

Protective Predictors of Smoking Intention among Lower Secondary School Students in Bangkok, Thailand

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This research tests predictions about pathways to smoking intention by using the prototype/willingness model of health risk with 676 Thai lower secondary school students (mean age: 14.0 years). Structural equation modeling indicates that future orientation has a negative path to smoking intention. In contrast, future orientation has positive paths to having negative attitudes toward smoking, negative prototype, and peer resistance. Good self-control is positively related to negative prototype, peer resistance, and having negative attitudes toward smoking, although not directly related to smoking intention. Good self-control also has an indirect effect on smoking intention through peer resistance, negative attitudes toward smoking, and negative prototype. The overall goodness-of-fit statistical analysis shows that the causal model of smoking intention is the best fit to the empirical data. The test of the invariant model across gender found that the relationship between future orientation and good self-control in males is not different from that of females. Although the invariant model suggested the same pattern of causative relationship in both males and females, it is interesting to note that some paths are different in separate parameter estimation across the two gender groups. Suggestions and implications for preventive interventions are discussed.

Keywords: *prototype/willingness model, future orientation, self-control, smoking intention, adolescence*

Introduction

During adolescence, many teenagers engage in harmful and questionable habits as a result of peer pressure. At this stage, young people are considered to be very vulnerable and susceptible to developing these habits (Jessor, 1991). According to the National Statistical Office of Thailand (NSO), a substantial number of Thai adolescents have initiated smoking behavior (NSO, 2008). In two successive research studies (2007-2008; 2009-2011), it was established that there has been a steady increase in the number of adolescent smokers (NSO, 2008, 2011). Also, it is important to note that the starting age of smoking significantly declined between 2007 and 2011. At the same time, smoking intention (the percentage surveyed who said they intend to smoke in the future), has increased with age. With specific regard to neophyte smoking, the number of adolescent smokers in the age range of 15-24 years recorded a significant increase (NSO, 2008, 2011).

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According to a survey carried out in the Bangkok Metropolitan Area in 2009, 27.5% of 600 secondary school students smoked at the time of the survey and first tried smoking at a mean age of 13 (Wattananonsakul, 2009). This finding is consistent with research carried out in Asia and other countries which has documented early teenage smoking (Chen, et al., 2006; Page, Huong, Chi & Tien, 2012; Evans, Powers, Hersey & Renaud, 2006; Gerrard, Gibbons, Stock, Lune & Cleveland, 2005; Vitória, Salgueiro, Silva & De Vries, 2009). Preventive interventions have been recommended by most researchers to prevent smoking behavior amongst teenagers who have never smoked. Through this research, the key reasons for smoking reported by teenagers have been identified. These are curiosity, imitation, peer pressure, desire to prove maturity, and the perception that smoking teens are outstanding amongst peers (Jessor, 1993; Vazsonyi et al., 2008). In Thailand however, researchers have paid little attention to understanding personal reasons that affect cognitive factors leading to early adolescent smoking. Instead, most Thai research uses youth risk behavior surveys to focus only on the smoking behavior ratio or rates (Ruangkanchanasetr, Plitponkarnpim, Hetrakul & Kongsakon, 2005; Wongtongkam, Ward, Day & Winefield, 2014).

Past research findings indicate that prevention activities should start before smoking begins and before the target habit has been established (Colby, Tiffany, Shiffman & Niaura, 2000). Hence the early teenage period is the appropriate focus of study. According to the theory of planned behavior (TPB) and the theory of reasoned action (TRA), intention is seen as the best predictor of future behavior (Ajzen & Fishbein, 1980; Fishbein & Ajzen, 1975). Besides predicting variation in health-related behaviors and individual-level psychosocial factors, the TPB and TRA also recognize the concept of social influence and subjective norms as proximal parameters of intention and behavior.

The study applies the concepts of protective and risk factors derived from problem behavior theory (PBT) in response to the preventive program which guided the present study (Jessor, 1993; Jessor, Donovan & Costa, 1991). This theory emphasizes social-contextual and individual-level protective factors in the family, peer group, school, and neighborhood contexts (Jessor et al., 1991). Consistent with the problem behavior model, this study examines good self-control, future orientation, and peer resistance as protective variables that could be associated with smoking intention directly and indirectly. The variables measure protective factors within the personality system (measured by social psychology scales) that are directly and indirectly associated with smoking intention through their associations with mediation variables. Health-enhancing behavior, such as not smoking, is likely to be increased by protective variables whereas non-smoking intention is likely to be decreased by risk factors (Jessor, 1991). This research examines attitudes toward smoking, prototype and willingness as risk variables associated with smoking intention, whether directly or indirectly.

Parameters of the model

Future orientation and good self-control

According to Nurmi (1991), future orientation is a fundamental process: a pervasive way of relating to people and situations that is learned at an early stage in life through culture, religion, social class, education, and family influence. Future orientation consists of individual images holding concern for the future, as these images are reflected in hopes and

fears (Seginer & Halabi-Kheir, 1998). Good goal setting and achievement are realized by individuals with high future orientation who plan strategies for meeting long-term obligations. These individuals may also be able to restrain themselves from engaging in tempting but unproductive behaviors because of an increased ability to articulate a set of negative consequences more clearly, as well as to visualize and formulate future goal states that shape current judgments and decisions (Keough, Zimbard & Boyd, 1999). Greene and DeBacker (2004) suggested that future orientation can be a powerful motivator of current behavior.

Self-control is highly related to substance use because individuals with low self-control experience higher levels of emotional distress, and hence tend to avoid facing problems rather than trying to cope with them (Wills et al., 2007). As was mentioned earlier, the vulnerability level of adolescents is very high. It is therefore paramount for effective and efficient guidance to be accorded to this age group by their parents, guardians, elders and peer counselors. By doing so, there is increased efficiency in curbing this behavior although it takes individual skills to completely handle this situation. These characteristics contribute to the tendency to perceive substance use (Wills, Sandy & Shinar, 1999). Results from past research show that good self-control among adolescents is negatively related to smoking intentions and conversely, poor self-control is an important factor for escalation of the smoking habit (Will et al., 2007).

This study examines self-control and future orientation as important inhibitive factors of improper behavior in teenagers. According to previous research, both factors are found to be predictors of problematic or unconventional behaviors (Chen & Vazsonyi, 2011; Keough et al., 1999; Wills, Gibbons, Gerrard, Murry & Brody, 2003). Factors such as self-control and future orientation are very crucial since they continue to develop through early and middle adolescence (Tarter, Mezzich, Hsieh & Parks, 1995) and are elicited as important factors for escalation of health risk behaviors such as smoking. Therefore, we hypothesize that future orientation and self-control characteristics are negatively related to smoking intention. Additionally, these variables are also related to smoking intention directly and indirectly through mediating variables.

Prototype/willingness model and attitudes

Researchers developed the prototype/willingness model with the basic assumption that risky behaviors in teenagers are acquired, or rather initiated, unintentionally and unplanned, in response to their environment (Gibbons & Gerrard, 1995; Gerrard et al., 2005; Gibbons, Gerrard, Ouellette & Burzette, 1998). According to the prototype/willingness model, the assumption is that there are two paths to risk behavior for adolescents. The first path, called the reasoned path, reflects that risk behavior is intentionally performed by young adolescents. The theory of reasoned action (TRA) and the theory of planned behavior (TPB) describe details concerning attitude toward performing the behaviors and supportive subjective norms proceeding to the behavior through behavioral intentions (Ajzen, 1991; Fishbein & Ajzen, 1975). The association between intention and behavior is clearly stated in these two theories; however, this association is weak during adolescence, when many risk behaviors are started, and increases with age.

The “prototype” has been used in explaining the issue through suggesting a second path to health risk behaviors which does not involve planning or intentions. This prototype is an image of the type of person their age who engages in a specific risk behavior such as smoking. Behavioral willingness is defined as a person’s openness to risk opportunity, that

is, willingness to engage in risk behaviors in circumstances that are conducive to those behaviors. Behavioral willingness can simply be defined as the unplanned reaction to a situation. According to Erikson (1950), adolescents tend to be preoccupied with their own social image and are sensitive to the impact that their behavior has on their image. They realize that if they smoke in public or with peers, they will acquire the image associated with unconventional behavior or aspects of it (Gerrard et al., 2006). Hence the more negative the adolescent's images of the typical smoker, the less willingness they will have to smoke when given the opportunity. The model is also useful in explaining the behavior of pre-adolescents (Wills et al., 2007).

The theories of planned behavior and reasoned action explain the risk of tobacco use among adolescents through a plausible mechanism. According to TPB, when an individual believes smoking is beneficial they are likely to intend to smoke. Similar studies have found that attitudes towards smoking predict the smoking intention of an individual. Previous research has examined two types of attitudes: (a) those related to health consequences that arise from smoking such as diseases, and (b) those related to social or functional aspects of smoking. The increased use of tobacco, the inception of tobacco use and addiction (both current and previous) have been attributed to the existence of positive expectancies that concern psychosocial utilities. The notion has been widely shared that there exists a direct relationship between attitudes towards smoking and an individual's intention and willingness to smoke (Chen et al., 2006; Gerrard et al., 2005).

Most researchers have explored three factors—attitudes, prototype and willingness—as mediating variables between smoking behavior and exogenous variables (Gibbons, Gerrard, Blanton & Russell, 1998; Gerrard et al., 2005; Gerrard et al., 2006). These studies further established that negative attitudes, negative smoking prototypes and risks that are related to smoking are some of the mediating variables. In addition, it has been established that the above named mediating variables are correlated with self-control, smoking intention and future orientation.

Peer Resistance

According to Brown (2004), peer influence is very important since it determines adolescent psychosocial functioning. A substantial number of studies have been conducted to explain the significance of peer influence during adolescence (Brown, Clasen & Eicher, 1986). Changes in the salience of peers as a reference group determine the role of the peer crowd in defining the social landscape of early and middle adolescence. As individuals begin to sort themselves into peer groups they feel the pressure to adopt the styles, values and interests of their friends. This pressure may intensify as adolescents use social influence to regulate each other's behavior in order to create solidarity and uniformity within the group, and to develop a group identity that set them apart from other students. This process has proven to be pervasive among middle adolescents in the Western context, since 85% of American youth report membership in at least one peer group (Brown, 2004).

Peer pressure is commonly found to be a major reason for adolescent misbehavior and risk taking, since most of the risky behaviors that adolescents engage in, such as substance use, takes place in the company of peers. The increase in peer influence in adolescence arises from changes in individuals' susceptibility to peer pressure. Considering highly what their friends think about them and fearing being rejected, adolescents tend to go along with the crowd and alter their behavior so as to fit in (Brown et al., 1986).

In this study, we hypothesize that peer resistance will mediate the relationship between exogenous variables and smoking intention and will be negatively associated with smoking intention. Notwithstanding the existence of counseling and proper guidance, the urge not to cave into peer pressure entirely depends on the individual adolescent. The desire to be associated with a particular group poses a great challenge during this developmental stage. Research has established that is during this stage adolescents prefer to 'hang out' with people their own age. This increases the likelihood of them giving into peer pressure.

Gender differences

There are significant sex differences that contribute to the risks of cigarette smoking and substance abuse, though this variation differs greatly by setting. Research carried out in Asian countries note marked gender differences in smoking rates, and it has been established that the ratio of men to women who smoke is relatively high (Li, Fang & Stanton, 1999; Chen et al., 2001; Chen et al., 2006; Wattananonsakul, Suttiwan, and Iamsupasit, 2010). However, in the United States women now have comparable smoking rates to men (Grunberg, Winders & Wewers, 1991). From this background, we determined that tested models be non-invariant across gender groups.

The present study

In response to increasing smoking behavior among Thai teenagers, this study explores the influence of cognitive factors on smoking intention for students in the early teenage years. The focus on smoking intention examines the influential factors that lead to smoking amongst teenagers as exogenous variables. It develops a casual model of adolescents' smoking intentions to examine whether the self-control and future orientation variables suggested by previous research are antecedent to smoking intentions and decrease the likelihood to smoke (Chen & Vazsonyi, 2011; Keough et al., 1999; Wills et al., 2003). Attitudes towards smoking, peer resistance, prototype, and willingness are modeled as mediators between good self-control and teenage intentions to smoke. Using a multi-group analysis between male and female teenage students as suggested by previous research, invariance across gender is analyzed to examine whether the variable relationships by gender share any common patterns and to explore parameter invariance of these variables (Warren et al., 1997).

Methods

Measures

The survey questionnaire included scale items to measure the protective and risk factors described above. All scales were developed in Thai and psychometric properties (e.g. item analysis, content testing, construct validity and reliability) were tested with Bangkok adolescent samples. Scales included in the questionnaire are:

Future orientation: Based on the concept of Nurmi (1991), this construct measures the perception of future events and attitudes towards self-regulation in order to reach one's target goals. The future orientation scale contains 12 items assessing future perspective (six items, e.g., "I will try to do difficult things that I don't like if it means progress in the

future”) and planning (six items, e.g., “I usually set a revision plan near the exam period”). Each of the 12 items had a 4-point response scale ranging from 1 (very untrue of me) to 4 (very true of me); reliability of the scale is $\alpha=.82$. Item scores were summed so that a higher score meant a higher future orientation.

Good self-control: From previous research (Wills et al., 2007) the scale comprises three constructs: soothability (4 items, e.g., “I can calm down easily when I am excited); delayed gratification (4 items, e.g., “I can wait for something”), and problem solving (4 items, e.g., “I like to plan before doing something”). The 12-item scale for good self-control had reliability of $\alpha=.83$. Each item had a 4-point response ranging from 1 (very untrue of me) to 4 (very true of me). Item scores were summed so that a higher score means higher self-control (Wattananonsakul, 2012).

Peer resistance: Developed from the Resistance to Peer Influence (RPI) scale of Steinberg and Monahan (2007), this measures the ability of teen students to resist influence or peer pressure. The scale consists of two constructs: normative regulation (6 items, e.g., “My friends cannot change my decision”), and peer influence (5 items, e.g., “I don’t think that I am hanging around with my friends only because I want to make them happy”). This 11-item scale for peer resistance had a reliability of $\alpha=.80$; each item had a 4-point response ranging from 1 (very untrue of me) to 4 (very true of me). Item scores were summed so that a higher score means higher resistance to peer influence.

Negative attitudes toward smoking in adolescence: A 13-item scale was developed with reliability of $\alpha=.84$ based on the attitude construct of affection and behavior (e.g., “Smoking behavior in adolescence is unconventional behavior”). Item scores were summed so that a higher score meant higher negative attitudes toward smoking in adolescence.

Smoking willingness: This scale was derived from previous research which measured the willingness to smoke cigarettes (Conger et al., 1992; Gibbons & Gerrard, 1995). The introductory sentence was “Suppose you were in a group of adolescents your age and there were some cigarettes that you could smoke if you wanted to. How willing would you be to do the following things?” The items that followed were “smoke one cigarette”, “smoke more than one cigarette”, and “smoke an unlimited number of cigarettes”; each item had a 4-point response ranging from 1 (not at all willing) to 4 (very willing).

Prototypes of smokers: This construct was introduced with “Take a moment to think about an adolescent your age who smokes,” followed by adjective descriptor stems such as “popular” or “careless.” Each item had a 7-point response scale with the anchor points “not at all” to “very.” Measurement of prototype was obtained for smokers ($\alpha = .88$) and drinkers ($\alpha = .89$). The higher the score, the more favorable the perception of smokers.

Smoking Intention: This scale is composed of questions pertaining to the smoking behavior of students, including such constructs as intention, deliberation, decision, and possibility to smoke (Vitoria et al., 2009). All are focused on present and near future behavior (within 6-12 months). The five items had 7 response choices from impossible (1) to possible (7); the results had an overall reliability of $\alpha=.89$. The higher the score, the higher the likelihood or possibility to smoke in the near future.

Study Participants and Survey Procedure

Secondary school students from four different schools in Bangkok, Thailand were sampled through a clustered random sampling process for the survey. Respondents were mainly comprised of students between Grade 7 to Grade 9 (the lower secondary level), as this is the time that many young teenagers experience adolescence or begin the developmental stage. Items that were originally developed in English were translated into Thai and underwent internal consistency and item total correlation analyses; this was to ensure good validity and reliability before test administration.

The survey protocol was certified by the Ethical Review Committee for Research Involving Human Research Subjects, Faculty of Medicine, Srinakharinwirot University. Research staff administered the self-administered questionnaire to the students in a classroom setting from November 2012 to February 2013. The survey was administered under confidential conditions and researchers assured the students that responses would not be shared with anyone.

The questionnaire took approximately 30 minutes to fill out. Of the total final sample of 676, 39% were male and 61% female, with a mean age of 14 ($SD=0.97$).

Data analysis

Prior to analysis, cases with missing data of less than 2% were handled by average score computation replacement for the missing items. Descriptive statistics and correlations were computed for the demographic variables and variables in the conceptual framework model. Path analysis was used to test whether protective factors could predict smoking intentions in the students, either directly or indirectly. Future orientation and good self-control were used as exogenous variables, while negative attitudes toward smoking, peer resistance, negative prototype and willingness were used as mediators.

LISREL 8.72 (Jöreskog and Sörbom, 1996) was used to estimate the path models using maximum likelihood (ML) estimation. The covariance matrix was used as input and measurement errors were allowed to be related. The overall fit of this model was evaluated by considering three criteria: chi-square, root mean square error of approximation (RMSEA) less than .08 (Kliwer & Murrelle, 2007), and comparative fit index (CFI) greater than .90 (Browne & Cudeck, 1993). The fit was also evaluated by checking standardized residuals greater than 2.00. A very good model fit is considered to have a relative chi-square (χ^2/df ratio) of 3.00 or less with CFI and NNFI at .90 or higher (Bentler & Bonett, 1980). Finally, invariance analyses were tested across gender.

Model 1 (Model Form Testing) consists of an equal number of model variables and the same pattern of relationship structure in both groups. All paths were free to vary (Base model).

Model 2 (Parameter testing): determines whether each matrix had the same parameter in all population groups, based on invariance of least restriction to invariance of matrix and with the most restrictive parameter, with the hierarchical nested hypothesis. Paths from exogenous variables to mediators (Γ) and criterion variables were constrained to invariance across gender.

Model 3 looks at paths among mediation variables and criterion variables (Beta matrix) which were constrained to invariance across gender. Model fit was assessed by the χ^2 fit statistic, the χ^2 / df ratio, and criterion evaluation suggested by prior research. The χ^2 difference test was used as criterion for invariance across gender groups.

Results

The results show significant relationships among the exogenous variables, criterion variable and mediators. Future orientation has a negative path to smoking intention, however, it also has positive paths to negative attitudes toward smoking, negative prototype, and peer resistance. Good self-control, although not directly related to smoking intention, is related to negative prototype, peer resistance, and negative attitudes toward smoking. Good self-control also has an indirect effect on smoking intention through peer resistance, negative attitudes toward smoking, and negative prototype. Correlations, means, and standard deviations of variables in the model are presented in Table 1.

Willingness has a strong path to smoking intention, while both negative attitudes toward smoking and negative prototypes have an inverse direct path to willingness. In contrast, peer resistance is not related to smoking intention directly, but is related indirectly through the willingness construct to smoking intention. Thus, pathways from negative attitudes toward smoking, negative prototype, and willingness to criterion variables indicate both direct and indirect effects.

The results show several significant relationships among exogenous variables, mediators, and criterion variables (Figure 1) as follows.

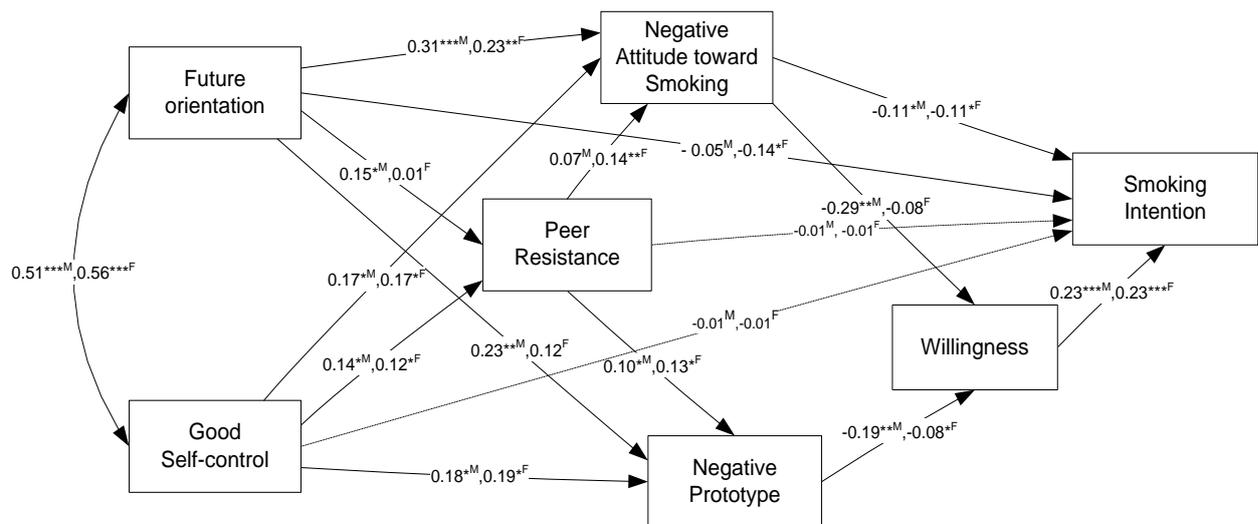
Male students: The male students are seen to have good self-control related to negative prototype, peer resistance and negative attitudes toward smoking, but not related directly to smoking intention. Future orientation shows no direct influence on smoking intention but has an indirect effect on smoking intention through negative attitudes toward smoking, willingness, peer resistance and negative prototype. Also, good self-control among the male students has an indirect effect on smoking intention through peer resistance, negative attitudes toward smoking, and negative prototype. Willingness has a strong path to smoking intention, and both negative attitudes toward smoking and negative prototype have an inverse direct path on willingness. In contrast, peer resistance is not directly related to smoking intention for male students but was related indirectly through negative prototype and the willingness construct to smoking intention. Hence, pathways from negative attitudes toward smoking, willingness and negative prototype to criterion variable indicate both direct and indirect effects.

Table 1: Intercorrelations, means, and standard deviations for all study variables among male and female students

<i>Variables</i>	1	2	3	4	5	6	7	<i>M_{female}</i>	<i>SD_{female}</i>
1.Future Orientation	-	.565**	.302**	.049	.248**	-.119*	-.200**	57.609	7.216
2. Good Self-control	.499**	-	.233**	.113*	.292**	-.108*	-.137**	40.695	6.248
3. Negative Attitude toward Smoking	.361**	.295**	-	.166**	.521**	-.092	-.201**	46.007	5.298
4. Peer Resistance	.206**	.188**	.141**	-	.162**	.025	-.098	23.449	4.226
5. Negative Prototype	.318**	.287**	.558**	.160*	-	-.099	-.149**	68.640	10.682
6. Willingness	-.082	-.088	-.275**	-.122	-.203**	-	.183**	2.002	0.417
7. Smoking Intention	-.123	-.058	-.277**	-.057	-.235**	.326**	-	5.724	3.626
<i>M_{male}</i>	54.033	40.080	44.451	21.924	66.552	2.071	6.243		
<i>SD_{male}</i>	7.449	6.212	6.864	4.616	12.608	.778	3.993		

* $p < .05$, ** $p < .01$: Correlations above diagonal are of female students ($n=374$), below are of male students ($n=238$).

Female students: Future orientation has a negative path to smoking intention and has positive paths to negative attitudes toward smoking. Good self-control is related to negative prototype, peer resistance, and negative attitudes toward smoking, hence not related directly to smoking intention. It also has an indirect effect on smoking intention through peer resistance, negative attitudes toward smoking, and negative prototype for female students. On the other hand, willingness has a strong path to smoking intention, whereas negative prototype has an inverse direct path on willingness. In contrast, peer resistance is not related to smoking intention directly but is related indirectly through negative prototype and willingness to smoking intention.



Notes: Standardized coefficients are presented for males and females respectively. Chi-square =19.25, $df=12$, $p=.083$; goodness of fit index (GFI)=.99; adjusted goodness of fit index (AGFI)=.97; root mean square error of approximation (RMSEA) =.045
 * $p<.05$, ** $p<.01$, *** $p<.001$

Figure 1: Multiple-group analysis of causal model of adolescent’s smoking intention.

Tests for Invariance across Gender

To examine the hypothesis about gender differences, invariance analyses were tested across gender in this study. The initial models were tested under the same pattern constraints. Modification indices were used to modify the overall fit model and correlating error terms were allowed. The overall fit of Model 1 yielded a chi-square of 19.25 ($df=12$, $p=.083$) with root mean square error of approximation of .045 and adjusted goodness of fit index of .97 ($\chi^2(12) =19.25$, $p=.083$, GFI= .99, RMSEA=.045). This indicates that there are no significant gender differences in the model.

Model 2 with a matrix of pathways from exogenous variables to endogenous variables (Gamma matrix) constraints has a good fit to the data ($\chi^2(18) =26.17$, $p=.096$, GFI= .99, RMSEA=.069). The χ^2 difference test ($\Delta\chi^2(6) =6.92$, $\Delta RMSEA= .024$) shows that there are no significant gender differences indicated in the Gamma matrix parameter. From Model 3 the findings show that constraints of pathways among the endogenous variables matrix (Beta matrix) also has a good fit to the data. The χ^2 difference test ($\Delta\chi^2(7) =9.79$, $\Delta RMSEA=.031$)

indicates that there are no significant gender differences in the Beta matrix parameter. Two group models are equal in parameter estimation as indicated by the result of invariance analyses across males and females.

Discussion

The study findings can be divided into several parts. First, the conceptual model examined relationships among future orientation, self-control and smoking intention with mediators including peer resistance, willingness to smoke, negative attitudes towards smoking and negative prototype. Multiple path mediation tests illustrating the importance of student's future orientation skills and self-control were included in the model. It also included how immune both male and female students could be to smoking intention through social influence mediators such as peer influence and the group of cognitive variables which included prototype, attitude willingness and prototype (Gibbon & Gerrard, 1995; Gerrard et al., 2005; Gibbon et al., 1998).

The results also show that having a high future orientation and good self-control could be protective against the influence of attitudes toward smoking in multiple path mediation tests; this could lead to higher smoking intention in both genders. This situation can be explained by emotional states of individuals. Wills and Filer (1996) stated that self-control is seen as important for tobacco and substance use since adolescents with low self-control experience high levels of emotional distress and hence tend to avoid facing problems rather than trying to cope with them. These characteristics contribute to the tendency to smoke. However, adolescents with good self-control are able to control emotional states, use coping mechanisms to deal with their problems and have a planning approach, including addressing behaviors that involve substance use (Wills, Sandy & Yeager, 2000). Good self-control may help adolescents achieve better emotional balance against smoking (Wills, Sandy, Shinar & Yeager, 1999)

Future orientation had direct and indirect effects through the mediation variables. As suggested by these findings, future orientation can be a powerful motivator of some behavior variables. Adolescents with high future orientation are good at setting and achieving goals and planning strategies for meeting long-term obligations. These adolescents are able to restrain themselves from tempting behaviors since they have the ability to articulate a set of negative consequences clearly, and to visualize and formulate future goal states that shape current judgments and decisions (Keough, et al., 1999). This is also supported by the Problem Behavior Theory of Jessor (1993). It can be said that future orientation and good self-control are personal attributes acting as protective factors to deter or diminish the probability of smoking intention and other risk behaviors in Thai adolescent students.

Second, this research examined prototype and willingness concepts for predicting smoking intention as suggested by Gibbon and Gerrard (1995). According to past research, these two factors had the greatest impact on intention. Results of this study are in line with previous findings in that prototype and willingness could predict behavior intention. They support research showing the beginning of behavior intention to smoke and the forming of smoking behavior, without plans or intentions but in response to the surrounding context (Gibbons & Gerrard, 1995). Intention to smoke increases due to a conducive environment for smoking and positive awareness towards smoking. This model is comparable to the

Prototype/Willingness Model (Gibbons & Gerrard, 1995). In contrast, theory of reasoned action (TRA) assumes human beings are rational and plan before acting (Fishbein & Ajzen, 1975). In addition, adolescence is a period in which there is sensitivity to social image (Erikson, 1950). In his work on psychosocial development theory, Erikson (1950) stated that adolescents tend to be preoccupied with their own social images and that they are sensitive to the impact that their behavior has on their image, which is consistent with these findings. Adolescents realize if they smoke in public or with peers they will acquire an image related with smoking or aspects of it (Gerrard et al., 2006). Thus, the more negative the adolescents' image of the typical smoker, the less willing they will be to smoke when given the opportunity.

Finally, the study found that there was invariance across gender in the model form and invariance in overall pathway testing. Males and females were seen to have a similar relationship between future orientation and good self-control. However, although the invariance model across gender suggested the same pattern of causative relationship in both males and females, it is interesting to note that some paths were different in separate parameter estimation across the two gender groups. Future orientation is negatively related to smoking intentions only in the female group and not in the male group, implying that female students with high future orientation have less likelihood of having smoking intentions.

A similar relationship was found between peer resistance and negative attitudes towards smoking for the female group only, suggesting that female students with resistance to peer influence were more likely to have negative attitudes toward smoking. Results found only in the male group included that prototype is directly influenced by future orientation: male students require a form of future orientation promotion different from that applied in female students so as to encourage resistance against prototype or the image of smoking teenagers among them. Hence, gender appears to be a significant moderating variable in understanding the processes linking variables in Thai adolescents. The findings from the comparison of the causative model of smoking intention in the male and female groups are congruous with the previous literature that gender is a moderator between variables (Simons-Morton et al., 1999; Gibbons & Gerrard, 1995; Evans et al., 2006).

These findings can be applied to the development of activities and preventive programs, including campaigns against smoking in early adolescence by taking into consideration the group variables on the personal level, such as future orientation and self-control. In addition, the findings can be expedient to the development of cognition process programs and activities, which includes promoting germane attitudes towards teenage smoking and adapting accurate understanding of the social image of smoking teenagers (Wattananonsakul, 2014).

Based on the variables examined in this study, programs can be developed to influence intention to smoke among teenagers. However, for the implementation to be effective, the intensity of programs and suitability to the gender of target students should not be neglected. The limitations of this study include that participants were drawn only from Thai students in educational area 1, Bangkok. Hence, it is not possible to generalize conclusions from this study to other student populations outside this area. Caution may be needed when interpreting and using the results. Model testing and development of programs based on findings to explore their preventive efficacy should be included in future research. Recommendations are to address future orientation, self-control enhancement,

understanding health promotion, and development of cognition process regarding negative attitudes towards smoking, among others.

References

- Ajzen, I. (1991). The theory of planned behavior. *Organizational Behavior and Human Decision Processes*, 50(2), 179–211. doi: 10.1016/ 0749-5978(91)90020-T
- Ajzen, I. & Fishbein, M. (1980). *Understanding attitudes and predicting social behavior*. Englewood Cliffs, New Jersey: Prentice Hall.
- Bentler, P. M. & Bonett, D. G. (1980). Significance tests and goodness-of-fit in the analysis of covariance structures. *Psychological Bulletin*, 88, 588-606.
- Brown, B. (2004). Adolescents' relationships with peers. In R. Lerner & L. Steinberg (Eds.), *Handbook of adolescent psychology* (pp. 363–394). New York: Wiley.
- Brown, B., Clasen, D. & Eicher, S. (1986). Perceptions of peer pressure, peer conformity dispositions, and self-reported behavior among adolescents. *Developmental Psychology*, 22, 521–530.
- Browne, M. W. & Cudeck, R. (1993). Alternative ways of assessing model fit. In K. A. Bollen & J. S. Long (Eds.), *Testing structural equation models* (pp. 136-62). Newbury Park, CA: Sage.
- Chen, P. & Vazsonyi, A. T. (2011). Future orientation, impulsivity, and problem behaviors: A longitudinal moderation model. *Developmental Psychology*, 47(6), 1633-1645. doi:10.1037/a0025327
- Chen, X., Li, Y., Unger, J. B., Gong, J., Johnson, C. A. & Guo, Q. (2001). Hazard of smoking initiation by age among adolescents in Wuhan, China. *Preventive Medicine*, 32(5), 437-445.
- Chen, X., Stanton, B., Fang, X., Li, X., Lin, D., Zhang, J., Liu, H. & Yang, H. (2006). Perceived smoking norms, socioenvironmental factors, personal attitudes and adolescent smoking in China: A mediation analysis with longitudinal data. *Journal of Adolescent Health*, 38, 359-368.
- Colby, S. M., Tiffany, S. T., Shiffman, S. & Niaura, R. S. (2000). Are adolescent smokers dependent on nicotine? A review of the evidence. *Drug and Alcohol Dependence*, 59 (Suppl1), S83-S95.
- Conger, R. D., Conger, K. J., Elder, G. H., Lorenz, F. O., Simons, R. L. & Whitbeck, L. B. (1992). A family process model of economic hardship and adjustment of early adolescent boys. *Child Development*, 63, 526-541.
- Erikson, E. (1950). *Childhood and society*. New York: Norton.
- Evans, W. D., Powers, A., Hersey, J. & Renaud, J. (2006). The influence of social environment and social image on adolescent smoking. *Health Psychology*, 25(1), 26-33.
- Fishbein, M. & Ajzen, I. (1975). *Belief, attitude, intention, and behavior: An introduction to theory and research*. Don Mills, Ontario: Addison-Wesley.
- Gerrard, M., Gibbons, F. X., Brody, G. H., Murry, V. M., Cleveland, M. J. & Wills, T. A. (2006). Theory-based dual-focus alcohol intervention for preadolescents: The strong African American families program. *Psychology of Addictive Behaviors*, 20, 185– 195.
- Gerrard, M., Gibbons, F. X., Stock, M. L., Lune, L. S. V. & Cleveland, M. J. (2005). Images of smokers and willingness to smoke among African American pre- adolescents: An application of the prototype/ willingness model of adolescent health risk behavior to smoking intention, *Journal of Pediatric Psychology*, 30(4), 305-318.
- Gibbons, F. X. & Gerrard, M. (1995). Predicting young adults' health risk behavior. *Journal of Personality and Social Psychology*, 69(3), 505-517.
- Gibbons, F. X., Gerrard, M., Blanton, H. & Russell, D. W. (1998). Reasoned action and social reaction: Willingness and intention as independent predictors of health risk. *Journal of Personality and Social Psychology*, 74(5), 1164-1180.
- Gibbons, F. X., Gerrard, M., Ouellette, J. A. & Burzette, R. (1998). Cognitive antecedents to adolescent health risk: Discriminating between behavioral intention and behavioral willingness. *Psychology and Health*, 13, 319-339.
- Greene, B.A. & DeBacker, T.K. (2004). Gender and orientations toward the future: Links to motivation. *Educational Psychology Review*, 16(2), 91-120.
- Grunberg, N. E., Winders, S. E. & Wewers, M. E. (1991). Gender differences in tobacco use. *Health Psychology*, 10(2), 143-153.

- Jessor, R. (1991). Risk behavior in adolescence: A psychosocial frame-work for understanding and action. *Journal of Adolescent Health, 12*, 597-605.
- Jessor, R. (1993). Successful adolescent development among youth in high-risk settings. *American Psychologist, 48*, 117-126.
- Jessor, R., Donovan, J. E. & Costa, F. (1991). *Beyond adolescence: Problem behavior and young adult development*. New York: Cambridge University Press.
- Jöreskog, K. G. & Sörbom, D. (1996). *LISREL 8: User's reference guide*. Chicago: Scientific Software International.
- Keough, K. A., Zimbardo, P. G. & Boyd, J. N. (1999). Who's smoking, drinking, and using drugs? Time perspective as a predictor of substance use. *Basic and Applied Social Psychology, 21*(2), 149-164.
- Kliwer, W. & Murrelle, L. (2007). Risk and protective factors for adolescent substance use: Findings from a study in selected Central American countries. *Journal of Adolescent Health, 40*, 448-455.
- Li, X., Fang, X. & Stanton, B. (1999). Cigarette smoking among schoolboys in Beijing, China. *Journal of Adolescence, 22*(5), 621-625.
- National Statistical Office of Thailand (2008). *The survey of smoking and drinking in Thai population (การสำรวจพฤติกรรมการสูบบุหรี่และการดื่มสุราของประชากร พ.ศ. 2551)*. Bangkok: Bangkok Block.
- National Statistical Office of Thailand (2011). *The survey of smoking and drinking in Thai population (การสำรวจพฤติกรรมการสูบบุหรี่และการดื่มสุราของประชากร พ.ศ. 2554)*. Bangkok: Bangkok Block.
- Nurmi, J.-E. (1991). How do adolescents see their future? A review of the development of future orientation and planning. *Developmental Review, 11*, 1-59. doi:10.1016/0273-2297(91)90002-6
- Page, R. M., Huong, N. T., Chi, H. K. & Tien, T. Q. (2012). Social normative beliefs about smoking among Vietnamese adolescents. *Asia-Pacific Journal of Public Health, 24*(1), 68-81. doi:10.1177/1010539510370993
- Ruangkanchanasetr, S., Plitponkarnpim, A., Hetrakul, P. & Kongsakon, R. (2005). Youth risk behavior survey: Bangkok, Thailand. *Journal of Adolescent Health, 36*, 227-235.
- Seginer, R. & Halabi-Kheir, H. (1998). Adolescent passage to adulthood: Future orientation in the context of culture, age, and gender. *International Journal of Intercultural Relations, 22*(3), 309-328.
- Simons-Morton, B. G., Crump, A. D., Haynie, D. L., Saylor, K. E., Eitel, P. & Yu, K. (1999). Psychosocial, school, and parent factors associated with recent smoking among early adolescent boys and girls. *Preventive Medicine, 28*, 138-148.
- Steinberg, L. & Monahan, L. (2007). Age differences in resistance to peer influence. *Developmental Psychology, 43*(6), 1531-1543. doi: 10.1037/0012-1649.43.6.1531
- Tarter, R., Mezzich, A., Hsieh, Y-C & Parks, M. (1995). Cognitive capacities in female adolescent substance abusers: Association with severity of drug abuse. *Drug and Alcohol Dependence, 39*, 15-21.
- Vazsonyi, A.T., Chen, P., Young, M., Jenkins, D., Browder, S., Kahumoku, E., Pagava, K., Phagava, H., Jeannin, A. & Michaud, P. A. (2008). A test of Jessor's problem behavior theory in a Eurasian and a Western European developmental context. *Journal of Adolescent Health, 43*, 555-564.
- Vitória, P. D., Salgueiro, F., Silva, S. A. & De Vries, H. (2009). The impact of social influence on adolescent intention to smoke: Combining types and referents of influence. *British Journal of Health Psychology, 14*, 681-699. doi:10.1348/135910709x421341
- Warren, C. W., Kann, L., Small, M. L., Santelli, J. S., Collins, J. L. & Kolbe, L. J. (1997). Age of initiating selected health-risk behaviors among high school students in the United States. *Journal of Adolescent Health, 21*(4), 225-231.
- Wattananosakul, S. (2009). *A development of the causal models of adolescent smoking/ drinking behaviors and a study of model invariance across age* (Unpublished doctoral dissertation). Chulalongkorn University, Bangkok.
- Wattananosakul, S. (2012). Development and validation of self-control scale: A construct separation study (การพัฒนาและตรวจสอบคุณภาพมาตรวัดการควบคุมตนเอง: การศึกษาแยกภาวะต้นนิษฐาน). *Srinakharinwirot Research and Development (Journal of Humanities and Social Sciences)*(วารสารศรีนครินทรวิโรฒวิจัยและพัฒนาสาขามนุษยศาสตร์และสังคมศาสตร์), 4(8), 153-167.
- Wattananosakul, S. (2014). A development of preventive program to increase protective outcomes and a study of preventive effects on smoking intention among secondary school students (การพัฒนา

- โปรแกรมเพื่อเพิ่มผลลัพธ์เชิงป้องกันและการศึกษาผลของโปรแกรมที่ส่งผลต่อเจตนาเชิงพฤติกรรมการสูบบุหรี่ของนักเรียนชั้นมัธยมศึกษาตอนต้น). *Journal of Behavioral Science for Development (วารสารพฤติกรรมศาสตร์เพื่อการพัฒนา)*, 6(1), 263-284.
- Wattananonsakul, S., Suttiwan, P. & Iamsupasit, S. (2010). Pathways to smoking and drinking: The role of family functioning, supportive parenting, self-control, risk and protective factors in Thai adolescents. *Journal of Health Research*, 24(3), 135-142.
- Wills, T. A. & Filer, M. (1996). Stress-coping model of adolescent substance use. In T. H. Ollendick & R. J. Prinz (Eds.), *Advances in clinical child psychology. Vol. 18* (pp. 91-132). New York: Plenum Press.
- Wills, T. A., Gibbons, F. X., Gerrard, M., Murry, V. M. & Brody, G. H. (2003). Family communication and religiosity related to substance use and sexual behavior in early adolescence: A test for pathways through self-control and prototype perceptions. *Psychology of Addictive Behaviors*, 17(4), 312-323.
- Wills, T. A., Murry, V. M., Brody, G. H., Gibbons, F. X., Gerrard, M., Walker, C. & Ainette, M. G. (2007). Ethnic pride and self-control related to protective and risk factors: Test of the theoretical model for the strong African American families program. *Health Psychology*, 26, 50-59.
- Wills, T. A., Sandy, J. M. & Shinar, O. (1999). Cloninger's constructs related to substance use level and problems in late adolescence: A mediational model based on self-control and coping motives. *Experimental and Clinical Psychopharmacology*, 7, 122-134.
- Wills, T. A., Sandy, J. M., Shinar, O. & Yaeger, A. (1999). Contributions of positive and negative affect to adolescent substance use: Test of a bi-dimensional model in a longitudinal study. *Psychology of Addictive Behaviors*, 13, 327-338.
- Wills, T. A., Sandy, J. M. & Yeager, A. (2000). Temperament and adolescent substance use: An epigenetic approach to risk and protection. *Journal of Personality*, 68, 1127-1152.
- Wongtongkam, N., Ward, P. R., Day, A. & Winefield, A. H. (2014). The influence of protective and risk factors in individual, peer and school domains on Thai adolescents' alcohol and illicit drug use: A survey. *Addictive Behaviors*, 39, 1447-1451.