented with numerous opportunities to smoke. It is therefore of paramount importance to equip them with refusal skills and confidence to resist offers to smoke. Apart from these, they lack coping skills to cope with stress and other negative emotions and are dependent on cigarette smoking to relive their stress and tensions. Adolescents should be taught ways to cope with stress and should be equipped with the necessary skills to deal with negative tensions and emotions.

Self efficacy of adolescents could be developed via social modelling and social persuasion (Bandura 1994). Seeing positive social role models who manage to cope with stress and negative emotions
without turning to cigarette smoking, and able to resist the temptation to smoke, will raise adolescents’ beliefs that they are also able to do so. However, the impact of role modelling on self efficacy is influenced by perceived similarity to the models (Bandura 1994). The greater similarities to the models, the more persuasive are the models’ perceived success of coping with stress. Thus, role models should ideally be youths with similar social background as the adolescents.

Social persuasion is another way to raise individuals’ beliefs that they have the ability to succeed. According to Bandura (1994: 72), “individuals who are persuaded verbally that they possess the capabilities to master given activities are likely to mobilize greater effort and sustain it than if they harbour self-doubts and dwell on personal deficiencies when problems arise.” Social persuasion raises self efficacy which in turn results in people trying hard to succeed. In the context of preventing adolescent smoking, role models or health educators could convince adolescents that they have the ability to resist the urge to smoke and able to cope with stress successfully without smoking.

5.5.1.2 Interpersonal Level

As outlined by Emmons (2000), interventions at interpersonal level should be aimed at providing social support to effect behaviour change. In addition, as social norms within social networks may influence individual’s attitudes and shape their behaviours, interventions should also focus on
inculcating prosocial norms within social networks. It is evident from this research that adolescents who smoke are those who are disengaged from their families. They are not close to their parents and do not have strong social and emotional support from their parents. Their parents are not concerned about their social activities and the type of friends whom they go out with. These young smokers do not have strong social ties with their parents. Apart from this, there is always someone in the family who smokes. Hence, most of the young smokers grow up in families where smoking is a norm. Even though parents may discourage their children from smoking, as long as they smoke, they lose the credibility in convincing their children that smoking is bad for them.

It is thus proposed that interventions at interpersonal level include intervention at the family with the objectives of encouraging family cohesion, strengthening prosocial norm and preventing infiltration of smoking network. It is of paramount importance to have strong family bonds because family brings about several benefits in the course of adolescent development. For example, adolescents who are socially integrated in their families often perform well in schools and are more engaged in academic studies and school activities. Interventions should impress upon the parents on the importance of family cohesion for overall development of adolescents.

Parents are role models for children and their behaviours are likely to influence their children. A Cochrane review of 22 randomised control trials on family-based interventions to prevent smoking among children and
adolescents concludes that family interventions may deter smoking among children and adolescents (Thomas, Baker and Lorenzetti 2007). Smoking prevention programmes for adolescents should include a component for parents with the aim of promoting non-smoking attitudes and encouraging them to inculcate a smoke-free environment at home. They should also be educated on the adverse effects of their smoking behaviour on their children.

Messages on adverse effects of parental smoking on their children’s health, as well as the effect of parental smoking on youths’ smoking behaviour have been included in smoking cessation programmes for adult smokers currently. The outcome of these programmes will be monitored via Ministry of Health’s National Health Surveillance Survey and National Health Survey which track changes in health behaviours of adult population at three-yearly and six-yearly intervals. There are also plans to encourage parents to set up smoke-free home rules in enclosed places such as homes and vehicles, where children are present.

5.5.1.3 Organisational/ Environmental Level

As suggested by Emmons (2000), at institutional level, interventions should focus on the organisations. Interventions should be conducted at social environments or settings such as schools, workplaces and healthcare systems. This will ensure that interventions at the larger environmental or organisational level complement and support programmes at the individual level.
The school is an important prosocial establishment in adolescents’ development. Adolescents spend a large proportion of their time in school especially among those who are committed to school activities and academic studies. In order to prevent the development and entrenchment of negative peer groups in schools, there should be effective interventions in schools.

However, findings from this study reveal that young smokers are disengaged from their schools. As compared to the non-smokers, they pale in comparison in terms of their academic performance, they do not relish the importance of academic studies and are not committed to school activities. These students fall behind the competitive academic system as their strengths are not in academic studies. They are not engaged in school activities and are alienated from their schools. As a result, these students are likely to mix with friends of similar background and together, they deviate from prosocial norms and adopt anti-social behaviours so as to express their individuality and rebelliousness. In view of this, it is proposed that schools develop a culture and environment which appraise students on a more holistic basis apart from academic achievements. There should be alternatives for students whose strengths are not in academic studies. Appraising the laggards based on an alternative set of skills and engaging them in areas which they are good at, could prevent the infiltration of negative peer groups and negative influence. Thus, interventions should focus on ways to keep students in prosocial environments such as schools. This is important because once negative peer groups infiltrate adolescents’ social network, it is difficult for them to break away from the peer groups as cigarette smoking bond them tightly to the peer
group. Intervention focusing on ways to engage youths in schools is likely to be the most effective in addressing the social conditions which put the “youths at risk for risk”.

5.5.1.4 Community Level

Apart from interventions at institutional level to ensure that programmes at environmental setting support individual-focused interventions, policies and facilities at the community should also complement efforts made at interpersonal, intrapersonal and environmental level to facilitate behaviour change. Emmons (2000) proposed that efforts at community level include networking with community resources, social service advocacy as well as structural/ environmental interventions in communities.

As schools may not be able to cope with additional responsibilities apart from the provision of education, in the absence of functional families and schools, alternatives should be explored at the community level to ensure that there are other avenues which provide adolescents with social support. The growth of positive youth groups should be encouraged. For example, a youth mentorship programme can be set up to provide social support to adolescents. Mentors could play the role of guardians and counsellors and to lead on-the-fringe youths in the right paths. They can also serve as role models for the other youths. As highlighted in earlier section on intrapersonal interventions, role models could help to raise the self efficacy of adolescents. An example of such an initiative is the Health Promotion Board’s Youth Advolution for Health Programme (Health Promotion Board 2009d). This peer advocacy
programme is a platform for youths to be involved in health promotion for youths. It taps on youth leaders to bring about positive health behaviour changes. This programme was launched in 2005. The outcome of this programme on the health behaviours of youths will be tracked collectively with the effects of other health promotion programmes in the Students’ Health Survey.

There should be ample social space in the community for adolescents. There should be facilities and activities to engage these youths so as to fill the void of smoking. Activities should be healthy alternatives (for example, sports and games) to smoking so as to ease their boredom and keep them away from negative influence. For instance, The Ministry of Community and Youth, and Sports set aside physical space in the heart of Orchard Road to engage and enable youths to express their social interests and creative passion in 2004 (SCAPE 2011). Now known as *SCAPE, it is a physical platform where youths can gather to showcase their skills and share ideas and aspirations. It is a hub where young people are engaged through music, art, dance, theatre, sports, multimedia and entrepreneurship.

5.5.1.5 Policy Level

Interventions at intrapersonal, interpersonal, organisational/ environmental and community levels collectively have an impact on lay epidemiology. These interventions, if effective, will create an environment where smoking is unacceptable. This will in turn impact on the way young people make sense of the risks of smoking in their everyday life. Increase
awareness on the addictive effects of smoking, confidence to resist temptations to smoke, skills to cope with stress, and positive anti-smoking influence and facilities in their environment will change their perceptions of smoking. Interventions at these levels create a grounds-up movement to smoking control and policies which increase the difficulty of obtaining cigarettes are essential to support smoking control ranging from intrapersonal level to environmental and community level.

Studies have shown that policies such as youth access laws and taxation on cigarettes are effective in lowering the prevalence of smoking among adults and youths (Chaloupka 1999, DeCicca, Kenkel and Mathios 2008, Ding 2003, Forster, Widome and Bernat, 2007, Liang et al. 2003). This research shows that while the prohibition on sale of cigarettes to minors below age of 18 years should have the most direct impact on adolescents, participants from the qualitative study commented that they did not have difficulties getting cigarettes when they were below 18 years old. It appears that the current polices which have most direct impact on adolescents are with respect to the legislation for underage smoking and taxation which leads to the increase in price of cigarettes. Enforcement on underage smoking should be strengthened to make it difficult for adolescents to have access to cigarettes. Although the high price of cigarettes is not a barrier for smoking initiation, it is an effective legislation in motivating smokers to quit smoking (DeCicca, Kenkel and Mathios 2008). Thus, fiscal policy such as taxation on cigarettes should be reviewed regularly in order to have an impact on smoking prevalence.
5.6 CONCLUSION

Smoking, the most preventable cause of death, is a major public health concern which arises out of a social problem—alienation from prosocial establishments. Smoking is one of the many measurable manifestations of this social problem and there could be many other problems associated with alienation.

We do not live in a vacuum; our social environment plays a dominant role in shaping our everyday lives and cultural norms. The social environment and social network could almost determine the type of health behaviours which individuals engage in. This research suggests that smoking prevention needs to go beyond the mandate of public health. We need to address issues at the larger social environment if we want to eradicate the problem of adolescent smoking and to prevent smoking prevalence from escalating among young Singaporeans. Smoking prevention should focus on the well-being of children from a broader perspective.


Weber, Max. 1905. The Protestant Ethics and The Rise of Capitalism. New York: Scribners,


Wills, Wendy, Kathryn Backett-Milburn, Susan Gregory, Julia Lawton. 2006. “Young Teenagers Perceptions of Their Own and Others’ Bodies: A


Students’ Health Survey

Instructions:

You are **not** required to write your name on this questionnaire.

Please be assured that you will not be identified and that the information you give is **strictly confidential**.

We would appreciate your **honest answers** as it will help us to better understand and help teenagers.

Please complete the survey form by marking a cross ✗ against the answer that best describes you. Please cross ✗ **only one box**, unless the question states that you can cross ✗ **more than one box**.
ABOUT YOURSELF

This section requires you to describe yourself.

1.1 Sex
- Male
- Female

1.2 Age in 2006
- 14 years old or younger
- 15 years old
- 16 years old
- 17 years old
- 18 years old
- 19 years old or older

1.3 Race
- Chinese
- Malay
- Indian/ Pakistani/ Sri Lankan/ Sikh
- Eurasian
- Others: Pls specify: ________________________

1.5 Housing type
- HDB 1 room flat
- HDB/SAF/PSA/PUB 2 room flat
- HDB/SAF/PSA/PUB 3 room flat
- HDB/SAF/PSA/PUB 4 room flat
- HDB/SAF/PSA/PUB 5 room flat
- HDB/ Government Executive flat
- HUDC flat
- Condominium/ Private flat/ apartment
- Terrace/ Semi-detached house/ Bungalow
- Others: Pls specify____________________________

1.6 Educational level
- Sec 1
- Sec 2
- Sec 3
- Sec 4
- Sec 5
- JC1/ PU1
- JC2/ PU2
- PU 3

* If you are in the Integrated Programme, please cross ✗ the equivalent academic level that you are currently in.

- Primary
1.8 Highest educational level of your father
- No schooling
- Primary
- Secondary
- ITE
- Pre-U
- Polytechnic Diploma
- Other Diploma
- University
- Degree
- Post graduate degree
- Others: Please specify ________________________________

### SMOKING & SUBSTANCE USE

4.1 Have you ever tried or experimented with cigarette smoking, even one or two puffs?
- Yes
- No

4.2 During the **past month or 30 days**, on how many days did you smoke cigarettes?
(Please indicate ‘0’ if you do not smoke / have not smoked in the past 30 days.)
- Days

4.3 During the **past month or 30 days**, on the days you smoked, how many cigarettes did you usually smoke?
(Please indicate ‘0’ if you do not smoke or have not smoked in the past 30 days.)
- Cigarettes

4.4 During the past year, have you ever tried to stop smoking cigarettes?
- I did not smoke during the past year
- Yes
- No
4.5 Do your parents smoke?
- None
- Both
- Father only
- Mother only
- I don't know

4.6 Do/Does any of your older brother(s) or sister(s) smoke?
- Yes
- No
- I do not have any older brother or sister
- I don't know

4.7 Do any of your close friends smoke cigarettes?
- None of them
- Some of them, less than half
- About half
- Most of them, more than half but not all
- All of them

YOUR OPINIONS

6.1 How much do you agree with the following:

<table>
<thead>
<tr>
<th>a) Cigarette smoking is harmful to my health</th>
<th>Strongly Agree</th>
<th>Agree</th>
<th>Disagree</th>
<th>Strongly Disagree</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

6.2 How wrong do you think it is for someone your age to:

<table>
<thead>
<tr>
<th>a) Smoke cigarettes?</th>
<th>Very Wrong</th>
<th>Wrong</th>
<th>A little wrong</th>
<th>Not wrong all</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>
YOUR FRIENDS AND YOUR EXPERIENCES

Think of your 4 closest friends (the friends you feel closest to) when answering the following questions.

7.1 My friends…

<table>
<thead>
<tr>
<th></th>
<th>Never</th>
<th>Sometimes</th>
<th>Usually</th>
<th>Always</th>
</tr>
</thead>
<tbody>
<tr>
<td>a) Seem to understand my problems</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>b) Help me as much as I need</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

YOUR SCHOOL

8.2 How would you rate your school results in the past year?

- Very good
- Good
- Average
- Poor
- Very poor

8.4 How interesting are most of your school subjects to you?

- Very interesting
- Quite interesting
- Fairly interesting
- Slightly boring
- Very boring

8.5 How important do you think the things you are learning in school are going to be for your future?

- Very important
- Quite important
- Fairly important
- Slightly important
- Not important at all

8.6 Thinking back over the past year, how often did you:

<table>
<thead>
<tr>
<th></th>
<th>Almost always</th>
<th>Often</th>
<th>Sometimes</th>
<th>Rarely</th>
<th>Never</th>
</tr>
</thead>
<tbody>
<tr>
<td>a) Enjoy being in school?</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>b) Try to do your best in school?</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
### YOUR FAMILY

The following questions are about the people whom you are living with at home.

#### 9.1 How much do you agree with the following statements? Please cross “Not applicable” if you do not have brothers, sisters and/or parents.

<table>
<thead>
<tr>
<th>Statement</th>
<th>Strongly Agree</th>
<th>Agree</th>
<th>Disagree</th>
<th>Strongly Disagree</th>
</tr>
</thead>
<tbody>
<tr>
<td>a) I am close to my father</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>b) I am close to my mother</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>c) I enjoy spending time with my family</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>d) If I have a personal problem I could ask my mother or father for help</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>e) I feel that my parents are always available to listen to me</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

#### 9.3 How wrong do your parents feel it would be for you to:

<table>
<thead>
<tr>
<th>Activity</th>
<th>Very Wrong</th>
<th>Wrong</th>
<th>A little wrong</th>
<th>Not wrong at all</th>
</tr>
</thead>
<tbody>
<tr>
<td>a) Smoke cigarettes?</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### YOUR NEIGHBOURHOOD

#### 10.1 How much do you agree with the following statements?

<table>
<thead>
<tr>
<th>Statement</th>
<th>Strongly Agree</th>
<th>Agree</th>
<th>Disagree</th>
<th>Strongly Disagree</th>
</tr>
</thead>
<tbody>
<tr>
<td>a) I can easily get cigarettes in my neighbourhood</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
ANNEX 2- Figure 13: Structural equation model (with standardised estimates) of risk and protective factors influencing smoking among Singaporean adolescent girls (Full model)
ANNEX 3: Figure 14: Structural equation model (with standardised estimates) of risk and protective factors influencing smoking among Singaporean adolescent boys (Full model)

* * p<0.05, ** * p<0.01, *** p<0.001
## ANNEX 4: PROFILE OF PARTICIPANTS FROM QUALITATIVE STUDY

Table 16: Profile of participants

<table>
<thead>
<tr>
<th>Participant ID</th>
<th>Profile</th>
</tr>
</thead>
<tbody>
<tr>
<td>P1</td>
<td>Malay male, 21 years old</td>
</tr>
<tr>
<td>P2</td>
<td>Chinese female, 20 years</td>
</tr>
<tr>
<td>P3</td>
<td>Chinese female, 20 years</td>
</tr>
<tr>
<td>P4</td>
<td>Malay male, 20 years</td>
</tr>
<tr>
<td>P5</td>
<td>Chinese female, 20 years</td>
</tr>
<tr>
<td>P6</td>
<td>Malay female, 19 years</td>
</tr>
<tr>
<td>P7</td>
<td>Chinese female, 18 years</td>
</tr>
<tr>
<td>P8</td>
<td>Chinese female, 21 years</td>
</tr>
<tr>
<td>P9</td>
<td>Chinese female, 20 years</td>
</tr>
<tr>
<td>P10</td>
<td>Chinese female, 20 years</td>
</tr>
<tr>
<td>P11</td>
<td>Chinese female, 20 years</td>
</tr>
<tr>
<td>P12</td>
<td>Chinese female, 20 years</td>
</tr>
<tr>
<td>P13</td>
<td>Indian female, 19 years</td>
</tr>
<tr>
<td>P14</td>
<td>Malay female, 19 years</td>
</tr>
<tr>
<td>P15</td>
<td>Chinese female, 19 years</td>
</tr>
<tr>
<td>P16</td>
<td>Malay female, 19 years</td>
</tr>
<tr>
<td>P17</td>
<td>Malay female, 18 years</td>
</tr>
<tr>
<td>P18</td>
<td>Chinese male, 19 years</td>
</tr>
<tr>
<td>P19</td>
<td>Indian female, 19 years</td>
</tr>
<tr>
<td>P20</td>
<td>Chinese male, 20 years</td>
</tr>
<tr>
<td>P21</td>
<td>Chinese female, 19 years</td>
</tr>
<tr>
<td>Participant ID</td>
<td>Profile</td>
</tr>
<tr>
<td>---------------</td>
<td>--------------------------</td>
</tr>
<tr>
<td>P22</td>
<td>Indian male, 18 years</td>
</tr>
<tr>
<td>P23</td>
<td>Chinese male, 20 years</td>
</tr>
<tr>
<td>P24</td>
<td>Malay female, 19 years</td>
</tr>
<tr>
<td>P25</td>
<td>Chinese female, 20 years</td>
</tr>
<tr>
<td>P26</td>
<td>Chinese male, 21 years</td>
</tr>
<tr>
<td>P27</td>
<td>Chinese male, 21 years</td>
</tr>
<tr>
<td>P28</td>
<td>Chinese female, 20 years</td>
</tr>
<tr>
<td>P29</td>
<td>Chinese male, 20 years</td>
</tr>
<tr>
<td>P30</td>
<td>Chinese male, 20 years</td>
</tr>
<tr>
<td>P31</td>
<td>Chinese female, 20 years</td>
</tr>
<tr>
<td>P32</td>
<td>Chinese male, 21 years</td>
</tr>
<tr>
<td>P33</td>
<td>Chinese female, 20 years</td>
</tr>
<tr>
<td>P34</td>
<td>Chinese female, 20 years</td>
</tr>
<tr>
<td>P35</td>
<td>Chinese female, 19 years</td>
</tr>
<tr>
<td>P36</td>
<td>Chinese female, 20 years</td>
</tr>
<tr>
<td>P37</td>
<td>Chinese female, 20 years</td>
</tr>
<tr>
<td>P38</td>
<td>Chinese male, 19 years</td>
</tr>
<tr>
<td>P39</td>
<td>Chinese male, 20 years</td>
</tr>
<tr>
<td>P40</td>
<td>Chinese male, 18 years</td>
</tr>
<tr>
<td>P41</td>
<td>Chinese male, 20 years</td>
</tr>
<tr>
<td>P42</td>
<td>Chinese female, 19 years</td>
</tr>
<tr>
<td>P43</td>
<td>Chinese male, 18 years</td>
</tr>
<tr>
<td>Participant ID</td>
<td>Profile</td>
</tr>
<tr>
<td>----------------</td>
<td>------------------------------</td>
</tr>
<tr>
<td>P44</td>
<td>Chinese male, 20 years</td>
</tr>
<tr>
<td>P45</td>
<td>Malay male, 19 years</td>
</tr>
<tr>
<td>P46</td>
<td>Chinese male, 20 years</td>
</tr>
<tr>
<td>P47</td>
<td>Chinese female, 20 years</td>
</tr>
<tr>
<td>P48</td>
<td>Chinese male, 19 years</td>
</tr>
<tr>
<td>P49</td>
<td>Chinese male, 19 years</td>
</tr>
<tr>
<td>P50</td>
<td>Chinese male, 19 years</td>
</tr>
</tbody>
</table>