

DIFFERENCES BETWEEN ADOLESCENT MALE AND FEMALE
REGULAR SMOKERS
BASED ON SELECTED PSYCHOSOCIAL FACTORS

BY

SUZANNE FILIATRAULT RING

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Submitted to the Faculty of Graduate Studies
in Partial Fulfillment of the Requirements
for the Degree of

MASTER OF EDUCATION

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ABSTRACT

Recent trends in cigarette smoking among adolescents reveal an increase in smoking rates among females surpassing adolescent males. This study investigated gender differences in attitudes toward smoking, self concept, peer influence, stress perception and strength of nicotine tolerance for adolescent regular smokers.

A closed form questionnaire was administered to 192 female and 198 male grade 11 students attending 7 selected schools in Winnipeg. Of these, 80 students (49 female and 31 male) reported that they were regular smokers and were accepted for this study.

The results confirm gender differences in attitudes toward smoking, and peer influence. Of the four components of the self concept variable, gender differences were revealed in school self perception, self image, and self esteem with no real differences in family perception. No real gender differences were reported in the strength of nicotine tolerance and stress perception of adolescent regular smokers. Overall, females smoke in response to psychological influence while male smoking maintenance is influenced by the social aspects of the behavior.

In summary, the findings indicate clear gender differences in some of the psychosocial factors associated with adolescent smoking maintenance and suggest the development of gender specific anti smoking messages and smoking cessation programs.

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CHAPTER 1. INTRODUCTION

At current death rates, for every 100,000 smokers now age 15 (half male and half female), diseases caused by tobacco will kill about 30,000 of these adolescents before they reach age 70. This is 13 times the total number of deaths due to car accidents, suicide, murder, AIDS and drug abuse all combined (Canadian Council on Smoking and Health, 1989). The number of deaths attributed to cigarette smoking clearly outweighs all other preventable factors as a cause of death.

This investigation will be undertaken in order to advance our understanding of adolescent cigarette smoking, specifically, to isolate the differences between adolescent male and female regular smokers.

1.0. THE RESEARCH PROBLEM AND CONTEXT

Cigarette smoking has been identified as the single most important source of preventable morbidity and premature mortality in each of the reports of the U.S. Surgeons General produced since 1964. Recent reports suggest that lung cancer rates for Canadian women have doubled in the past decade and soon may surpass breast cancer as the leading cause of cancer deaths among women (L'Abbe and Hoey, 1984; Mao and Smith, 1983). Subsequent to the release of the U.S. Surgeon General's first report on smoking and health, smoking prevalence rates have declined in Canada for both men and women. In 1966, 53.6 percent of males smoked compared to 30.8 percent in 1986. Corresponding rates for women were 32.1 percent and 25.8 percent respectively. In general, rates among women have shown a slower rate of decline (Smoking Behavior of Canadians, 1986).

The decline in smoking rates among adolescents has been less dramatic. Indeed, while male smokers in the 15 to 19 year range decreased from 35.1% in 1966 to 17.4% in 1986, adolescent girls in the same age bracket decreased from 20% to 17.8% respectively, a decline of only 2.2% (Smoking Behavior of Canadians, 1986). While these rates for Canadian adolescents show a decrease, a 1985 province wide study to explore the smoking behavior of students in Manitoba (Manfreda et al., 1985) demonstrated that for students between the ages of 15 to 18 years; 25% to 35% of males and 29% to 37% of females smoked everyday. These figures show that despite anti smoking media campaigns, smoking prevention programs and the ever increasing body of knowledge about the negative health effects of tobacco use, adolescents of both genders continue to smoke. Furthermore, the percentage of adolescent females regularly smoking cigarette has increased markedly and may now exceed the prevalence of regular smoking among adolescent males.

Smoking is a multi determined behavior involving complex interactions between social and personal variables. Leventhal and Cleary (1980) and Flay et al. (1983) suggest that the adoption of smoking consists of several distinct stages. The first of these is the preparation stage during which a person observes smokers and anticipates the experience of smoking. The next stage is the initiation, which is marked by the use of the first cigarette. The third stage is the experimentation stage, during which adolescents begin to use cigarettes on a more frequent basis but have not yet become strongly addicted to nicotine and are able to stop without difficulty. Next is the maintenance stage, which is reached when a person becomes a regular user of cigarettes.

The adolescent years have been seen as the developmental stage in which smoking habits are formed (Jessor and Jessor, 1977); therefore, a great deal of research attention has focused on attempting to understand factors responsible for the smoking initiation process in an effort to produce effective prevention programs (Ary and Biglan, 1988; Skinner et al., 1985; Chassin et al., 1984; Stuart and Livson, 1966). Four categories of variables have been found to be correlated with smoking initiation:

- Sociodemographic characteristics such as age, sex and socioeconomic status of parents (Hoover, 1988; Coombs et al., 1986);
- Social factors including peer and parental influence (Mosbach and Leventhal, 1988; Hansen et al., 1985; Chassin et al., 1984);
- Personality variables such as rebelliousness, non conformity, poor self concept (Jessor and Jessor, 1977; Williams, 1973; Stuart and Levson, 1966); and
- Psychosocial factors including inner needs, beliefs and attitudes (Krohn et al., 1986; Downey and O'Rourke, 1976; Fishbein and Azjen, 1975).

The onset of cigarette smoking involves the complex interplay of the above variables. Cigarette smoking is promoted by pro-smoking social influences from the family, peers and media. Such social influences combine with individual characteristics that can potentiate or attenuate the impact of these influences. Among the characteristics found to be associated with cigarette smoking are low self-esteem and poor self-concept, high anxiety, rebelliousness, low academic achievement and career aspirations, poor relationship with parents, strong need for group acceptance and positive beliefs about smoking (Burton, 1989; Flay and Conrad, 1989; Mosbach and Leventhal, 1988; Jessor and Jessor, 1977).

For many years cigarette smoking was seen as masculine behavior but research in the last decade has shown that females are now smoking at a rate equivalent to males (Hoover and Graffney, 1988; *Smoking Behavior of Canadians*, 1986; Skinner et al., 1985). Smoking initially develops among boys and then is followed by an increasing smoking rate among girls that eventually levels off at about the same level as that of boys (Flay et al., 1983). Smoking in adolescent girls is particularly troubling because more young women are beginning to smoke and are continuing the habit into early adulthood, a time when the risk of smoking to their personal and reproductive health begins to be manifest (Pirie et al., 1991). Although gender differences in the prevalence of cigarette smoking in the adolescent population have disappeared, gender differences in the motivation to smoke cigarettes have emerged (Burton, 1989; Greaves, 1987; Skinner et al., 1985; Urberg and Robbins, 1981).

Advertising has, since the late 1960's, increasingly targeted adolescent females. The advertising and promotion of tobacco, using themes of sexual attractiveness, freedom and athletic wholesomeness are powerful in influencing image conscious adolescent females (Tye et al., 1987). The initiation of smoking behavior in adolescent girls though heavily influenced by social pressure may be further influenced by an affective dimension. For girls having a positive view on smoking and having a best friend who smokes are important factors involved in smoking initiation; whereas, for males having a best friend who smokes is the most important influence in deciding to smoke (Flay and Conrad, 1989). Barton, Chassin, Presson and Sherman (1982) found that intention to smoke in adolescent girls was related to the positive social assets of smoking, especially interest in the opposite sex, wanting to be with the group and relaxation. Girls seem to view smoking as a sign of independence and autonomy while boys view it as a coping mechanism in social situations (Urberg

and Robbins, 1981). Mosbach and Leventhal (1988) found that a greater number of girls stated a preference for being with the 'hot-shots', or popular group of kids, characterized in their data as being female smokers, moderately high in self-esteem, and high in dissatisfaction and frustration with performance generally (i.e. school, athletics, popularity with peers). Charlton (1984) reported that the belief that smoking 'keeps your weight down' was strongly related to the level of smoking, particularly in adolescent girls among whom concern about body image is notoriously high. In these studies, three characteristics of adolescent females emerge and indicate a context in which smoking behavior can easily root:

- Importance of peer group acceptance;
- Interest in realizing the ideal of extreme slimness; and
- Dropping of interest in physical activity with corresponding increase in the development of interpersonal and social skills, such as being a good friend, being able to talk to friends, being honest (Greaves, 1987).

While we have accumulated a great deal of knowledge about the smoking acquisition process in adolescents, little is known about adolescents who are already regular smokers. If smoking behavior is a process involving stages through which individuals progress (Flay et al., 1983); then, what are the motivational factors associated with becoming a smoker and the maintenance of regular smoking among adolescent youth?

Few studies have examined the effects of changes in independent variables related to changes in smoking status. Flay et al. (1987) argue that in the becoming a regular smoker the physiological rewards of nicotine, peer influences, and self concept are all moderately influential factors. Pederson et al. (1981) found that increases in parental and peer smoking were related to increased adolescent involvement with cigarettes.

The maintenance of smoking behavior is one area that has received relatively little attention. While it is clear that gender differences exist in smoking initiation, studies among regular adolescent cigarette smokers have not indicated very clear distinctions in this respect. Longitudinal and cross sectional findings suggest that adolescent male and female regular smokers share common traits:

- A belief in the positive values of smoking and not in the health dangers of smoking. Smoking is perceived as fun, pleasant and nice. They feel it makes them look attractive and gives them confidence (Hansen et al., 1985; Chassin et al., 1984);
- Like adults, some young people smoke in the belief that it will ease feelings of stress (Wills, 1986; Mitic et al., 1985);
- Have parents and friends who smoke (Skinner et al., 1986; Hansen et al., 1985; Chassin et al., 1984);
- Use smoking as a means of rebelling against society and as an attractive badge of adulthood marking the transition from child to adult (Mosbach & Leventhal, 1988; Hansen et al., 1983);
- Have relatively weak social bonds with parents and with school (Pederson & Lefcoe, 1986; Krohn et al., 1986); and
- Experience the powerful influence of nicotine addiction. Young people experience physiological addiction to tobacco quite early in the acquisition of smoking (McNeil et al., 1986).

It is probably through the repeated pairing of smoking with social and physiological reinforcement that the behavior becomes habitual (Leventhal & Cleary, 1980). The key elements of why adolescents persist in smoking in face of negative social attitude and increased awareness and education of health risks remain elusive.

1.1. JUSTIFICATION FOR THE STUDY

Smoking is already an established behavior for many adolescents yet the scope of smoking research has concentrated largely on primary prevention. Evidence indicates the earlier the age of onset, the more likely the person will remain a smoker, increase smoking involvement in adulthood and suffer from a tobacco related disease. Since smoking cessation is more likely to reduce health risks when achieved early in life, special attention to adolescent smokers is warranted.

Smoking cessation programs specifically designed for adolescents are only now becoming a focus of concern and development. Prior efforts in this area have been mostly modified existing adult cessation programs which have not had a significant impact on adolescent smoking cessation. Although there is a dearth in research on adolescent smoking maintenance, cessation interventions must be based on a thorough understanding of the determinants promoting the maintenance of cigarette smoking. Most research in adolescent smoking has focused on cross sectional comparisons of smokers and non smokers. This cannot prove a clear understanding of the process of adolescent smoking since smoker - non smoker differences can be either the cause or result of smoking (Chassin et al., 1984).

A major change in the pattern of adolescent smoking has recently been documented. The incidence and prevalence of smoking among adolescent girls has surpassed that of boys (Smoking Behavior of Canadians, 1986). If smoking maintenance is reinforced by different factors in adolescent males and females; then, to achieve effective smoking cessation programs, these salient factors need to be identified.

This proposed study will investigate selected psychosocial factors among grade 11 male and female regular smokers. The study will create a profile of the adolescent male and female regular cigarette smoker highlighting differences between them. This will increase understanding of the adolescent smoker and assist in the development of effective smoking cessation interventions for adolescents.

1.2. RESEARCH QUESTION FOR INVESTIGATION

Main Question:

Do adolescent male and female regular smokers differ on selected psychosocial variables?

Subquestions:

- A) Is there a difference in attitudes toward smoking for adolescent male and female regular smokers?

- B) Is there a difference in self concept for adolescent male and female regular smokers?

- C) Is there a difference in peer influence for adolescent male and female regular smokers?

- D) Is there a difference in stress perception for adolescent male and female regular smokers?

- E) Is there a difference in strength of nicotine tolerance for adolescent male and female regular smokers?

1.3. LIMITATIONS OF THE STUDY

Several basic assumptions will be made in conducting this exploratory study. It is assumed that adolescent students at the grade eleven level have been exposed to anti smoking media campaigns, and are aware of the health risks associated with smoking. Due to the anonymity given to the respondent it is assumed the student will respond in an honest manner.

This study has several limitations. The major limitation is that survey research has the weakness of being somewhat artificial as it is difficult to gain a full sense of a behavior process through a questionnaire.

This study is cross sectional and therefore causal relationships between variables cannot be demonstrated.

Schools and students have not been chosen at random and thus this sample is not necessarily representative of grade eleven students in Winnipeg or Manitoba.

1.4. DEFINITIONS OF TERMINOLOGY

To clarify the terminology to be used in this study, the following direct and operational definitions are provided.

Adolescent - male and female students in Grade 11, ranging in age from 16 to 18 years.

Belief and Attitude - belief refers to a person's position on a particular topic, idea or concept; whereas, attitude represents the strength of that belief (Fishbein and Azjen, 1975).

Nicotine addiction - a habitual use of tobacco that leads to psychological and/or physiological dependence (Abelin, 1989).

Peer influence - an obligation students feel to conform to the expectations and values of other students as opposed to the expectations and values of their parents or teachers (Newman, 1984).

Regular smoker - adolescent male or female grade eleven student who smoke cigarettes daily.

Self concept - refers to an individual's description of his/her abilities, personality and relationship with others; whereas, self esteem refers to the value an individual places on these personal characteristics (Beane et al., 1980).

Stress - a psychological and/or physiological response to threatening or overtly demanding situations (Mitic & McGuire, 1985).

CHAPTER 2. REVIEW OF LITERATURE

This chapter presents a review of literature focussing on the contributions of social psychological theory and research to our understanding of adolescent cigarette smoking. Theoretical perspectives are outlined followed by psychosocial factors and gender issues in adolescent smoking maintenance.

2.0 THEORETICAL PERSPECTIVES ON ADOLESCENT SMOKING

Adolescence is a developmental period characterized by psychological, physiological and social change which moves the young person from childhood to young adulthood. These transition years involve changes in social and self definition, new patterns of interpersonal relationships, access to new kinds of personal and social experience, membership to different social groups, increased opportunities to gain certain rewards and to pursue certain goals and the acquisition of new behaviors. Jessor (1982) explains that " young people are active throughout this period, trying out new behaviors, exploring new roles, sampling new experiences, doing - being - becoming " (p.296).

One new behavior that some adolescents are 'doing' is cigarette smoking. It has been suggested that cigarette smoking, in adolescence, serves a purposeful role as an affirmation of maturity and a symbol of status as a young adult (Jessor & Jessor, 1977).

Since the late 1970's, principles derived from social psychological research and theory have formed the basis for explaining smoking behavior. Studies investigating adolescent smoking behavior have viewed smoking in the context of four research traditions:

- Smoking as a result of changes in attitudes and beliefs;
- Smoking as a result of social influence;

- Smoking as a result of self concept; and
- Smoking as a problem behavior, marking a premature transition to adult status (Chassin et al., 1990).

2.0.0 Smoking as a Result of Attitudes and Beliefs

Understanding the conditions under which attitudes guide behavior and the processes through which attitudes lead to behavior change is most often explained by the theory of reasoned action. Ajzen and Fishbein's (1967) theoretical approach heavily emphasizes the role of cognition in determining behavior. In this model, the intention to engage in a behavior is seen as the best predictor of that behavior. The intention to perform a behavior includes two components; i) the person's attitudes toward the specific behavior, and ii) the normative influence of others. The normative component consists of the individual's beliefs about what significant others think of their engaging in the behavior and the individual's motivation to comply with these expectations.

The theory of reasoned action has been applied as a model in predicting smoking intention and initiation. Chassin, Presson, Besenberg, Corty, Olshavsky and Sherman (1981) found the theory to significantly predict intentions to smoke. In a one year longitudinal study of over 2000 students, Chassin et al. (1984) found that the theory of reasoned action was a significant predictor of behavior for both non smokers and smokers. Moreover, the transition from Triers to Regular smokers was best predicted by behavioral intention and the attitude measure (smoking is fun, pleasant and nice). Pederson et al. (1986) also found attitude and behavioral intention to smoke, together with parental and peer smoking related to increased adolescent smoking. Attitude toward smoking, established early in adolescent

development, is one of numerous interrelating factors implicated in the maintenance of cigarette use.

2.0.1 Smoking as a Result of Social Influence

Social influence can be defined as a relatively constant set of external environmental pressures that increases the probability of experimenting with a particular substance. Graham et al. (1991) identified three sources of social influence: active social pressure in the form of explicit offers to try a substance, and two sources of passive social pressure, namely, social modeling of behavior as explained by Bandura(1963), and misperception (overestimation) of peer use of a substance. In testing this model, Graham et al. (1991) found that social influence from both active and passive sources contributed significantly to future cigarette use.

Peer and parent smoking models as well as mass media (cigarette company advertising) are social influence variables shown to be highly associated with adolescent smoking. Indeed, parent and peer smoking models have been shown to be among the most important prospective predictors of smoking initiation (Biglan & Lichenstein,1984; Chassin et al.,1984; Flay et al.,1983). Data suggest that the majority of initial experiences with smoking occur in a social context in the presence of peers. In their review of literature, Leventhal & Cleary (1980) concluded that " (active) social pressure is probably a prime initiator of experimentation with cigarettes " (p.384). However, recent work derived from social psychology has suggested that the concept of "active" peer pressure is overly simplistic in explaining adolescent smoking behavior.

While it is possible that adolescents try cigarettes because they are coerced into it by their friends, it has been suggested that adolescents choose

as their friends others of similar attitudes, beliefs and activities which may include smoking behavior (Eiser et al., 1991). Mosbach and Leventhal (1988) suggest that within certain adolescent social cliques, cigarette smoking may function more as a cue for group formation than as a result of group formation. The longitudinal study of Chassin et al. (1984) demonstrates that although peer smoking models were a predictor of initial smoking onset, once smoking had occurred, adolescents sharply increased their number of smoking friends.

Although social influence in the form of peer modeling, peer reinforcement and conformity to peer norms is considered central to adolescent smoking initiation, regular smoking behavior is also controlled by factors such as physiological rewards of nicotine, self-concept and stress reduction (Cleary et al., 1988; Flay et al., 1983).

2.0.2 Smoking as a Result of Self Concept Processes

Self concept is generally viewed as one's composite self perception based on attributes, capabilities, objects and activities which an individual possesses and pursues. The terms self concept and self esteem are often used interchangeably, although strictly speaking, self concept is a description of personal characteristics, and self esteem refers to the value an individual places on these personal attributes (Beane et al., 1980; Coopersmith, 1967).

Within social psychology theory, various aspects of self concept have been used to understand behavioral decisions. It has been suggested that behaviors that have trait implications in line with certain aspects of one's self image are likely to be adopted. For example, adolescents may adopt behaviors in order to express or confirm an existing self image. Two studies (Barton et al., 1982; Chassin et al., 1981) investigated the social image associated with

smoking in relation to adolescent self concept. Both studies reported that smoking carried negative characteristics such as being less healthy and less wise. However, smoking models also possessed many positive qualities, including toughness, sociability, and interest in the opposite sex. The social image of smoking was found to be related to smoking behavior. Adolescents whose actual self images were consistent with the phototypic smoker were more likely to smoke, and among non smokers, were more likely to intend to smoke in the future.

It has been proposed that adolescents may smoke not only to express and affirm 'who they are', but also to achieve an idealized self image, either in their own eyes or in the eyes of others. In the Chassin et al. (1981) study, intentions to smoke were predictable not only from the degree of match between actual selves and the phototype of the smoker, but also from the match between their ideal self images and the phototype of the smoker. These two studies suggest that despite some negative characteristics, adolescents may smoke to express an existing self concept or to aspire to an idealized self concept.

Moreover, social psychological research suggests that the tendency to choose behaviors representative of one's self concept increases when important aspects of the self concept are threatened (Sherman et al., 1983). These findings have important implications for adolescent smoking since adolescence involves changes in social and self definition (Jessor, 1982). Uncertainties about autonomy and independence produce distress that may threaten self concept. At these times, adolescents whose self concept are consistent with the social image of the smoker may be particularly motivated to smoke as a way of affirming their threatened identities (Bonagura and Bongura, 1987; Chassin et al., 1981).

2.0.3 Smoking as a Problem Behavior

A fourth social psychological approach views adolescent cigarette smoking in the context of problem behavior theory. Jessor and Jessor (1977) characterized problem behavior as unconventional behaviors by adolescents which evoke some controlling response by adults. It involves a premature transition to adult activities such as the use and abuse of alcohol, illicit drug use and cigarette smoking. Jessor (1982) suggests that problem behavior in adolescence should be seen as purposeful, meaningful, goal oriented and functional rather than arbitrary and perverse. Problem behavior serves a variety of functions of importance to the adolescent and plays a key role in normal adolescent development. For the adolescent, engaging in cigarette smoking can serve as:

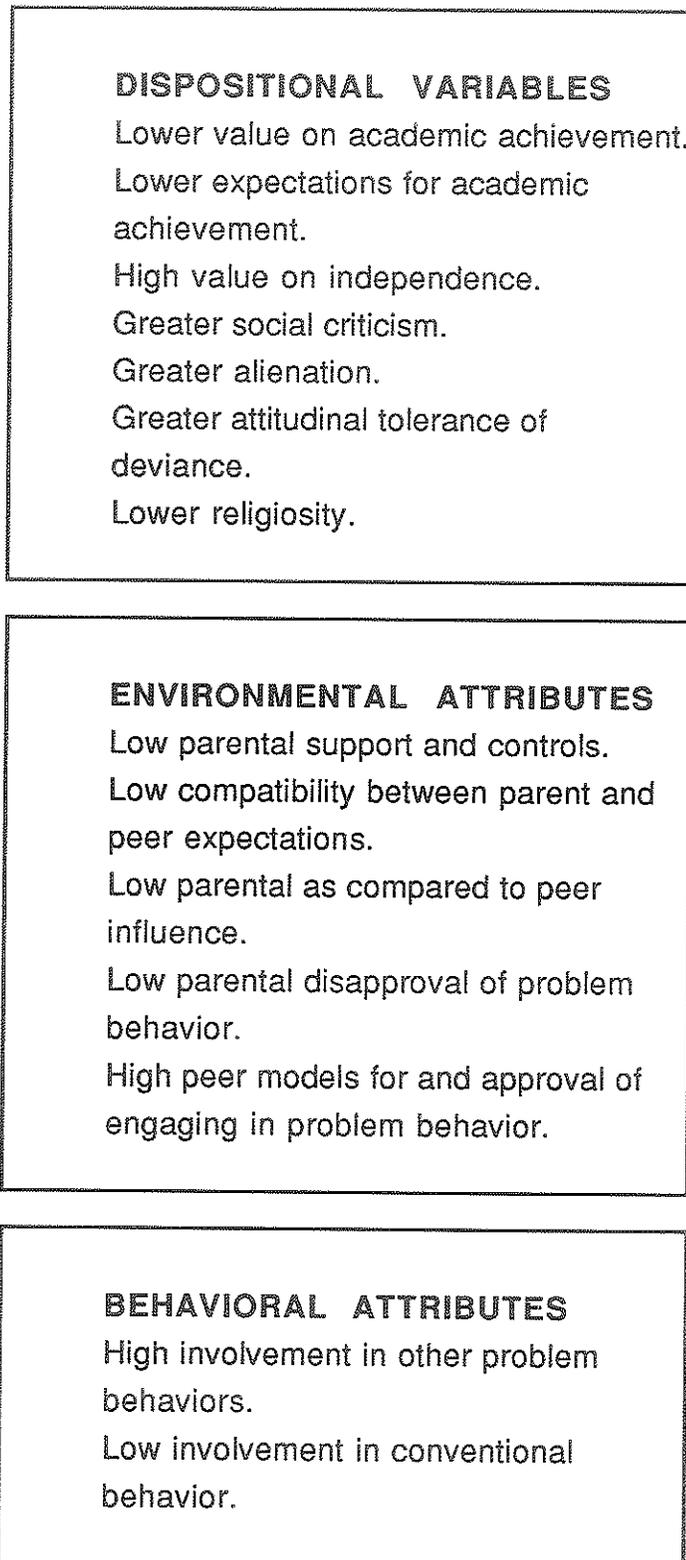
- a way of expressing opposition to adult authority;
- a way of coping with anxiety, frustration or failure;
- an expression of solidarity with peers; and
- a way of confirming for self and significant others, certain important attributes of personal identity (Jessor, 1982). The most important function of problem behavior identified by Jessor is that of a transition marker, that is, as a symbol of having made a developmental transition. From this perspective, cigarette smoking becomes part of the adolescent's negotiations with the larger society for the status of young adult.

Problem Behavior Theory is based on the social-psychological relationship within and between three major systems: (1) the personality system; (2) the perceived environment system, which includes peer and parental influence; (3) the behavior system, both problem and conventional behavior. Within each of these three systems there is a set of variables or psychosocial risk factors that have theoretical implications for the occurrence or

non-occurrence of problem behavior. The patterning of these risk factors within each of the systems specifies the degree of risk for engaging in problem behavior. The likelihood of the occurrence of a problem behavior is determined by the combined risk across these three systems.

The three major systems of Problem Behavior Theory and the respective psychosocial risk factors are presented in Figure 1. Adolescents with the outlined pattern of attributes would be more likely to engage in problem behavior than adolescents with the opposite pattern. In a longitudinal study, Chassin et al.(1984) used Jessor and Jessor's environmental and personality variables, the theory of reasoned action as well as measures of family and peer smoking to predict smoking behavior in over 2000 students in grades 6 to 11. This study was able to identify a group of high risk adolescents who were generally deviance prone in Jessor and Jessor's sense of the term. They were relatively non conventional, had higher attitudinal tolerance for deviance, had lower expectations for attaining academic success, and had family and peer environments that were relatively lower in personal control. Moreover, these adolescents were in environments with more smoking models, and they overestimated the extent of smoking by adults and peers. Finally, high risk adolescents had stronger intentions to smoke and more positive attitudes towards smoking. All three categories of psychosocial variables proved to be statistically significant predictors of smoking transition. In addition, Chassin et al.(1984) found that the Jessor and Jessor variables were the relatively best predictors of first trying cigarettes, whereas the Ajzen and Fishbein model was the best predictor of increases from trying cigarettes to regular smoking.

Figure 1. The Major Systems of Problem Behavior Theory and the Respective Psychosocial Risk Factors.



2.0.4 Integrated Model of Adolescent Smoking Behavior

Research on adolescent smoking behavior have indicated that cigarette use is a multi dimensional behavior involving cognitive, psychosocial and biological factors. A number of social psychology theories have attempted to explain why adolescents begin, and in many cases, continue to smoke. Integrating these social psychological theories and principles, Flay et al.(1983) developed a causal model of the major influences, and their relative strengths, on stages of smoking behavior. External social influence (family & peers) are seen as more important in the early stages of smoking initiation, whereas internal factors, such as attitudes and beliefs and self image are seen as more important at later stages. The social reinforcement and physiological effects obtained from smoking are believed to be the most important factors on whether or not an experimenting adolescent will become a regular smoker (Flay et al.,1983). Hirschman et al.(1984) suggest that smoking may serve different functions for different adolescents. For some smoking may serve self definitional functions, whereas smoking may serve to regulate negative affective states for others.

Social psychology theory and research has provided significant recent gains in the study of adolescent smoking and will be used as the framework to investigate differences between adolescent male and female regular smokers. The psychosocial variables selected for this study include: attitudes toward smoking, self concept, peer influence, stress perception, and strength of nicotine tolerance.

2.1 LONGITUDINAL STUDIES OF ADOLESCENT SMOKING TRANSITION AND MAINTENANCE

Only longitudinal research which follow adolescents as they make the transition to regular cigarette smoking can isolate the psychosocial factors that influence the changes of smoking behavior over time. A small number of studies have used a longitudinal design in which school students were tracked over periods during which some of them made the transition from experimental to regular cigarette use. As there is a dearth of information concerning adolescent smoking transition and maintenance these studies will be reviewed in some detail.

Pederson and Lefcoe (1985) investigated the degree and type of changes in adolescent smoking status that occurred over an eight year period, when the group was in grades 4 to 6, to late adolescence. In a group of 2,731 students, 65.9% of the respondents reported to have at least tried cigarettes and 33.8% were current regular or occasional smokers. When changes in smoking status occurred, they were more likely to be in the direction of increased (57.7%) as compared to decreased (4.1%) involvement with smoking. Variables measured in 1975 found that peer smoking showed the strongest relationship to smoking status followed by positive attitude toward smoking. In contrast to these early findings, a 1983 analysis suggested that attitude toward smoking had become more important. More positive attitudes towards smoking, its consequences in terms of pleasure and relaxation, and toward individuals who smoked had the strongest relationship to current smoking among the cohort of late adolescents. The most frequently given reason for continuing the habit were enjoyment (44.8%), followed by friends smoking and tension reduction (both at 24.7%). Pederson and Lefcoe (1985) suggest that "while

peer group pressure may be the most important influence leading to experimentation with cigarettes, continuation of smoking is not so much under the control of social factors as it is under individual personal ones" (p.235).

Chassin, Presson, Sherman, Corey and Olshavsky (1984) reported on 2596, 7th to 12th grade school students surveyed twice, one year apart. During Time 1, 10.1% of the Triers (smoked no more than a few cigarettes but not in past month) progressed to Regular smoking. There were 28 variables measured at Time 1, including measures of attitudes, normative beliefs and behavioral intentions from Ajzen and Fishbein's Theory of Reasoned Action (1975), 17 variables from Jessor and Jessor (1977) personality and perceived environment systems, and eight measures of the students' smoking environment indicated by parental, peer and sibling smoking habits, perceived prevalence of smoking and amount of direct experience of smoking. The transition from Trier to Regular smoker was best predicted by behavioral intention and the attitude measure (smoking is fun, pleasant, and nice). This was in contrast to the transition from Never smoked to Trier which was better predicted by the immediate environmental context combined with a vulnerability to 'deviance proneness'.

Collins, Sussman, Rauch, Dent, Johnson, Hansen and Flay (1987) replicated and extended the Chassin et al.(1984) study to include: i) prior behavior as a predictor of smoking; ii) a study design extending over three waves of data collection instead of two. A group of 3295, 7th grade students completed a questionnaire on three different occasions regarding cigarette smoking behavior and psychosocial predictors of smoking. Results provided strong support for the risk taking and smoking environment predictors. Subjects who held more risk taking / rebellious attitudes and who had higher estimates of normative smoking and smoking among significant others were more likely to

progress from the 'tried only' to the 'higher use' category. This study found the risk taking predictor to be importantly related to transition out of both the 'never smoked' and the 'tried' categories; whereas, Chassin et al.(1984) found the deviance proneness predictor to be related only to transitions out of the 'never tried' category. Both studies confirm that psychosocial variables may exert significant influence on smoking onset. In addition, Collins et al.(1987) investigated the effects of prior use on transition to higher levels of smoking and found that "prior use was a much stronger predictor of increases in usage than psychosocial variables" (p. 569).

Skinner, Massey, Krohn and Lauer (1985) reported on a theory laden longitudinal study of 1068, 7th to 12th grade students, but the transition from initiation to becoming a smoker was not examined in their analysis. However, they did report upon predictors of cessation in students who had been smokers during the preceding three years. Those who maintained their smoking, rather than stopping were less likely to be supervised by their parents, less likely to believe in the moral duty to abide by the law, and more likely to associate with smoking friends. Skinner et al. concluded that those who had reached the stage of trying cigarettes had weakened social bonds (conventional attachments to school and parents) at the same time as developing associations with smokers and beliefs favorable to smoking.

Two longitudinal studies have focussed specifically on determinants of maintenance among adolescent smokers who had already become regular smokers when first surveyed (Chassin, Presson and Sherman,1984; Hansen, Collins, Johnson, and Graham,1985). Both these studies provide results that show consistencies with Skinner et al.(1986).

Chassin's group reported on 178, 6th to 11th grade smokers who either maintained smoking (82%) or gave up in the year between surveys. The

questionnaires students answered covered parent and peer smoking models, parent and peer attitudes to smoking, perceived supportiveness and strictness of parents and peers, motivation to comply with parents and peer, health beliefs, and perceived control of smoking. Results suggested that the antecedents of maintenance were different among younger adolescents (grades 6,7,8) than older students (grades 9, 10, 11). Among younger students parental influences were related to maintenance, particularly in respect to less negative parental attitudes to smoking and less general emotional support from parents. Young smokers who maintained their habit showed less independence from the opinion of their peers. In contrast, among older students parental factors did not discriminate continuing smokers from those who gave up, and peers became more important. Interestingly, this study showed a positive effect of peer group influence in that those who stopped smoking had fewer smoking friends at Time 1 and stronger motivation to comply with their friends' opinions than did continuing smokers.

Hansen et al.(1985) followed 392, 15 to 16 year old smokers over a 16 month follow up period with recontact at 4 and 16 months. A 109 item questionnaire was administered at each contact covering smoking behavior, attitudes and beliefs about smoking, and the social smoking environment. Factor analysis identified the following five factors: negative beliefs about smoking, positive short term consequences, social morality, normative expectations and rebelliousness. In addition, friends, parents and sibling smoking behavior were included in the analysis. After four months, 67% of the smokers at Time 1 were still smoking and in comparison to those who gave up were:

- Less likely to endorse items reflecting a belief in and a desire for short term consequences of smoking;

- Less likely to agree with items suggesting society has a right to do something about smoking; and

- More likely to have friends who smoke.

By the 16 month follow up, 26% of the former quitters who could be contacted had gone back to smoking. Those who went back to smoking:

- Had previously had more positive beliefs about smoking;

- Were more rebellious; and

- Were more likely to have parents who smoke.

The particular beliefs that were most predictive of relapse were: **NOT** believing smoking causes lung cancer, is bad for the lungs, is a health hazard, causes shortness of breath, bad breath or yellow teeth, dampens taste and smell, and not believing that good manners are important. They also were more likely to go along with others even when they think what others are doing is wrong.

The Hansen et al.(1985) results suggest that those who maintained their smoking did not have such high expectations about the 'lift' smoking can provide and its capacity to help one make friends, as those who went on to quit (who may have found their expectations unrealistic). Continued smoking was also facilitated by having friends who smoke, and in the long term, by absence of parental example, absence of belief in the dangers of smoking, and presence of a tendency to rebel.

2.2 PSYCHOSOCIAL FACTORS AND ADOLESCENT SMOKING MAINTENANCE

2.2.0 Attitude Toward Smoking and Smoking Maintenance

Despite increased information about the health consequences of smoking and the high level of knowledge in the adolescent population, a significant number of adolescents continue to smoke. Research on attitudes toward smoking has focussed primarily on specific positive and negative beliefs about this behavior. Studies have shown that adolescent cigarette smokers hold favorable attitudes toward smoking and smokers. Specific attitudinal traits shared by adolescent smokers include:

- The belief that cigarette smoking is a pleasurable and very relaxing pastime (Gordon, 1986; Pederson & Lefcoe, 1985; Skinner et al., 1985; Chassin et al., 1984; Alexander et al., 1983; Newman et al., 1973);
- Being significantly less convinced that smoking will harm their health (Hansen et al., 1985; Downey & O'Rourke, 1976; Roberts, 1980);
- The belief that smoking is not an impossible habit to break (Newman et al., 1973);
- The belief in the potential of smoking to relieve tension and stress (Eiser et al 1989; Wills, 1986; Mitic et al., 1985; Pederson & Lefcoe, 1985; Charlton, 1985; Roberts, 1980); and
- The belief that smoking is often motivated by a desire to be part of a social group (Gordon, 1986; Skinner et al., 1985; Friedman et al., 1985).

Eiser et al. (1989) found adolescents who smoked held less negative views about the consequences of smoking and had more smokers as models within their families and among their peers. Reimers et al.'s (1990) investigation concurred with these findings and found positive opinions about

smoking present in 8th graders before they became regular smokers in grade 11.

In a study by Lauer et al.(1982) students who perceived their friends attitudes toward smoking as unfavorable were less likely to smoke than those who perceived their friends attitudes as more permissive. The Chassin et al.(1984) study support the positive effect of peer influence.

2.2.1 Self Concept and Smoking Maintenance

School looms large in the self perception of adolescents (Beane et al.,1980). In McGuire's (1979) research on spontaneous self concept, interviews with 560 children and adolescents revealed that by grade 11 school topics were the largest single category of self concept descriptors, while the family was mentioned less than 5% of the time. McGuire concluded that a student's sense of self was tied to academic performance and the quality of the relationships (s)he had with fellow students and teachers.

One of the most frequently replicated findings in studying adolescent smoking is the negative association found between cigarette smoking and academic aspirations and achievements (Hover & Gaffney, 1988; Skinner et al., 1985; Chassin et al.,1984; Jessor & Jessor, 1977). Chassin et al.(1981) have shown that negative attitudes toward school predicted the transition from non smokers to smokers. Young et al.(1989) reported statistically significant associations of self declared cigarette smoking in high school students with low grade point averages, low achievement test scores and high absence rates, during elementary school prior to their commencing smoking. Young et al. suggest that the level of academic performance and high school absenteeism may reflect underlying values and practices of the child's family. An alternative

interpretation is that the child who fails at school, either academically or socially, adopt behaviors, including smoking, that together characterize a 'smokers lifestyle'. Reimers et al.(1990) found that as early as 8th grade, students who began smoking regularly by the time they reached grade 11 tended to be less academically oriented and less involved in extra curricular activities. Prior research by Borland and Rupolph (1975) suggested that smoking may be used by low grade achievers as a defense against a derogated self image; however, data did not necessarily suggest that smoking lead to lower grade achievement. These findings support investigations that identify adolescents who smoke as dissatisfied with traditional forms of socialization, such as school and family, and tend to form relationships with peers who also participate in less conventional forms of behavior (Krohn et al.,1986; Rooney,1982). Hover and Gaffney (1988) suggest that cigarette smoking may be used as a symbol of toughness, maturity or independence by low grade achievers in an attempt to enhance their self image.

Research has demonstrated that a poor relationship within the family setting, in terms of a lack of parental affection, concern and involvement, appears to play an important role in adolescent smoking behavior (Krohn et al.,1986; Chassin et al.,1986). Adolescent smokers have difficult relations and tend to perceive their family as negative. Smokers perceive themselves as further away from meeting parental expectations than do non smokers (Newman, 1973). Rebelliousness, indicative of parental conflict, is also associated with regular cigarette smoking (Urberg & Robbins,1991; Stuart & Livson,1966). As a group, regular smokers, consistently indicate that they are less attached to and less supervised by their parents (Reimers et al.,1990).

Parental attitudes on adolescent smoking may be a more important indicator of adolescent smoking maintenance than parental smoking behavior. Downey and O'Rourke (1976) reported that if parents who did not object to their children smoking, the adolescent was more likely to believe that cigarette smoking is an acceptable behavior. Nolte et al. (1983) reported when both parents smoked and were not upset if their adolescents smoked, 51.6% of their adolescents smoked. When smoking parents were upset if their adolescents smoked, only 10.4% of their adolescents reported smoking. Newman and Ward (1989) replicated the findings of Nolte et al. and suggest that parental attitudes, when expressed, appear to be important in moderating adolescent smoking regardless of parents smoking behavior.

Although research has shown that regular adolescent smokers are more likely to have parents who smoke (Gordon, 1986; Leventhal & Cleary, 1980) several studies suggest that parental smoking may not be related to maintenance of the smoking habit. Chassin et al. (1984) noted that the presence of parents who smoke was more important to the initiation of smoking than to the later transition from experimental to habitual smoking. A similar difference was noted by Flay et al. (1983), who suggested that family models are more important in the early 'preparation' stage of smoking initiation. Both authors suggest that after the initial experimentation, adolescents' subsequent smoking decisions may be based on different factors.

Adolescents smoke partly out of a desire to acquire the images of being 'adult', sophisticated, independent and glamorous. Recent studies (Chassin et al., 1985; Grube et al., 1984; Barton et al., 1982; Chassin et al., 1982; Chassin et al., 1981) have investigated the tobacco-related imagery of youth. The various categories of 'images' include: a) self image (qualities the adolescent ascribes

to her/his self); b) ideal self image (qualities the adolescent would like to possess); and c) smokers' image (qualities the adolescent ascribe to smokers in general).

Chassin et al.(1981) reported that positive relationships of self image, ideal date image and certain attributes of ideal self image with smokers' image were predictive of smoking intention and also differentiated adolescents who already smoked from non smokers. Among the various separate items constituting the image indices in the study, having a positive relationship of ideal self image to smokers image on 'tough', 'foolish', 'acts big', 'disobedient' and 'interested in the opposite sex' attributes were significantly related with cigarette smoking.

A subsequent study by Barton et al.(1982) supported the association of these particular attributes with smoking. Students in 6th and 10th grades evaluated slides of peer models posing with and without cigarettes. Adolescents in both age groups rated smoking models 'less healthy', 'tougher', 'poor at schoolwork', 'more sociable' and 'more disobedient' than non smokers. Burton et al.(1989) also examined relationships among various categories of 'images' and adolescent smoking. The strongest findings replicate the results of Chassin et al.(1981) reporting that those who view themselves to be similar to smokers are likely to smoke. However, Burton et al. offer an alternative explanation suggesting that adolescents with relatively lower self concept, who do not perceive themselves as distinctive in terms of being especially healthy, wise, tough or interested in the opposite sex, may be drawn to smoking as a way of 'adding something' to their identity. Thus, smoking may appeal more to adolescents who have relatively low self concepts and an elevated image of 'what sort of person' a smoker is.

Finally, another factor bearing on adolescents use of cigarettes for self image reasons involves motivation for weight control. Considerable evidence is available that there is a general tendency for smokers, both genders, to weigh less than non smokers of the same age (Abelin,1989). There is also evidence that smokers who give up the habit gain weight (Pirie et al.,1991). This gain has usually been attributed to compensatory eating, but recent evidence suggests that physiological effects probably play a larger part than previously suspected (Hall et al.,1986).

Self esteem, the evaluative component of the self concept, is derived from the reflected appraisal of others. Where the appraisal of others is negative, the level of self esteem is likely to be low. Penny and Robinson (1986) found although smokers generally evaluate themselves less positively than non smokers, the cluster scores showed that their lower evaluation was not true in all aspects of their self concept. While little difference was observed between smokers and nonsmokers on clusters related to their physical attractiveness and their popularity; significant differences occurred in areas of their behavior and their school and intellectual status. Many of the questions comprising the cluster of 'behavior' were related to the individuals' functioning within the family. Experiences such as failure in school, parental neglect, rejection by peers and failure to live up to expectations resulted in low self esteem. Thus in two major sectors of the adolescent's life, home and school, smokers had a less satisfactory perception of themselves. Previous findings by Chassin et al. (1981) and Newman (1973) agree that adolescent smokers indicate more alienation from home life and school, and have a more negative self appraisal in this regard.

Self esteem has been found to be related to social functioning (Coopersmith, 1967) and is considered to affect one's choices of behaviors and life style (Jessor & Jessor, 1977). Penny and Robinson (1986) hypothesize that due to the negative evaluation of life experiences, the adolescent strives less to conform to her/his reference group and is motivated to deviate from the group, seeking that which would enhance self esteem. This may occur through identification and the formation of friendships with others who engage in the same deviant behavior.

2.2.2 Peer Influence and Smoking Maintenance

Peers are a source of entertainment, gratification and status validation for adolescents, and peer influence is cited as one of the most potent forces in the adolescent's life. Research, both longitudinal and cross sectional, have repeatedly identified social influences, particularly peer group influence, as involved in the development and maintenance of regular smoking.

The variable consistently found to be the strongest correlate of adolescent cigarette smoking is whether friends of the adolescent smoke (Leventhal & Cleary, 1980; Flay et al., 1983; Urberg & Robbins, 1981). Reimers, Pomrehn, Becker and Lauer (1990) investigated the longitudinal influences of the association with 'friends who smoke' and reported that 11th graders who smoked regularly had more friends who smoked than 11th graders who were non smokers. This was also the tendency when the smokers were in eighth grade and most of them were non smokers. Biglan et al. (1984) confirm the social nature of adolescent smoking. In a situational analysis, 26 male and 18 female smokers self monitored their smoking for one week. Seventy-one percent of all cigarettes were smoked in the presence of another person and

roughly 50% of those cigarettes were smoked with peers. In a Dublin study of adolescents O'Rourke (1983) found that smoking rates for girls and boys were 91% and 87% respectively, if all their friends smoked, 66% and 68% if half their friends smoked, and 26% and 36% if none of their friends smoked. Lauer et al.(1982) found the smoking rate was 4% among students with non smoking friends compared to 38% among those whose best friends smoked. McCaul et al.(1984) demonstrated that the best predictor of smoking after one year was the number of friends who presently smoked.

Peer influence has often been described as a singular force; however, recent research has identified and investigated several dimensions. Chassin et al.(1981) conceptualized peer pressure as normative influence. The normative component consists of an adolescent's perception of what important others, such as peers, think that person should do. This component is weighted by motivation to comply with the expectations of these others. Chassin et al.(1981) found normative influence to be related to initiation to smoke cigarettes. Collins et al.(1987) reported that subjects who held higher estimates of normative smoking and smoking among significant others were more likely to engage in increased cigarette usage. The result that relatively high perceived smoking prevalence predicted future smoking is supported by the findings obtained by Sherman and colleagues. Sherman et al.(1983) found that adolescent smokers were selectively exposed to smoking in significant others and consistently overestimated the proportion of adolescents who smoked cigarettes.

Peer influence is conceptualized by Friedman et al.(1985) as direct social pressure. In their analysis of smoking experiences of a group of adolescents, they identified social pressure in only 30% of the incidents. However, of this 30%, modeling accounted for a quarter of the incidents and the adolescent's own appraisal that they needed to smoke to be accepted by the

group accounted for another quarter. This self appraisal seems similar to normative pressure as described by Chassin et al.(1981). The remaining half (15%) of the incidents appeared to involve direct pressure to smoke, such as teasing and ridicule. Thus, Friedman et al.'s (1985) results revealed peer influence as heterogeneous, including both normative and direct influence.

Urberg, Shyu and Liang (1990) adopted a multidimensional construct of peer influence and investigated four dimensions: normative pressure to smoke and not to smoke as well as direct pressure to smoke and not to smoke. A group of 2334, 8th and 11th grade students completed a questionnaire and provided a saliva sample to analyze for the presence of thiocyanate. The major findings of this study were the moderate effect of normative pressure on adolescent cigarette smoking, and the low levels of normative and direct pressure to smoke cigarettes reported by the subjects. The lack of direct peer pressure, inconsistent with prevailing views, is explained by Urberg and colleagues as the adolescent's concern with acquiring independence and therefore would be reluctant to report being pressured or feeling pressured to smoke. Smoking adolescents perceived their friends as being neutral about their smoking. Also, adolescent smokers overestimated the amount of smoking by their best friends.

In addition to normative and direct peer influence, recent studies have looked at cigarette smoking in the context of friendship choices and selective association. It is suggested that adolescents select each other to be friends on the basis of similar attitudes, beliefs and characteristics, which may or may not include smoking behavior. Jessor and Jessor (1977) argue that similarities between friends occur because many traits and behaviors are not independent. Adolescents who smoke are also more likely to drink and have values that do not focus on family and school. Two studies have examined the relative

contributions of peer influence and selective association to similarity among adolescent friends. Eiser, Morgan, Gammage, Brooks and Kirby (1991) assessed smoking habits and related attitudes in a sample of 4059, 11 to 16 year olds who also identified their best friends from among fellow respondents. The findings implied that adolescents and their friends resembled one another in their smoking habits; but not in their smoking habits alone. Drinking and health related attitudes and beliefs showed much the same covariation. Eiser et al.(1991) suggest that young people tend to choose as friends those who are somewhat similar to themselves on a whole variety of similarities, and smoking is just one form of similarity among many. Mosbach and Leventhal (1988) hypothesized that adolescents will affiliate with others who are similar to themselves in attitudes and behaviors. Through structured interviews striking associations between particular types of peer groups and adolescent smoking were demonstrated. Seventh and 8th grade students readily indicated groups they preferred doing things with - regulars, jocks, hot shots and dirts (students who held problem prone values). The majority of dirts (63%) were currently smoking compared to 28% of the hot shots, 9% of the regulars and 4% of the jocks. Mosbach and Leventhal speculate that group formation probably follows the initiation of smoking in 'dirts' who are seeking risk taking and excitement. If this is so, then continuing the association with peers who smoke would appear to be a substantial factor in maintaining regular smoking.

2.2.3 Stress Perception and Smoking Maintenance

The adolescent years are a time of indecision, risk taking and experimentation. The transition from childhood to young adulthood may, for some adolescents, lead to anxiety, insecurities and rebellious behavior. In

attempting to cope with this turmoil and moderate unpleasant feelings causes by stress, some adolescents may turn to tobacco as a coping strategy (Leventhal & Cleary, 1980).

One longitudinal study has related stress and the use of tobacco as a method of coping with stress in adolescence. Wills (1986) studied over one thousand five hundred adolescents during the 7th to 8th grade period with four measurements occurring at the beginning and end of each school year. The findings were consistent with Leventhal & Cleary (1980) indicating that stress was positively related to subsequent tobacco use. In addition, Wills suggested that if individuals indicated certain characteristic ways of coping with stress, their smoking behavior in association with the onset of stressors could be predicted. Thus, it would appear that stress, particularly in combination with inappropriate coping strategies (distraction, aggression), could be a factor in the development of regular smoking.

Consistent with the Wills longitudinal study, others have reported associations based on cross sectional analyses between perceived stressors and the use of cigarettes among the adolescent population. Revell, Warburton and Wesnes (1985) investigated how smoking fits into the overall strategies that 450 respondents employed for coping with stress. There seemed to be three distinct subgroups in this 18 to 21 year old population as defined by their preferred coping strategy: those who seek help from friends when faced with a problem, those who seek 'expert advice', and those who attempt to solve their problems alone; often with the use of drugs. Smokers falling into the third category, that of self help, smoked more cigarettes and chose their brand on the basis of strength of a cigarette. This was statistically significant for males, females and both genders combined. Lotecka and Lasselban (1981) concluded that cigarettes were viewed by adolescents as an important means

for achieving temporary stability and control over the uncomfortable feelings of nervousness, depression and boredom. Regular smokers in Charlton's (1985) study supported the view that smoking 'calms the nerves' and 'gives confidence'.

Mitic, McGuire and Neumann (1985) surveyed 1,684 students from grades 7 to 12 on their use of cigarettes and the types of circumstances they perceived as stressful. The data strongly indicated that the students who were heavy smokers perceived the greatest level of overall stress as compared to those students who smoke less or not at all. Among both genders, regardless of smoking status, school work and appearance were the most frequent stressors. Findings in a study by Penny and Robinson (1986) suggest that smoking performs a stress management function for those adolescents with a low sense of personal effectiveness. An examination of the relationship between psychological resources and cigarette use indicated that adolescents who smoked had a higher trait anxiety compared with adolescents who did not smoke.

While the reasons adolescents begin to smoke may not necessarily be the ones which encourage them to continue, it is possible that during the period in which they are experimenting with cigarette usage those adolescents who find it beneficial as a means of coping with stress are more likely to become regular smokers. Leventhal and Cleary (1980) suggest that both nicotine and emotional regulation are involved in the dependence process.

2.2.4 Nicotine Tolerance and Smoking Maintenance

Initially the adolescent starts smoking for social and psychological reasons rather than biological factors. But after some time of cigarette use pharmacological rewards become increasingly important in reinforcing and maintaining regular patterns of cigarette use (Lichenstein, 1982). The nicotine in cigarettes is a powerful psychoactive drug with a wide range of effects. Regular smokers will perform better in cognitive tasks involving speed, reaction time and concentration when a sufficient plasma nicotine level is present. However when deprived of nicotine, smokers experience stress which decreases their performance level and increases their need for a cigarette. Knowledge on the nature of nicotine addiction comes entirely from research on adult cigarette smokers and little is known about how and at what point nicotine tolerance develops in the adolescent tobacco user. Leventhal and Cleary (1980) have suggested that adolescents who have smoked for as little as two years frequently report difficulty in quitting. The U.S. Surgeon General's Report on Nicotine Addiction (1988) states that many adolescents who experiment with cigarettes declare that they do not intend to use tobacco in later years. "They are unaware or underestimate, the strength of tobacco addiction".

Hansen (1983) hypothesized that an inability to attain long term abstinence from smoking would be a prime indicator of strength of nicotine addiction. Sixty-six high school students who were current smokers were questioned about recent attempts to give up cigarette smoking and about the nature of their smoking habits. The results provide evidence that a dependence on tobacco, as indicated by rate of relapse, is established relatively early in the

lives of adolescent smokers. Those who relapsed early were characterized as relatively frequent, regular smokers. McNeil, Jarvis, Jackson and Bryant (1986) confirm Hansen's findings that the dependence on tobacco develops rapidly in the career of the smoker. One hundred and sixteen female adolescent smokers were asked about withdrawal symptoms experienced during past attempts to give up smoking for good. Sixty-three percent reported experiencing one or more withdrawal effects when they attempted to quit. The most common withdrawal effect (reported by 38% of the sample) was a strong need to smoke, and a second (32%) was feeling hungry.

Ershler, Leventhal, Fleming and Glynn (1989) replicated the McNeil et al.(1986) study and included male as well as female adolescents. Six hundred and twenty two grade 6 through grade 12 male and female cigarette smokers were interviewed about withdrawal symptoms upon quitting smoking. The results support MacNeil et al.(1986) findings that adolescents who tried to quit report withdrawal symptoms with those who are heavier smokers being more likely to report such effects. Withdrawal symptoms reported by adolescents are similar to those experienced by adult. Hence, it seems reasonable to conclude that for some adolescents cigarette smoking is not simply a matter of choice but involves a degree of dependence.

Overall, what is known about adolescent smoking maintenance is derived from surprisingly few longitudinal and cross sectional studies. However, some general conclusions can be drawn:

- Social influence (family and peer) are clearly implicated in the development and maintenance of regular smoking;

- Adolescents have adopted adult perceptions of the benefits of smoking, specifically it's use as a means of relieving stress and keeping weight under control;
- Adolescents who display 'deviance prone' behavior are more likely to progress to regular smoking; and
- Adolescents experience nicotine tolerance quite early in the acquisition of the smoking habit.

2.3 GENDER ISSUES IN ADOLESCENT SMOKING MAINTENANCE

Adolescents initiate and continue smoking as a means for achieving socially and psychologically important goals. At least three non exclusive functional goals have been identified as relevant for adolescent smoking: social approval, self definition and affect regulation. The bulk of research has assumed that the developmental pathways leading to cigarette use are the same for adolescent males and females, and gender differences have either been ignored or disregarded. However, recent works suggest that this assumption is false (Chassin et al.,1985; Barton et al.,1982). In 1986, Pederson and Lefcoe investigated changes in smoking status among a cohort of late adolescents over an eight year period beginning when the group was in grade 4 to 6. Data analysis of gender differences found that females were more likely than males to remain current smokers, more likely to go from never smoker to current smoker and less likely to remain in the never smoker category. Given clear evidence of the harmful effects of smoking on women's health (Abelin, 1989) and given the rich existing literature on sex differences in other areas of human behavior, surprisingly few studies have examined gender differences related to adolescent cigarette smoking maintenance. Findings of gender differences, largely generated in piecemeal fashion, are grouped into attitudinal, psychological, social and physiological categories.

2.3.0 Attitudinal Factors in Genders Issues

Few studies have researched the possibility of sex differences in attitudes towards smoking. Urberg and Robbins (1981) explored the perception of the cost and benefits of cigarette smoking in 155 adolescent male and female students. Girls saw health costs as being more important than did boys, and

perceived the benefits differently than boys did. Girls were more likely than boys to endorse the following benefits of smoking, 'smoking shows you do what you want', 'girls like boys who smoke' and 'smoking makes your parents mad'. Girls also were more likely than boys to endorse the following cost, 'smoking hurts athletic ability'. Urberg and Robbins suggest that girls seem to view smoking as a sign of rebellion or perhaps independence and autonomy. Whereas boys seem to view smoking as a coping mechanism in social situations. The data also revealed that the effect of having friends who smoked was always mediated by the gender of the adolescent. Boys who had friends who smoked displayed a tendency to minimize the health costs of smoking. That is, the more friends who smoked that a boy had, the more he was apt to see the health costs of smoking as unimportant. Girls viewed all these costs as being more important, the more friends they had who smoked.

Eiser et al.(1989) surveyed 10,597 students aged eleven to sixteen years regarding health beliefs in relation to adolescent smoking. Results suggest that smokers more than non-smokers favoured health beliefs concerned with 'chance' and were less in favour of beliefs in 'powerful others' and 'personal control'. Substantial gender differences were noted in the results. Girls reported greater concern with all aspects of being ill, believed less in 'powerful others' and 'personal control' over health and were more likely to be smokers. These findings support a prior study by Williams (1973) that found high impulsivity and low order related to smoking among boys but not girls, while external control was related to smoking among girls but not boys. Those girls who felt that their own actions, rather than fate or luck, were a major determinant of what happens to them tended to be non smokers.

Newman et al.(1973) administered a set of attitude items to 276 adolescent cigarette smokers and 679 adolescent non smokers. Results

indicated that basically adolescents smoke to be part of a group and to show their independence from authority. The gender of the respondents had little effect on attitudes toward smoking.

Pederson and Lefcoe (1985) undertook multiple regression analysis to assess whether the explanatory variables related to smoking status might be different for the two genders. Results showed that for females, the first variable to enter was attitude towards smoking, followed by peer smoking; whereas for males, peer smoking was the first variable to enter, with attitude toward smoking entering as the second step. Pederson and Lefcoe explain that in the 1978 cross sectional analysis peer smoking showed the strongest relationship to smoking status; however, by late adolescence positive attitudes towards smoking have displaced peer smoking in importance. Furthermore, the relative strength of attitude towards smoking was particularly noticeable among females and the authors suggest that the "continuation of smoking is not so much under the control of social factors as it is under individual personal ones" (p.235).

2.3.1 Psychological Factors in Gender Issues

Various psychological factors may account for the differences of smoking between male and female adolescents. Adolescent girls may be more 'ego involved' in smoking. That is, girls who smoke may have a greater part of their self image connected to smoking as compared to males. For example, adolescent girls viewed women models in cigarette advertisements as young, healthy, independent, active and successful (Elkind, 1985). Howe (1984) suggested that the increased prevalence of adolescent female smokers appeared to follow the increase in cigarette advertisements targeting women. Barton et al. (1982) found the intention to smoke in adolescent girls was related

to the positive social assets of smoking, including interest in the opposite sex, wanting to be with the group and relaxation. Frequently mentioned in the literature are the findings of Urberg and Robbins (1981) suggesting that girls who smoked were more self confident, rebellious, socially advanced and sexually experienced than their non smoking peers. Furthermore, female smokers viewed smoking as a sign of rebelliousness and independence, whereas boys viewed smoking as a coping mechanism in social situations. One explanation for these findings may be that because of gender differences in maturation, many girls may choose to associate with older friends and may be interested in sexual attractiveness and opposite sex relationships earlier than boys of the same age (Gilchrist et al.,1989; Piepe et al.,1988).

Regular smoking adolescents tend to be less successful in school and do not participate in school related activities (Reimers et al.,1990; Pederson & Lefcoe,1985; Chassin et al.,1984). Hover & Gaffney (1988) investigated the relationship between smoking and academic achievement in adolescent girls and found that low grade achievement was related to adolescent female smoking behavior. Krohn et al. (1986) investigated the impact of social disaffection among 1,180, 9th to 12th grade students. Differences in separate analyses for males and females reflected the greater importance of social disaffection measures for females than for males. Additionally, the degree to which students have difficulty in or trouble with the school environment was a significant predictor of cigarette smoking for males but not for females. This result may indicate that females have fewer acceptable means of rebelling or indicating disaffection than males. Smoking may be the practical avenue for rebelling for many females whereas adolescent males have a constellation of deviant behaviors they can readily adopt.

In all studies reviewed, parental smoking was a significant predictor of smoking for at least one gender. Two studies found interesting modifications of the relationship between parental and adolescent smoking. Williams (1973) reported that the smoking behavior of mothers and fathers had independent and cumulative effects on their daughters smoking behavior. Daughters were more likely to smoke if both parents smoked; however, the mother's smoking behavior was the more important indicator of whether or not their daughter smoked. The smoking behavior of boys was not significantly related to that of the parents. Chassin et al.(1986) obtained a somewhat similar result. For initial 'never smokers' the association between parental smoking and transition to a higher level was significant for girls, whereas for those who had initially tried cigarettes, the relationship was significant only for boys. These two studies suggest that parental smoking may influence adolescent boys and girls differently. Parental smoking seems to influence girls to smoke, whereas for boys, it is only among those who begin to experiment, perhaps as a result of other influences, that parental smoking is related to a faster adoption of higher levels of smoking.

Some smokers appear attracted to cigarette smoking by a strong need to express individuality and autonomy (Chassin et al.,1985). Evidence suggests that adolescent girls accept cigarette smoking as a symbol of independence and believe that the act of smoking projects a desired social image to others (Urberg & Robbins, 1981).

The belief that smoking controls weight appears to be a powerful motivator in maintaining regular smoking behavior in adolescent girls

(Greaves,1987; Charlton,1984). Jacobson (1982) noted a compelling motivation that attracts some adolescent girls to smoking:

"Being thin has a meaning for women that it does not have for men...Thinness is one of the few sources of self esteem society allows women...Although smoking is not a passport to weight loss...women smokers often equate smoking with being thin and in control...The thought of being fat, undesired and unsuccessful seems far more difficult to face than the prospect of becoming ill from smoking". (p.45).

Data from high school students further substantiate that at a young age females more than males are interested in cigarettes as a weight control aid (Charlton 1984). Pirie et al.(1991) surveyed 6,711 young men and women (average age 19 yrs.) concerning gender differences in cigarette smoking and quitting. Findings support the observation that young women concerns about weight gain emerged as a major issue for young women smokers. Given the cultural pressure to maintain an ideal body weight and to aspire to an unrealistic thin body image, adolescent girls are consequently very concerned about the possible weight gain that may result if the smoking habit ceases.

Leventhal and Cleary (1980) noted that a smoker's primary use of cigarettes is to regulate emotional states. Coleman (1981) found that adolescent females experienced greater levels of anxiety and insecurity about friendship, greater fears of rejection and higher levels of vulnerability to impulsive behavior. Consistent with these findings in a study by Evans and Lowe (1986) 266 students completed a 'reason for smoking scale'. Comparisons between male and female smokers revealed one significant

difference - female smokers scored higher on the negative affect factor (smoke to reduce unpleasant states such as tension).

Gottlieb (1983) surveyed 932 college women in smoking behavior and found that 30.5% were current smokers, 20.3% former smokers and 49.2% non smokers. Most (86.1%) had begun smoking in high school. Current smokers were not unanimously committed to a lifetime of smoking, and 70% had made one serious but unsuccessful attempt to stop smoking. School pressures (17.4%) were seen as the single most important reason for smoking maintenance, with addiction (9.8%) and friends' smoking (9.4%) other frequently mentioned reasons.

Revell et al.(1985) in their investigation of smoking as a coping strategy found marked sex differences in terms of coping strategies. Females were significantly more likely than males to talk their problems over with a friend or parent. Conversely, males were significantly more likely than females to sort out their own problems or to solve their problems using drugs. Another indication of gender effect reported by Mitic et al.(1985) were the finding that appearance, parents and money appeared to create the highest level of perceived stress for female smokers, while schoolwork, money and parents affected male smokers' perceived stress score.

In sum, because of existing differences in gender role expectations and prevailing social norms, the processes of self concept that attract girls to smoking may not be the same as the self concept processes that lead boys to smoke.

2.3.2 Social Factors in Gender Issues

Social factors in smoking maintenance continue to include friends and family members who smoke, the influence of tobacco advertising directed at young women and the manufacturing and promotion of specific tobacco products directed towards the women's market.

Having friends who smoke has been related consistently to smoking for both genders (Krohn et al., 1986; McCaul et al., 1982; Hover and Gaffney, 1988). Chassin et al. (1986) investigated peer and parent influences on the actual smoking transitions of adolescents. The study sought to discover whether the influence of peers or parents on smoking transition differed at different ages or differed for girls and boys. Findings suggest that for girls, the transition to regular smoking was more likely if their friends had more positive attitudes toward their smoking and if their friends had lower expectations for the subjects general and academic success. For boys, the transition to regular smoking was more likely if their friends had higher expectations for the subjects academic and general success.

Girls are sometimes said to be more susceptible than boys to external influences and pressure to smoke (Chassin et al., 1984). Huba and Bentler (1980) found that peer models were more strongly related to cigarette use among girls than among boys. Skinner et al. (1985) reported that association with both male and female friends who smoked was greater for those who eventually began to smoke cigarettes than for those who remained non smokers. This was particularly apparent for females who associate with female smoking friends. The authors suggest that the rise in female adolescent cigarette smoking at the time that male adolescent smoking is levelling off may be due to more peer pressure to smoke being brought to bear on females by

their female friends. Mosbach and Leventhal (1988) found that a greater number of girls stated a preference for being with the 'hot shots' or popular group of kids, characterized in the data as being female, moderately high in self esteem, and high in dissatisfaction and frustration with performance generally (ie. school, athletics, popularity with peers, perceived parental satisfaction with behavior). More male than female students preferred to affiliate with the 'jocks' and the 'dirts'. These differences were consistent with earlier comparisons between female and male adolescents that showed the former valued academic achievement while the latter socialized about athletic ability (Fine, 1981) and were more frequently involved in 'problem behavior' (Jessor & Jessor, 1977).

These findings are consistent with investigations of other substance-use behaviors (Chassin et al., 1984; Jessor, 1982) and demonstrate that both parents and peers exert important influences on adolescent smoking behavior.

2.3.3 Physiological Factors in Gender Issues

Recent works have shown that nicotine dependence is an important factor in maintaining adolescent smoking behavior (Ershler et al., 1989; McNeil et al., 1986; Hansen et al., 1983). Once adolescents become regular smokers, their bodies become accustomed to regular nicotine dosages and they thereby develop a tolerance or addiction. Studies have shown that females' smoking behavior exhibits greater sensitivity to nicotine than does that of males (Grunberg et al., 1991). During the process of learning to smoke, light or mild cigarettes produced specifically for adolescent girls and women reduce unpleasant physiological reactions to nicotine and allows the body to adapt to smoking behavior.

Silverstein et al.(1980) hypothesized that the increased availability of low nicotine cigarettes is implicated in the recent rise in smoking among adolescent females. Analysis of a survey of 1,233 students suggested that females (as compared to males) experienced both a greater social pressure to smoke and a greater physiological pressure not to smoke stemming from a high sensitivity to nicotine. The pressure to smoke leads females to be much more likely than males to become smokers. Thirty seven percent of the males who tried smoking never reached the point of smoking at least one cigarette a day for two months, whereas 75% of the females trying cigarettes became smokers. However, the female smokers smoked less than the male regular smokers. Among those students currently smoking at least one cigarette per day, a greater proportion of females than males were very light smokers, smoking one to five cigarettes a day (29% female, 21% male), and a greater proportion of females than males smoked low nicotine cigarettes (34% female, 22%male). Silverstein et al.(1980) emphasized that prior to 1968 low nicotine cigarettes were unavailable and suggest that females who were faced with a choice between frequent overdose reactions to nicotine and not smoking might have chosen to remain non smokers.

Friedman et al.(1985) failed to replicate findings by Silverstein et al.(1982) and reported no significant difference between males and females on number of unpleasant physiological reactions during initial smoking experiences. An analysis of unpleasant emotional reactions (fear, guilt) approached significance with girls describing more negative emotional effects. Friedman et al.(1985) found that persistent experimenters reported more positive physiological reactions compared to those who did not continue smoking.

Pirie et al.(1991) collected data using the Fagerstrom Nicotine Tolerance Scale and noted that genders differed slightly on items reflecting addictive or dependent smoking with more males reporting that they smoked within 30 minutes of getting up and that the first cigarette in the morning was the most satisfying. Smoking withdrawal symptoms were reported equally, except for wanting to eat more than usual and weight gain, both of which were reported more often by adolescent females than males.

CHAPTER 3. METHODS AND PROCEDURES

This chapter explains the methods employed in testing the research questions outlined in Chapter 1. This exploratory cross sectional study is encompassed within the auspices of a larger study which examined the effectiveness of the Freedom Now Teen Smoking Cessation Program for the Manitoba Lung Association. The process of student sample selection is described as well as the instrument used in the data collection. Details of analysis procedures are presented.

3.0 SAMPLE SELECTION

The target population for this investigation was grade eleven female and male students who were regular smokers, and attended one of seven selected schools in Winnipeg, Manitoba. Permission was obtained from the superintendents of the Winnipeg school divisions by the Manitoba Lung Association. Principals within the seven selected schools identified contact teachers for liaison purposes. These teachers identified 390 grade eleven students, both smokers and non smokers, to participate in the evaluation of the Teen Smoking Cessation Program. In May 1990, a questionnaire was administered to 192 females and 198 males ranging in age from 15 to 18 years and older with a modal age of 16 years from predominantly urban Winnipeg. Of these, 80 students (49 female and 31 male) reported they presently smoked and were accepted for this study.

3.1 QUESTIONNAIRE DEVELOPMENT

A self report closed form questionnaire was chosen as the most appropriate method for collecting original data from a large student population. Questionnaires are cost effective, easy to code and offer anonymity and privacy hence encouraging more candid responses. Items for the survey instrument were drawn from previous age related research studies; specifically from studies conducted by Mitic (1985) on stress and coping, Pederson (1985) on smoking attitudes, behavior and self image, Fagerstrom (1978) on nicotine addiction and the Canada Youth and AIDS Study (1988) on self concept. The questionnaire is divided into three major sections:

3.1.0 Attitudes Toward Smoking

The ten items in the attitude section were obtained from a questionnaire developed by L. Pederson, Department of Epidemiology and Biostatistics, University of Western Ontario. Pederson and Lefcoe (1985) investigated the degree and type of changes in adolescent smoking status that occurred over an eight year period, when the group was in grade 4 to 6, to late adolescence and early adulthood. See Chapter 2 for a detailed description of this study and findings. Pederson and Lefcoe modified their original questionnaire to reflect the use of language more appropriate for the older age of the group. It is from the modified version that ten attitude items were selected. (see Appendix A)

3.1.1 Some Facts About You

This second section of the questionnaire (see Appendix A) measures the individual's perception of self, family, peers and includes a number of demographic items such as age and gender.

'Some Facts About You' is divided into three components:

1. **Self Concept** as reflected in school and family perception, self esteem and self image. The majority of the questions were obtained from the Canada Youth and AIDS Study (1988). This survey reported on the characteristics of 38,000 Canadian Youth (aged 11-21), their social circumstances, relationships with parents and peers and their knowledge and attitudes with respect to AIDS and STDS. Scales focussing on self esteem, mental health, relationship with parents and relationships with peers were designed to measure aspects of the lives of adolescents. All survey items were viewed in terms of reliability and validity. The items measuring self image were drawn from the Pederson and Lefcoe questionnaire.

2. **Peer Influence** consists of four questions adapted from the Canada Youth and AIDS Study (1988) concerned with asking friends for advice, being encouraged to do things that are wrong and being pressured to smoke.

3. **Stress Perception** consists of seven questions obtained from the Adolescent Perceived Stress Scale. This instrument, developed by W.R. Mitic, D.P. McGuire and B. Neumann (1985), measures whether students have felt nervous, anxious or worried in the past month as a result of relationships with particular people (teachers, parents, opposite sex) or as a result of particular issues (school, personal appearance, money). The response set for all seven questions is a three point Likert scale ranging from 'often' to 'never'.

3.1.2 Current Smoking Status

The third section, (See Appendix A) to be completed by current regular smokers, contains questions on amount smoked, reasons for smoking, health beliefs about smoking, cessation and prediction of future smoking. The majority of these items were drawn from Pederson and Lefcoe's (1985) questionnaire. In addition, nicotine tolerance is assessed utilizing questions from Fagerstrom's Nicotine Tolerance Scale. The tolerance questionnaire, intended to measure physical dependence to nicotine, has been validated against body temperature and heart rate increase during withdrawal after smoking termination (Fagerstrom,1978). The questionnaire consists of eight questions with a range of 0 - 11 points with 0 indicating minimum dependence and 11 points maximum physical dependence. Six questions from the tolerance questionnaire have been chosen with a range of 0 to 8 points.

Directions for answering the questions are clearly printed at the beginning of each section of the questionnaire.

3.2 PILOT STUDY

A pilot survey of the questionnaire was administered to an eleventh grade physical education class unrelated to this study to ensure readability and comprehension. Since there are contingency questions, the flow of the questionnaire was particularly important to ensure that questions were not missed. Following the pilot survey revisions were made to simplify words and expressions where deemed appropriate.

3.3 PROCEDURE

The revised questionnaire (Appendix A) was completed by selected classes under test conditions supervised by the class teacher and the investigator. Instructions given orally reemphasized the anonymity of response and assured the students that there would be no recourse from teachers or parents. The questionnaire was answered on IBM response sheets and the students were instructed on how to complete these sheets prior to the distribution of the questionnaire. On completion, the response sheets were placed in an envelope and delivered to the University of Manitoba Computer Services where an optical scanning system read and recorded student responses. This information was placed into a data disk file for subsequent analysis.

3.4 OPERATIONALIZATION OF VARIABLES

All variables formed part of a larger survey used to study adolescent cigarette smoking. The composite variables, derived from other instruments measuring adolescent smoking maintenance, are on a continuum and operationalized as follows:

Dependent Variable:

Gender: was assessed by question 11

11. Are you.....

a) Male?

b) Female?

Independent Variables:

Subquestion #1. Is there a difference in **attitudes toward smoking** for adolescent male and female regular smokers?

Attitudes Toward Smoking: were assessed by ten items (questions 1 - 10). The response set for all ten questions is a five point Likert scale ranging from 'strongly agree' to 'strongly disagree'. The possible scores range from 10 to 50 and are coded such that a lower score is theoretically a more favourable attitude towards smoking. (Appendix A)

Subquestion #2. Is there a difference in **self concept** for adolescent male and female regular smokers?

Self Concept: is subdivided into four components, school self perception, family perception, self image and self esteem. These components are presented and analysed separately as follows:

a) School Self Perception: was assessed by 6 items (questions 15 - 20).

The response set is a Likert scale with possible scores ranging from 6 to 20. Point scales are codes such that higher scores signify more positive school perception.

(Appendix A)

b) Family perception: was assessed by 5 items (questions 26 to 30).

The response set is a Likert scale with possible scores ranging from 5 to 15. Point scales are coded such that higher scores signify more positive family perception. (Appendix A)

c) Self image: was assessed by 5 items (questions 21 to 25). The response set is a Likert scale with possible scores ranging from 5 to 15. Point scales are coded such that higher scores signify a more positive self image. (Appendix A)

d) Self esteem: was assessed by 11 items (questions 31 to 37 and 51 to 54). The response set is a Likert scale with possible scores ranging from 11 to 41. Point scales are coded such that higher scores signify higher self esteem. (Appendix A)

Subquestion # 3. Is there a difference in **peer influence** for adolescent male and female regular smokers?

Peer Influence: was assessed by 5 items (questions 41 to 45). The response set is a Likert and Yes/No scale with possible scores ranging from 5 to 12. Point scales are coded such that lower scores signify higher peer influence. (Appendix A)

Subquestion # 4. Is there a difference in **stress perception** for adolescent male and female regular smokers?

Stress Perception: was assessed by 7 items (questions 56 to 62). The response set is a three point Likert scale with possible scores ranging from 7 to 21. Point scales are coded such that lower scores signify higher stress perception. (Appendix A)

Subquestion #5. Is there a difference in **strength of nicotine tolerance** for adolescent male and female regular smokers?

Nicotine tolerance: was assessed by 6 items (questions 70 - 75). These questions are derived from Fagerstrom's Nicotine Tolerance Scale. The highest possible score for the six questions is 8, a score of 5 or more will be considered as highly dependent on nicotine. (Appendix A)

3.5 DATA ANALYSES

Students were classified as regular smokers based on their answers to the questionnaire. There is no universally accepted definition of regular smoking behavior, nor is there a standardized method of measuring it.

Adolescents were labeled regular smokers if they satisfied the following criteria:

1. they stated that they presently smoked, and
2. they usually smoked every day.

Students who stated that they did not 'ever smoke' or did not 'presently smoke' were excluded from the study. Of the 390 male and female grade 11 students who provided sufficient information for the foregoing classifications,

20.5% (80) presently smoked, 43.6% (170) have never smoked, and 35.9% (140) had 'ever smoked' but did not 'presently smoke'.

Only the data from the 49 female and 31 male regular smokers were used in this study.

3.6 STATISTICAL ANALYSES

Of interest are the significant differences between adolescent male and adolescent female regular smokers. Statistical analyses were performed on selected psychosocial and demographic variables related to smoking maintenance using Number Cruncher Statistical System (NCSS) version 5.1 software.

Unpaired (independent) two tailed T tests were utilized to determine if there were any significant differences between the means of adolescent female and male regular smokers. Levels of significance were based on probability values below 0.05 for two-tailed tests, except where indicated (Hassard, 1989). Logistic regression analyses were performed to investigate the items within the composite variables (or the set of variables) that best accounted for gender in regular smokers and assess whether the explanatory variables might differ for the two genders.

The logistic regression model demonstrated its full power and applicability when employed by the Framingham Heart Study to provide multivariate analysis of data (Hosmer, 1989). As a form of multiple regression where the outcome studied is not a continuous variable but a binary variable (male/female), logistic regression has become the standard method of analysis (Evans, 1988). In a multiple logistic model each variable has a logistic coefficient which can be used to quantify the impact of each factor. It untangles

the effects of the various explanations and assesses the impact of each explanation on outcome, while controlling for, or eliminating, the effects of other confounding explanations (Hassard,1990). Each beta coefficient in a multiple logistic model measures the unique impact of that particular explanatory variable on the outcome (male/female). This statistical method is relatively complex and enables one to adjust for variables in assessing both the magnitude and the significance of each variable on the qualitative outcome.

Descriptive statistics, percentages and frequencies, were used to present demographics and smoking behavior. Where appropriate female and male responses were shown separately. Although 80 students qualified as 'regular smokers', not all questions were answered by all 80 students. Non response questions were treated in the analysis as missing values.

3.7 PRESENTATION OF RESULTS

The results and discussion are presented in the next chapter. Characteristics of the sample include demographic information presented in percentages and broken down by gender. This is followed by the research subquestions which are divided into individual sections. Each subquestion is reiterated and results of the data analyses presented. A discussion of the findings pertaining to the subquestion completes each section.

CHAPTER 4. RESULTS AND DISCUSSION

4.0 CHARACTERISTICS OF THE SAMPLE

In May 1990, three hundred and ninety grade 11 students from 7 Winnipeg area high schools completed a questionnaire related to smoking behavior (Appendix A). Of these, 220 students or 56% had tried smoking and 80 students or 21% of the total reported they were regular smokers (Table 1).

Table 1. Smoking Prevalence in a Cohort of 390 Students, by Gender

Gender	N	Never Smoked	Ever Smoked	Regular Smoke
Female	192	67	125 (65%)	49 (39%)
Male	198	103	95 (48%)	31 (32%)
Total	390	170	220 (56%)	80 (36%)

A comparison of female and male smoking prevalence (Table 1) reveals that a higher percentage of females than males (65% versus 48%) have 'ever smoked' or experimented with cigarette smoking. Furthermore, of the 125 females who have tried smoking 39% (49) are now regular smokers and 32% (31) of the 95 males who have tried smoking are regular smokers. Seven percent more females than males have progressed to the 'regular smoker' category, a comparison consistent with Manitoba (Manfreda et al., 1985) and Canadian (Smoking Behavior of Canadians, 1986) trends which show that the percentage of female smokers exceeds that for male smokers. Eighty

adolescents met the defined criteria (page 54) for 'regular smoker' and constitute the subjects for this study.

The group of 80 regular smokers were 49 (61%) female and 31 (39%) male. They ranged in age from 15 to 18 years and older with a modal age of 16 years. All respondents were in grade 11 with 38.7% of males and 49% of females reporting an overall mark last year of B or higher. Most (71.3%) plan for post secondary education, with 23.8% preparing for community college or business school and 47.5% planning to complete university. This compares to the Canada Youth and AIDS Study (1988) in which 75% of grade 11 students planned for post secondary education, with 29% preparing for college and 46% planning to complete university. Table 2 provides the gender breakdown of academic aspirations for the 80 grade 11 regular smokers of this study.

Table 2. Academic Aspiration, by Gender

When do you plan to complete your education	Female (n = 49)	Male (n = 31)
Before high school completed.	0%	10% (3)
When high school completed	18.4% (9)	0%
Complete community college or business school	20.4% (10)	29% (9)
Complete university	49.0% (24)	45% (14)
Don't know	12.2% (6)	16% (5)

Although previous research has shown that adolescent smokers experience academic difficulties and have low academic and career aspirations (Jessor & Jessor, 1977, Chassin et al., 1984, Pederson & Lefcoe, 1985), the findings of the present study do not concur with these observations. Only 16.5% of the regular smokers had an overall grade last year of D+ or lower and 15% of the study population do not intend to continue their education following high school completion. These results compare with the findings of the Canada Youth and AIDS Study (1988) where 10% of Canadian grade 11 students surveyed reported they did not intend to continue their education following high school completion.

4.1 ATTITUDES TOWARD SMOKING: RESULTS AND DISCUSSION

Research Subquestion #1. Is there a difference in attitudes toward smoking for adolescent male and female regular smokers?

4.1.0 RESULTS

The response set for all ten questions concerning attitudes toward smoking is a five point Likert scale ranging from 'strongly agree' to 'strongly disagree'. The possible scores range from 10 to 50 and are coded such that a lower score is theoretically more pro smoking. Sample scores ranged from 10 to 43, with mean scores of 31 for male regular smokers and 32.3 for female regular smokers.

The T test indicates no significant group mean difference in attitudes towards smoking between female and male regular smokers.

$$t = 1.05 \text{ with } 77 \text{ d.f., N.S.}$$

However, when the ten items comprising attitudes toward smoking were considered simultaneously using a logistic regression model, a significant

relationship between attitudes toward smoking and gender was observed (Model chi square = 34.16 with 10 d.f., $p < 0.0002$).

The individual item/gender relationship are summarized in Table 3 (only relationships which reach statistical significance at the 0.05 level are presented).

Table 3. Attitude Predictor of Gender in Regular Smoker

Variable	Beta Estimate	Standard Error	Chi Square, Beta=0
C10 One of the main reasons people smoke is to be part of a group.	.6720	.2929	5.26
C2 Smoking is something nice to do when your having fun or enjoying yourself.	.8159	.3791	4.63
C3 People who smoke are usually more friendly than people who don't.	1.1249	.3456	10.59
C9 Cigarette smoking can help to control weight.	-.7532	.3319	5.15
C5 To be popular with friends, you have to smoke cigarettes.	-.7627	.3483	4.79

- Chi Square Beta 3.8 is significant at the 0.05 probability level
- Females = negative beta estimate values
- Males = positive beta estimate values

Logistic regression indicates that the strongest attitude predictor of gender in regular smokers is item C3 (*Table 3 - People who smoke are usually more friendly than people who don't.*). Males more than females tend to agree that people who smoke are more friendly than people who don't. Males also agree that smoking is something nice to do when you're having fun or enjoying yourself and the main reason people smoke is to be part of a group. More females tend to agree that cigarette smoking can help to control weight. Females also report that to be popular with friends you have to smoke cigarettes.

4.1.1. DISCUSSION

The bulk of the research, while assuming that attitudes toward smoking are the same for adolescent male and female smokers, has focused on specific positive and negative beliefs about smoking behavior. Studies have shown that adolescent smokers hold favourable attitudes toward smoking and believe that smoking is pleasurable, relieves stress, connotes independence and expresses solidarity with peers (Hansen et al.,1985; Mitic et al.,1985; Pederson & Lefcoe,1985; Chassin et al.,1984; Jessor & Jessor,1977).

Based on the results of this investigation, it is apparent that adolescent regular smokers share an overall favourable attitude towards smoking. In addition, surprisingly clear gender specific distinctions in attitudes were observed. Males appear to smoke in response to social situations; to be part of a group, when having fun or to appear friendly. While adolescent male smokers appear to associate smoking with group solidarity and conformity, adolescent female smokers associate smoking with popularity and self image. Smoking for adolescent girls seems to entail a strong functional component; the use of cigarettes to control weight and to be popular with friends. These results concur

with the findings of Pederson and Lefcoe (1985) who reported that for females more than for males, smoking maintenance comes under internal individual influences rather than social external ones.

These results answer the research subquestion that there are indeed real differences in attitudes toward smoking in adolescent male and female regular smokers. These gender differences must be considered when designing smoking cessation programs. Gender specific adolescent smoking cessation programs should be designed to address the individual needs of self definition and affect regulation in the female smoker, whereas for male smokers the need for social recognition and acceptance need to be addressed.

4.2 SELF CONCEPT: RESULTS AND DISCUSSION

Research Subquestion #2. Is there a difference in self concept for adolescent female and male regular smokers?

This self concept research subquestion is divided into four components: school self perception, family perception, self image and self esteem. Each is presented and analysed separately, followed with a discussion of the combined components.

4.2.0 RESULTS

4.2.0.1. School Self Perception Results

The response set for questions 15 to 20 regarding school self perception is a Likert scale with possible scores ranging from 6 to 20. Point scales were coded such that higher scores signify more positive school self perception. Sample scores ranged from 6 to 19, with mean scores of 13.4 for male regular smokers and 14.8 for female regular smokers.

The T test indicates a significant group mean difference between female and male regular smokers at the $p < 0.01$ level.

$$t = -2.63 \text{ with } 77 \text{ d.f.}$$

There is strong evidence to suggest that real differences in school self perception exist between the two groups, with female smokers having a more positive school self perception than male smokers (mean 14.8 vs. 13.4). In addition, when the six items comprising school self perception were considered simultaneously using a logistic regression model, a significant relationship between self concept and gender was observed (Model chi square = 12.22 with 6 d.f., $p < 0.05$). The individual item/gender relationship are summarized in Table 4.

Table 4. School Self Perception Predictor of Gender in Regular Smoker

Variable	Beta Estimate	Standard Error	Chi Square, Beta=0
C16 Are you happy at school	.7590	.4204	3.26

- Chi square beta 3.8 is significant at 0.05 probability level
- Females = positive beta estimate value
- Males = negative beta estimate value

Logistic regression indicated that the strongest predictor of gender in regular smokers is item C16 (*Table 4 - Are you happy at school?*). Although not statistically significant at the conventional 0.05 probability level, females tend to be more happy at school than males.

4.2.0.2. Family Perception Results

The response set for questions 26 to 30 regarding family perception is a Likert scale with possible scores ranging from 5 to 15. Point scales were coded such that higher scores signify more positive family perception. Sample scores ranged from 5 to 15, with a mean score of 10.2 for male regular smokers and 10.5 for female regular smokers.

The T test indicates no significant difference exists in family perception between female and male regular smokers.

$$t = -.550 \text{ with } 75 \text{ d.f., N.S.}$$

When the five items comprising family perception were considered simultaneously using a logistic regression model, no significant relationship between family perception and gender was observed (Model chi square = 2.13 with 5 d.f., $p < 0.8316$). In addition, when each of the five items comprising the composite variable of family perception were considered independently, no significant difference between female and male gender emerged (Table 5).

Table 5. Family Perception Predictor of Gender in Regular Smokers

Variable	Beta Estimate	Standard Error	Chi Square, Beta=0
C28 Do you get a lot of attention at home	.3181	.3262	0.95 *

* Not significant

- Chi square beta 3.8 is significant at 0.05 probability level
- Females = positive beta estimate value
- Males = negative beta estimate value

Logistic regression indicates that the strongest predictor of gender in regular smokers is item 28 (*Table 5 - Do you get a lot of attention at home?*). Females report they get a lot of attention at home most of the time; however, the difference between females and males is not significant. Family perception is not a good predictor of gender in regular smokers.

4.2.0.3. Self Image Results

The response set for questions 21 to 25 regarding self image is a Likert scale with possible scores ranging from 5 to 15. Point scales are coded such that higher scores signify more positive self image. Sample scores ranged from 5 to 15, with mean scores of 12 for male regular smokers and 10.7 for female regular smokers.

The T test indicates a significant group mean difference between female and male regular smokers at the $p < 0.02$ level.

$$t = 2.31 \text{ with } 77 \text{ d.f.}$$

There is strong evidence to suggest that real differences in self image exist between the two groups with female smokers reporting a lower self image than male smokers (mean: 10.7 vs. 12). When the five items comprising self image were considered simultaneously using a logistic regression model, a significant relationship between self image and gender was observed (Model chi square = 21.74 with 5 d.f., $p < 0.0006$). The individual item/gender relationships are summarized in Table 6 (only relationships which reach statistical significance at the conventional 0.05 level are presented).

Table 6. Self Image Predictors of Gender in Regular Smokers

Variable	Beta Estimate	Standard Error	Chi Square, Beta=0
C22 Do you diet	-1.6804	.5677	8.76
C21 Do you consider yourself to be of normal weight	.9170	.4092	5.02
C23 Do you consider yourself excellent at sports	-.7256	.3340	4.72
C25 Do you play sports outside of school	-1.1723	.5844	4.02

- **Chi square beta 3.8 is significant at 0.05 probability level**
- **Females = positive beta estimate value**
- **Males = negative beta estimate value**

Logistic regression indicates that the strongest predictor of gender in regular smokers is C 22 (*Table 6 - Do you diet?*). Males more than females are likely to never diet. Females are more likely to consider themselves of normal weight than males. Males are more likely to consider themselves proficient at sports; however, males are more likely to play sports outside of school.

4.2.0.4. Self Esteem Results

The response set for questions 31 to 37 and 51 to 54 regarding self esteem is a Likert scale with possible scores ranging from 11 to 41. Point scales are coded such that higher scores signify higher self esteem. Sample scores ranged from 15 to 38 with mean scores of 31.1 for male regular smokers and 30.6 for female regular smokers.

The T test indicates no significant group mean difference in self esteem between female and male regular smokers.

$$t = .5149 \text{ with } 75 \text{ d.f., N.S.}$$

Although evidence does not support the premise that females and males genuinely differ in self esteem, male smokers mean scores were slightly higher than females (Mean: 31.1 vs. 30.6). When the seven items comprising self esteem were considered simultaneously using a logistic regression model, a significant relationship between self esteem and gender was observed (Model chi square = 17.73 with 7 d.f., $p < 0.0132$). The individual item/gender relationships are summarized in Table 7a.

Table 7a. Self Esteem Predictors of Gender in Regular Smokers

Variable	Beta Estimate	Standard Error	Chi Square Beta=0
C36 Do your friends show interest in your ideas and feelings	1.1448	.4625	6.12
C31 Do you like the way you are	-.8169	.4204	3.77

- **Chi square beta 3.8 is significant at the 0.05 probability level**
- **Females = positive beta estimate value**
- **Males = negative beta estimate value**

Logistic regression indicates the strongest predictor of gender in regular smokers was item C36 (*Table 7a.- Do your friends show interest in your ideas and feelings?*). Females are more likely than males to report that their friends

show interest in their ideas and feelings. Males more often than females tend to like the way they are.

Some further self esteem questions (51 to 54) were analyzed with no significant relationship between self esteem and gender observed (Model chi square = 2.82 with 4 d.f., $p < 0.5888$). Although logistic regression demonstrated no significant differences in individual items, females more often than males reported that they could never have an effect on what happens in the world (Table 7b).

Table 7b. Self Esteem Predictors of Gender in Regular Smokers

Variable	Beta Estimate	Standard Error	Chi Square Beta=0
C51 Someone like me could never have an effect on what happens in the world.	-.21044	.2114	0.99 *

*** Not significant**

- **Chi square beta 3.8 is significant at the 0.05 probability level**
- **Females = negative beta estimate value**
- **Males = positive beta estimate value**

4.2.1. SELF CONCEPT DISCUSSION

The results of this study indicate that there is a real difference in self concept for adolescent male and female regular smokers. The components of the self concept variable with significant mean differences were school self perception and self image. Female regular smokers appear to have more favourable attitudes toward school and appear satisfied with their level of

academic performance although these differences were not enough to be significant at the $p < 0.05$ level.

Beane et al (1980) and McGuire et al (1979) maintain that a large proportion of an adolescent's sense of self is tied to academic performance since much of their day is spent in an environment where academic achievement is observed and rewarded. Thus, from the results of this study one would postulate that a positive attitude towards school and academic performance should yield a more positive self image and higher self esteem for adolescent female smokers than for adolescent male smokers. However, male smokers in this sample set were found to have a significantly higher self image mean score than female smokers. Specifically, males more often than females did not diet and tend to consider themselves excellent at sports.

Most students (80%) considered themselves average or better at sports with 15% reporting that they were excellent at sports. More males than females considered themselves proficient at sports and more males played sports outside of school. These results do not concur with previous investigations that suggest adolescents who smoke are less likely to participate in extracurricular activities and athletics (Penny & Robinson 1986, Reimers et al 1990, Krohn et al 1986). However, these gender differences in school self perception and self image are consistent with findings by Mosbach and Leventhal (1988) that demonstrated females valued academic achievement while males favoured athletic ability.

Research suggests that adolescent girls may be more vulnerable to the appeals of smoking for the sake of projecting a desired social image to themselves and to their peers (Chassin et al., 1981; Clayton, 1991; Gilchrist et

al.,1989). This desired social image is depicted in cigarette advertisements as an independent, slim, glamorous and successful young women (Howe, 1984). Since body image and weight control are of overwhelming importance to adolescent girls, it is not surprising that females reported that they tended to diet more than males. However, most females (63%) and males (58%) considered themselves of normal weight, while more females than males perceived themselves as overweight (29% versus 19%) and more males than females reported being underweight (23% versus 8%). These findings appear to reflect adolescents' perceptions of prevailing social norms which promote the ideal body image of slim females and muscular males. Females more than males (44% versus 17%) reported that they used cigarette smoking to curb their appetite for food suggesting that females more than males are interested in cigarettes as a weight control aid.

Although males had a significantly higher self image mean score, no genuine group mean difference in self esteem was observed in male and female regular smokers. Mean scores were slightly above the mid range with male smokers reporting a slightly higher self esteem than females (31.1 versus 30.6). However, when items comprising self esteem were considered simultaneously, a significant relationship between self esteem and gender was observed. Females more than males reported that their friends showed interest in their ideas and feelings and males more often than females reported that they liked themselves. Although not statistically significant, females recorded that they could never have an effect on what happened in the world. This is congruent with Williams (1973) who found that girls who felt that fate or luck was a major determinant of what happens to them tended to be smokers. This lack

of self efficacy is in contrast to male smokers who stated more often than females that they like the way they are.

In summary, these results answer the research subquestion that there are indeed real differences in self concept for adolescent male and female regular smokers. Two components of the self concept variable demonstrate significant mean differences: female smokers have a more positive school perception than male smokers; and male smokers have a more positive self image than female smokers. When developing cessation programs it is important that the planner take these gender differences in self concept variable into consideration.

4.3. PEER INFLUENCE: RESULTS AND DISCUSSION

Research Subquestion #3. Is there a difference in peer influence for adolescent male and female regular smokers?

4.3.0. RESULTS

The response set for questions 41 to 45 regarding peer influence is a Likert scale with possible scores ranging from 5 to 12. Point scales were coded such that lower scores signify higher peer influence. Sample scores ranged from 5 to 9, with mean scores of 6.9 for male regular smokers and 7.2 for female regular smokers.

The T-test indicates no significant group mean difference between female and male regular smokers.

$$t = -1.22 \text{ with } 77 \text{ d.f., N.S.}$$

Although evidence does not support the proposition that males and females genuinely differ in peer influence males tend to have lower mean

scores than females (6.9 versus 7.2). When the five items comprising peer influence were considered simultaneously using a logistic regression model, no significant relationship between peer influence and gender was observed (model chi square = 6.67 with 4 d.f., $p < 0.154$). However, when each of the items comprising the composite variable of peer influence was considered independently, a significant difference between male and female gender emerged (Table 8).

Table 8. Peer Influence Predictor of Gender in Regular Smoker

Variable	Beta Estimate	Standard Error	Chi Square Beta=0
C43 Do your friends encourage you to do things you know are wrong.	.8103	.3705	4.78

- Chi square beta 3.8 is significant at the 0.05 probability level
- Females = positive beta estimate value
- Males = negative beta estimate value

Logistic regression indicates the only predictor of gender is C43 (*Table 8 - Do your friends encourage you to do things you know are wrong?*). Female smokers report that their friends are less likely to encourage them to do things they know are wrong than the friends of male smokers.

4.3.1. DISCUSSION

While 6% of the adolescents in this sample recorded that none of their close friends smoked, 64% reported that 4 or more of their close friends smoked

cigarettes. These figures are consistent with the bulk of the research on adolescent smoking which found that having friends who smoke is related to smoking maintenance for both genders (Leventhal & Cleary, 1980; Flay et al., 1983; Reimers et al., 1990; O'Rourke, 1983; Krohn et al., 1986; Hover & Gaffney, 1988).

Adolescent girls are sometimes said to be more susceptible than boys to external influences and pressure to smoke (Chassin et al., 1984; Skinner et al., 1985). The results from this study provide little evidence to support this premise. In this investigation, both genders reported peer influence scores in the lower range, with males more responsive to peer influence than females although the difference is not significant. Consistent with lower scores denoting higher peer influence, 86% of the students recorded that if a friend offered them a cigarette they would smoke it. Newman (1984) suggests that adolescents may perceive peer pressure as involving overt acts to coerce an individual to comply with the will of others. The diversity of peer influence (ie. pressure to appear independent, pressure for recognition, pressure to appear mature and pressure to have fun) is not understood and therefore adolescents often deny the existence of peer pressure to smoke. Urberg et al. (1990) observed that adolescent smokers perceived their friends, not as encouraging them to smoke, but as not providing any discouragement for smoking.

Furthermore, when individual items comprising the peer influence variable were considered males reported that their friends were significantly more likely to encourage them to do things they know are wrong than female regular smokers. Smoking in adolescence has been found to covary with other behaviors which have an increased health risk such as risk taking (Jessor & Jessor, 1977; Williams, 1973).

In sum, these results answer the research subquestion that there is indeed a real difference in peer influence for adolescent male and female regular smokers with males being more susceptible to encouragement to do things they know are wrong.

4.4 STRESS PERCEPTION RESULTS AND DISCUSSION

Research Subquestion #4. Is there a difference in stress perception for male and female regular smokers?

4.4.0 RESULTS

The response set for questions 56 to 62 regarding stress perception is a Likert scale with possible scores ranging from 7 to 21. Point scales were coded such that lower scores signify higher stress perception. Sample scores ranged from 7 to 21, with mean scores of 14.1 for male regular smokers and 13.5 for female regular smokers.

The T test indicates no significant group mean difference in stress perception exist between female and male regular smokers.

$$t = .854 \text{ with } 76 \text{ d.f., N.S.}$$

Although no appreciable differences exist in stress perception between female and male regular smokers, females report a higher stress perception than males (mean: 13.5 versus 14.1).

When the seven items comprising stress perception were considered simultaneously using a logistic regression model, no significant relationship between stress perception and gender was observed (Model chi square = 7.70 with 7 d.f., $p < 0.463$). In addition, when each of the stress perception items were considered independently, no significant item/gender relationship was observed (Table 9).

Table 9. Stress Perception Predictor of Gender in Regular Smoker

Variable	Beta Estimate	Standard Error	Chi Square Beta=0
C62 In the past month have you felt nervous, anxious or worried because of not doing as well in school as you should	- .4706	.3372	1.95 *

* **Not significant**

- **Chi square beta 3.8 is significant at the 0.05 probability level.**
- **Females = positive beta estimate value**
- **Males = negative beta estimate value**

Males reported feeling nervous, anxious or worried because of not doing well in school less often than females; however, the difference between males and females is not large enough to be significant.

4.4.1. DISCUSSION

Mitic et al.(1985) indicated a gender effect in the type of circumstances adolescent smokers perceived as stressful. Appearance, parents and money appeared to create the highest level of perceived stress for female smokers, while schoolwork, money and parents affected male smokers' perceived stress score. Adolescent female smokers more than males reported smoking for tension relief.

This investigation drew from the 'Adolescent Perceived Stress Scale' developed by Mitic et al.(1985). Contrary to expectations, no appreciable differences in stress perception exist between male and female regular smokers, although female regular smokers tend to have a slightly higher

perception of stress than male regular smokers. Both males and females were mid range in their scores indicating that they felt nervous, anxious or worried at least some of the time for various reasons. When individual items comprising the stress perception variable were considered, no significant gender difference was observed in adolescent regular smokers.

These results answer the research subquestion that there is no real difference in stress perception for adolescent male and female regular smokers.

4.5. NICOTINE TOLERANCE RESULTS AND DISCUSSION

Research Subquestion #5. Is there a difference in strength of nicotine addiction for adolescent male and female regular smokers?

4.5.0. RESULTS

Six questions from Fagerstrom's Nicotine Tolerance Scale were utilized to assess nicotine tolerance in male and female regular smokers. The highest possible score for the six chosen questions was 8, and a score of 5 or higher was considered highly dependent on nicotine. Twenty-eight (35%) of the total regular smoking population (n=80) reported high nicotine tolerance (>4). Table 10 provides a breakdown by gender of high nicotine tolerance scores.

Table 10. Nicotine Tolerance in Regular Smokers, by Gender

	Female (n = 49)	Male (n = 31)
Regular smokers reporting scores >4 on nicotine dependence items	30.6% (15)	42% (13)

Although more males than females reported a high nicotine tolerance (42% vs. 30.6%), a chi square test of significance (1.070 with 1 d.f., $p < 0.300$) indicates that the gender difference in nicotine tolerance is not significant.

The genders also differed on items reflecting addictive or dependent smoking (Table 11) with more males reporting that they smoked within thirty minutes of getting up, and that the first cigarette in the morning was the most satisfying. However, more females reported smoking more during the morning than in the rest of the day.

Table 11. Self Reported Smoking Habits of Addictive or Dependent Smoking among Adolescent Regular Smokers, by Gender.

Smoking Habits	Females N=49	Males N=31
always inhale	87.8% (43)	87.1% (27)
smoke more during the morning than in the rest of the day	26.5% (13)	16.1% (5)
find it hard not to smoke in places where it's forbidden	24.5% (12)	22.6% (7)
find first cigarette in the morning the most satisfying	41.0% (19)	48.0% (15)
smoke within 30 minutes of getting up	27.7% (13)	48.4% (15)

When the items comprising the smoking habits of regular smokers were considered simultaneously using a logistic regression model, no significant relationship between smoking habits and gender was observed (model chi square = 6.81 with 6 d.f., $p < 0.338$). Logistic regression also indicated no significant individual item/gender relationship.

Gender differences exist in the number of cigarettes smoked with more females reporting that they smoke 6 to 15 cigarettes per day, whereas more males report smoking 16 or more cigarettes per day (Table 12). Silverstein et al

(1980) also found that female regular smokers smoked less than males and attributed the increased incidence in adolescent female smoking to the availability of low nicotine cigarettes.

Table 12. Number of Cigarettes Smoked Per Day, by Gender

Number of cigarettes smoked	Female	Male
1 to 15	42.9% (21)	43.3% (13)
6 to 15	44.9% (22)	33.3% (10)
16 or more	12.2% (6)	23.3% (7)

However a chi square test of significance (2.005 with 2 d.f., $p < 0.3668$) indicates that the gender difference in number of cigarettes smoked per day is not significant.

4.5.1. DISCUSSION

In the present study, more adolescent females than males are regular smokers; however, more males than females report a high nicotine tolerance. Pirie et al (1991) reported that in a cohort ($n=6,711$) of adolescents, more females than males reported current smoking, with more males reporting that they smoked within 30 minutes of getting up and that the first cigarette in the morning was the one they would most hate to give up. The results of this study support the findings of Pirie et al (1991) that more adolescent females smoke but males show a higher nicotine tolerance. However, when nicotine tolerance

was analysed using a model chi square no significant gender difference in nicotine tolerance is demonstrated.

This answers the research question that there is no significant difference in the strength of nicotine addiction for adolescent male and female regular smokers. Although not statistically significant, the reporting of a higher nicotine tolerance among males should be considered in developing smoking cessation programs which are gender specific. Adolescent cessation programs must address the fact that males tolerance to nicotine may cause stronger physiological withdrawal symptoms which may require a collaborative effort among various health disciplines.

4.6. SMOKING BEHAVIOR COMPARISONS OF INTEREST

Table 13. Smoking Behaviors, by Gender

Behaviors	Female n = 49	Male n = 31
Would like to stop smoking	56% (27)	54% (15)
Tried to stop smoking	75% (36)	62% (18)
Would join a stop smoking group	15% (7)	7% (2)
Believe in ability to stop smoking	79% (38)	82% (23)
Believe they will be smoking after 21 years of age	74% (34)	64% (18)

These descriptive data indicate that the majority of adolescent regular smokers believe in their ability to stop smoking. More than half of the male and female smokers reported that they would like to quit. Responses show that 75%

of females and 62% of males have tried to stop smoking. These figures compared to the 56% of female and 54% of male smokers who would like to stop suggest that some students have tried to stop smoking, most notably females, were unsuccessful and thus no longer wish to quit smoking. The fact that adolescent smokers see the smoking habit as one easily given up reflects a degree of ignorance about the habit-forming potential of cigarettes.

While more than half of the regular smokers would like to stop smoking, with even higher percentages who have tried, only 15% of the female smokers and 7% of the male smokers would join a stop smoking group. It is also interesting to note that 70% of males and 79% of females reported health warnings on cigarette packs did not affect their smoking. The fact that so few of the adolescents in this study would join a stop smoking group or are affected by health warnings explains why these strategies and interventions have been unsuccessful and suggests that a different approach is warranted.

CHAPTER 5. SUMMARY AND CONCLUSION

Cigarette smoking among adolescents remains an important public health problem. A decline in adolescent smoking has been noted in the last decade; however, a major change in the pattern of adolescent smoking has been observed. The incidence and prevalence of cigarette smoking among adolescent girls has surpassed that of boys (Smoking Behavior of Canadians, 1986). Given clear evidence of the harmful effects of smoking on women's health and trends identifying increased rates in adolescent female smoking, surprisingly few studies have investigated gender differences related to cigarette smoking maintenance. Moreover, the literature review reveals a dearth of information on adolescent smoking maintenance. Longitudinal and cross sectional findings suggest that adolescent male and female regular smokers share common traits:

- A belief in the positive values of smoking;
- An adult perception of the benefits of smoking (ie. relieves stress, weight control); and
- The experience of nicotine tolerance early in the acquisition of the smoking habit.

This study proposed to investigate selected psychosocial factors among adolescent regular smokers. Specifically, to isolate differences in attitudes toward smoking, self concept, peer influence, stress perception and strength of nicotine tolerance for adolescent male and female regular smokers. The results confirm gender differences in attitudes toward smoking, and peer influence. Of the four components of the self concept variable, gender differences were revealed in school self perception, self image, and self esteem with no real differences in family perception. No real gender differences were reported in

the strength of nicotine tolerance and stress perception of adolescent regular smokers.

The present investigation supports the following conclusions derived from a cohort of 80 adolescent regular smokers (49 female and 31 male).

1. Adolescent regular smokers share favorable smoking-related beliefs; however, gender specific distinctions in attitudinal traits are evident. Males report the social aspects of smoking (ie, to have fun, be friendly, and part of a group) influence their smoking; whereas for girls, smoking entails a strong functional component (ie, to control weight and to be popular).

2. Gender differences are observed in school self perception and self image. Female regular smokers have a more favorable attitude toward school and are satisfied with their level of academic performance. Male regular smokers consider themselves proficient at sports and like the way they are. Female regular smokers tend to diet and use cigarettes to curb their appetite for food. Family perception does not contribute significantly to differences in male and female regular smokers.

3. While both genders report being influenced by peers, male smokers are more susceptible to encouragement to do things they know are wrong.

4. No appreciable gender difference in stress perception exists for male and female regular smokers.

5. More females than males are regular smokers, but males report a higher nicotine tolerance.

In summary, the results of this study indicate that there clearly are gender differences in the psychosocial factors associated with adolescent smoking maintenance. Overall, females smoke in response to psychological influences while male smoking maintenance is influenced by the social aspects of the behavior.

The current findings have several important implications for the design of smoking cessation programs for adolescents. Consideration should be given to tailoring anti smoking messages and intervention techniques to the gender of the smoker. Gender specific cessation programs should be developed to address the individual needs of self definition and affect regulation in female smokers while nicotine tolerance and the need for social recognition and acceptance ask to be addressed in male smokers.

The research on psychosocial factors associated with adolescent smoking maintenance suffers greatly from a lack of attention to gender differences. Yet, an important prerequisite for developing effective smoking cessation programs is an understanding of the key factors promoting regular cigarette smoking. To identify with precision the factors that influence the maintenance of regular smoking requires the application of reliable and valid instruments to measure personal variables in adolescents, together with a longitudinal research design which begins in the pre school years and continues into late adolescence.

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APPENDIX A**QUESTIONNAIRE ON SMOKING BEHAVIOR**

1. MOST OF THE QUESTIONS ASK ABOUT WHAT YOU THINK ABOUT TOBACCO USE. ANSWER THE QUESTIONS AS HONESTLY AS YOU CAN, THERE ARE NO RIGHT OR WRONG ANSWERS. YOUR PARENTS, TEACHERS AND OTHER PEOPLE WILL NEVER SEE THE ANSWERS YOU HAVE GIVEN.

2. DO NOT PUT YOUR NAME ON ANY OF THE MATERIAL.

3. FOR EACH OF THE QUESTIONS, WITH THE PENCIL PROVIDED BLACKEN THE SPACE ON THE COMPUTER RESPONSE SHEET WHICH CORRESPONDS TO THE ANSWER YOU HAVE SELECTED. BE SURE THAT YOUR MARKS ON THE ANSWER SHEET ARE CLEAR AND DARK.

4. IF YOU WISH TO CHANGE AN ANSWER, BE SURE TO ERASE THE OLD ANSWER. ANSWER ONLY ONCE TO EACH QUESTION OR STATEMENT.

5. ALWAYS BE SURE THAT THE ITEM NUMBER ON THE RESPONSE SHEET CORRESPONDS TO THE ITEM NUMBER ON THE QUESTIONNAIRE.

6. WHEN YOU HAVE ANSWERED ALL THE QUESTIONS, PUT THE QUESTIONNAIRE AND THE RESPONSE SHEET IN THE ENVELOPE PROVIDED.

7. IF YOU HAVE ANY QUESTIONS ASK THE PERSON IN CHARGE.

* * * * *
* ITEMS 1 TO 10 ASK FOR YOUR ATTITUDES ABOUT *
* SMOKING. FOR EACH STATEMENT, BLACKEN THE *
* SPACE ON THE COMPUTER RESPONSE SHEET THAT *
* EXPRESSES HOW YOU FEEL. IF YOU STRONGLY *
* AGREE WITH THE STATEMENT, BLACKEN THE *
* BUBBLE 'A' ON THE RESPONSE SHEET. IF YOU *
* AGREE OR DISAGREE, BUT ONLY MODERATELY, *
* BLACKEN EITHER OF THOSE BUBBLES; AND, IF *
* YOU STRONGLY DISAGREE, BLACKEN BUBBLE 'E'. *
* * * * *

1. I feel smoking is a health risk worth taking.
 - a) Strongly agree.
 - b) Agree.
 - c) Neither agree or disagree.
 - d) Disagree.
 - e) Strongly disagree.

2. Smoking is something nice to do when you're having fun or enjoying yourself.
 - a) Strongly agree.
 - b) Agree.
 - c) Neither agree or disagree.
 - d) Disagree.
 - e) Strongly disagree.

3. People who smoke are usually more friendly than people who don't.
 - a) Strongly agree.
 - b) Agree.
 - c) Neither agree or disagree.
 - d) Disagree.
 - e) Strongly disagree.

4. Most cigarette smokers can stop if they want to.
 - a) Strongly agree.
 - b) Agree.
 - c) Neither agree or disagree.
 - d) Disagree.
 - e) Strongly disagree.

5. To be popular with your friends, you have to smoke cigarettes.
 - a) Strongly agree.
 - b) Agree.
 - c) Neither agree or disagree.
 - d) Disagree.
 - e) Strongly disagree.

6. Smoking cigarettes helps people when they feel nervous about something.
 - a) Strongly agree.
 - b) Agree.
 - c) Neither agree or disagree.
 - d) Disagree.
 - e) Strongly disagree.

7. Teenagers smoke mainly because their friends smoke.
 - a) Strongly agree.
 - b) Agree.
 - c) Neither agree or disagree.
 - d) Disagree.
 - e) Strongly disagree.

8. Smoking is an impossible habit to stop.
 - a) Strongly agree.
 - b) Agree.
 - c) Neither agree or disagree.
 - d) Disagree.
 - e) Strongly disagree.

9. Cigarette smoking can help to control weight.

- a) Strongly agree.
- b) Agree.
- c) Neither agree or disagree.
- d) Disagree.
- e) Strongly disagree.

10. One of the main reasons people smoke is to be part of the group.

- a) Strongly agree.
- b) Agree
- c) Neither agree or disagree.
- d) Disagree.
- e) Strongly disagree.

* * * * *
* SOME FACTS ABOUT YOU *
* WE'D LIKE YOU TO TELL US SOMETHING ABOUT *
* YOURSELF, YOUR FAMILY AND FRIENDS. *
* REMEMBER TO BLACKEN ONLY ONE ANSWER *
* FOR EACH QUESTION OR STATEMENT. *
* * * * *

11. Are you a) Male?
b) Female?

12. How old are you?
a) 14 years.
b) 15 years.
c) 16 years.
d) 17 years.
e) 18 years or older.

13. When do you plan to finish your education?
a) Before I complete high school.
b) When I complete high school.
c) When I complete community college/business school.
d) When I complete university.
e) I don't know.

14. What was your overall average mark last year?
a) A to A+
b) B to B+
c) C to C+
d) D to D+

15. Compared with other students in your grade, how good a student would you say you are?
a) One of the best.
b) Above average.
c) Average.
d) Below average.
e) Poor.

16. Are you happy at school?
- a) Most of the time.
 - b) Some of the time.
 - c) Never.
17. Do you find it difficult to speak in front of the class?
- a) Most of the time.
 - b) Some of the time.
 - c) Never.
18. Are you proud of your school work?
- a) Most of the time.
 - b) Some of the time.
 - c) Never.
19. Do your classmates think you are a good student?
- a) Most of the time.
 - b) Some of the time.
 - c) Never.
20. Would you like to quit school?
- a) Most of the time.
 - b) Some of the time.
 - c) Never.
21. Do you consider yourself to be
- a) Of normal weight?
 - b) Underweight?
 - c) Overweight?
22. Do you diet?
- a) Most of the time.
 - b) Some of the time.
 - c) Never.

23. Do you consider yourself to be
- a) Excellent at sports?
 - b) Good at sports?
 - c) Average at sports?
 - d) Below average at sports?
 - e) Poor at sports?
24. Do you play sports at school?
- a) Yes.
 - b) No.
25. Do you play sports outside of school?
- a) Yes.
 - b) No.
26. Do your parents understand you?
- a) Most of the time.
 - b) Some of the time.
 - c) Never.
27. Even when your parents are strict do you feel they are being so for your own good?
- a) Most of the time.
 - b) Some of the time.
 - c) Never.
28. Do you get a lot of attention at home?
- a) Most of the time.
 - b) Some of the time.
 - c) Never.
29. Do you ask your parents for advice on serious matters?
- a) Most of the time.
 - b) Some of the time.
 - c) Never.

30. Do your parents expect too much of you?
- a) Most of the time.
 - b) Some of the time.
 - c) Never.
31. Do you like the way you are?
- a) Most of the time.
 - b) Some of the time.
 - c) Never.
32. Do you have trouble making decisions?
- a) Most of the time.
 - b) Some of the time.
 - c) Never.
33. If you have something to say, do you say it?
- a) Most of the time.
 - b) Some of the time.
 - c) Never.
34. Do you have a hard time saying "no" to your friends?
- a) Most of the time.
 - b) Some of the time.
 - c) Never.
35. Do you often feel left out of things?
- a) Most of the time.
 - b) Some of the time.
 - c) Never.
36. Do your friends show interest in your ideas and feelings?
- a) Most of the time.
 - b) Some of the time.
 - c) Never.

37. Do you think you are able to do things (CHECK ONLY ONE)
- a) Better than most people your age?
 - b) The same as others your age?
 - c) Not as well as people your age?
38. Do you think it is important to have friends?
- a) Yes.
 - b) No
39. Do you have any close friends?
- a) Yes.
 - b) No.
40. Of your close friends, how many smoke cigarettes?
- a) 0
 - b) 1
 - c) 2
 - d) 3
 - e) 4 or more
41. When you have a big decision to make, do you ask your friends for advice?
- a) Most of the time.
 - b) Some of the time.
 - c) Never.
42. Do you sometimes do things that you don't want to do because your friends are doing them?
- a) Yes.
 - b) No.
43. Do your friends encourage you to do things you know are wrong?
- a) Most of the time.
 - b) Some of the time.
 - c) Never.

44. Have your friends ever asked you to smoke cigarettes?
- a) Yes.
 - b) No.
45. If a friend offers you a cigarette, would you smoke it?
- a) Yes.
 - b) No.
46. How often do you do dangerous things for kicks?
- a) Most of the time.
 - b) Some of the time.
 - c) Never.
47. Do you take risks (CHECK ONLY ONE)
- a) More often than others your age?
 - b) As often as others your age?
 - c) Less often than others your age?
48. Have you ever had a drink of wine, beer or liquor - not just a sip or taste?
- a) Yes.
 - b) No.
49. On how many occasions during the last month did you have a drink?
- a) None.
 - b) Once.
 - c) 2 - 3 times.
 - d) 5 - 10 times.
 - e) 11 or more times.
50. Which one of the following best describes your use of drugs such as marijuana, speed or downers?
- a) Tried drugs once or twice to see what they were like.
 - b) Taken drugs three or more times.
 - c) Taken drugs in the last week.
 - d) Never taken drugs.

51. Someone like me could never have an effect on what happens in the world.
- a) Strongly agree.
 - b) Agree.
 - c) Neither agree or disagree.
 - d) Disagree.
 - e) Strongly disagree.
52. I know what is expected from me at school.
- a) Strongly agree.
 - b) Agree.
 - c) Neither agree or disagree.
 - d) Disagree.
 - e) Strongly disagree.
53. When things are going to happen, they will happen no matter what I do.
- a) Strongly agree.
 - b) Agree.
 - c) Neither agree or disagree.
 - d) Disagree.
 - e) Strongly disagree.
54. My ideas are important and respected by others.
- a) Strongly agree.
 - b) Agree.
 - c) Neither agree or disagree.
 - d) Disagree.
 - e) Strongly disagree.
55. Do you usually find daily life events ...
- a) Very stressful?
 - b) Fairly stressful?
 - c) Not very stressful?
 - d) Not at all stressful?

56. In the past month, have you felt nervous, anxious or worried because of your parents or guardian(s)?
- a) Often.
 - b) Sometimes.
 - c) Never.
57. In the past month, have you felt nervous, anxious or worried because of a teacher or principal?
- a) Often.
 - b) Sometimes.
 - c) Never.
58. In the past month, have you felt nervous, anxious or worried because of your friends of the opposite sex?
- a) Often.
 - b) Sometimes.
 - c) Never.
59. In the past month, have you felt nervous, anxious or worried because of your schoolwork?
- a) Often.
 - b) Sometimes.
 - c) Never.
60. In the past month, have you felt nervous, anxious or worried because of your personal appearance?
- a) Often.
 - b) Sometimes.
 - c) Never.
61. In the past month, have you felt nervous, anxious or worried because of money?
- a) Often.
 - b) Sometimes.
 - c) Never.

62. In the past month, have you felt nervous, anxious or worried because of not doing as well in school as you should?
- a) Often.
 - b) Sometimes.
 - c) Never.

63. If you have any problems do you prefer to ...
- a) Talk it over with a friend?
 - b) Talk it over with a parent?
 - c) Solve it on your own?
 - d) Talk it over with a school counsellor?
 - e) Other answer not given here?

64. Have you ever smoked?
- a) Yes.
 - b) No.

* IF YOU HAVE ANSWERED "NO" TO QUESTION 64 *
* YOU HAVE FINISHED ANSWERING THE QUESTIONS. *
* PLEASE PUT RESPONSE SHEET IN THE ENVELOPE *
* PROVIDED. THANK YOU. *
* IF YOU HAVE ANSWERED "YES" TO QUESTION 64 *
* PLEASE CONTINUE TO QUESTION 65. *

65. When did you have your first cigarette?
- a) Before grade 4.
 - b) In grades 4, 5 or 6.
 - c) In grades 7 or 8.
 - d) In grades 9 or 10.
 - e) In grade 11.

66. Do you presently smoke?

- a) Yes.
- b) No.

* * * * *

* IF YOU ANSWERED "NO" TO QUESTION 66 YOU *

* HAVE FINISHED ANSWERING THE QUESTIONS. *

* PLEASE PUT RESPONSE SHEET IN THE ENVELOPE *

* PROVIDED. THANK YOU. *

* IF YOU HAVE ANSWERED "YES" TO QUESTION 66 *

* WE WOULD LIKE TO KNOW ABOUT YOUR SMOKING *

* BEHAVIOR. PLEASE ANSWER QUESTIONS 67 *

* TO QUESTION 89. *

* * * * *

67. When did you start smoking cigarettes regularly?

- a) Before Grade 4.
- b) In Grades 4, 5, or 6.
- c) In Grades 7 or 8.
- d) In Grades 9 or 10.
- e) In Grade 11.

68. Have you smoked in the last 4 weeks?

- a) Yes.
- b) No.

69. Do you usually smoke every day?

- a) Yes.
- b) No.

70. How many cigarettes a day do you smoke?

- a) 1 to 5.
- b) 6 to 15.
- c) 16 or more.

71. How soon after you wake do you smoke your first cigarette?

- a) After 30 minutes.
- b) Within 30 minutes.

72. Do you find it difficult to refrain from smoking in places where it is forbidden, such as in the library, the arena, bus or movie theatre?
- a) Yes.
 - b) No.
73. Which of all the cigarettes you smoke in a day is the most satisfying one?
- a) The first one in the morning.
 - b) Any other than the first one of the morning.
74. Do you smoke more during the morning than during the rest of the day?
- a) Yes.
 - b) No.
75. How often do you inhale the smoke from your cigarette?
- a) Always.
 - b) Sometimes.
 - c) Never.
76. When do you smoke cigarettes?
- a) When I am by myself.
 - b) When I am with people my own age.
 - c) When I am with older people.
 - d) I am just as likely to smoke at any of these times.
77. Why did you start smoking? (CHECK THE MOST IMPORTANT ONE TO YOU)
- a) To see what it was like.
 - b) Because my friends smoked.
 - c) To act or feel more like an adult.
 - d) Because my parent(s) smoked.
 - e) Some other reason not given here.

78. Why do you smoke now? (CHECK THE MOST IMPORTANT ONE TO YOU)

- a) I smoke because my friends smoke.
- b) Smoking soothes me when angry or irritable.
- c) I smoke out of habit.
- d) Smoking helps me feel more confident.
- e) Smoking makes me feel grown-up.

79. Do you smoke to maintain or decrease your weight?

- a) Yes.
- b) No.

80. Do you use cigarette smoking to curb your appetite for food?

- a) Most of the time.
- b) Some of the time.
- c) Never.

81. Do any of your parents smoke at home?

- a) Yes.
- b) No.

82. Do you smoke in front of your mother or father?

- a) Yes.
- b) No.

83. Do health warnings on cigarette packs affect your cigarette smoking?

- a) I smoke more because of it.
- b) I smoke less because of it.
- c) It hasn't affected my smoking.
- d) I have never heard of it.

84. Are you worried about the possible effects of smoking on your health?

- a) Not at all concerned.
- b) Only slightly concerned.
- c) Fairly concerned.
- d) Very concerned.

85. Would you like to stop smoking?

- a) Yes.
- b) No.

86. Have you ever tried to stop smoking?

- a) Yes.
- b) No.

87. Do you believe you have the ability to stop smoking?

- a) Yes.
- b) No.

88. Would you join a stop smoking group?

- a) Yes.
- b) No.

89. Do you think you will be smoking after you are 21?

- a) Yes, for sure.
- b) Probably yes.
- c) Probably no.
- d) No, for sure.

* * * * *
* YOU HAVE NOW FINISHED ANSWERING THE *
* QUESTIONS. PLEASE PUT THIS *
* QUESTIONNAIRE AND RESPONSE SHEET IN *
* THE ENVELOPE PROVIDED. *
* THANK YOU. *
* * * * *

APPENDIX B

REGULAR SMOKERS QUESTIONNAIRE RESPONSES
FREQUENCIES AND PERCENTAGES

All variables formed part of a larger survey used to study adolescent cigarette smoking. The response frequencies and percentages of the composite variables are presented and broken down by gender where appropriate.

INDEPENDENT VARIABLES:

1. ATTITUDES TOWARD SMOKING FREQUENCIES AND PERCENTAGES

QUESTION ITEMS	TOTAL RESPONSE
	(%)
1. I feel smoking is a health risk worth taking.	
a) Strongly agree	14 (17.5%)
b) Agree	9 (11.3%)
c) Neither agree or disagree	24 (30.0%)
d) Disagree	24 (30.0%)
e) Strongly disagree	9 (11.3%)
2. Smoking is something nice to do when you're having fun or enjoying yourself.	
a) Strongly agree	11 (13.8%)
b) Agree	23 (28.8%)
c) Neither agree or disagree	29 (36.3%)
d) Disagree	14 (17.5%)
e) Strongly disagree	3 (3.8%)

3. People who smoke are usually more friendly than people who don't.

a) Strongly agree	7	(8.9%)
b) Agree	6	(7.6%)
c) Neither agree or disagree	30	(38.0%)
d) Disagree	16	(20.3%)
e) Strongly disagree	20	(25.3%)

4. Most cigarette smokers can stop if they want to.

a) Strongly agree	17	(21.3%)
b) Agree	11	(13.8%)
c) Neither agree or disagree	26	(32.5%)
d) Disagree	14	(17.5%)
e) Strongly disagree		

5. To be popular with your friends, you have to smoke cigarettes.

a) Strongly agree	3	(3.8%)
b) Agree	1	(1.3%)
c) Neither agree or disagree	5	(6.3%)
d) Disagree	22	(27.5%)
e) Strongly disagree	49	(61.3%)

6. Smoking cigarettes helps people when they feel nervous about something.

a) Strongly agree	11	(13.9%)
b) Agree	38	(48.1%)
c) Neither agree or disagree	21	(26.6%)
d) Disagree	6	(7.6%)
e) Strongly disagree	3	(3.8%)

7. Teenagers smoke mainly because their friends smoke.

a) Strongly agree	7	(8.8%)
b) Agree	28	(35.0%)
c) Neither agree or disagree	25	(31.3%)
d) Disagree	15	(18.8%)
e) Strongly disagree	5	(6.3%)

8. Smoking is an impossible habit to stop.

a) Strongly agree	4	(5.0%)
b) Agree	11	(13.8%)
c) Neither agree or disagree	10	(12.5%)
d) Disagree	31	(38.8%)
e) Strongly disagree	24	(30.0%)

9 Cigarette smoking can help to control weight.

a) Strongly agree	6	(7.5%)
b) Agree	15	(18.8%)
c) Neither agree or disagree	29	(36.3%)
d) Disagree	18	(25.5%)
e) Strongly disagree	12	(15.0%)

10. One of the main reasons people smoke is to be part of a group.

a) Strongly agree	10	(12.5%)
b) Agree	20	(25.0%)
c) Neither agree or disagree	22	(27.5%)
d) Disagree	20	(25.0%)
e) Strongly disagree	8	(10.0%)

2. **SELF CONCEPT:** is divided into four components.

SCHOOL SELF PERCEPTION FREQUENCIES AND PERCENTAGES

QUESTION ITEMS	TOTAL RESPONSE	%
15. Compared with other students in your grade, how good a student would you say you are?	6	(7.6%)
a) One of the best	20	(25.3%)
b) Above average	44	(57.7%)
c) Average	6	(7.6%)
d) Below average	3	(3.8%)
e) Poor		
16. Are you happy at school?		
a) Most of the time	32	(40.0%)
b) Some of the time	38	(47.5%)
c) Never	9	(11.3%)
17. Do you find it difficult to speak in front of the class?		
a) Most of the time	21	(26.2%)
b) Some of the time	31	(38.8%)
c) Never	28	(35.0%)
18. Are you proud of your school work?		
a) Most of the time	17	(21.3%)
b) Some of the time	53	(66.3%)
c) Never	10	(12.5%)

19. Do your classmates think you are a good student?

a) Most of the time	24	(30.0%)
b) Some of the time	48	(60.0%)
c) Never	7	(8.8%)

20. Would you like to quit school?

a) Most of the time	13	(16.3%)
b) Some of the time	27	(33.8%)
c) Never	39	(48.8%)

SELF IMAGE PERCEPTION FREQUENCIES AND PERCENTAGES

QUESTION ITEMS	TOTAL	MALE	FEMALE
21. Do you consider yourself to be			
a) Of normal weight?	49 (61.3%)	18 (58.0%)	31 (63.3%)
b) Underweight?	11 (13.8%)	7 (22.6%)	4 (8.2%)
c) Overweight?	20 (25.0%)	6 (19.4%)	14 (28.6%)
22. Do you diet?			
a) Most of the time	7 (8.8%)		
b) Some of the time	26 (32.5%)		
c) Never	46 (57.5%)		
23. Do you consider yourself to be			
a) Excellent at sports?	12 (15.0%)		
b) Good at sports?	26 (32.5%)		
c) Average at sports?	26 (32.5%)		
d) Below average at sports?	11 (13.8%)		
e) Poor at sports?	5 (6.3%)		

24. Do you play sports at school?	
a) Yes	30 (38.0%)
b) No	49 (62.0%)

25. Do you play sports outside of school?	48 (60.0%)
a) Yes	30 (37.5%)
b) No	

FAMILY SELF PERCEPTION FREQUENCIES AND PERCENTAGES

QUESTION ITEMS	TOTAL	MALE	FEMALE
26. Do your parents understand you			
a) Most of the time	29 (37.2%)		
b) Some of the time	32 (41.0%)		
c) Never	17 (21.8%)		
27. Even when your parents are strict do you feel they are being so for your own good?			
a) Most of the time	31 (39.7%)		
b) Some of the time	34 (43.6%)		
c) Never	10 (13.0%)		
28. Do you get a lot of attention at home?	31 (39.7%)		
a) Most of the time	34 (43.6%)		
b) Some of the time	13 (16.7%)		
c) Never			

29. Do you ask your parents for advice on serious matters?

a) Most of the time	16 (20.0%)
b) Some of the time	30 (38.5%)
c) Never	32 (41.0%)

30. Do your parents expect too much of you?

a) Most of the time	20 (25.6%)
b) Some of the time	34 (43.6%)
c) Never	23 (29.5%)

SELF ESTEEM FREQUENCIES AND PERCENTAGES

QUESTION ITEMS	TOTAL	MALE	FEMALE
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31. Do you like the way you are?

a) Most of the time	44 (55.7%)
b) Some of the time	25 (31.6%)
c) Never	9 (11.4%)

32. Do you have trouble making decisions?

a) Most of the time	13 (16.5%)
b) Some of the time	46 (58.2%)
c) Never	20 (25.3%)

33. If you have something to say, do you say it?

a) Most of the time	48 (60.8%)
b) Some of the time	26 (32.9%)
c) Never	5 (6.3%)

34. Do you have a hard time saying 'no' to your friends?

- | | |
|---------------------|------------|
| a) Most of the time | 12 (15.0%) |
| b) Some of the time | 32 (40.0%) |
| c) Never | 36 (45.0%) |

35. Do you often feel left out of things?

- | | |
|---------------------|------------|
| | 6 (7.5%) |
| a) Most of the time | 39 (48.8%) |
| b) Some of the time | 35 (43.8%) |
| c) Never | |

36. Do your friends show interest in your ideas and feelings?

- | | |
|---------------------|------------|
| a) Most of the time | 50 (62.5%) |
| b) Some of the time | 26 (32.5%) |
| c) Never | 3 (3.8%) |

51. Someone like me could never have an effect on what happens in the world.

- | | |
|------------------------------|------------|
| | 5 (6.3%) |
| a) Strongly agree | 10 (12.5%) |
| b) Agree | 24 (30.0%) |
| c) Neither agree or disagree | 24 (30.0%) |
| d) Disagree | 17 (21.3%) |
| e) Strongly disagree | |

52. I know what is expected from me at school.

- | | |
|------------------------------|------------|
| a) Strongly agree | 21 (26.2%) |
| b) Agree | 43 (53.8%) |
| c) Neither agree or disagree | 13 (16.3%) |
| d) Disagree | 2 (2.5%) |
| e) Strongly disagree | 1 (1.3%) |
-

53. When things are going to happen, they will happen no matter what I do.

a) Strongly agree	9 (11.5%)
b) Agree	22 (28.2%)
c) Neither agree or disagree	19 (24.4%)
d) Disagree	22 (28.2%)
e) Strongly disagree	6 (7.7%)

PEER INFLUENCE: FREQUENCIES AND PERCENTAGES

QUESTION ITEMS	TOTAL RESPONSES (%)
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41. When you have a big decision to make, do you ask your friends for advice?

a) Most of the time	27 (33.8%)
b) Some of the time	40 (50.0%)
c) Never	13 (16.3%)

42. Do you sometimes do things that you don't want to do because your friends are doing them?

a) Yes	24 (30.0%)
b) No	55 (69.8%)

43. Do your friends encourage you to do things you know are wrong?

a) Most of the time	7 (8.8%)
b) Some of the time	31 (38.8%)
c) Never	42 (52.5%)

44. Have your friends ever asked you to smoke cigarettes?

- | | |
|--------|----------|
| a) Yes | 40 (50%) |
| b) No | 40 (50%) |
-

45. If a friend offers you a cigarette, would you smoke it?

- | | |
|--------|------------|
| a) Yes | 68 (86.1%) |
| b) No | 11 (13.9%) |
-

SMOKING BEHAVIOR: FREQUENCIES AND PERCENTAGES

QUESTION ITEMS	TOTAL	MALE	FEMALE
76. When do you smoke cigarettes?			
a) When I am by myself.	5 (6.4%)		
b) When I am with people my own age.	10 (12.8%)		
c) When I am with older people.	2 (2.6%)		
d) I am just as likely to smoke at any of these times.	60 (76.9%)		
77. Why did you start smoking?			
a) To see what it was like.	28 (35.4%)		
b) Because my friends smoked.	9 (11.4%)		
c) To act or feel more like an adult.	3 (3.8%)		
d) Because my parent(s) smoked.	4 (5.1%)		
e) Some other reason not given here.	35 (44.3%)		

 78. Why do you smoke now?

a) I smoke because my friends smoke.	5 (6.6%)	2 (6.9%)	3 (6.4%)
b) Smoking soothes me when angry or irritable.	19 (25.0%)	9 (31.4%)	10 (21.3%)
c) I smoke out of habit.	46 (60.5%)	13 (44.8%)	33 (70.2%)
d) Smoking helps me feel more confident.	4 (5.3%)	4 (13.8%)	0
e) Smoking makes me feel grown-up.	2 (2.6%)	1 (3.4%)	1 (2.1%)

79. Do you smoke to maintain or decrease your weight?

a) Yes	11 (14.3%)	2 (7.1%)	9 (18.8%)
b) No	65 (84.4%)	26 (92.9%)	39 (81.3%)

80 Do you use cigarette smoking to curb your appetite for food?

a) Most of the time.	6 (7.7%)	1 (3.3%)	5 (10.4%)
b) Some of the time	20 (25.6%)	4 (13.3%)	16 (33.3%)
c) Never	52 (66.7%)	25 (83.3%)	27 (56.3%)

81. Do any of your parents smoke at home?

a) Yes	47 (59.9%)
b) No	32 (40.5%)

82. Do you smoke in front of your father or mother?

a) Yes	31 (39.2%)
b) No	46 (58.2%)

83. Do health warnings on cigarette packs affect your cigarette smoking?

a) I smoke more because of it.	7 (8.9%)	5 (16.7%)	2 (4.2%)
b) I smoke less because of it.	12 (15.2%)	4 (13.3%)	8 (16.3%)
c) It hasn't affected my smoking.	60 (75.9%)	21 (70.0%)	39 (79.6%)
d) I have never heard of it.	0	0	0

84. Are you worried about the possible effects of smoking on your health?

a) Not at all concerned.	21 (27.3%)	9 (31.0%)	12 (25.%)
b) Only slightly concerned.	32 (41.6%)	15 (51.7%)	17 (35.4%)
c) Fairly concerned.	20 (26.0%)	5 (17.2%)	15 (31.3%)
d) Very concerned.	4 (5.2%)	0	4 (8.3%)

DEMOGRAPHICS: FREQUENCIES AND PERCENTAGES

QUESTION ITEMS	TOTAL	MALE	FEMALE
11. Are you....			
a) Male	31 (39.0%)		
b) Female	49 (61.0%)		
12. How old are you?			
a) 14 years.	0		
b) 15 years.	1 (1.3%)	0	1 (2.0%)
c) 16 years.	33 (41.3%)	14 (45.%)	19 (38.8%)
d) 17 years.	29 (36.3%)	9 (29.%)	20 (40.8%)
e) 18 years or older.	17 (21.3%)	8 (26.%)	9 (18.4%)
13. When do you plan to finish your education?			
a) Before I complete high school.	3 (3.8%)	3 (10.0%)	
b) When I complete high school.	9 (11.3%)		9 (18.4%)
c) When I complete community college/business school.	19 (23.8%)	9 (29.0%)	10 (20.4%)
d) When I complete university.	38 (47.5%)	14 (45.0%)	24 (49.0%)
e) I don't know.	11 (13.8%)	5 (16.0%)	6 (12.2%)
14. What was your overall average mark last year?			
a) A to A+	4 (5.1%)	1 (3.2%)	3 (6.1%)
b) B to B+	32 (40.5%)	11 (35.5%)	21 (42.9%)
c) C to C+	30 (38.0%)	11 (35.5%)	19 (38.8%)
d) D to D+	13 (16.5%)	8 (25.8%)	5 (10.2%)