1984

Adolescent Cigarette Smoking Acquisition: Measurement and Sample Profiles

Robert Andrew Stern
University of Rhode Island

Follow this and additional works at: <https://digitalcommons.uri.edu/theses>

Recommended Citation

Stern, Robert Andrew, "Adolescent Cigarette Smoking Acquisition: Measurement and Sample Profiles" (1984). *Open Access Master's Theses*. Paper 1738.
<https://digitalcommons.uri.edu/theses/1738>

This Thesis is brought to you for free and open access by DigitalCommons@URI. It has been accepted for inclusion in Open Access Master's Theses by an authorized administrator of DigitalCommons@URI. For more information, please contact digitalcommons@etal.uri.edu.

ADOLESCENT CIGARETTE SMOKING ACQUISITION:
MEASUREMENT AND SAMPLE PROFILES

BY

ROBERT ANDREW STERN

A THESIS SUBMITTED IN PARTIAL FULFILLMENT OF THE
REQUIREMENTS FOR THE DEGREE OF
MASTER OF ARTS
IN
PSYCHOLOGY

UNIVERSITY OF RHODE ISLAND

1984

ABSTRACT

A stage model of adolescent cigarette smoking acquisition was proposed. This model was based on past research on adolescent smoking, stages of adult smoking cessation, and a transtheoretical model of adult psychotherapy change. An instrument to measure the stages of acquisition was developed. Internal validity evidence was obtained. Based on principal component analysis, item analysis, and coefficient alpha, 21 items were retained, representing three distinct components. These components accounted for 64.8% of the variance and were labeled Precontemplation, Decision-Making, and Maintenance. The three component scales had reliability coefficients ranging from .86 to .94. Initial external validity evidence was obtained by comparison of scale scores with measures of smoking behavior and intent to smoke. Cluster analyses were performed using a variety of methods and solutions. Nine distinct clusters resulted, representing sample profiles based on scores on the three acquisition scales. Among the nine clusters were profiles representing children in five stages of acquisition: Precontemplation, Contemplation, Decision-Making, Action, and Maintenance. Further validity evidence was obtained for these clusters by comparison with scores on measures of Decisional Balance (i.e. the weights given to the perceived positive and negative consequences of smoking), the amount of pleasure derived from cigarette smoking, and social desirability. Future research, including the potential use of the stages of acquisition model and instrument in establishing the differential effectiveness of smoking prevention program components, was suggested.

ACKNOWLEDGEMENT

Writing a thesis is often a long, painful, and frustrating experience. However, because of a group of incredibly gifted and supportive individuals, my experience has been rewarding, enjoyable, and quite painless. Many thanks are in order to all those who have provided guidance, insight, support, time, and love along the way.

The staff of the Pawtucket Heart Health Program (PHHP) of the Memorial Hospital and Brown University School of Medicine provided me not only with financial and clerical support, but with an exciting and stimulating environment in which to work. Special thanks go to my two research assistants at PHHP, Kurt Greenlund and David Rowland. Their extra energy and time in the early stages of the project certainly made the later stages a great deal easier.

My two reading specialists, Marjorie Bumpass and Mary Lou D'Amico donated their expertise, time, and careful attention in establishing the readability of the original item pool. Thanks also go to Lew Stern, Nancy Wilcox, and John Elder, who had the tedious, yet crucial job of judging the items.

Special thanks go to John DeGoes and Robert Gerardi, the Superintendents of Schools in Central Falls and Pawtucket, Rhode Island. Their concern for the future health of their own students, and for children in general, as well as their willingness to open the doors of their schools for this project, is quite rare and much appreciated. Additional thanks go to the building principals and teachers of these two communities. Their assistance in data gathering

was indispensable. And, of course, the 200 students involved in this study really made it all possible. Thanks.

My committee members all contributed to teaching me the definition of "team effort." Janet Hirsch provided invaluable assistance in the early stages of proposing the thesis. Jerry Schaffran joined us in the final stages and provided the direction and insight needed to pull it all together. John Elder started it all. He first gave me the opportunity to be involved in this and other exciting research at PHHP. His supportive and knowledgeable supervision provided me with direction and the strength to follow my own ideas. Wayne Velicer taught me that methodology and test development can actually be fun. His gift of teaching instilled in me an excitement for the field; his wealth of knowledge gave me a sense of security that the correct answers to my many questions were always just a phonecall away. Jim Prochaska, my major professor, provided me with just about everything. He gave me guidance and support, encouragement and critical evaluation, and intellectual excitement and understanding.

My family and friends have always stuck by me during this past year. Their support, patience, and love have always been, and will continue to be greatly appreciated. A special thanks goes to my mother, who has often asked how she could be of help. Her endless love and encouragement have helped me more than she has known. A final thanks goes to my partner, roommate, teacher, and best friend, Ruthanne Simmons. Her brilliant mind, smiling face, and insightful understanding always provide me with inspiration, warmth, and happiness.

TABLE OF CONTENTS

<u>Contents</u>	<u>Page Number</u>
List of Tables.....	vi
List of Figures.....	vii
Introduction.....	1
Method.....	16
Results.....	21
Discussion.....	37
References.....	49
Tables.....	58
Figures.....	68
Appendix A.....	81
Appendix B.....	82

LIST OF TABLES

- Table 1. Grade and Sex Distribution of Subjects
- Table 2. Items of the Stages of Acquisition Questionnaire
- Table 3. Varimax Rotated Component Pattern of the Final
21 SAQ Items.
- Table 4. Means, Standard Deviations, Coefficient Alphas,
and Pearson Correlation Coefficients for the
Three Scales.
- Table 5. Varimax Rotated Component Pattern of the Final
Nine-Item Decisional Balance Scales.
- Table 6. Items of the Final Nine-Item Decisional Balance
Scales.
- Table 7. The Four Items of the Pleasure Scale.
- Table 8. Means, Standard Deviations, and T -Scores for
the Three Validation Groups for the Three SAQ
Scales.
- Table 9. Means, Standard Deviations, and T -Scores for
the Five Clusters on the Decisional Balance,
Pleasure, and Desirability Scales.

LIST OF FIGURES

- Figure 1. Mean Scores for Uninvolved Cluster.
- Figure 2. Mean Scores for Older Precontemplation Cluster.
- Figure 3. Mean Scores for Younger Precontemplation Cluster.
- Figure 4. Mean Scores for Decision-Making Cluster.
- Figure 5. Mean Scores for Action Cluster.
- Figure 6. Mean Scores for Contemplation Cluster.
- Figure 7. Mean Scores for Smoking Image Cluster.
- Figure 8. Mean Scores for Maintenance Cluster.
- Figure 9. Mean Scores for Never-Smoker Cluster.
- Figure 10. Mean Scores on the Pro- Approval and Con Scales
for the Five Clusters Representing Five Stages
of Acquisition.
- Figure 11. Mean Scores on the Desirability Scale for the
Five Clusters Representing Five Stages of
Acquisition.

INTRODUCTION

The psychological and cognitive variables associated with adult smoking behavior in general and smoking cessation in particular have received much investigation in recent years. However, 54 million Americans continue to smoke (U.S. Dpt. of Health and Human Services [USDHHS], 1982). Perhaps, even more alarming is the amount of increase in smoking prevalence among teenagers (National Institute of Drug Abuse, [NIDA], 1980). A logical direction of research and intervention has been toward the prevention of smoking among adolescents. Although there have been several effective prevention programs implemented in the past decade, few, if any, of these programs have been found to be successful across a wide range of student populations (Elder & Stern, 1984).

In the field of adolescent smoking prevention, conflicting results between groups of investigators using similar interventions are common. For example, the early literature suggests that the use of approaches aimed at educating students about the physiological health hazards of smoking is, for the most part, ineffective (Thompson, 1978). However, recent reports (Arkin, Roemhild, Johnson, Luepker, & Murray, 1981; Hansen & Evens, 1982; Johnson, 1982; Perry, Telch, Killen, Burke, & Maccoby, 1983) suggest that such approaches should not be dismissed quickly.

As a possible explanation of these conflicting reports, many

investigators have suggested that the complexity of the various interventions has made it impossible to identify which specific program components are effective and which are not (e.g. Perry et al, 1983). In other words, a single program may include such diverse components as rehearsal of resisting pressures to smoke, public commitments not to smoke, testimonials from older peers, and exercises relating to the impact of the media on smoking (Perry, Killen, Slinkard, & McAllister, 1980). Another possible explanation of the conflicting reports is that certain approaches are effective for some children, while other strategies are more effective for other children. In order to more clearly understand the relative effectiveness of the various prevention programs, as well as to gain knowledge of the acquisition process of addictive behaviors, several investigators have suggested the need for specific intervention component evaluation in addition to the more common behavioral outcome evaluation of adolescent smoking prevention programs (Flay, d'Avernas, Best, Kersell, & Ryan, 1981; Hurd et al, 1980; O'Neill, Glasgow & McCaul, 1983).

One method of investigating the differential effectiveness of prevention strategies has been to compare the effects on subjects who exhibit different levels of smoking behavior at the outset of intervention (e.g. Arkin et al, 1981; Hurd et al., 1980). A number of studies have made distinctions between various behavioral levels of smoking acquisition such as "non-smokers," "experimenters," "irregular smokers," and "regular smokers," based on the frequency of cigarette consumption. However, there is a lack of correspondence

between studies in terms of the criteria and terminology used in these classifications, thus making any comparison of results impossible (Schinke & Gilchrist, 1983).

Hansen (1983) examined smoking behavior in a multidimensional framework. In a study of high-school-aged smokers, he found that regularity, duration, and frequency of cigarette use were independent dimensions of smoking habit. He suggests that these findings have implications for the content of prevention programs in terms of their differential effectiveness (e.g. early cessation versus primary prevention) based on these dimensions. In addition, he suggests that future research should investigate the psychosocial covariates of these dimensions.

The concept of risk has been used to study the differential effectiveness of prevention strategies by combining both behavioral and psychosocial dimensions in the classification of adolescents. Best and Flay and their colleagues (Best et al., in press; Flay et al., 1981, in press) have defined risk to smoke in terms of smoking experience (i.e. a child's actual smoking behavior) and social models (i.e. the smoking behavior of a child's parents, siblings, and friends). Their findings do suggest that individuals at different levels of risk are effected by different prevention strategies.

Evans and Raines (1982) have outlined how different developmental and social psychological theories may account for smoking acquisition. Among the theories addressed are Bandura's Social Learning Theory, Piaget's Cognitive Model, Erikson's Psychosocial Model, and McGuire's Communications Model. Although the

authors present a clear and useful discussion on the relation between these theories and smoking initiation, a synthesis of these theoretical perspectives, in terms of a single model of the stages of smoking acquisition, is not presented.

Only one report to date has proposed a viable and comprehensive model of smoking acquisition. This model, proposed by Flay et al (1981), is based on an integrated theory of the interaction between the individual's knowledge, beliefs and attitudes, based on locus of control and value expectancy theories. The model suggests the following five stages of smoking acquisition: preparation and anticipation, initiation, learning and becoming, habituation, and maintenance. Although this model appears quite promising in terms of furthering the understanding of adolescent smoking acquisition, it has not been studied empirically.

There is no comprehensive model of adolescent smoking acquisition, to date, that has received empirical investigation. Several behavioral, attitudinal, and psychosocial variables have been shown to be salient in the acquisition of smoking and a variety of theoretical models have been proposed. However, in order to provide answers to some of the questions regarding smoking prevention program effectiveness, a measurable and comprehensive model of the stages of smoking acquisition based on past research and theory must be developed.

In a recent report, Best et al (in press) compare the questions now being asked about smoking prevention programs and those asked twenty years earlier regarding the effectiveness of

psychotherapy. They suggest that, in both instances, the connection between program effectiveness and the mediating processes is vague and that the mediating processes, themselves, are unclear. This analogy between psychotherapy and smoking prevention may prove useful in furthering our knowledge of the relatively new field of adolescent smoking prevention. By continuing this analogy, it is seen that, just as there are several theoretical camps of psychotherapy (e.g. psychoanalytic, behaviorist, humanist), there have developed different camps of smoking prevention (e.g. psychosocial, health hazard education, media awareness). In the field of psychotherapy, Goldfried (1980) has suggested that a Zeitgeist is developing in which therapists and theorists from different schools of thought are looking for common mechanisms of change. Several authors, in addition to Goldfried (1980), have proposed theories of integration across therapy systems (e.g. Bandura, 1977; Frank, 1973; Gurman, 1978). Therefore, with an understanding of the underlying effective processes of change, a "selective eclectic" model of therapy can be realized. A similar emphasis on integration of a wide range of theoretical positions may prove beneficial in smoking prevention work (Botvin, 1982; Flay et al, in press; Perry et al, 1983). However, in order to incorporate different theoretical positions, the underlying common processes of change must first be delineated and evaluated.

One model of the stages and processes of change in psychotherapy that has received much attention in recent years is that based on Prochaska's integrative survey of psychotherapy systems (Prochaska, 1979). This transtheoretical model of change (Prochaska &

DiClemente, 1982) has been used successfully in the study of adult smoking cessation (DiClemente & Prochaska, 1982; Prochaska & DiClemente, 1983). Among the aspects of this model is the concept of stages of change. Individuals in formal cessation programs, as well as those who had stopped smoking on their own, suggested common stages of change in the course of smoking cessation (DiClemente & Prochaska, 1982). Prochaska and DiClemente (1983) initially hypothesized five stages of change: Precontemplation, Contemplation, Decision-making, Action and Maintenance. However, principal component analysis of an instrument for assessing these stages in psychiatric outpatients yielded only four reliable and well defined components: Precontemplation, Contemplation, Action and Maintenance (McConaughy, Prochaska & Velicer, 1983). The authors suggest that either the Decision-making stage may be such a transitory event that individuals cannot be assessed while making these quick, yet important commitments, or the decisions are not realized until action is begun. In additional studies on the transtheoretical model, corresponding processes of change have been identified (Prochaska & DiClemente, 1982, 1983; Prochaska, DiClemente, Velicer, & Zwick, 1982); differential weights have been given to the pros and cons of smoking perceived by individuals, in terms of a Decisional Balance model (Velicer, DiClemente, Prochaska, & Brandenburg, in press); the role of self-efficacy has been studied (DiClemente, 1981; DiClemente, Prochaska, & Gibertini, in press); and the concept of habit strength has been investigated (Wilcox, Prochaska, Velicer, & DiClemente, in press). In sum, this model has received much empirical investigation

and has led to a clearer understanding of the interaction between the stages, processes, and other mechanisms of change.

Stages of Acquisition Model

By applying Prochaska and DiClemente's stages of change model (DiClemente & Prochaska, 1982; Prochaska & DiClemente, 1982, 1983) to the acquisition of adolescent smoking, a stages of acquisition model is proposed. This stages of acquisition model is, in effect, a mirror image of the stages of change model. For example, whereas in the stages of change model, adults who are in the Precontemplation stage have not yet considered stopping their smoking habit, children in the Precontemplation stage of acquisition have not yet considered beginning to smoke. Adults in the Contemplation stage of cessation have just started to think of breaking their habit while adolescents in this stage have just started to think of starting to smoke. Adults in the Action stage of change have started to take action on their decision to stop smoking whereas adolescents in this stage have taken action on the decision to start smoking. And, at the end of the spectrum, adults who are in the Maintenance stage of change have stopped smoking and are attempting to maintain their abstinence, whereas children in this stage of acquisition have started to smoke regularly and have little or no desire to stop. Therefore, a continuum is created where this later stage of acquisition is actually the first stage of cessation (i.e. Precontemplation).

In defining the stages of acquisition, four variables are taken into account: 1) current smoking behavior (i.e. whether or not

the individual is currently smoking, and if so, how much); 2) future intent to smoke; 3) attitude toward smoking in terms of a decisional balance model (i.e. the individual's weightings of the perceived positive and negative consequences of smoking); and 4) for those who currently smoke, the amount of pleasure received from smoking. These four variables were chosen based on previous research on adolescent smoking acquisition and on adult stages of change.

Current smoking behavior (i.e. frequency, regularity, and duration), as described above, has been found to be a salient dimension of the acquisition of a smoking habit. In terms of the four proposed stages of acquisition, two stages (Precontemplation and Contemplation) involve non-smokers while the other two (Action and Maintenance) involve current smokers and should be able to be distinguished behaviorally in terms of the frequency, duration, and regularity of the smoking behavior.

Ajzen and Fishbein (1970) presented a theoretical model of behavior called the Behavioral Intention Model. This model views intention to engage in a particular behavior as the best predictor of that behavior. Urberg and Robbins (1981) have suggested that this model may help account for adolescent smoking behavior acquisition. Therefore, in terms of the proposed stages of acquisition model, it is expected that individuals in the Precontemplation stage will show no desire or intent to smoke in the future while individuals in the Contemplation, Action, and Maintenance stages will, respectively, show increasing degrees of intent to smoke in the future.

Adolescents, particularly young adolescents, have difficulty

in decision-making (Elkind, 1984; Schvaneveldt & Adams, 1983). Parents, peers, teachers, and the media all seem to present the adolescent with different values and directions from which to choose. This is especially evident when faced with the question of whether or not to smoke. In general, children and adolescents are faced with a variety of reasons not to smoke (e.g. potential health hazards, parental disapproval, bad breath) as well as reasons to smoke (e.g. perceived peer approval and acceptance, feeling and looking more grown up, positive social image) and must weigh these reasons against each other to decide which direction to take.

Janis and Mann (1977) have developed a model of decision-making which entails certain processes that individuals employ when making decisions. Their model involves a Decisional Balance schema in which an individual weighs the positive against the negative consequences related to a particular action in order to make a decision. More specifically, they suggest four categories of consequences: self-approval or self-disapproval, other-approval or other-disapproval, losses or gains for self, and losses or gains for significant others. This process is comparative rather than absolute. In other words, when making decisions, one weighs the gains compared to losses. They describe their model as representing both the cognitive and motivational aspects of the decision-making process.

Based on the Janis and Mann (1977) model, Velicer et al (in press) developed a Decisional Balance measure for predicting and assessing adult smoking status. Their study resulted in the identification of two scales, labeled Pros and Cons (even though the

original item pool was written to represent the four different categories described above), that were able to differentiate between five groups representing different stages of change. They found that Immotives (i.e. Precontemplators) place much greater emphasis on the Pros of smoking than on the Cons. Contemplators placed equal emphasis on the Pros and Cons. Recent Quitters (i.e. Action-takers) gave more weight to the Cons than Pros, yet both were perceived to be less important than in the previous two groups. And, for Long Term Quitters (i.e. Maintainers), the Cons continued to outweigh the Pros, yet both were of little importance. Scores on the two scales also proved useful as predictors of future behavior for the Precontemplator and the Contemplator groups.

Urberg and Robbins (1981) developed a measure of what they have termed the "costs" and "benefits" of adolescent smoking. In a study using this measure they found that subjects who currently smoked saw significantly fewer costs of smoking compared to nonsmokers, but did not differ in respect to the perceived benefits. They also found that subjects who were sure they would not begin to smoke in the next year saw significantly less benefits and more costs of smoking than those who planned on smoking or were unsure of their future intent.

Schneider and Vanmastrigt (1974) administered a questionnaire regarding the negative beliefs about smoking (i.e. "cons" or "costs") to a group of adolescents. They found that preadolescents (ages 7-8 and 10-11) agreed significantly more than adolescents (ages 13-14) with those items related to the health hazards of smoking (e.g.

"Smoking can cause cancer," and "Smoking shortens a person's life"). However, they found no significant differences in response to these items between smokers and nonsmokers. This latter finding is in accord with other studies that have shown that most children and adolescents, smokers and nonsmokers alike, see smoking as hazardous to one's health (National Clearinghouse for Smoking and Health [NCSH], 1974; United States Public Health Service [USPHS], 1976).

In a related study, Botvin, Botvin & Baker (1983) developed an instrument to assess adolescents' attitudes toward cigarette smokers. They found that there is a significant shift through early adolescence in terms of the perceived social benefits of smoking (i.e. "pros" or "gains"), with eighth graders seeing more benefits than seventh graders who, in turn, saw more benefits than sixth graders. These differences were not related to the smoking status of friends. Although smoking status of the subjects themselves was attained by the investigators, the interaction of smoking status with perceived social benefits was not reported.

The concept of subjective expected utility (SEU) is at the root of several theories of behavioral decision-making (e.g. Edwards, 1961; Fishbein & Ajzen, 1975; Rapoport & Wallsten, 1972). SEU is similar to the Decisional Balance schema of Janis and Mann (1977) in that it is the extent to which the different consequences of a behavior, when weighed together, are seen as undesirable or desirable. Bauman, Fisher, Bryan, and Chenoweth (1984) conducted a study of the relation between SEU and smoking behavior of adolescents and found significant reciprocal relationships between the two. In

other words, SEU was found to predict behavior, and behavior, in turn, was found to predict SEU. In addition, SEU accounted for the relationship between a variety of psychological and social variables and smoking behavior.

Based on the above studies of decision-making in smoking behavior, it is expected that individuals at different stages of smoking acquisition will view the consequences of smoking differently. This would be expected especially in terms of the positive consequences (i.e. pros), with individuals in the Precontemplation stage placing little, if any, emphasis on the pros and individuals in the Contemplation, Action, and Maintenance stages placing greater and greater emphasis on them, respectively. The reverse order of emphasis would be expected in terms of the perceived negative consequences (i.e. cons) of smoking, with those in the Precontemplation stage emphasising the cons the most and those in the Maintenance stage, the least. One exception to this would be the negative consequences relating to the health hazards of smoking, which would be perceived similarly by individuals in different stages.

The last variable involved in defining the stages of smoking acquisition is the degree of pleasure derived from smoking. This variable was chosen based on two basic findings: (1) A child's first cigarette is rarely pleasurable (Bewley, Bland & Harris, 1974) and (2) the amount of pleasure derived from smoking is indicative of the strength of smoking habit (Wilcox, Prochaska, Velicer & DiClemente, in press). Therefore, it is expected that the amount of pleasure an

adolescent receives from cigarettes is positively related to the extent to which the individual has acquired a smoking habit. In other words, individuals in the Action stage would be expected to derive less pleasure from smoking than those in the Maintenance stage.

Based on the above descriptions of the variables associated with the stages of acquisition, the following definitions of the stages result:

1. Precontemplation: Youngsters in this stage have not yet begun to think of smoking or have no desire to start smoking in the future. These children may be either never-smokers or ex-smokers. While the negative consequences of smoking (i.e. cons) are emphasized strongly, these children are either not aware of any positive reasons (i.e. pros) to start smoking or are ignoring or effectively combatting the various pressures to smoke.

2. Contemplation: This stage also involves nonsmokers. However, these children are presently thinking of starting to smoke. Individuals in this stage are beginning to be aware of the various pressures to experiment with cigarettes and have started to perceive certain positive consequences (i.e. pros). Further, the cons to smoking are perceived to be relatively less important by these children than by those in the previous stage.

3. Action: Children in this stage have begun to experiment with cigarette smoking. They have decided to "act" on their previous thoughts about starting to smoke. Although they may have greater intent to smoke than individuals in the Contemplation stage, adolescents in this stage are not totally committed to smoking in the

future and are still deciding whether or not smoking is for them. These individuals place much emphasis and value on the positive aspects of smoking and relatively little emphasis on the negative. In addition, they receive minimal pleasure from actually smoking a cigarette.

4. Maintenance: Adolescents who are smoking on a more regular basis have entered the Maintenance stage of acquisition. These individuals are committed to smoking now and in the future and have no desire to stop smoking. They do not see their smoking as a problem and, therefore, have no desire to change their smoking behavior. In fact, they receive a great deal of pleasure from smoking and, if it was entirely up to them (e.g. no parental restrictions), they would probably smoke even more frequently than they do now. These children place much value on the positive aspects of smoking, while they place relatively little, if any, emphasis on the negative consequences of smoking.

In actual adolescent behavior acquisition, these stages are not distinct, but rather fall on a continuum. In addition, movement from one stage to another is not unidirectional. Rather, individuals may go back and forth between adjacent stages. In fact, since as many as 90% of us have tried smoking at one time or another (Flay et al, 1983), it is obvious that movement between the stages of acquisition involves much backward direction. However, in order to provide a framework for measurement, it is the intent of the present study to describe the stages as consecutive and discrete.

This report will present the development a short and reliable

instrument to measure the stages of adolescent smoking acquisition described above. In addition, initial validity evidence for the instrument, based on the variables used to define the construct, will be presented. Finally, sample profiles of adolescent smokers based on scores on the acquisition instrument will be reported.

METHOD

Subjects

Subjects were 202 students in public school systems in two lower to lower middle class urban communities in Southern New England. Both communities have a large ethnic population consisting of first and second generation Portuguese families. Of the 202 subjects, 56 (27.7%) reported speaking primarily another language besides English at home. The subjects were from science, special needs and homeroom classes from grades 6 through 11, representing five different schools. Table 1 depicts the grade and sex distribution of the students. Selection of classes was made by the school principals in order to obtain a heterogeneous sample in terms of cigarette smoking behavior. This sample size of 202 has been shown to be sufficient for the statistical analyses described below (Guadagnoli & Velicer, 1984)

Instrumentation

Stages of Acquisition Questionnaire. A rational scale, as described by Edwards (1970), was developed in order to measure the stages of acquisition described earlier. This scale is called the Stages of Acquisition Questionnaire (SAQ). The development of the SAQ followed a sequential model of scale development, modified from the procedures described by Jackson (1970, 1971).

A total of 128 items were generated based on the definitions provided by the proposed model of the stages of acquisition and on previous instrumentation of stages of change in psychotherapy

(McConnaughy et al, 1983). Each of the proposed four stages of acquisition were represented by 32 of the total 128 items. A five-point, Likert-type response format was used (1 = Strongly Disagree to 5 = Strongly Agree). All items were written for students at a grade four reading level. To insure readability, the original item pool was revised and reworded independently by two elementary reading specialists.

Content validity was obtained by giving the 128 items to three judges familiar with the Stages of Acquisition model. Each judge was asked to indicate which stage each of the items represented, based on conceptual definitions previously provided. Items which received 100% agreement among all three judges were retained. Of the 128 original items, 110 received 100% agreement. From these 110 "good" items, 80 items, representing 20 items per stage, were retained for the form of the instrument administered in this study.

Behavioral Self-Report. A series of questions addressing subjects' past and present cigarette smoking behavior as well as their future intent to smoke was included in the questionnaire packet. All subjects responded to questions regarding whether they have smoked in the last month and their intent to smoke in one year and as an adult. In addition, current "non-smokers" responded to questions addressing whether they had tried smoking in the past, and if so, at what age and what amount of cigarettes consumed weekly. Current "smokers" responded to questions addressing the number of cigarettes consumed daily or weekly, the greatest number of

cigarettes ever consumed on a daily basis, and the length of time the subject had been smoking. These questions were chosen so as to classify subjects into behavioral/cognitive categories corresponding to the four proposed stages of acquisition in order to provide partial external validity for the SAQ.

Decisional Balance Scale. A rational scale (Edwards, 1970) was devised to measure subjects' attitudes toward cigarette smoking based on the perceived pros and cons of the consequences of smoking behavior. This scale was created in order to provide additional external validity for the SAQ. The Decisional Balance Scale followed a similar method of scale development to that described above for the Stages of Acquisition Scale.

Twenty-four items were generated based on those used in an adult smoker Decisional Balance measure (Velicer et al, in press) as well as those used by Botvin et al (1983) to assess adolescents' attitudes toward smokers and by Bauman et al (1984) to assess adolescents' subjective expected utility (SEU). Twelve items were written to reflect the pros of smoking behavior and twelve were written to reflect the cons. All items were written at the fourth grade level based on sentence and syllable length (Fry, 1977). A five-point Likert-type response format was used.

Pleasure Scale. One final very brief rational scale (Edwards, 1970) was developed to measure the amount of pleasure subjects derived from smoking cigarettes. This scale was also created in order to provide additional construct validity for the SAQ. Five items were generated based on previous instrumentation on habit

strength for adult smokers (Wilcox et al, in press). All items were written at the fourth grade reading level. A five-point Likert-type response format was used. Only those subjects who reported being current smokers completed this scale.

Desirability Scale. The Desirability scale of the Personality Research Form (PRF Form E; Jackson, 1984) was included in order to both provide discriminant validity of the SAQ and to study the role of social desirability in smoking acquisition. This scale consists of 16 true-false items aimed at measuring the degree to which an individual presents a favorable picture of self.

Procedure

Prior to their participation, active parental consent was sought for all subjects. Passive consent of parents was accepted when necessary. However, in all cases, subjects' active consent was given. The consent forms (Appendices A and B) and the following procedure were approved by an Institutional Review Board.

Subjects participated in this study in classroom groups ranging in size from 13 to 42 students. The same two examiners conducted all administrations. The following procedures were administered identically to all groups: At the beginning of each administration, subjects viewed a videotape on the "scientific accuracy" of thiocyanate analysis of saliva samples in the detection of recent cigarette smoking. Subjects then provided saliva samples by placing dental cotton, which they had had in their mouths, in individual plastic bags. Each plastic bag had attached to it a label

with a computer-generated identification number. Following the saliva sampling, questionnaire packets were distributed to each subject. The questionnaires had identical labels with corresponding identification numbers. Subjects were asked to make sure that the numbers on their bags and questionnaires matched. This "bogus pipeline" method has been shown to increase the validity of self-reports of smoking behavior (Evans, Hansen, & Mittelmark, 1977; Jones & Sigall, 1971; Luepker, et al., 1981). Subjects were informed of the confidentiality of all saliva "analyses" and subsequent questionnaires. Names were not used on any materials.

RESULTS

Stages of Acquisition Questionnaire

Analysis of the instrument. The original analysis of the instrument was intended to delete items, resulting in a short, reliable questionnaire. The analysis consisted of the following three steps: (1) reducing the number of items from 80 to 42; (2) further reducing the number of items to 27; and (3) a final reduction to 21 items, representing seven items per each of three stages.

At each of the three item-reduction steps, three different procedures were employed in order to eliminate items. The first procedure involved performing a principal component analysis on the interitem correlation matrix. The number of components retained was determined by the Scree method (Cattell, 1966) for the original 80 items (Step 1) and by both the Minimum Average Partial procedure (Velicer, 1976) and the Scree method for the remaining reductions, i.e. Steps 2 and 3. Varimax rotations were performed. Items were retained only if they had a minimum loading of .55 for one component and a maximum loading of .40 for all other components. Although the number of components suggested by the original Stages of Acquisition model was four, the number of components retained at all three steps was three. This discrepancy was accounted for by the finding that the first component, at all three steps, consisted of a combination of "Contemplation" and "Action" items, i.e. those items originally written as and judged to be representing these two stages.

The second procedure employed was that of obtaining the correlations between each item and the total "subscale" score of those items belonging to the same component. Items were retained only if the particular item-subscale correlation was greater than .55.

The third procedure involved obtaining the coefficient alpha for the group of items representing each component, with and without a particular item included.

The final 21 items of the SAQ are presented in Table 2. A principal component analysis was performed on the final 21 X 21 interitem correlation matrix. The varimax rotated component pattern is reported in Table 3. The first component consisted of four items originally judged to represent the Action stage and three items originally judged to represent the Contemplation stage. No other items loaded on this component. The combination of Contemplation and Action items all loading highly on the same component suggests that the subjects responded similarly to items that were believed to have been representing two separate levels of the decision-making process, i.e. deciding to begin smoking and deciding to continue/increase smoking behavior. Therefore, this component was labeled Decision-Making.

The second component consisted of items all judged originally to represent the Precontemplation stage. No other items loaded on this component which was labeled Precontemplation.

The third component consisted of items all judged to represent the Maintenance stage of smoking acquisition. No other items loaded on this component which was labeled Maintenance. The

three components accounted for 64.8% of the variance.

Internal consistency reliability coefficients (Coefficient Alpha) were calculated on the three scales representing the three components. The coefficients ranged from .86 to .94 and are presented in Table 4. Item-scale correlations were also calculated. These ranged from .66 to .77 for the Precontemplation scale; from .77 to .83 for the Decision-Making scale; and from .60 to .68 for the Maintenance scale.

Three scale scores were calculated for each subject. These scores were the unweighted total of the seven items for each scale. The means and standard deviations for each of the scales are presented in Table 4 along with the Pearson correlations between the three scales. The scores were converted to standardized T -scores ($M = 50$, $SD = 10$) for validity analyses and interpretation.

Behavioral Self-Report

Based on self-report, 51 (25.2%) of the total 202 subjects had smoked during the previous month. Of the 202 subjects, 45 (22.3%) reported thinking that they would smoke as adults and 35 (17.3) of the total population reported thinking that they would smoke in one year. Of the 151 subjects who had not smoked in the previous month, 83 (55%) reported having tried smoking sometime in the past. Forty-nine of the 51 current smokers reported the amount of cigarettes they smoke daily. Of these 49, 31 (63.3%) reported smoking only between zero and two cigarettes per day, 11 (13.4%) reported smoking between three and six; 4 (4.9%) reported between seven and

ten; and the remaining four (4.8%) subjects reported smoking more than ten cigarettes per day. Forty-eight of the 51 smokers reported how long they had been smoking. Of these 48, 11 (22.9%) reported smoking for less than two months, 10 (20.8%) for between three and six months, 3 (6.3%) for seven to ten months, 11 (22.9%) for one to two years, and 13 (27.1%) for over two years.

Decisional Balance Scale

The purpose of the original analysis of the Decisional Balance Scale was to eliminate items and produce reliable subscales measuring the pros and cons of smoking. This analysis was done in two steps, each resulting in a shorter, more reliable scale. The first step deleted four pro items and six con items. The second step deleted two additional pro items and three additional con items, resulting in a total of nine items. At each step of the analysis, the same three procedures were used to delete items as outlined above for the SAQ, namely, principal component analysis, item-scale correlations, and coefficient alphas.

A principal component analysis was performed on the 9 X 9 interitem correlation matrix of the final Decisional-Balance Scale. The Varimax rotated component pattern is presented in Table 5. Three items loaded highly on the first Component and not on any others. These items were all originally written as Pro items. No other items loaded on this component.

Three items loaded highly on the second component and not on any others. These items were also originally written as Pro items. No

other items loaded on this component. Upon closer examination, the items on the second component reflect what Janis and Mann (1977), in their model of decision making, have described as utilitarian gains for self, whereas the items of the first component reflect what they have described as other-approval. Therefore, the first component was labeled the Pro- Approval Scale and the second component was labeled the Pro- Utility Scale.

Three items loaded highly on the third component and not on any others. These items were originally written to reflect the negative consequences (i.e. cons) of smoking. No other items loaded on this component which was labeled the Con Scale. The three components accounted for 61.2% of the variance. The nine items are presented in Table 6.

Item-scale correlations were calculated for each scale and ranged from .43 to .57. Internal consistency coefficients (Coefficient Alpha) were also calculated for the three scales. The Coefficient Alpha for the Pro- Approval Scale was .70; for the Pro- Utility Scale, .68; and for the Con Scale, .64.

Scale scores were calculated for each subject. These scores were the unweighted sum of the three items comprising each scale. The mean Pro- Approval score was 5.47 with a standard deviation of 2.47. The mean Pro- Utility score was 5.90 with a standard deviation of 2.68. And, the mean Con score was 12.35 with a standard deviation of 2.90. Scale scores were converted into standardized T-scores for interpretation and for later external validity analyses.

Pleasure Scale

Forty-seven subjects completed the Pleasure scale. An internal analysis was performed based on these subjects' responses. This analysis involved obtaining the item-scale correlations as well as the coefficient alpha for the entire group of items, with and without each item. Based on this procedure, four of the original five items were retained for the final form of this brief scale. The four items have item-total correlations ranging from .69 to .80 and the coefficient alpha for the entire scale is .88. The four items are presented in Table 7. The mean score was 10.94 with a standard deviation of 4.20. Scores were converted to standardized T -scores for later use.

Desirability Scale

The mean Desirability score was 10.34 with a standard deviation of 3.10. Norms for this age group are not available. Pearson correlations were performed to study the relation between desirability and the three SAQ scales. A weak positive relation between desirability and the Precontemplation scale was found ($r = .35$). A weak negative relation with the Decision-Making Scale was found ($r = -.29$). The Desirability and Maintenance Scales did not correlate ($r = .01$). Desirability did not correlate with age ($r = -.07$) or with grade ($r = .01$). In addition, Desirability and both Pro scales had weak negative correlations (Pro-Approval, $r = -.25$; Pro-Utility, $r = -.27$), while there was a weak positive correlation between Desirability and the Con scale ($r = .27$). Further analyses

showed that smokers received significantly lower desirability scores ($M = 8.88$) than nonsmokers ($M = 10.83$), $t(81) = 3.93$, $p < .001$.

SAQ External Validity

External validity for the Stages of Acquisition Questionnaire was partially obtained by comparing subjects' scale scores with responses to the Behavioral Self-Report. This was accomplished by classifying subjects into one of three groups based on their current smoking status (whether they have smoked in the last month) and their intent to smoke in one year. This grouping method was thought to be an accurate means of representing the three stages of acquisition (Precontemplation, Decision-Making, Maintenance) on two important aspects of the construct, i.e. smoking behavior and future intent to smoke. Subjects who do not smoke currently and have no desire to smoke in one year comprised the Immotiv Group and were thought of as being in the Precontemplation stage. Likewise, in order to represent the Decision-Making stage, two types of subjects were grouped together to form the Ambivalent Group. These included subjects who do not smoke currently but think that they will in one year's time (i.e. "Contemplators") and subjects who are currently smoking but do not think they will be smoking in one year (i.e. "Action-Takers"). A Confirmed Group was thought of as representing the subjects in the Maintenance stage of acquisition and was comprised of those subjects who smoke currently as well as intend to be smoking in one year. Based on this grouping method, The Immotiv Group consisted of 146

subjects, the Ambivalent Group consisted of 26 subjects, and the Confirmed Group had 30 subjects.

Three separate one way analyses of variance were performed to determine if between group differences existed on any of the three SAQ scales. All analyses were performed at the $p < .05$ significance level. Fmax tests were performed to check for homogeneity of variance and were all found to be nonsignificant. A one way analysis of variance was significant for the Precontemplation Scale, $F(2, 195) = 69.46$,. A Newman-Keuls follow-up test was employed and showed that subjects in the Immotive Group scored significantly higher than those in both the Ambivalent and Confirmed Groups. Subjects in the Ambivalent Group scored significantly higher than those in the Confirmed Group.

A one way analysis of variance was also significant for the Decision-Making Scale, $F(2, 197) = 76.96$. A Newman-Keuls follow-up test was employed. No significant differences were found between the Ambivalent and Confirmed Groups, yet both of these groups scored significantly higher than the Immotive Group.

A third one way analysis of variance was also significant for the Maintenance Scale, $F(2, 196) = 12.86$. A Newman-Keuls follow-up test found no significant differences between the Immotive and Ambivalent Groups, yet subjects in the Confirmed Group scored significantly higher than subjects in both of the other groups. The means and standard deviations for all three analyses of variance are reported in Table 8.

Cluster Analysis

In order to provide additional validity evidence for the SAQ, as well as to determine whether the original pool of subjects could be classified into smaller cohesive subgroups, a hierarchical clustering procedure (Johnson, 1967) was employed using the three SAQ scale scores for the entire sample. Both Ward and Centroid methods were used, resulting in similar cluster patterns. The results of the Ward method were analyzed. Solutions were investigated for three to twenty clusters. The nine-cluster solution was the most clearly interpretable and will be discussed here.

Interpretation of the Profiles. Nine distinct clusters resulted from the cluster analysis. Five of these were classified as major clusters, each consisting of 26 to 45 subjects. These five clusters accounted for 158 of 194 valid cases. The remaining four minor clusters accounted for 36 subjects combined, with each cluster comprised of 4 to 15 subjects.

Major Clusters

Cluster 1. The 27 subjects in this cluster are average on all three SAQ scales (see Figure 1). These subjects seemed to have chosen the neutral response to most items regardless of their content. This "centrality response bias" often occurs with odd number Likert-type response formats (Guilford, 1954). This type of response pattern suggests that these subjects would rather remain uninvolved and neutral regardless of the content of the items. A closer examination of these subjects' scores on the other measures

administered reveals similar patterns of this centrality response bias. This group of subjects represented a wide range of ages and grades, with sex distribution about equal. Although the majority of subjects were non-smokers, five (18.5%) reported smoking currently. This percentage is similar to that found in the total sample pool. This cluster was called the "Uninvolved" profile.

Cluster 2. The 45 subjects in this cluster are characterized by above average scores on Precontemplation, below average scores on Decision-Making and even lower scores on Maintenance (see Figure 2). All but one of these subjects reported not smoking currently nor intending to in one year. The one current smoker did not intend on smoking in one year and reported not smoking on a daily basis. Although a wide range of grades and ages are represented, the means on both of these variables (Age, $M = 14.4$, $SD = 1.5$; Grade, $M = 8.6$, $SD = 1.5$) were higher than those for the entire subject pool. This cluster was, therefore, called the "Older Precontemplation" profile.

Cluster 3. The 32 subjects in this cluster had above average scores on Precontemplation, below average scores on Decision-Making and above average scores on Maintenance (see Figure 3). All of these subjects were non-smokers who did not intend to smoke in one year. By looking at the Precontemplation and Decision-Making scores alone, this cluster would resemble the "Precontemplation" profile of Cluster 2. However, the high Maintenance scores distinguish this cluster from Cluster 2. These high Maintenance scores can, perhaps, be explained by the relatively

young mean age of this group (Age, $M = 13.7$, $SD = 1.5$; Grade, $M = 8.0$, $SD = 1.5$) compared to Cluster 2. The wording of several of the Maintenance items may elicit "Strongly Agree" responses from actual Maintainers as well as relatively "unsophisticated" (i.e. younger) Precontemplators. For example, item 1 of the Maintenance Scale is, "I don't think about stopping smoking because I really like it." The younger adolescent may not comprehend fully this item due to both its complex structure and the potential ambiguity of the statement. In other words, a child may read this item as, "I don't think about stopping smoking," period. This child may respond with "Strongly Agree," meaning, "I don't have to think about stopping smoking because I don't smoke now!" Other Maintenance items may elicit similar responses. Based on the relatively clear pattern of Precontemplation and Decision-Making scores along with the younger mean age of these subjects, this cluster was called the "Younger Precontemplation" profile.

Cluster 4. The 28 subjects in this cluster are characterized by below average Precontemplation scores, above average Decision-Making scores and below average Maintenance scores (see Figure 4). Subjects represent a wide range of ages and grades. Of the 28 subjects, 12 were current non-smokers who did not plan on smoking in one year, yet all but one of these reported having smoked in the past. The remaining 16 subjects consisted of six current smokers who intended to smoke in one year, eight current smokers who did not intend to smoke in a year, and two non-smokers who thought they would be smoking in a year. Subjects in this cluster, therefore,

are ex-smokers, future smokers and current smokers who are in the midst of trying to make decisions regarding their smoking behavior. This cluster was called the "Decision-Making" profile.

Cluster 7. The 26 subjects in this cluster scored well below average on Precontemplation, well above average on Decision-Making, and above average on Maintenance (see Figure 5). All but eight of the subjects in this cluster were current smokers, with 11 of the smokers planning on continuing to smoke in one year. These subjects are still deciding whether to smoke regularly, yet have already started to take action on their smoking behavior. Thus, while Action did not emerge as a separate component, it is a common profile. This cluster was called the "Action" profile.

Minor Clusters

Cluster 5. The nine subjects in this cluster are characterized by above average scores on Precontemplation, lower, yet still above average scores on Decision-Making, and below average scores on Maintenance (see Figure 6). Only two of these subjects are currently trying smoking and neither of them plan on smoking in a year. By and large, the subjects in this cluster have just started to contemplate smoking and can be seen as being on the Precontemplation side of the decision-making process. Thus, while Contemplation did not emerge as a separate component, it appears to define a profile of a small number of adolescents in this subject pool. This cluster was called the "Contemplation" profile.

Cluster 6. This cluster had eight subjects characterized by

extremely low Precontemplation scores (over two standard deviations below the mean), below average Decision-Making scores, and slightly above average Maintenance scores (see Figure 7). Three of these subjects were current smokers who thought that they would be smoking in one year, while the other five subjects were non-smokers who did not intend to smoke in a year. All of these subjects appear to want to project the image of being smokers, regardless of their actual current behavior or future desire to smoke. This cluster was called the "Smoking Image" profile.

Cluster 8. This cluster had only four subjects. They were characterized by well below average Precontemplation scores, well above average Decision-Making scores, and even higher Maintenance scores (see Figure 8). All of these subjects were current smokers who planned on smoking in one year. Although these subjects are still making decisions regarding their smoking behavior, they are also maintaining their current smoking habit. This cluster best represents the Maintenance stage of acquisition and was called the "Maintenance" profile.

Cluster 9. The 15 subjects in this cluster had above average Precontemplation scores, below average Decision-Making scores, and average Maintenance scores (see Figure 9). All of the subjects were non-smokers and did not intend to smoke in a year. This cluster profile is similar to that of Clusters 2 and 3 in terms of Precontemplation and Decision-Making scores, yet subjects in this cluster scored even more extremely on these two scales (i.e. higher Precontemplation and lower Decision-Making scores). Whereas subjects

in Clusters 2 and 3 were about equally divided among ex-smokers and never-smokers, all but one of the subjects in Cluster 9 were never-smokers. Therefore, this cluster was called the "Never-Smoker" profile.

Cluster Validation

The cluster profiles described above received partial validation by comparing clusters using scores on the Decisional-Balance, Pleasure and Desirability scales. This was accomplished by a series of analyses of variance. The following five clusters were selected for use in these analyses: Cluster 2- Older Precontemplation; Cluster 5- Contemplation; Cluster 4- Decision-Making; Cluster 7- Action; and Cluster 8- Maintenance. These clusters were chosen because they were the most clearly interpretable and because they represent five separate stages of smoking acquisition. They would therefore be able to illustrate the different emphasis placed on the pros and cons of smoking at the different levels of acquisition as well as the varying amount of pleasure derived from smoking at the different levels.

Decisional Balance. Four separate one way analyses of variance were performed to test the difference in cluster means on the three Decisional-Balance scales and the Pleasure scale. All analyses were performed at the $p < .05$ significance level. Fmax tests were employed to check for homogeneity of variance for each analysis and in each case were nonsignificant. An analysis of variance for the Pro- Approval scale was significant, $F(4,107) =$

9.37. A Newman-Keuls follow-up test was employed and showed that subjects in both the Action and Maintenance clusters scored significantly higher than those in both the Precontemplation and Contemplation clusters. In addition, the mean scores on this scale increased in order of the stages, i.e. Precontemplation, lowest to Maintenance, highest.

An analysis of variance for the Pro- Utility scale was also significant, $F(4,107) = 15.16$. Results of a Newman-Keuls follow-up test showed that subjects in the Decision-Making, Action, and Maintenance clusters scored significantly higher than those in the Precontemplation and Contemplation clusters. The means on this scale increased in a similar fashion to those for the Pro- Approval scale, i.e. in order of the stages, except that the mean scores for the Action and Maintenance clusters were identical.

A third analysis of variance was performed on the Con scale and was not significant, $F(4,107) = .34$. Therefore, no differences occurred on this scale between the five clusters. Figure 10 depicts a comparison of the Pro-Approval and Con scale means for the five groups.

Pleasure. An analysis of variance was performed on the Pleasure scale, comparing the means between the Decision-Making, Action, and Maintenance clusters, since only current smokers completed the Pleasure scale. Results showed significant differences between the group means, $F(2,32) = 10.69$. A Newman-Keuls follow-up test showed significant differences between all three group means, with subjects in the Maintenance cluster scoring higher than those in

the Action cluster, who in turn scored higher than subjects in the Decision-Making cluster. The means and standard deviations for all four of the above analyses of variance are reported in Table 9.

Desirability. The relation between desirability and the five stages, as represented by the same clusters used above, was also examined. All analyses were performed at the $p < .05$ significance level. An F_{max} test was employed to test for homogeneity of variance and was found nonsignificant. A one way analysis of variance was significant, $F(4,107) = 5.84$. A Newman-Keuls follow-up test showed that subjects in the Maintenance stage scored higher on desirability than did subjects in both the Contemplation and Action stages. The means, standard deviations, and T-scores are reported in Table 9 and are depicted in Figure 11.

DISCUSSION

The results of this study provide initial validity for the proposed model of adolescent smoking acquisition. This model suggests that adolescents move through a series of stages in acquiring a smoking habit. According to the model, children at different stages would be expected to differ on a number of variables including actual smoking behavior, future intent to smoke, the relative weightings of the perceived pros and cons of smoking, and the amount of pleasure derived from smoking.

The Stages of Acquisition Questionnaire (SAQ) was found to be a brief, highly reliable, and valid measure of the stages of adolescent smoking acquisition. Both internal and external validity of the instrument was obtained, thus providing support for the underlying construct of smoking acquisition. In terms of internal validity, the results show a clear and well-defined structure yielding three components representing three stages: Precontemplation, Decision-Making, and Maintenance. Although the original theoretical model, as well as past research on adult psychotherapy change (McConaughy, Prochaska, & Velicer, 1983), suggested that a Decision-Making stage would be subdivided into Contemplation and Action stages, it appears that subjects in this sample were unable to distinguish between the two, based on the items of the instrument. However, cluster analysis suggests that, even though Contemplation and Action did not emerge as separate components, they do represent separate stages of acquisition.

Therefore, five stages of smoking acquisition have been depicted by this study: Precontemplation, Contemplation, Decision-Making, Action, and Maintenance. In addition to these five stages, other groups of subjects have been distinguished on the basis of SAQ profiles. These include an "Uninvolved" group of subjects whose scores reflect a centrality response bias and a group of subjects who present a "Smoking Image," regardless of their current smoking behavior. In addition, subjects who are in the Precontemplation stage were found to have three distinct profiles of SAQ scores: Younger Precontemplation, Older Precontemplation, and Never-Smoker.

Correlations between the three SAQ scales suggest a simplex pattern (Guttman, 1955). Adjacent stages correlated more highly than nonadjacent stages. This simplex pattern provides support for the ordering of the stages, i.e. from Precontemplation to Decision-Making to Maintenance.

The four variables used in defining the construct of smoking acquisition were operationalized by way of various self-reports. These included measures of current smoking behavior, future intent to smoke, the weights given to the positive and negative consequences of smoking, and the amount of pleasure derived from smoking. These measures were able to distinguish subjects in different stages of acquisition, thus providing evidence of external validity. In addition, the concept of social desirability was found to play a potential role in smoking acquisition. These results will now be discussed on greater detail.

The Precontemplation Scale was found to be the most effective

of the three scales in distinguishing between Immotive, Ambivalent, and Confirmed subjects (as defined by current smoking behavior and future intent to smoke). The Decision-Making Scale was able to distinguish between Immotive and other subjects. And, the Maintenance Scale was able to distinguish between Confirmed and other subjects.

The five stages of acquisition did not differ in terms of subjects' awareness of the health hazards of smoking as evidenced by scores on the Con Scale. These results are in accord with past research that has shown that most adolescents, smokers and nonsmokers alike, are aware of the potential harmful effects of cigarette smoking (NCSH, 1974; USPHS, 1976). These results, if replicated in future studies, suggest that smoking prevention programs aimed primarily at increasing participants' awareness of the health hazards of smoking, would be ineffective in either deterring the onset of smoking or decreasing current smoking.

Items relating to the non-health-related negative consequences of smoking did not emerge as a single reliable measure of the Decisional Balance Scale. This may be more related to the small number of items used than to the construct they were to represent. Past research has shown that smokers and nonsmokers do differ in terms of their perceptions of certain "costs" of smoking (Urberg & Robbins, 1981). Therefore future research should involve comparing the stages of acquisition in terms of a reliable and valid measure of the non-health-related "costs" of smoking.

The five stages differed in terms of two aspects of subjects' perceptions of the positive consequences of smoking: social approval

and overall utility. Precontemplators perceived few positive consequences of smoking. Contemplators, Decision-Makers, Action-Takers, and Maintainers perceived more and more positive consequences of smoking, respectively. These results, again if replicated, also have potential ramifications for smoking prevention programs. Depending on a participant's current stage of acquisition, one may expect differential effectiveness of interventions aimed at decreasing the perceived positive consequences. For example, individuals in the Precontemplation stage may benefit from strategies aimed at "inoculating" them against future peer pressure, whereas those in the Action stage may gain from approaches dealing with assertiveness and social skills.

Upon examination of Figure 10, it appears that the stage at which subjects placed almost equal weight upon the pros and cons of smoking was the Decision-Making stage. In other words, subjects in the Decision-Making stage are balancing rather equally the positive and negative consequences of smoking cigarettes. Subjects in stages on either side of Decision-Making clearly placed greater emphasis on either the pros or the cons. This finding suggests that adolescents in the Decision-Making stage may benefit from strategies aimed at problem-solving and decision-making, with emphasis placed on keeping the decisional balance weighted on the side of the negative consequences of smoking.

In recent years, personality test developers have used various social desirability scales in the construction of new tests in order to examine discriminant validity (e.g. Jackson, 1971). For

example, if an item or a scale correlates highly with a measure of desirability, it is thought that what is really being measured is, in part, desirability, and not the originally intended construct. Social desirability is seen typically as a distorted response style, i.e. presenting a "positive" picture of oneself. Recently, however, desirability has also been thought to be a separate personality characteristic, in and of itself (McCrae & Costa, 1983). In the present study, a measure of desirability correlated with two of the three SAQ scales, thus not contributing to the discriminant validity of the instrument. However, it is possible that desirability is actually a separate and important trait related to the construct of smoking acquisition. This notion is supported by the vast amount of literature emphasizing the roles of peer pressure and impression management in adolescent smoking.

The results of the present study show that, in general, although there are no age or grade differences in terms of desirability, smokers in this sample present themselves in a less desirable fashion than do nonsmokers. Upon closer examination of the relation between the five stages of smoking acquisition and desirability scores, it is seen that individuals in the Precontemplation stage present themselves in a highly desirable manner but as soon as adolescents begin thinking about starting to smoke (i.e. when they enter the Contemplation stage), they present themselves in a much less desirable way. This low level of desirability continues until the Maintenance stage, where subjects, once again, present themselves in a highly desirable way.

It should be noted that the Desirability Scale used in this study was originally developed for adults. Therefore, interpretations of the results may not be entirely accurate. It is possible that the definition of "desirability" may be quite different for adolescents, especially those currently effected by "negative" peer pressure or those who are actively rebelling against parental values. In other words, what may be seen as desirable to an adult may be seen as undesirable to a teenager. Smoking may be seen by some adolescents as a means to gain social approval and to defy the wishes of parents. The negative relation found between the Pro- Approval Scale and Desirability supports this notion. Further evidence for this is provided by the finding that the cluster with the lowest mean Desirability score was the "Smoking Image" cluster (T -score = -.72); the group of subjects who presented themselves as "smokers", regardless of whether or not they actually smoked.

In light of the above, the differences in desirability scores among the subjects in the five stages of acquisition becomes clearer. Subjects on both extremes of the acquisition continuum (i.e. Precontemplation and Maintenance stages) are, perhaps less effected by or more able to combat negative peer pressures in general than those subjects in the middle three stages. The latter subjects are in the midst of a decision-making process; one that is, perhaps, effected greatly by peer influence and approval. In sum, desirability may be a salient variable in the construct of smoking acquisition. Further research is needed on this topic, utilizing reliable and valid measures of desirability that are appropriate for this age

group, in order to more clearly understand its role in smoking acquisition. In addition, in order to study the developmental changes associated with desirability, as well as with smoking acquisition in general, the role of the various developmental theories presented by Evans and Raines (1982), especially the cognitive (Piaget, 1960) and psychosocial (Erikson, 1963) models, should be investigated.

The model of acquisition proposed by Flay et al (1981) described five stages: Preparation and Anticipation, Initiation, Learning and Becoming, Habituation, and Maintenance. Comparing their model and the present model, as measured by the SAQ, one finds both similarities and differences. The Habituation and Maintenance stages of the Flay et al (1981) model appear similar to the Action and Maintenance stages of the present model. However, whereas four of the five stages proposed in the Flay et al (1981) model deal with actual smokers, only two of the five stages in the present model do so exclusively. In the present model, a greater emphasis is placed on the decision-making process involved in acquisition; prior to, during, and following the time of actual smoking initiation. Since a primary goal of most interventions is to deter or prevent the onset of cigarette smoking, it is suggested that focusing on the acquisition process prior to, or during experimentation, will prove useful in the understanding of the differential effectiveness of prevention program components. Therefore, although the Flay et al (1981) model and the present stages of acquisition model have some aspects in common, the present model appears to more clearly represent the actual cognitive, psychosocial, and behavioral aspects

of adolescent smoking acquisition.

The stages of acquisition appear to be on a continuum with the stages of adult smoking cessation. This is especially evident in terms of the perceived pros and cons of smoking and the pleasure derived from cigarettes. Velicer, DiClemente, Prochaska, and Brandenburg (in press) found that Precontemplators placed greater emphasis on the pros than on the cons, Contemplators weighed the pros and cons about equally, and Action-Takers and Maintainers placed more emphasis on the cons. Wilcox, Prochaska, Velicer, and DiClemente (in press) found that smoking pleasure was indicative of habit strength, i.e. cessation Precontemplators derived the most pleasure and Maintainers, the least. These results, along with those of the present study, suggest that acquisition Maintainers are similar to cessation Precontemplators. This has possible implications for program interventions. For example, participants in the later Maintenance stage of acquisition may benefit from cessation strategies found effective for individuals in the Precontemplation stage of cessation. However, individuals in the late Action or earlier Maintenance stages of acquisition may still benefit from interventions aimed at "moving" them to earlier stages of acquisition. However, more investigation into the specific processes of moving from one stage into another is needed.

Although results of this study provide evidence for both the internal and external validity of the SAQ, some methodological shortcomings must be taken into account. To begin with, the sample used in this study is by no means representative of adolescents in

the general population. Subjects were not randomly selected nor did they necessarily represent a cross-section of the particular schools. In addition, both communities had large ethnic populations. This was evident by the finding that over 25% of the sample did not speak english in their homes. Although the SAQ items were written at the fourth grade level, it is possible that certain slang words or phrases may not have been understood fully by non-english speaking subjects. There are also potential cultural differences that may affect the subjects' performance. These differences could be manifest in terms of both item content and response style. Furthermore, the data reported in this study should not be used as population norms, as they are based on a non-representative development sample.

Another methodological difficulty is that classrooms in this study were selected in order to obtain a large percentage of current smokers. However, only approximately one fourth of the subjects did smoke. Of those, only a handful could at all be considered "regular" smokers, based on amount of cigarette consumption and length of smoking history. The remainder were primarily experimenting with cigarettes. In order to investigate more accurately the later stages of acquisition (i.e. Action and Maintenance), a larger number of smokers would be needed.

The use of the Decisional Balance and Pleasure Scales poses another difficulty in interpreting the results. Although these scales were shown to have high reliability, they received partial evidence for external validity by the same instrument that they, themselves, were used to validate. Future research on the construct validity of

the SAQ should involve measures that have been found to be reliable and valid prior to their use in the investigation. In addition, other variables associated with smoking acquisition should be studied in order to provide further construct validity for the scale, as well as to broaden and strengthen the theoretical base of this model.

The results showed that subjects' responses to the Maintenance Scale may be related to their age and reading level as well as to their actual stage of acquisition. This was evidenced by the emergence of two groups of subjects in the Precontemplation stage who differed in terms of their mean Maintenance scores. It is suggested that subjects in the Younger Precontemplation cluster responded positively to items on the Maintenance Scale because of the complexity of the items. In order to understand more fully this finding, future research involving a comparison of scale scores and subject profiles with reading levels, intellectual ability, and cognitive development, is needed. Further, the addition of a "Not Applicable" response category may help to clarify these findings.

Another response style problem involved the centrality response bias of a large number of the subjects, as exemplified by the "Uninvolved" cluster profile. In order to investigate means of diminishing or eliminating this response problem, future research should involve a comparison of several different response formats such as even-numbered Likert-type or true-false.

Although the Stages of Acquisition Questionnaire appears promising in its ability to classify subjects into various stages of smoking acquisition, further research is needed prior to its use in

adolescent smoking research and prevention program implementation. In addition to the suggestions for future research discussed above, it is suggested that additional reliability and validity studies be conducted on the final 21-item instrument.

Once further reliability and validity evidence is gathered, the Stages of Acquisition Questionnaire could be used for a variety of both research and intervention purposes. For example, by being able to classify students into the various stages, investigation of the differential effectiveness of specific prevention program components on children at different levels of acquisition would be possible. This type of research could lead to the systematic selection of specific types of interventions, based on the subjects' individual stages of acquisition. In addition, longitudinal studies of the relation between smoking acquisition and risk would be possible by following subjects' movement from one stage to another in light of various demographic, developmental, and psychosocial variables. Further, a similar model and instrumentation could be employed in the study of the acquisition of other potentially harmful behaviors such as alcohol and marijuana use.

In sum, the present study provides evidence for a comprehensive adolescent smoking acquisition model. This model involves five stages of acquisition. The Stages of Acquisition Questionnaire appears to be a reliable and valid measure, able to categorize subjects into the various stages, based on score profiles. This model and instrument may prove useful in future investigations of the differential effectiveness of smoking prevention program

components, as well as in the study of smoking acquisition, in general.

References

- Ajzen, I. & Fishbein, M. (1970). The prediction of behavior from attitudinal and normative variables. Journal of Experimental Social Psychology, 6, 466-487.
- Arkin, R.M., Roemhild, H.F., Johnson, C.A., Luepker, R.V., & Murray, D.M. (1981). The Minnesota Smoking Prevention Program: A seventh-grade health curriculum supplement. Journal of School Health, 51, 611-616.
- Bandura, A. (1977). Self-efficacy: Toward a unifying theory of behavioral change. Psychological Review, 84, 191-215.
- Bauman, K.E., Fisher, L.A., Bryan, E.S. & Chenoweth, R.L. (1984) Antecedents, subjective expected utility, and behavior: A panel study of adolescent cigarette smoking. Addictive Behaviors, 9, 121-136.
- Best, J.A., Flay, B.R., Towson, S.M.J., Ryan, K.B., Perry, C.L. Brown, K.S., Kersell, M.W. & d'Avernas, J.R. (in press). Smoking prevention and the concept of risk. Journal of Applied Social Psychology.
- Bewley, B.R., Bland, J.M. & Harris, R. (1974). Factors associated with the starting of cigarette smoking by primary school children. British Journal of Preventive Social Medicine, 28, 37.

Botvin, E.M., Botvin, G.J. & Baker, E. (1983). Developmental changes in attitude toward cigarette smokers during early adolescence.

Psychological Reports, 53, 547-553.

Cattell, R.B. (1966). The Scree test for the number of factors.

Multivariate Behavioral Research, 1, 245-276.

DiClemente, C.C. (1981). Self-efficacy and smoking cessation

maintenance: A preliminary report. Cognitive Therapy and Research, 5, 175-187.

DiClemente, C.C. & Prochaska, J.O. (1982). Self-change and therapy

change of smoking behavior: A comparison of processes of change and cessation and of maintenance. Addictive Behavior, 7, 133-142.

DiClemente, C.C., Prochaska, J.O., & Gibertini, M. (in press).

Self-efficacy and the stages of self-change of smoking. Cognitive Therapy and Research .

Edwards, A.L. (1970). The measurement of personality traits by scales and inventories. New York: Holt, Reinhart, and Winston, Inc.

Edwards, W. (1961). Behavioral decision theory. Annual Review of Psychology, 12, 473-398.

- Elder, J.P. & Stern, R.A. (1984). A review of adolescent smoking prevention programs. Unpublished manuscript, San Diego State University, School of Public Health.
- Elkind, D. (1984). All grown up & no place to go. Reading, MA: Addison-Wesley.
- Erikson, E.H. (1963). Childhood and society (2nd ed.). New York: W.W. Norton & Co., Inc.
- Evans, R.I., Hansen, W.B., & Mittlemark, M.B. (1977). Increasing the validity of self-reports of behaviors in a smoking in children investigation. Journal of Applied Psychology, 62, 521-523.
- Evans, R.I. & Raines, B.E. (1982) Control and prevention of smoking in adolescents: A psychosocial perspective. In J. Coates, A.C. Peterson, & C. Perry (Eds.) Promoting adolescent health: A dialog on research and practice. New York: Academic Press.
- Fishbein, M. & Ajzen, I. Belief, attitude, intention, and behavior: An introduction to theory and research. Reading, MA: Addison-Wesley, 1975.
- Flay, B.R., D'Avernas, J.R., Best, J.A., Kersell, M.W., & Ryan, K.B. (1981). Cigarette smoking: Why young people do it and ways of preventing it. In P. Fierstore and P. McGrath (Eds.), Pediatric

behavioral medicine. New York: Springer Verbis.

Flay, B.R., Ryan, K.B., Best, J.A., Brown, K.S., Kersell, M.W.,
d'Avernas, J.R., & Zanna, M.P. (in press). Are social psychological
smoking prevention programs effective?: The Waterloo Study. Journal
of Behavioral Medicine.

Frank, J. (1973). Persuasion and Healing. Baltimore: Johns Hopkins
University Press.

Fry, E. (1977). Fry's readability graph: Clarification, validity, and
extension to level 17. Journal of Reading, 21, 242-252.

Goldfried, M.R. (1980). Toward the delineation of therapeutic change
principles. American Psychologist, 35, 991-999.

Guadagnoli, E. & Velicer, W.F. (1984). The relationship of sample size
to the stability of component patterns: A simulation study.
Unpublished manuscript, University of Rhode Island, Kingston.

Guilford, J.P. (1954). Psychometric methods (2nd ed.). McGraw-Hill, New
York.

Gurman, A. (1978). Contemporary marital therapies: A critique and
comparative analysis of psychoanalytic, behavioral and systems theory
approaches. In T. Paolino and B. McCrady (Eds.), Marriage and

Marital Therapy. New York: Brunner/Mazel.

Guttman, L. (1955). A generalized simplex for factor analysis.

Psychometrika, 20, 173-192.

Hansen, W.B. (1983). Behavioral predictors of abstinence: Early indicators of dependence on tobacco among adolescents. The International Journal of the Addictions, 18, 913-920.

Hurd, P.D., Johnson, C.A., Pechacek, T.F., Best, C.P., Jacobs, D.R., & Luepker, R.J. (1980). Prevention of cigarette smoking in seventh grade students. Journal of Behavioral Medicine, 3, 15-28.

Jackson, D.N. (1970). A sequential system for personality scale development. In C.D. Spielberger (Ed.), Current topics in clinical and community Psychology. (Vol. 2, pp. 61-96). New York: Academic Press.

Jackson, D.N. (1971). The dynamics of structured personality tests: 1971. Psychological Review, 78, 229-248.

Jackson, D.N. (1984). Personality Research Form manual. (3rd ed.). Port Huron, Michigan: Research Psychologists Press, Inc.

Janis, I.L. & Mann, L. (1977). Decision making: A psychological analysis of conflict, choice and commitment. New York: Free Press.

Johnson, C.A. (1982). Untested and erroneous assumptions underlying antismoking programs. In T.J. Coates, A.C. Peterson, & C. Perry (Eds.), Promoting adolescent health: A dialog on research and practice. New York: Academic Press.

Johnson, S.C. (1967). Hierarchical clustering schemes. Psychometrika. 32, 241-254.

Jones, C.E. & Sigall, H. (1971). The bogus pipeline: A new paradigm for measuring affect and attitude. Psychological Bulletin. 76, 349-364.

Luepker, R.V., Pechacek, T.F., Murray, D.M., Johnson, C.A., Hurd, F., & Jacobs, D.R. (1981). Saliva thiocyanate: A chemical indicator of cigarette smoking in adolescents. American Journal of Public Health. 71, 1320-1324.

McConaughy, E.A., Prochaska, J.O., & Velicer, W.F. (1983). Stages of change in psychotherapy: Measurement and sample profiles. Psychotherapy: Theory, Research and Practice. 20, 368-375.

McCrae, R.R. & Costa, P.T. (1983). Social desirability scales: More substance than style. Journal of Consulting and Clinical Psychology. 51, 882-888.

National Clearinghouse for Smoking and Health (1974). Teenage

self-test: Cigarette Smoking (DHEW Publication No. [CDC] 74-8723).

Washington, D.C.: U.S. Government Printing Office.

National Institute on Drug Abuse (1980). National survey on drug abuse:

Main findings: 1979. U.S. Department of Health and Human Services,
Public Health Service, Alcohol, Drug Abuse and Mental Health
Administration. Rockville, MD.

O'Neill, H.K., Glasgow, R.E. & McCaul, K.D. (1983). Component analysis
in smoking prevention research: Effects of social consequences
information. Addictive Behaviors, 8, 419-423.

Perry, C., Killen, J., Slinkard, L.A. & McAlister, A.L. (1980). Peer
teaching and smoking prevention among junior high students.
Adolescence, 15, 277-281.

Perry, C.L., Telch, M.J., Killen, J., Burke, A. & MacCoby, N. (1983).
High school smoking prevention: The relative efficacy of varied
treatments and instructors. Adolescence, 18, 561-566.

Piaget, J. (1960). The psychology of intelligence. London: Routledge
and Kegan Paul.

Prochaska, J.O. (1979). Systems of psychotherapy: A transtheoretical
analysis. Homewood, IL: Dorsey Press.

- Prochaska, J.O. & DiClemente, C.C. (1982). Transtheoretical therapy: Toward a more integrative model of change. Psychotherapy: Theory, Research and Practice, 19, 276-288.
- Prochaska, J.O. & DiClemente, C.C. (1983). Stages and processes of self-change of smoking: Toward an integrative model of change. Journal of Consulting and Clinical Psychology, 51, 390-395.
- Prochaska, J.O., DiClemente, C.C. Velicer, W.F., & Zwick, W.R. (1982). Measuring processes of change. Journal of Consulting and Clinical Psychology.
- Rapoport, A. & Wallsten, T.S. (1972) Individual decision behavior. Annual Review of Psychology, 23, 131-176.
- Schneider, F.W. & Vanmastrigt, L.A. (1974). Adolescent-preadolescent differences in beliefs and attitudes about cigarette smoking. The Journal of Psychology, 87, 71-81. ✓
- Schvaneveldt, J.D. & Adams, G.R. (1983) Adolescents and the decision-making process. Theory Into Practice, 22, 98-104.
- Schinke, S.P. & Gilchrist, L.D. (1983). Survey and evaluation methods: Smoking prevention among children and adolescents. National Institute on Drug Abuse. Research Monograph Series, 48, 96-104.

United States Department of Health and Human Services. (1983). The Surgeon General's report: Health consequences of smoking (DHHS Publication No. [PHS] 82-50179). Washington, D.C.: U.S. Government Printing Office.

United States Public Health Service (1976). Teenage smoking: National patterns of cigarette smoking, age 12 through 18, in 1972 and 1974 (DHEW Publication No. [NIH] 76-931). Washington, D.C.: U.S. Government Printing Office.

Urberg, K. & Robbins, R.L. (1981). Adolescents' perceptions of the costs and benefits associated with cigarette smoking: Sex differences and peer influence. Journal of Youth and Adolescence, 10, 353-361. ✓

Velicer, W.F. (1976). Determining the number of components from the matrix of partial correlations. Psychometrika, 41, 321-327.

Velicer, W.F., DiClemente, C.C., Prochaska, J.O., & Brandenburg, N. (in press). A decisional balance measure for assessing and predicting smoking status. Journal of Personality and Social Psychology.

Wilcox, N.S., Prochaska, J.O., Velicer, W.F. & DiClemente, C.C. (in press). Subject characteristics as predictors of self change in smoking. Addictive Behaviors.

TABLES

Table 1
Grade and Sex Distribution
of Subjects

<u>Grade Level</u>	<u>n</u>
6	30
7	56
8	31
9	48
10	27
11	10
Sex	
Female	117
Male	85
Total	202

Table 2
The Final 21 Items of the Stages of Acquisition Questionnaire

Scale I. Precontemplation

1. I do not have any plans to start smoking.
2. I don't feel any need to start smoking.
3. I never think that I will start smoking.
4. I have no interest in smoking cigarettes.
5. I have no reason to start smoking.
6. I don't want to smoke.
7. I don't feel like I want to start smoking.

Scale II. Decision-Making

1. Sometimes I think I may start smoking cigarettes.
2. I decided to see what smoking is like.
3. I have started to smoke a little.
4. Every so often I think about starting to smoke cigarettes.
5. I wanted to see what smoking was like so I am trying it out.
6. I am smoking a little to see if I like it.
7. I may give smoking a try.

Scale III. Maintenance

1. I don't think about stopping smoking because I really like it.
 2. I don't want to cut down on the amount I smoke.
 3. I'm going to keep on smoking at least as much as I do now.
 4. I don't want to quit smoking.
 5. Smoking is something I don't want to stop doing.
 6. I am not going to stop smoking because it makes me feel good.
 7. I don't think about breaking my smoking habit.
-

Table 3
Varimax Rotated Component Pattern of the Final 21 SAO Items

Item Number	Original Judged Stage ^a	Component		
		1	2	3
1	C	.81		
2	A	.81		
3	A	.81		
4	A	.80		
5	A	.75		
6	C	.75		
7	C	.72		
8	P		.77	
9	P		.77	
10	P		.76	
11	P		.74	
12	P		.72	
13	P		.71	
14	P		.67	
15	M			.77
16	M			.75
17	M			.73
18	M			.70
19	M			.69
20	M			.68
21	M			.67

^aP = Precontemplation; C = Contemplation; A = Action;
M = Maintenance.

Table 4
Means, Standard Deviations, Coefficient Alphas, and
Pearson Correlation Coefficients for the Three Scales.

Scale	M	SD	Reliability Coefficient	Pearson Correlation Coefficient	
				D	M
Precontemplation (P)	26.60	7.27	.91	-.65	-.39
Decision-Making (D)	15.59	7.60	.94	—	.46
Maintenance (M)	14.67	5.69	.86		—

Table 5
Varimax Rotated Component Pattern of the Final Nine-Item
Decisional-Balance Scales

Item #	Component		
	1 (Pros- Approval)	2 (Pros- Utility)	3 (Cons)
1	.83		
2	.77		
3	.71		
4		.80	
5		.77	
6		.73	
7			.79
8			.75
9			.72

Table 6

Items of the Final Nine-Item Decisional Balance Scales

Scale 1. Pro- Approval

1. Kids who smoke have more friends.
2. Smoking makes kids get respect from others.
3. Kids who smoke go out on more dates.

Scale 2. Pro- Utility

1. Smoking cigarettes is pleasurable.
2. Smoking helps people to cope better with frustration.
3. Smoking cigarettes relieves tension.

Scale 3. Con

1. Smoking can affect the health of others.
 2. Smoking cigarettes is hazardous to people's health.
 3. Cigarette smoke bothers other people.
-

Table 7

The four items of the Pleasure Scale

-
1. Smoking cigarettes is pleasant and relaxing.
 2. I find cigarettes pleasurable.
 3. I feel happy when I am smoking.
 4. Smoking cigarettes gives me a good feeling.
-

Table 8
Means, Standard Deviations, and T-Scores for the Three
Validation Groups for the Three SAO Scales

Group	Scale	<u>M</u>	<u>SD</u>	<u>T-Score</u>
Immotive	Precontemplation	29.26	5.68	53.7
	Decision-Making	12.50	5.52	45.9
	Maintenance	13.66	5.20	48.2
Ambivalent	Precontemplation	22.92	5.12	44.9
	Decision-Making	22.92	5.57	59.7
	Maintenance	15.42	4.91	51.3
Confirmed	Precontemplation	16.32	5.50	35.9
	Decision-Making	24.37	6.74	61.6
	Maintenance	19.21	6.55	58.0

Table 9

Means, Standard Deviations, and T-Scores for the Five Clusters
on the Decisional-Balance, Pleasure, and Desirability Scales

Cluster Name	Scale	<u>M</u>	<u>SD</u>	<u>T-Score</u>
Precontemplation	Pro- Approval	4.04	2.24	44.2
	Pro- Utility	4.33	1.75	44.2
	Con	12.73	3.43	51.3
	Pleasure	—	—	—
	Desirability	11.16	2.60	52.7
Contemplation	Pro- Approval	4.44	1.51	45.9
	Pro- Utility	5.11	2.32	47.1
	Con	12.44	3.88	50.3
	Pleasure	—	—	—
	Desirability	8.22	3.15	43.1
Decision-Making	Pro- Approval	6.04	2.52	52.3
	Pro- Utility	7.32	2.48	55.3
	Con	12.46	2.38	50.4
	Pleasure	9.00	3.08	45.4
	Desirability	9.80	3.36	48.1
Action	Pro- Approval	7.08	2.73	56.5
	Pro- Utility	8.19	2.67	58.6
	Con	11.84	3.00	48.2
	Pleasure	12.47	2.85	53.7
	Desirability	8.42	2.27	43.8
Maintenance	Pro- Approval	7.25	4.57	56.5
	Pro- Utility	8.19	2.67	58.6
	Con	12.50	1.73	50.5
	Pleasure	16.00	2.71	62.1
	Desirability	12.50	2.08	57.0

FIGURES

Figure 1. Mean scores for Uninvolved Cluster (N=27).

Figure 2. Mean scores for Older Precontemplation Cluster (N=45).

Figure 3. Mean scores for Younger Precontemplation Cluster (N=32).

Figure 4. Mean scores for Decision-Making Cluster (N=32).

Figure 5. Mean scores for Action Cluster (N=26).

Figure 6. Mean scores for Contemplation Cluster (N=9).

Figure 7. Mean scores for Smoking Image Cluster (N=8).

Figure 8. Mean scores for Maintenance Cluster (N=4).

Figure 9. Mean scores for Never-Smoker Cluster (N=15).

Cluster: Older Contemplation Decision-Making Action Maintenance
Precontemplation

Figure 10. Mean scores on the Pro-Approval and Con Scales for five clusters representing five stages of acquisition.

Figure 11. Mean scores on the Desirability Scale for five clusters representing five stages of acquisition.

APPENDICES

APPENDIX A

P A R E N T A L I N F O R M E D C O N S E N T F O R M

CHILD'S NAME _____

SCHOOL _____ GRADE _____

I understand that my child has been selected to participate in a study being conducted by the Pawtucket Heart Health Program and the University of Rhode Island Department of Psychology. The study is designed to better understand how children and teenagers acquire the behavior of cigarette smoking.

I further understand that this study will take place for one hour during school time and has been approved by the school principal and the Superintendent of Schools.

My child will view a video tape depicting the scientific analysis of saliva in detecting recent cigarette smoking. My child will then chew on a piece of dental cotton which can later be used to detect traces of cigarette smoking.

My child will then answer a questionnaire about such things as who in their family and amongst their friends smoke cigarettes, whether or not they smoke now or plan to in the future, whether they feel any peer pressure to smoke, what their attitudes toward smoking are, etc.

The answers to these questions will be strictly confidential. Names will not be used. Code numbers will be used to match saliva samples and questionnaires. Under no condition will any teacher, parent, other child or anyone who knows my child be allowed to see the answers he/she gives or the results of the saliva analysis. The results of this study will be used for research purposes only and will be helpful in the development of future programs aimed at preventing cigarette smoking.

I may withdraw my permission for my child to participate at any time and for any reason and my child may refuse to answer any questions. If I have any questions or comments I can call Robert Stern at the Pawtucket Heart Health Program, telephone 728-7591.

Please check one:

☐ Yes, my child may participate.

☐ No, my child may not participate.

Signed _____ Date _____

Please have your child return this form to his or her teacher
WITHIN FIVE DAYS

APPENDIX B

PARTICIPANT'S INFORMED CONSENT FORM

NAME _____ GRADE _____
SCHOOL _____ TEACHER'S NAME _____

I understand that I have been selected to be part of a project being run by the Pawtucket Heart Health Program and the University of Rhode Island Department of Psychology. This project will help to understand why kids start smoking cigarettes.

I also understand that this project will take place during one hour of school time. The principal of my school and the Superintendent of Schools have given their approval for this project.

I understand that I will be asked to do the following during the one hour:

- * Watch a video tape showing me how saliva can be tested to see if someone has been smoking.
- * Chew on a piece of cotton that will then be used to help see if I have been smoking.
- * Answer a questionnaire about things like whether or not I smoke now or want to smoke in the future, who in my family smokes, what I feel about smoking in general, and what kind of pressures I feel about smoking.

I understand that all of my answers to the questionnaire and the results of the saliva test will be TOTALLY CONFIDENTIAL. This means that no one I know will ever see my answers, including my parents, teachers, and friends. My name will not be on the questionnaire and only code numbers will be used for identification.

The answers to the questionnaire will only be used by the Pawtucket Heart Health Program and the University of Rhode Island and will never be seen by my school or parents. The results of this project will only be used for future research on smoking.

I may decide not to participate at any time and for any reason and I may refuse to answer any question. I may only participate if my parents (or guardians) give their permission. If I have any questions about this project I can call Mr. Robert Stern at the Pawtucket Heart Health Program, 728-7591.

Please check one:

- _____ Yes, I will participate.
_____ No, I will not participate.

Signed _____ Date _____