INFORMATION TO USERS

This manuscript has been reproduced from the microfilm master. UMI films the text directly from the original or copy submitted. Thus, some thesis and dissertation copies are in typewriter face, while others may be from any type of computer printer.

The quality of this reproduction is dependent upon the quality of the copy submitted. Broken or indistinct print, colored or poor quality illustrations and photographs, print bleedthrough, substandard margins, and improper alignment can adversely affect reproduction.

In the unlikely event that the author did not send UMI a complete manuscript and there are missing pages, these will be noted. Also, if unauthorized copyright material had to be removed, a note will indicate the deletion.

Oversize materials (e.g., maps, drawings, charts) are reproduced by sectioning the original, beginning at the upper left-hand corner and continuing from left to right in equal sections with small overlaps. Each original is also photographed in one exposure and is included in reduced form at the back of the book.

Photographs included in the original manuscript have been reproduced xerographically in this copy. Higher quality 6” x 9” black and white photographic prints are available for any photographs or illustrations appearing in this copy for an additional charge. Contact UMI directly to order.
THE IMPACT OF A PSYCHOSOCIAL SMOKING PREVENTION PROGRAM ON SELECT SOCIAL COGNITIVE THEORY CONSTRUCTS

DISSERTATION

Presented in Partial Fulfillment of the Requirements for the Degree Doctor of Philosophy in the Graduate School of The Ohio State University

By

Marietta Ann Langlois, M.A.

*****

The Ohio State University
1998

Dissertation Committee:

Rick Petosa, Adviser
Janet Henderson
Stephen Loebs

Approved by

Adviser
Health, Physical Education & Recreation Graduate Program
Copyright by
Marietta Ann Langlois
1998
ABSTRACT

The purpose of this study was to determine the impact of a psychosocial smoking prevention program on the Social Cognitive Theory constructs of behavioral capability to resist positive images of smoking, refusal skill-efficacy, total positive refusal expectations & importance and total negative refusal expectations & importance. A secondary purpose of this study was to determine if a student’s smoking status interacted with the treatment. The Minnesota Smoking Prevention Program was implemented in five intact sixth-grade classrooms. Five intact sixth-grade classrooms served as the comparison group. A three-way analysis of variance with an alpha of .05 was conducted. The three factors built into the design were treatment, smoking status and time of testing. An experimental smoker was defined as a student who reported any cigarette use in the past 365 days. For statistically significant ANOVA $F$ values, individual $t$-tests were conducted post hoc.

This study documented that a psychosocial smoking prevention program impacted three SCT constructs: refusal skill-efficacy, total positive refusal expectations & importance and total negative refusal expectations & importance. Student’s smoking status interacted with treatment for the constructs refusal skill-efficacy and total negative refusal expectations & importance. Participation in the program resulted in higher refusal skill-efficacy for smokers. Nonsmokers, after participation in the program, had lower
total negative refusal expectations and importance. For both nonsmokers and smokers, participation in the program resulted in significantly higher scores for total positive refusal expectations & importance. The fourth variable studied, behavioral capability to resist positive images of smoking, was not impacted by the program. Measurement threats may have influenced the lack of significant treatment effects for the variable behavioral capability to resist positive images of smoking.

Other study findings consistent with the SCT were the lower scores by smokers for behavioral capability to resist the positive images of smoking and refusal skill-efficacy. Study findings inconsistent with the SCT were scores by smokers for total positive refusal expectations & importance and total negative refusal expectations & importance.
ACKNOWLEDGMENTS

I would like to express my appreciation to my committee members, Drs. Janet Henderson, Stephen Loebs and Rick Petosa. I thank you for your input, guidance and enthusiasm for my project.

To “my fourth committee member”, statistical consultant, instrument panel member, proof reader and friend, Jeff Hallam, I thank you.

This project would not have been possible without the support of Middletown City Schools, specifically Substance Abuse Education Coordinator Sara Martin and the sixth grade teachers of Roosevelt, Amanda and Jefferson Elementaries.

I also acknowledge my wonderful co-workers who in addition to traveling the roller coaster ride with me, managed the fort while I was away and even more impressively were able to keep track of me during these past years. More specifically I thank Anne Haye for an outstanding job as program facilitator, instrument panel member and proof reader.

Most importantly, I thank my number one supporters, my family: Marilyn, Al, Paula, David, Morgan, Wendy, Curt, Ann, Bryan, Dani, Nick, Kristin and Kara. I greatly appreciate every act of kindness, support and healthy diversion that has been so much a part of this process.

Lastly, I would like to thank my writing partners, Keebler, Ben & Jerry’s and Diet Coke.
VITA

November 17, 1966 ........................................... Born - Windsor, Ontario

1989 .................................................................. B.A. HPER, University of Cincinnati

1990 .................................................................. M.A. HPER, Morehead State University

1990 - 1992 ........................................................... Health Educator, Morehead Clinic

1992 - 1994 ........................................................... Graduate Teaching Associate,
                                             The Ohio State University

1994 - present ....................................................... Director, Health Education
                                             Middletown Regional Hospital

FIELDS OF STUDY

Major Field: Health, Physical Education & Recreation
Cognate: Health Services & Hospital Administration
# TABLE OF CONTENTS

Abstract ...................................................................................................................... ii
Acknowledgment ....................................................................................................... iv
Vita ............................................................................................................................ v
Table of Contents ...................................................................................................... vi
List of Tables ............................................................................................................ x
List of Figures ......................................................................................................... xvi

<table>
<thead>
<tr>
<th>CHAPTER</th>
<th>PAGE</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>INTRODUCTION</td>
</tr>
<tr>
<td></td>
<td>Significance of Problem</td>
</tr>
<tr>
<td></td>
<td>Smoking Prevention Efforts</td>
</tr>
<tr>
<td></td>
<td>The Theoretical Model of Psychosocial Smoking Prevention Programs</td>
</tr>
<tr>
<td></td>
<td>Problem Statement</td>
</tr>
<tr>
<td></td>
<td>Research Questions</td>
</tr>
<tr>
<td></td>
<td>Hypotheses</td>
</tr>
<tr>
<td></td>
<td>Definition of Terms</td>
</tr>
<tr>
<td></td>
<td>Limitations</td>
</tr>
<tr>
<td></td>
<td>Delimitations</td>
</tr>
<tr>
<td>CHAPTER</td>
<td>PAGE</td>
</tr>
<tr>
<td>---------</td>
<td>------</td>
</tr>
<tr>
<td>4</td>
<td>RESULTS .............................................................................................................</td>
</tr>
<tr>
<td></td>
<td>Describing the Sample ..................................................................................</td>
</tr>
<tr>
<td></td>
<td>Descriptive Data of Social Cognitive Theory Constructs By Treatment ........</td>
</tr>
<tr>
<td></td>
<td>Descriptive Data of Social Cognitive Theory Constructs By Smoking Status ....</td>
</tr>
<tr>
<td></td>
<td>Hypotheses Testing .......................................................................................</td>
</tr>
<tr>
<td></td>
<td>Post Hoc Analysis .........................................................................................</td>
</tr>
<tr>
<td>5</td>
<td>DISCUSSION OF RESULTS &amp; CONCLUSIONS .......................................................</td>
</tr>
<tr>
<td></td>
<td>Introduction to Conclusions .........................................................................</td>
</tr>
<tr>
<td></td>
<td>Introduction to Discussion of Results ........................................................</td>
</tr>
<tr>
<td></td>
<td>Conclusions from Descriptive Data ................................................................</td>
</tr>
<tr>
<td></td>
<td>Conclusions for Behavioral Capability to Resist Positive Images of Smoking ...</td>
</tr>
<tr>
<td></td>
<td>Discussion for Behavioral Capability to Resist Positive Images of Smoking ....</td>
</tr>
<tr>
<td></td>
<td>Conclusions for Refusal Skill-Efficacy .......................................................</td>
</tr>
<tr>
<td></td>
<td>Discussion for Refusal Skill-Efficacy ........................................................</td>
</tr>
<tr>
<td></td>
<td>Conclusions for Total Positive Refusal Expectations &amp; Importance ...............</td>
</tr>
<tr>
<td></td>
<td>Discussion for Total Positive Refusal Expectations &amp; Importance ..................</td>
</tr>
<tr>
<td></td>
<td>Conclusions for Total Negative Refusal Expectations &amp; Importance ...............</td>
</tr>
<tr>
<td></td>
<td>Discussion for Total Negative Refusal Expectations &amp; Importance ..................</td>
</tr>
<tr>
<td></td>
<td>Implications for Future Research ..................................................................</td>
</tr>
<tr>
<td></td>
<td>Implications for the Health Promotion Practitioner .....................................</td>
</tr>
<tr>
<td></td>
<td>Summary Statement .........................................................................................</td>
</tr>
</tbody>
</table>
# LIST OF TABLES

<table>
<thead>
<tr>
<th>TABLE</th>
<th>PAGE</th>
</tr>
</thead>
<tbody>
<tr>
<td>3.1</td>
<td>Characteristics of Target Sample</td>
</tr>
<tr>
<td>3.2</td>
<td>Overview of Sample Sizes</td>
</tr>
<tr>
<td>3.3</td>
<td>Overview of Lesson 1 of the Minnesota Smoking Prevention Program</td>
</tr>
<tr>
<td>3.4</td>
<td>Overview of Lesson 2 of the Minnesota Smoking Prevention Program</td>
</tr>
<tr>
<td>3.5</td>
<td>Overview of Lesson 3 of the Minnesota Smoking Prevention Program</td>
</tr>
<tr>
<td>3.6</td>
<td>Overview of Lesson 4 of the Minnesota Smoking Prevention Program</td>
</tr>
<tr>
<td>3.7</td>
<td>Overview of Lesson 5 of the Minnesota Smoking Prevention Program</td>
</tr>
<tr>
<td>3.8</td>
<td>Overview of Lesson 6 of the Minnesota Smoking Prevention Program</td>
</tr>
<tr>
<td>3.9</td>
<td>Percentages of Program Implemented by Classroom</td>
</tr>
<tr>
<td>4.1</td>
<td>Demographic and Smoking Variables for the Treatment and Comparison Group, as Measured at Pretest</td>
</tr>
<tr>
<td>4.2</td>
<td>Pretest and Posttest Frequency Distribution and Mean Scores of Cigarettes Smoked During Past Seven Days for Treatment Group and Comparison Group</td>
</tr>
<tr>
<td>4.3</td>
<td>Pretest and Posttest Frequency Distribution and Mean Scores of Cigarettes Smoked During Past 30 Days for Treatment Group and Comparison Group</td>
</tr>
<tr>
<td>TABLE</td>
<td>PAGE</td>
</tr>
<tr>
<td>-------------</td>
<td>-------</td>
</tr>
<tr>
<td>4.4</td>
<td>152</td>
</tr>
<tr>
<td>Pretest and Posttest Frequency Distribution of Cigarettes Smoked During Past 365 Days for Treatment Group and Comparison Group</td>
<td></td>
</tr>
<tr>
<td>4.5</td>
<td>153</td>
</tr>
<tr>
<td>Pretest and Posttest Frequency Distribution of Cigarettes Smoked in Lifetime for Treatment Group and Comparison Group</td>
<td></td>
</tr>
<tr>
<td>4.6</td>
<td>155</td>
</tr>
<tr>
<td>Pretest and Posttest Mean Scores of Dependant Variables: Behavioral Capability to Resist Positive Images of Smoking, Refusal Skill-Efficacy, Total Positive Refusal Expectations &amp; Importance and Total Negative Refusal Expectations &amp; Importance</td>
<td></td>
</tr>
<tr>
<td>4.7</td>
<td>157</td>
</tr>
<tr>
<td>Pretest and Posttest Mean Scores of Behavioral Capability to Resist Positive Images of Smoking for Treatment and Comparison Group</td>
<td></td>
</tr>
<tr>
<td>4.8</td>
<td>159</td>
</tr>
<tr>
<td>Pretest and Posttest Frequency Distribution of Behavioral Capability to Resist the Positive Images of Smoking for Treatment and Comparison Group</td>
<td></td>
</tr>
<tr>
<td>4.9</td>
<td>160</td>
</tr>
<tr>
<td>Pretest and Posttest Mean Scores of Refusal Skill-Efficacy for Treatment and Comparison Group</td>
<td></td>
</tr>
<tr>
<td>4.10</td>
<td>162</td>
</tr>
<tr>
<td>Pretest and Posttest Frequency Distribution of Refusal Skill-Efficacy for Treatment and Comparison Group</td>
<td></td>
</tr>
<tr>
<td>4.11</td>
<td>163</td>
</tr>
<tr>
<td>Pretest and Posttest Mean Scores of Refusal Skill-Efficacy and By Person Making the Cigarette Offer for Treatment and Comparison Group</td>
<td></td>
</tr>
<tr>
<td>4.12</td>
<td>164</td>
</tr>
<tr>
<td>Pretest and Posttest Mean Scores of Refusal Skill-Efficacy and By Situation for Treatment and Comparison Group</td>
<td></td>
</tr>
<tr>
<td>4.13</td>
<td>166</td>
</tr>
<tr>
<td>Pretest and Posttest Mean Scores of Refusal Skill-Efficacy and By Type of Pressure for Treatment and Comparison Group</td>
<td></td>
</tr>
<tr>
<td>4.14</td>
<td>168</td>
</tr>
<tr>
<td>Pretest and Posttest Mean Scores of Total Refusal Outcome Expectations for Treatment and Comparison Group</td>
<td></td>
</tr>
<tr>
<td>4.15</td>
<td>170</td>
</tr>
<tr>
<td>Pretest and Posttest Mean Scores of Total Refusal Outcome Expectancies for Treatment and Comparison Group</td>
<td></td>
</tr>
<tr>
<td>4.16</td>
<td>172</td>
</tr>
<tr>
<td>Pretest and Posttest Frequency Distribution and Mean Scores of Total Positive Refusal Expectations &amp; Importance for Treatment and Comparison Group</td>
<td></td>
</tr>
</tbody>
</table>
4.17 Pretest and Posttest Frequency Distribution and Mean Scores of Total Negative Refusal Expectations & Importance for Treatment and Comparison Group .............................................................. 174

4.18 Pretest and Posttest Mean Scores of Dependant Variables: Behavioral Capability to Resist Positive Images of Smoking, Refusal Skill-Efficacy, Total Positive Refusal Expectations & Importance and Total Negative Refusal Expectations & Importance for Treatment Group, Nonsmoker and Experimental Smoker .......................................................................................... 177

4.19 Pretest and Posttest Mean Scores of Dependant Variables: Behavioral Capability to Resist Positive Images of Smoking, Refusal Skill-Efficacy, Total Positive Refusal Expectations & Importance and Total Negative Refusal Expectations & Importance for Comparison Group, Nonsmoker and Experimental Smoker .......................................................................................... 179

4.20 Pretest and Posttest Mean Scores of Behavioral Capability to Resist Positive Images of Smoking for Treatment Group, Nonsmoker and Experimental Smoker .............................................................. 181

4.21 Pretest and Posttest Frequency Distribution of Behavioral Capability to Resist Positive Images of Smoking for Treatment Group, Nonsmoker and Experimental Smoker .............................................................. 182

4.22 Pretest and Posttest Mean Scores of Behavioral Capability to Resist Positive Images of Smoking for Comparison Group, Nonsmoker and Experimental Smoker .............................................................. 184

4.23 Pretest and Posttest Frequency Distribution of Behavioral Capability to Resist Positive Images of Smoking for Comparison Group, Nonsmoker and Experimental Smoker .............................................................. 186

4.24 Pretest and Posttest Mean Scores of Refusal Skill-Efficacy for Treatment Group, Nonsmoker and Experimental Smoker .............................................................. 188

4.25 Pretest and Posttest Frequency Distribution of Refusal Skill-Efficacy for Treatment Group, Nonsmoker and Experimental Smoker .............................................................. 189

4.26 Pretest and Posttest Mean Scores of Refusal Skill-Efficacy for Comparison Group, Nonsmoker and Experimental Smoker .............................................................. 190

xii
<table>
<thead>
<tr>
<th>TABLE</th>
<th>Description</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>4.27</td>
<td>Pretest and Posttest Frequency Distribution of Refusal Skill-Efficacy for <strong>Comparison Group</strong>, Nonsmoker and Experimental Smoker</td>
<td>192</td>
</tr>
<tr>
<td>4.28</td>
<td>Pretest and Posttest Mean Scores of Refusal Skill-Efficacy and By Person Making the Cigarette Offer for <strong>Treatment Group</strong>, Nonsmoker and Experimental Smoker</td>
<td>194</td>
</tr>
<tr>
<td>4.29</td>
<td>Pretest and Posttest Mean Scores of Refusal Skill-Efficacy and By Person Making the Cigarette Offer for <strong>Comparison Group</strong>, Nonsmoker and Experimental Smoker</td>
<td>195</td>
</tr>
<tr>
<td>4.30</td>
<td>Pretest and Posttest Mean Scores of Refusal Skill-Efficacy and By Situation for <strong>Treatment Group</strong>, Nonsmoker and Experimental Smoker</td>
<td>197</td>
</tr>
<tr>
<td>4.31</td>
<td>Pretest and Posttest Mean Scores of Refusal Skill-Efficacy and By Situation for <strong>Comparison Group</strong>, Nonsmoker and Experimental Smoker</td>
<td>198</td>
</tr>
<tr>
<td>4.32</td>
<td>Pretest and Posttest Mean Scores of Refusal Skill-Efficacy and By Type of Pressure for <strong>Treatment Group</strong>, Nonsmoker and Experimental Smoker</td>
<td>200</td>
</tr>
<tr>
<td>4.33</td>
<td>Pretest and Posttest Mean Scores of Refusal Skill-Efficacy and By Type of Pressure for <strong>Comparison Group</strong>, Nonsmoker and Experimental Smoker</td>
<td>202</td>
</tr>
<tr>
<td>4.34</td>
<td>Pretest and Posttest Mean Scores of Refusal Outcome Expectations for <strong>Treatment Group</strong>, Nonsmokers and Experimental Smokers</td>
<td>204</td>
</tr>
<tr>
<td>4.35</td>
<td>Pretest and Posttest Mean Scores of Refusal Outcome Expectations for <strong>Comparison Group</strong>, Nonsmokers and Experimental Smokers</td>
<td>206</td>
</tr>
<tr>
<td>4.36</td>
<td>Pretest and Posttest Mean Scores of Refusal Outcome Expectancies for <strong>Treatment Group</strong>, Nonsmokers and Experimental Smokers</td>
<td>208</td>
</tr>
<tr>
<td>4.37</td>
<td>Pretest and Posttest Mean Scores of Refusal Outcome Expectancies for <strong>Comparison Group</strong>, Nonsmokers and Experimental Smokers</td>
<td>210</td>
</tr>
</tbody>
</table>
TABLE | PAGE
--- | ---
4.38 Pretest and Posttest Frequency Distribution and Mean Scores of Total Positive Refusal Expectations & Importance for **Treatment Group**, Nonsmokers and Experimental Smokers | 212
4.39 Pretest and Posttest Frequency Distribution and Mean Scores of Total Positive Refusal Expectations & Importance for **Comparison Group**, Nonsmokers and Experimental Smokers | 214
4.40 Pretest and Posttest Frequency Distribution and Mean Scores of Total Negative Refusal Expectations & Importance for **Treatment Group**, Nonsmokers and Experimental Smokers | 216
4.41 Pretest and Posttest Frequency Distribution and Mean Scores of Total Negative Refusal Expectations & Importance for **Comparison Group**, Nonsmokers and Experimental Smokers | 218
4.42 Summary of Factorial Analysis of Variance for Behavioral Capability to Resist Positive Images of Smoking | 222
4.43 Summary of Factorial Analysis of Variance for Refusal Skill-Efficacy | 224
4.44 Summary of Factorial Analysis of Variance for Total Positive Refusal Expectations & Importance | 226
4.45 Summary of Factorial Analysis of Variance for Total Negative Refusal Expectations & Importance | 228
4.46 Post Hoc t-test for Behavioral Capability to Resist the Positive Images of Smoking, Smoking Status Main Effect | 229
4.47 Post Hoc t-test for Behavioral Capability to Resist the Positive Images of Smoking, Time of Testing Main Effect | 230
4.48 Post Hoc t-test for Refusal Skill-Efficacy, Treatment by Smoking Status Interaction Effect | 231
4.50 Post Hoc t-test for Total Positive Refusal Expectations & Importance, Treatment Main Effect | 233
4.51 Post Hoc t-test for Total Negative Refusal Expectations & Importance, Treatment by Smoking Status Interaction Effect | 234
<table>
<thead>
<tr>
<th>TABLE</th>
<th>PAGE</th>
</tr>
</thead>
<tbody>
<tr>
<td>4.52</td>
<td>235</td>
</tr>
<tr>
<td>Post Hoc t-test for Total Negative Refusal Expectations &amp; Importance, Time of Testing by Smoking Status Interaction Effect</td>
<td></td>
</tr>
<tr>
<td>A.1</td>
<td>318</td>
</tr>
<tr>
<td>Reliability &amp; Validity Results from Instrument Pilot Test</td>
<td></td>
</tr>
<tr>
<td>A.2</td>
<td>344</td>
</tr>
<tr>
<td>Instrument Confirmatory Factor Analysis Results</td>
<td></td>
</tr>
</tbody>
</table>
LIST OF FIGURES

<table>
<thead>
<tr>
<th>FIGURE</th>
<th>PAGE</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.1 Mediating Variables in Psychosocial Smoking Prevention Programs</td>
<td>8</td>
</tr>
<tr>
<td>2.1 Mediating Variables in Psychosocial Smoking Prevention Programs</td>
<td>45</td>
</tr>
<tr>
<td>3.2 Mediating Variables in Psychosocial Smoking Prevention Programs</td>
<td>103</td>
</tr>
</tbody>
</table>
CHAPTER 1

INTRODUCTION

SIGNIFICANCE OF PROBLEM

As noted by former Surgeon General Antonia Novello, "...smoking represents the most extensively documented cause of disease ever investigated in the history of biomedical research" (Department of Health and Human Services [US DHHS], 1990, p. 8). The Center for Disease Control & Prevention (CDC) estimates that smoking is responsible for 420,000 deaths each year in the United States (CDC, 1994a). As early as 1964, the Surgeon General concluded that smoking was causally associated to lung and laryngeal cancer in men and the most important cause of chronic bronchitis. Through the past 30 years of research, coronary heart disease, lung and laryngeal cancer in women, cancer of the esophagus and oral cavity, chronic obstructive pulmonary disease, aortic aneurysm and stroke have been added to the list of diseases linked causally to cigarette smoking. Additionally, cigarette smoking has been cited as either a probable cause or contributing factor of infertility, peptic ulcers, increased infant mortality and cancer of the bladder, pancreas and kidney (US DHHS, 1989). Former Surgeon General and tobacco control advocate C. Everett Koop called smoking “the most important public health issue of our time” (Orleans & Slade, 1993, p. vii).
Cigarette smoking's impact goes beyond premature mortality. One popular means of estimating societal economic costs is by assessing costs to employers. Feilding (1985) reported that in one chemical company, smokers averaged 5.5 more absences a year and eight more days of disability leave per year. Furthermore, conservative estimates of excess costs to employers per smoker was in a range of $300 to $800 per year. This additional cost was estimated at $960 by Bertera (1991), while costs for other lifestyle related risk factors were overweight, $401, excess alcohol, $389 and high blood pressure, $370. The economic cost of smoking alone was more than twice that of any other risk factor. The synergistic effect of smoking on other risk factors was not assessed; this might further increase the excessive costs. Smoking tobacco also harms and creates additional costs for non-smokers. Children of smokers have been found to have higher rates of respiratory infections and number of sick days (Byrd, 1992).

Tobacco, more specifically nicotine, is as addictive as heroin (CDC, 1994c). Thus, continuation of cigarette smoking is not by simple choice. The American Cancer Society has reported that 90% of current smokers would like to quit smoking (Feilding, 1985). However, one-year success rates for cessation programs average around 20% (US DHHS, 1990). Adolescent cessation rates are equally dismal. Johnson, O'Malley and Bachman (1989) estimate that annually, half of adolescent smokers attempt to quit smoking. Less than 20% are successful for even a month.

Smoking has been called a "pediatric epidemic" by former Surgeon General, Joycelyn Elders (Elders, Perry, Eriksen & Giovino, 1994, p. 546). Even though the physiological, disease and financial effects of smoking are often not realized until
adulthood, the behavioral roots begin in childhood. Of current smokers, 90% began smoking prior to the age of 18 and it is estimated that 75% of adult smokers became addicted prior to the age of 18 (CDC, 1996; Feighery, Altman & Schaffer, 1991). Of those who begin smoking prior to age 18, the CDC estimates that 50% will die from a smoking attributable disease. Between the years 1985 - 1989, the CDC estimated that 600,000 adolescents began smoking, thus, they conclude that 300,000 will die from a smoking attributable disease (CDC, 1995).

The rate of adolescent tobacco initiation has plateaued since 1984. Figures from 1995, report that 34.8% of high school students (grade 9 through 12) have reported trying a cigarette in the past 30 days. Half that, 16.1%, report smoking greater than 20 cigarettes in the past 30 days (CDC, 1996). While initiation rates have remained stable, the number of adolescents is increasing, thus the number of new adolescent smokers has been increasing gradually (CDC, 1996).

Poor cessation rates, the addictive nature of nicotine and the recruitment of adolescents to become smokers have led former Surgeon Generals C. Everett Koop and Joycelyn Elders to emphasize the importance of preventing smoking initiation and adoption. Since the average age of initiation is estimated at 14.5 years old, many of these prevention efforts have been targeted in our schools (CDC, 1994b). School-based tobacco education programs can prevent teens from starting to smoke and thus, avoid the difficulties in quitting, once addicted (CDC, 1994c).
SMOKING PREVENTION EFFORTS

The goal of smoking prevention programs is to provide educational experiences which decrease the likelihood of cigarette smoking initiation and promotes the cessation of experimental smoking. There has been an evolution from knowledge-based programs to a social influences programs. Knowledge-based programs consist primarily of information about the harmful effects of smoking while psychosocial programs address the social pressures to smoke. As the emphasis changed, program successes in changing behavior improved.

Smoking prevention efforts began in the mid-sixties, when the ill-effects of smoking were first being communicated. These educational, school programs were knowledge-based and consisted primarily of information about the negative health consequences of smoking, such as premature death from heart disease and cancer. The assumption of knowledge-based programs is that when students are informed about the ill effects of smoking, they will make a rational decision not to smoke. Effectiveness data for these knowledge-based programs is difficult to locate; however, Flay (1993) reported that these programs often increased knowledge, but were not effective in decreasing the number of new adolescent smokers. In one review of smoking education programs, 1960-1978 (Thompson, 1978), results were described as “contradictory.” Contradictory in that changes in knowledge were not associated with changes in behavior. No quantitative results were reported through-out the entire review, but the author summarized school programs by noting “most programs had no significant depressant effect on smoking habits” (p. 251).
Smoking prevention programs began to show promise in the late 1970's. Richard Evans et al. (1978) and his colleagues at the University of Houston implemented an innovative smoking prevention curriculum. Program content went beyond the dissemination of facts. Content addressed the social pressures of peers, smoking parents and media and then taught students skills to cope with these pressures. Additionally, the immediate and short-term consequences of smoking were emphasized. This program produced a 50% reduction in smoking initiation.

Through the next two decades, Evans’ original work was replicated numerous times. In some instances, results were mixed, but still promising. After reviewing over 50 of these psychosocial tobacco prevention programs, Flay concluded, “when implemented optimally, these programs appear to reduce the proportion of students starting to smoke by approximately 30-50%” (Flay, 1993, p. 373). Most of the program evaluations, though, only focused on documenting a reduction in the initiation of smoking; very few studies documented the theoretical constructs altered by these programs (Flay, 1985; McCaul & Glasgow, 1985). These psychosocial smoking prevention programs were deemed as innovative and ground breaking because of their theoretical foundation and attention to altering documented antecedents to smoking initiation. Very few studies have attempted to demonstrate changes in these hypothesized mediating variables. McCaul and Glasgow (1985) summarize smoking prevention program evaluations for “construct validity” and determined “It is totally unclear what specific information or combination of information and method of presentation is responsible for reducing (smoking) initiation” (p. 380).
Process evaluations allow researchers to identify program components which contribute to the desired behavioral change. By identifying "what's working" in a particular program, practitioners can maximize the potential impact of the program. Short-term activities which are not mediating a change in smoking initiation can be removed, with more time and resources being spent on those variables which contribute to the reduction in smoking initiation. Additionally, some of these programs can be lengthy, up to 12, 45-minute sessions. Removing unnecessary activities would streamlined the curriculum and could increase the likelihood of implementation into a busy classroom. Information on mediating variables can also be used to plan activities to increase the long-term effectiveness of these programs. Sustaining these positive program impacts has been difficult. Many researchers (Murray, Pirie, Luepker & Pallonen, 1989) conclude that to sustain program effects, effective booster sessions must be implemented. When booster session are implemented, they are often just one lesson per year. The first step to planning effect booster sessions or update other learning activities is to learn what are the mediating variables for decreasing adolescent smoking. Lastly, construct validity evaluations can dispel the hypothesis of a "attention placebo" in which students may be responding to the uniqueness of the curriculum.

Process or construct evaluations may also be referred to as theory testing (McCaul & Glasgow, 1985). "The validity of these theoretical models (which programs are designed upon) can best be assessed by evaluating whether successful treatments are influencing the theoretically relevant intervening variables and whether these variables are associated with treatment outcome" (McCaul & Glasgow, 1985 p. 363). Theoretical constructs are the hypothesized mediating variables.
THE THEORETICAL MODEL OF
PSYCHOSOCIAL SMOKING PREVENTION PROGRAMS

The Social Cognitive Theory provides the theoretical framework for psychosocial smoking prevention programs. In this theory, individual behavior is believed to be influenced by the interaction of behavior, personal factors and environment (Perry, Baranowski & Parcel, 1990). The model for these psychosocial programs, as illustrated in Figure 1.1, reflects such an interaction. Through knowledge of the short-term and long-term consequences of smoking and knowledge of the social norm, students develop intentions to smoke. Because of the vast media attention to smoking as well as the inclusion of knowledge-based tobacco education in prior grades, this knowledge likely exists prior to participation in the smoking prevention intervention. The hypothesis of pre-existing knowledge and intentions is supported by the findings of stable student smoking intentions after participating in such a program (De Vries, et al., 1994; Flay, et al., 1995; MacKinnon, et al., 1991; Turner, et al., 1993). As depicted by Figure 1.1, psychosocial smoking prevention programs assume that students intend to not use tobacco. Learning activities are aimed at developing skills for refusing smoking and through practice and role playing, efficacy or confidence for using these skills is also developed. Actual use of these skills is influenced by students’ confidence to execute them, by their expectations as to what will happen when they do execute them, the value the person places on these expectations and by the reinforcements they receive for their decision. Use of the refusal skills then subsequently influences behavior.
Figure 1.1
Mediating Variables in Psychosocial Smoking Prevention Programs
Recently, process evaluations have been published in the area of smoking prevention. Constructs or variables most often examined have been refusal skill development (Biglan, et al., 1987; Elder, Woodruff, Sallis & Wildey, 1993; Elder, et al., 1994; Hops, et al., 1986; Katz, Robisch & Telch, 1989; MacKinnon, et al., 1991, Sallis, et al., 1990; Schinke & Gilchrist, 1983; Turner, et al., 1993), refusal self-efficacy (De Vries, et al., 1994; Flay, et al., 1995; MacKinnon, et al., 1991; Schinke & Gilchrist, 1983; Turner, et al., 1993) and smoking intentions (Botvin, Baker, Dusenbury, Tortu & Botvin, 1990; De Vries, et al., 1994; Flay, et al., 1995; Turner, et al., 1993). Results from these twelve process evaluations have documented three consistent findings: students enter psychosocial smoking prevention programs with pre-existing refusal skills, smoking intentions are not altered through program participation and that self-efficacy also is not altered through program participation.

The development of refusal skills has been measured well. Findings suggest that students enter these programs with pre-existing medium to high levels of refusal skills and psychosocial programs can increase them modestly (Hops, et al., 1986; Sallis, et al., 1990; Katz, et al., 1989). Control groups have also shown modest improvements in refusal skills from pre to post test (Sallis, et al. 1990; Elder, et al., 1994).

Refusal self-efficacy was measured in four of the twelve evaluations (Botvin, et al., 1990; De Vries, et al., 1994; Flay, et al., 1995; Turner, et al., 1993). Measurement of self-efficacy has not been as comprehensive nor as clearly defined as refusal skills. Previous measurement has not clearly define the construct being measured and as a result, has measured various types of efficacy. Most often, two types of efficacy are measured:
students’ perceived ability and confidence to refuse tobacco offers and students’ self-efficacy to remain smoke-free. While three of the four studies documented no treatment effects for self-efficacy, preliminary findings have suggested that refusal self-efficacy is not a global factor. Two studies have documented instances where efficacy varies by situational influences. Turner et al. (1993) reported that students were more efficacious in refusing smokeless tobacco than cigarettes. De Vries et al. (1994) documented a treatment effect for smokers at nine months. The construct of efficacy should be looked at in more detail with specific definitions of self-efficacy and with further exploration of smokers’ differential response to treatment.

Lastly, students’ smoking intentions often remain unchanged by these programs (De Vries, et al., 1994; Flay, et al., 1995 MacKinnon et al., 1991; Turner, et al., 1993). Whether intentions to not smoke are high (Turner, et al., 1993) or low (Flay, et al., 1994), research has not documented changes in students’ intentions after participation in a psychosocial smoking prevention program.

Thus, the results from the twelve previous process evaluations have produced no clear understanding as to how psychosocial smoking prevention programs work (Flay, 1995). The exploration of new theoretical constructs as well as the improvement of previous measures are next steps for future research. The remaining section of this chapter identifies possible constructs to be measured.

In a skill development program, the development of a skill and the confidence to use this skill (self-efficacy) are key hypothesized mediating variables to impacting a behavior. Self-efficacy is skill specific and situation specific (Maibach & Murphy, 1995).
In psychosocial smoking prevention programs, educational activities focus on students' ability to identify social pressures to smoke cigarettes and to develop skills to overcome these pressures. Students are taught skills to refuse direct tobacco offers as well as to resist positive media images and adult modeling of smoking. Thus, students would develop self-efficacy for each of these skills; to refuse tobacco (refusal skill-efficacy) and to resist the positive images of smoking. The above mentioned research has not examined refusal self-efficacy in this varied manner. Self-efficacy has been measured as a global factor, not recognizing situational influences nor skill specific efficacy. The constructs of outcome expectations and expectancies are tied closely to the construct of self-efficacy (Maibach & Murphy, 1995). "People are motivated to perform behaviors (skills) they believe will produce desired outcomes" (Maibach & Murphy, 1995, p. 38). Thus, not only should students' efficacy to use refusal skills be measured, what they believe will happen when they use these skills (expectations) and the value they place on the outcome (expectancies) should also be measured. Previous research has not addressed the constructs of refusal outcome expectations and expectancies and their impact on students' refusal skill-efficacy.
PROBLEM STATEMENT

The purpose of this study was to determine the impact of a psychosocial smoking prevention program on the Social Cognitive Theory constructs of behavioral capability to resist positive images of smoking, refusal skill-efficacy, total positive refusal expectations & importance and total negative refusal expectations & importance. A secondary purpose of this study was to determine if a student’s smoking status interacted with the treatment for the constructs of behavioral capability to resist positive images of smoking, refusal skill-efficacy, total positive refusal expectations & importance and total negative refusal expectations & importance.
RESEARCH QUESTIONS

1. Is there a statistically significant difference in behavioral capability to resist positive images of smoking score between the treatment group and the comparison group after the implementation of the intervention?

2. Is there a statistically significant difference in refusal skill-efficacy score between the treatment group and the comparison group after the implementation of the intervention?

3. Is there a statistically significant difference in total positive refusal expectations & importance score between the treatment group and the comparison group after the implementation of the intervention?

4. Is there a statistically significant difference in total negative refusal expectations & importance score between the treatment group and the comparison group after the implementation of the intervention?

5. Does a student's smoking status interact with treatment for the variable behavioral capability to resist positive images of smoking?

6. Does a student's smoking status interact with treatment for the variable refusal skill-efficacy?

7. Does a student's smoking status interact with treatment for the variable total positive refusal expectations & importance?

8. Does a student's smoking status interact with treatment for the variable total negative refusal expectations & importance?
HYPOTHESES

I. Hypotheses to Test Research Questions

Main Effect of Treatment:
H0: Treatment group mean score on behavioral capability to resist positive images of smoking will be equal to the comparison group mean score.

H1: Treatment group mean score on behavioral capability to resist positive images of smoking will not be equal to the comparison group mean score.

H0: Treatment group mean score on refusal skill-efficacy will be equal to the comparison group mean score.

H1: Treatment group mean score on refusal skill-efficacy will not be equal to the comparison group mean score.

H0: Treatment group mean score on total positive refusal expectations & importance will be equal to the comparison group mean score.

H1: Treatment group mean score on total positive refusal expectations & importance will not be equal to the comparison group mean score.

H0: Treatment group mean score on total negative refusal expectations & importance will be equal to the comparison group mean score.

H1: Treatment group mean score on total negative outcome expectations & importance will not be equal to the comparison group mean score.

Treatment by Smoking Status Interaction:
H0: Treatment and smoking status will not interact for behavioral capability to resist positive images of smoking.

H1: Treatment and smoking status will interact for behavioral capability to resist positive images of smoking.

H0: Treatment and smoking status will not interact for refusal skill-efficacy.

H1: Treatment and smoking status will interact for refusal skill-efficacy.

H0: Treatment and smoking status will not interact for total positive refusal expectations & importance.
H1: Treatment and smoking status will interact for total refusal expectations & importance.

H0: Treatment and smoking status will not interact for total negative refusal expectations & importance.

H1: Treatment and smoking status will interact for total negative refusal expectations & importance.

II. Hypotheses Developed from Design of the Study

Main Effect of Smoking Status:

H0: Nonsmoker group mean score on behavioral capability to resist positive images of smoking will be equal to the experimental smoker group mean score.

H1: Nonsmoker group mean score on behavioral capability to resist positive images of smoking will not be equal to the experimental smoker group mean score.

H0: Nonsmoker group mean score on refusal skill-efficacy will be equal to the experimental smoker group mean score.

H1: Nonsmoker group mean score on refusal skill-efficacy will not be equal to the experimental smoker group mean score.

H0: Nonsmoker group mean score on total positive refusal expectations & importance will be equal to the experimental smoker group mean score.

H1: Nonsmoker group mean score on total positive refusal expectations & importance will not be equal to the experimental smoker group mean score.

H0: Nonsmoker group mean score on total negative refusal expectations & importance will be equal to the experimental smoker group mean score.

H1: Nonsmoker group mean score on total negative outcome expectations & importance will not be equal to the experimental smoker group mean score.
Main Effect of Time of Testing:

H0: Behavioral capability to resist positive images of smoking mean score measured at pretest (time 1) will be equal to behavioral capability to resist positive images of smoking mean score at posttest (time 2).

H1: Behavioral capability to resist positive images of smoking mean score measured at pretest (time 1) will be equal to behavioral capability to resist positive images of smoking mean score at posttest (time 2).

H0: Refusal skill-efficacy mean score measured at pretest (time 1) will be equal to refusal skill-efficacy mean score at posttest (time 2).

H1: Refusal skill-efficacy mean score measured at pretest (time 1) will be equal to refusal skill-efficacy mean score at posttest (time 2).

H0: Total positive refusal expectations & importance mean score measured at pretest (time 1) will be equal to total positive refusal expectations & importance mean score at posttest (time 2).

H1: Total positive refusal expectations & importance mean score measured at pretest (time 1) will be equal to total positive refusal expectations & importance mean score at posttest (time 2).

H0: Total negative refusal expectations & importance mean score measured at pretest (time 1) will be equal to total negative refusal expectations & importance mean score at posttest (time 2).

H1: Total negative refusal expectations & importance mean score measured at pretest (time 1) will be equal to total negative refusal expectations & importance mean score at posttest (time 2).

Treatment by Time of Testing Interaction:

H0: Treatment and time of testing will not interact for behavioral capability to resist positive images of smoking.

H1: Treatment and time of testing will interact for behavioral capability to resist positive images of smoking.

H0: Treatment and time of testing will not interact for refusal skill-efficacy.

H1: Treatment and time of testing will interact for refusal skill-efficacy.
H0: Treatment and time of testing will not interact for total positive refusal expectations & importance.

H1: Treatment and time of testing will interact for total refusal expectations & importance.

H0: Treatment and time of testing will not interact for total negative refusal expectations & importance.

H1: Treatment and time of testing will interact for total negative refusal expectations & importance.

Smoking Status by Time of Testing Interaction:

H0: Smoking status and time of testing will not interact for behavioral capability to resist positive images of smoking.

H1: Smoking status and time of testing will interact for behavioral capability to resist positive images of smoking.

H0: Smoking status and time of testing will not interact for refusal skill-efficacy.

H1: Smoking status and time of testing will interact for refusal skill-efficacy.

H0: Smoking status and time of testing will not interact for total positive refusal expectations & importance.

H1: Smoking status and time of testing will interact for total refusal expectations & importance.

H0: Smoking status and time of testing will not interact for total negative refusal expectations & importance.

H1: Smoking status and time of testing will interact for total negative refusal expectations & importance.
DEFINITION OF TERMS

Theoretical constructs are constitutively and operationally defined in the first part of this section. Part two of this section includes constitutive definitions of terms related to the purpose of this study.

I. Theoretical Constructs
   A. Behavioral Capability to Resist the Positive Images of Smoking: is one’s ability to identify, evaluate the truthfulness and reject favorable images of smoking presented through media and adult modeling. Operationally, this variable is measured as one’s score on a 12-item subscale, with possible scores ranging from 0 to 36. The higher the score, the higher the behavioral capability to resist positive images of smoking. Cronbach’s alpha equals 0.80 and the coefficient of stability equals 0.89.

   B. Refusal Skill-Efficacy: one’s perceived ability to resist direct, indirect, hassle and put down type cigarette offers made by best friends, groups of friends and older students. Operationally, this variable is measured by one subscale of 20 Likert-type items. Possible scores range from 0 to 60. The higher the score, the higher the student’s skill efficacy to refuse cigarette offers. Cronbach’s alpha equals 0.97 and the coefficient of stability equals 0.80.

   C. Refusal Outcome Expectations: expected outcomes, positive and negative social consequences, from refusing cigarette offers. This variable is measured as two subscales: (1) Positive expectations; scores range from 9 to 36. Cronbach’s alpha equals 0.65 and the coefficient of stability equals 0.69. The higher the score, the higher the student’s expectations for positive outcomes from refusing cigarette offers. (2) Negative expectations; scores range from 12 to 48. The higher the score, the higher the student’s expectations for negative outcomes from refusing cigarette offers. Cronbach’s alpha equals 0.88 and the coefficient of stability equals 0.64.

   D. Refusal Outcome Expectancies: are the values, important or unimportant, that an individual places on refusal outcome expectations. This variable is measured as two subscales: (1) Values for positive expectations; scores range from 9 to 36. Cronbach’s alpha equals 0.86 and the coefficient of stability equals 0.85. The higher the score, the more the student values these outcomes. (2) Values for negative expectations; scores range from 12 to 48. The higher the score, the more the student values the avoidance of the negative outcomes. Cronbach’s alpha equals 0.88 and the coefficient of stability equals 0.64.
E. **Total Positive Refusal Expectations & Importance:** is the multiplicative function of positive refusal outcome expectations and expectancies. Operationally, this variable is the sum of the nine refusal outcome expectations multiplied by the corresponding refusal outcome expectancy. Scores for this subscale range from 9 to 144. Cronbach’s alpha equals 0.74 and the coefficient of stability equals 0.74.

F. **Total Negative Refusal Expectations & Importance:** is the multiplicative function of negative refusal outcome expectations and expectancies. Operationally, this variable is the sum of the 12 refusal outcome expectations multiplied by the corresponding refusal outcome expectancy. Scores for this subscale range from 12 to 192. Cronbach’s alpha equals 0.89 and the coefficient of stability equals 0.74.

G. **Smoking Status:**
- **Nonsmoker:** no reported cigarettes use in the past 365 days.
- **Experimental Smoker:** any reported cigarette use in the past 365 days.

**II. Additional Definitions**

A. **Psychosocial Smoking Prevention Program:** also referred to as “social influence programs”, are educational programs directed toward adolescents and designed to decrease the number of new smokers. They address the psychological aspect of smoking initiation as well as the social influences to smoke and range in length from 4 to 12, 45-minute sessions. As reported by Glynn (1989) and Flay (1985), they include three minimum components:
   a) discussion of short-term consequences of smoking
   b) refusal skill development
   c) identification of social pressures, including media
For the purpose of this study, the Minnesota Smoking Prevention Program was chosen as the treatment psychosocial smoking prevention program.

B. **Refusal Skill Capability:** is the ability and the manner in which a participant rejects cigarettes offers. Learned strategies include just say “no”, hang out with kids who do not use tobacco, suggest something else, give a reason, add some humor, standing up for yourself and avoiding high risk environments.

C. **Self-Efficacy:** is a person’s perceived ability and confidence to perform a skill (Perry, et al., 1990).

D. **Outcome Expectations:** are expected outcomes of behavior (Perry, et al., 1990).
E. **Outcome Expectancies:** are the values the individual places on these expectations (Perry, et al., 1990).

F. **High-Risk Environments:** are situations in which the use of tobacco is increased due to availability, presence of peers, increased social pressures or lack of adult supervision.
LIMITATIONS

Limitations for this study include limited generalizability, reliance on self-report data and too few subjects for an instrument confirmatory factor analysis. The sample is one of convenience, not randomly selected. Thus, results should only be generalized to those students participating in the study. Secondly, data regarding refusal skill-efficacy, behavioral capability to resist positive images of smoking, refusal outcome expectations, refusal outcome expectancies and smoking status are self-reported by the student. Thirdly, while the instrument was piloted on a separate sample, because of practical constraints of resources and availability of subjects, a factor analysis testing for construct validity was conducted on pretest sample data. The actual number of pretest subjects with useable data was 166. Gorsuch (1983) recommends a minimum of five subjects for each questionnaire item included in the factor analysis, with no less than 100 subjects. Thus, for a 78-item questionnaire, 390 subjects are recommended. The discrepancy of subjects for the confirmatory factor analysis is a limitation of the study.

One should also consider the effects of attrition when interpreting substance abuse prevention programs (Botvin, 1990). Twenty-two percent of the pretest sample was not included in data analysis because of inability to match posttest scores or because of absences at treatment sessions. Flay (1985) cautions that should the loss of subjects occur differentially amongst sample subgroups, such as smokers, internal validity is threatened. Botvin (1990) notes, though, that attrition rates of smokers often occurs similarly in all treatment conditions and thus, does not threaten internal validity but decreases generalizability (external validity). Of the 22% loss of subjects, 20% of comparison
group pretest subjects were lost. The treatment group experienced a 24% loss of subject rate. While the percentage of lost subjects was similar in both groups, the comparison group appears to have lost more experimental smokers: 39% of the treatment and 60% of the comparison subjects who were not included in data analysis because of inability to match pre to post tests or because of missing data were categorized as smokers. The differential loss of smokers at pretest does not affect the internal validity of the study, though. Only complete data sets (subjects with a pre and post test) were used in analysis. Treatment effects would not have been experienced because of differential attrition of smokers through the program because subjects who did not have complete data sets were not included in the analysis. Having treatment and comparison group samples which differed from one another at the pretest would have decreased the internal validity of the program. Data from the responding sample indicates, though, that the proportion of smokers in the treatment group is similar; 35% of the treatment and 39% of comparison.

In addition to decreasing the generalizability of the study, the 22% loss of subject rate also decreases the statistical power of the study. Small or moderate effects sizes in this study may have gone undetected because of the loss of power.
DELIMITATIONS

For the purpose of this study, four of the Social Cognitive Theory constructs were measured. Those variables examined include self-efficacy (specifically called refusal skill-efficacy), behavioral capability (specifically called behavioral capability to resist the positive images of smoking), outcome expectations and outcome expectancies. Refusal skill capability, an educational objective of psychosocial smoking prevention programs, has been thoroughly examined by other researchers (Biglan, et al., 1987; Elder, et al., 1993; Elder, et al., 1994; Hops, et al. 1986; Katz, et al., 1989; MacKinnon, et al., 1991, Sallis, et al., 1990; Schinke & Gilchrist, 1983; Turner, et al., 1993) and will not be a part of this study. These researchers found that students appear to enter programs with pre-existing tobacco refusal skills and psychosocial smoking preventions programs improve these skills modestly (Elder, et al., 1994; Hops, et al., 1986; Katz, et al., 1989; Sallis, et al., 1990). MacKinnon, et al. (1991) found no treatment differences for refusal skill capability.

Smoking status is self-reported data. Physiological means, expired carbon monoxide and saliva thiocyanate levels, measures do exist to measure smoking behavior, but were not used in this study. Because adolescent smoking tends to be episodic and develops gradually, these measures are imperfect when assessing levels of student smoking (Murray, O'Connell, Schmid & Perry, 1987). Furthermore, these methods are expensive, time consuming and because experimental smoking was defined as any cigarette smoking in the past year, these biological means were not used to validate smoking behavior. Smoking status was used to stratify the sample for analysis purpose.
This information could only be collected by self-report data; the above mentioned biological methods do not accurately categorize adolescents as experimental smokers (Pechacek, et al., 1984). The bogus-pipeline method has been used to increase the validity of self-report data (Evans, Hansen & Mittlemark, 1977). This method assumes that children are more likely to report smoking behavior if they believe the researcher has a means of measuring the behavior. In a review of eleven bogus pipeline studies, Murray, Richards, Luepker and Johnson (1987) reported that six of the studies' findings did not support the use of a bogus pipeline. Additionally, Botvin (Botvin, Botvin, Renick & Filazzola, 1984) notes that when smoking is not socially undesirable, the use of the bogus pipeline may not be warranted. For the purpose of this study, questionnaires were anonymous and self-report smoking was not be collected under bogus pipeline conditions.

The curriculum addresses smoking prevention, other forms of tobacco were not addressed. Additionally, the program was implemented by the researcher and a research assistant. Both individuals have Masters degrees in health promotion and education with seven years of combined experience in teaching behavior change programs. Other program facilitators, beyond this study, may not have these skills, and thus, program impact may differ.

The sample is delimited to sixth graders in the participating Middletown City Schools. Sixth grade classes were selected because of prior research. Sixth and seventh grades are targeted because of an increase in tobacco initiation in these transitional school grades. Additionally, the curriculum selected, the Minnesota Smoking Prevention
Program, was written for sixth or seventh graders. One school, verses multiple school sites, was chosen to receive the treatment to minimize the effects of history and to help the researcher with ease of implementation. History refers to unplanned events which may influence the results of the study. Examples include the death of a student, enforcement of a new policy, or national news event. While these events can not be controlled by the researcher, they can be recorded and discussed in the findings. By minimizing the locations, the exposure to historical events will at least be similar for the treatment group and the comparison group. Roosevelt Elementary was selected as the treatment school because of its large number of sixth grade classes (n = 5), status as a median school of academic performance and school willingness to participate. The comparison sixth grade classes were selected because of the similar gender and race rates, social economic status and academic achievement. Sources of data were school records of gender and race and percentage of students on the free school lunch program. No records of student smoking existed.
CHAPTER 2

REVIEW OF LITERATURE

Smoking prevention has been a popular topic in the health education, behavioral and psychological research journals. Authors have examined antecedents to smoking initiation, effects of environment control and smoking prevention curricula. Much of this research activity began in the early 1980s after Richard Evans and his colleagues (1978) documented a 50% reduction in smoking initiation by implementing an innovative school program, later termed psychosocial smoking prevention programs. In the seven years following Evans' work, his study was replicated, with variations, over 25 times (Flay, 1985). To date, questions remain as to what program components mediate the decrease in smoking initiation (Flay, 1993). Only twelve process evaluations examining changes in intervening program theoretical constructs have been published.

The purpose of this study is to evaluate the impact of a psychosocial smoking prevention curriculum on the Social Cognitive Theory constructs of behavioral capability to resist positive images of smoking, refusal skill-efficacy, total positive refusal expectations & importance and total negative refusal expectations & importance. A secondary purpose of this study is to determine if a student's smoking status interacts with treatment for the constructs behavioral capability to resist positive images of
smoking, refusal skill-efficacy, total positive refusal expectations & importance and total negative refusal expectations & importance.

Because the body of adolescent smoking initiation and prevention research is so large, this review of the research is selective, focusing on psychosocial prevention program effectiveness and studies examining changes in mediating variables. This chapter begins by highlighting two thorough reviews of tobacco prevention programs. In these reviews, the dependent variable is initiation of cigarette use by adolescents. As with much of health education evaluation, a program was implemented and then the researcher evaluated the program's effect on the desired behavior.

In the second part of this chapter, the limited number of process evaluations related to these smoking prevention programs are reviewed in detail. In process evaluations, the independent variable is a tobacco prevention curriculum, and the dependent variable will include variables other than, but possibly including, tobacco initiation and use. These studies examine variables which mediate a change in behavior. The goal of these studies is to answer "what's working" in the curriculum to produce the desired decrease in smoking initiation. Examples of mediating variables examined include degree of program implementation, the effects of different program components and changes in theoretical constructs.
OVERVIEW OF SMOKING PREVENTION EFFORTS:

1960 - 1978

The Surgeon General’s report of 1964 created interest in smoking education and prevention. Early educational programs were knowledge-based school programs which consisted primarily of information about the negative health consequences of smoking, such as premature death from heart disease and cancer. They were described by McCaul and Glasgow (1985) as “...smoking prevention programs typically included one-sided persuasive attempts to increase adolescents’ knowledge about the dangers of smoking” (p.362). The assumption of knowledge-based programs is that when students are informed about the ill effects of smoking, they will make a rational decision not to smoke. Effectiveness data for these knowledge-based programs is difficult to locate; however, Flay (1993) reports that these programs often increased knowledge, but were not effective in decreasing the number of new adolescent smokers. In one review of smoking education programs, 1960 -1978 (Thompson, 1978), results were described as “contradictory”. Contradictory in that changes in knowledge were not associated with changes in behavior. A cited example of these contradictory findings included an evaluation of four teaching methods; (1) didactic, (2) group discussion, (3) psychological persuasion and (4) a combination of the three previous methods were evaluated for their impact on smoking behavior. The combination method produced the most change in knowledge, yet the didactic approach was most successful in changing smoking behavior. “The amount of behavior change measured...appeared to be small” (p.251). No quantitative results were reported throughout the entire review, but the author
summarized school programs by noting “most programs had no significant depressant effect on smoking habits” (p. 251).

OVERVIEW OF PSYCHOSOCIAL TOBACCO PREVENTION PROGRAMS: 1978 to PRESENT

Psychosocial programs began with Richard Evans at the University of Houston in 1978. His innovative approach moved away from traditional knowledge-based programs and addressed students’ awareness of social pressures and knowledge of short-term consequences of tobacco use. Additionally, he believed that if students could be inoculated against these social pressures prior to exposure to them, their resistance would be higher and they would be more likely to be successful in resisting pressures. Flay (1985) begins his review with Evan’s work and reviews 26 other psychosocial programs published between 1978 and 1985.

As noted by Flay, “social influence” programs are quite standardized and include information on the short-term consequences of tobacco use, correcting students perceptions regarding social norms, exploring social influences and the development of refusal skills. These programs tend to be more interactive and employ a variety of student-centered learning techniques. Social influences include modeling by friends, siblings, parents and media. Role-playing is most often taught by modeling of these pressure situations via peer educators or videotape and then role-playing involving all the students. Public commitments not to use tobacco are also common to these programs. Broader scope “life/social skills programs” include the same components as social
influence programs but also include self-esteem, assertiveness and general social competence skills; these programs were also included in this review. Flay’s review focused primarily on the methodologies employed by researchers. Flay thought that as the methods used by researchers became more rigorous, the confidence in the treatment findings would increase. Thus, each of the published studies/programs were reviewed for number of sessions, intervention grades, primary provider, random assignment, use of pretest/posttest, length of follow-up, attrition, tracking means, use of media and or peer leaders, saliva collections and reported data. Studies were grouped together into four generations; generational strengths and weakness were also summarized. For each study, there is a discussion of possible alternative data interpretations.

**Generation 1:**

The establishment of social influences prevention programs began with Evans’ (Evans, et al., 1978) promising study. Many of the innovative techniques and methods of this study have remained the same through the 18 years of smoking prevention research. To develop this original psychosocial program, Evans first pulled students together in focus groups to explore the antecedents to smoking initiation. He found that students already believed that smoking was harmful and that three primary perceived social pressures appeared to influenced a child’s smoking initiation; peers, smoking parents and media. In referring to McGuire’s Theory of Inoculation, Evans believed that if students were exposed to these pressures in a practice environment and developed refusals prior to exposure to the real pressures, students would be more likely to be successful in their refusal or coping with the pressure (Evans, et al., 1978). Thus, Evans’ curriculum
addressed the short-term social and physical consequences of smoking, identification of social influences, including media, refusal skill modeling and peer educators, via videotape.

There were four levels of treatment in this study; all levels received a pretest, with cigarette smoking as the dependant variable. The full treatment group viewed four videotapes addressing all of the above social influences followed by small group discussions. Students were also asked to make posters related to the video tape content. Posttests were given after each lesson/videotape. The next level of treatment received “feedback only” with posttesting after each session. While descriptions of “feedback only” by Flay (1985) or Evans et al. (1978) are unclear, it appears that it refers to the feedback students received regarding their group’s smoking status. After each posttest, the students received information collected from each posttest regarding smoking status of the class. The third level was testing only. The subjects received all the same testing (n = 4) as the two previous groups. Lastly, the control group received only the pretest (01) and the final posttest (04). The final posttest was administered ten weeks after the initiation of the treatment. Assignment to level of treatment was a combination of random assignment by school and assignment by student. In two of the ten schools, students were randomly assignment to level of treatment and all four treatment levels existed at that school. In two other schools, all four levels existed, but students were not randomly assigned to one of the four levels. The six remaining schools were randomly assigned to a level of treatment. The total number of subjects was 750.
Self-report measures of smoking were collected at each testing. To increase the validity, Evans introduced what is commonly used and known as the "bogus pipeline." Students were asked to submit saliva samples, which they believe would be analyzed for nicotine, and then asked about their smoking behavior. In preliminary evaluations of this method, Evans found significant differences in the number of students who reported smoking under the bogus pipeline conditions (Evans, Hansen & Mittlemark, 1977). In a later review of this method, Murray, O'Connell, Schmid and Perry (1987) concluded that evaluations of this method are divided. Their study produced findings to support the pipeline, but reviewed six studies which reported no significant differences when using the pipeline. Evans then used their self-report smoking status as the dependent variable. The control group did not participate in the bogus pipeline. Students were classified as smokers if they smoked greater than or equal to once a month. All students classified as smokers after the pretest were excluded from the data analysis. For the full treatment group (n = 80), there was a 10% onset of smoking; the control group (n = 104) had an 18% smoking onset rate. Thus, smoking decreased by approximately 50%. The two other levels of treatment, feedback (n = 93) and testing only (n = 97), had smoking onset rates of 9% and 10%, respectively. An alternative explanation, as pointed out by Flay and Evans, may be due to the extensive testing. Students, knowing that they were being testing for smoking behavior, may have been less likely to start smoking. This appears very plausible since the feedback group and the testing only group, whom also received the testing, also documented similar reductions in smoking initiation. Additionally, Evans notes that another methodological short-coming was the short
follow-up period of 10-weeks. Other study weaknesses include lack of reporting attrition rates and lack of random assignment. Statistically, the unit of analysis is also confusing; the unit of "assignment" in eight of the schools was by school, yet analysis was by student.

While results were difficult to interpret with confidence, this research still represents the most significant piece of work in present day substance prevention programs. Prior to this study, programs were knowledge-based and focused primarily on the long-term health consequences of smoking. Because of the promising results and the theoretical foundation and justification in this innovative curriculum, the next 18 years following this study were spent replicating this study with attention to introducing slight program alterations and increasing validity.

Generation 2:

Second generational studies, as defined by Flay (1985), were published between 1979 through 1982. During this generation, program topics and study design remained very similar to that of Evans' first generational study; however, Flay notes that programs had a stronger emphasis on theoretical constructs, including the Social Cognitive Theory, attribution and cognitive-behavior therapy. Modeling actual refusal skill development and self-efficacy received more attention. Programs were also strengthened by adding peer leaders, public commitment and behavioral learning techniques, such as role playing. The number of sessions increased to range between 5 to 12 sessions. Follow-up was often longer for these studies as well; ranging from 3 to 24 months. The main contributors to this generation were Botvin and Eng with their LifeSkills training and Schinke &
Gilchrist with their “cognitive, behavioral approach.” This cognitive, behavioral approach included lessons on decision making and problem solving, in addition to the standard psychosocial smoking prevention components. The second generational studies also included the first evaluations of Minnesota Smoking Prevention Program.

Findings were similar to that of Evans, often reporting a similar reduction in smoking initiation (Flay, 1985). In the two Washington studies, Schinke & Blythe, 1981 and Schinke & Gilchrist, 1983 (cited in Flay, 1985), smoking onset decreased by as much as 79% at six months. While exact numbers were not reported, 8% of the intervention group had smoked in the past month versus 37.5% of the control. The total number of subjects reported in these two groups was 56. Botvin reported similar findings; reducing the onset of monthly smoking by 56% at three months. This difference had decayed to a statistically insignificant value of 25% by one year. However, if examining weekly smoking, differences between the control (n = 99) and treatment (n = 109) were significant at one year. There were 50% more weekly smokers in the control group (n=25) than the treatment group (n=12). As Flay notes, because of incomplete data reported, small sample sizes in some instances and only one school or class being randomly assigned, interpreting these published findings still had various possible alternative explanations.

Individually, these results are difficult to interpret with great confidence; however, six of the seven studies during this generation documented reductions in smoking initiation. The advances in this generation, other than duplication of Evans’ original findings, were longer follow-ups periods, more comprehensive programs and
attention to skill development. These results were promising enough to warrant the next generation of smoking prevention research in which more detailed was directed to study design.

**Generation 3:**

The focus was now to improve research methods of the previous studies. Botvin and Schinke and Gilchrist continued to be contributors, but saw the addition of further evaluation of the Minnesota Smoking Prevention Program and the addition of community programs, including North Karelia and Oslo. The time frame for these publications was between 1981 and 1984.

During the third generation, much of the program content and theoretical foundations improved during the second generation remained the same. The number of sessions ranged from 5 to 20, with the median being six sessions. Differences were found dependant upon who provided the content; peer leaders, regular teachers or project staff. There was also the addition of booster sessions (Botvin, et al., 1984). Two to three schools were now assigned to experimental conditions. In all but two studies, the community projects, random assignment was used. Findings were mixed, yet still promising. Six of the 12 reviewed studies documented reductions in smoking initiation by nonsmokers. Botvin et al. (1984) reported a 50% reduction in smoking initiation. Gilchrist and Schinke (1984) reported a 78% reduction at 15 months. Five of the studies documented reductions in regular smoking and reductions in the number of experimenters becoming regular smokers. Peer lead programs appeared to impact smoking slightly more than their counterpart. Because of pre-group differences and testing differences,
Flay cautions the interpretation of these peer lead findings, though. In addition to missing reported data and high attrition rates, Flay notes that third generational studies, two alternative explanations existed for each of the 12 studies he reviewed. Testing by treatment interactions were possible as well as the Hawthorne Effect. Students likely perceived testing as part of the intervention and those students enrolled in programs received the special attention of researchers. Thus, one might argue that special attention to a problem or monitoring of a behavior may be the reason for behavior change, not because of changes of mediating program variables.

Flay concludes that contributions of third generation were that of testing different approaches to these psychosocial programs and the development of stronger research methods. Program changes adopted from this generation include peer educators and booster sessions. Emphasis was still on documenting changes in smoking behavior, process evaluations examining changes in constructs leading to changes in smoking, remained unaddressed. Serious methodological flaws still existed in many of the studies, yet the growing magnitude of individual studies producing similar, encouraging findings, produced a fourth generation of research in which the studies became much larger and focused on internal validity.

Fourth Generation:

"Many of the fourth generation studies were designed with the sole objective of establishing whether or not the social influences approach to smoking prevention is efficacious when tested under more rigorous methodological conditions" (Flay, 1985, p. 467). Little attention was paid to evaluating different components or methods of delivery.
This generation, (1983 -1985) consisted of six studies. These projects were labeled as Waterloo, Stanford/Harvard, Australia, Michigan, Oregon and USC II.

Flay notes as a strength of this generation was that in all studies, five or more units were randomly assigned to level of treatment (treatment verses comparison group). With the exception of one, Oregon (Biglan, et al., 1986), the targeted grade level was sixth or seventh grade; Evans, (1978) targeted seventh graders. The number of sessions varied, ranging from 4 (Oregon) through 12 (Stanford/Harvard). The Waterloo program had 11 sessions and included five booster sessions in subsequent grades. All programs used peer leaders and used the media as a teaching tool. Attrition rates were consistent, ranging between 12 and 35%.

Results were mixed. Flay notes the four methodologically weaker studies produced the least promising results. The Stanford/Harvard study and the Oregon study produced no significant effects on the prevalence of smoking. As alternative explanations, the Oregon study had significant attrition rates and the curriculum was short, in comparison to other programs, consisting of three sessions and then a booster session two weeks later. One of these sessions was devoted to refusal skill modeling and then practice. Both the Oregon and Stanford/Harvard projects had large pretest differences in the smoking status. Similarly, the USC study documented short-term changes in knowledge, attitudes and normative beliefs, yet no difference in smoking behavior (note try and find actual USC study, citations not journals). The two most rigorous studies documented reductions in smoking and smoking initiation. Summarized by Flay, the Waterloo study reduced experimental smoking by 43% and had significant
effects on the initiation of experimental smoking. The Australian study, implemented similar to the Stanford/Harvard study, documented a reduction of 26% in smoking initiation for girls and 39% for boys.

In all these studies, with the exception of the USC study, the Hawthorne Effect and the testing treatment interaction remained as threats to validity. Testing may have interacted with the program; because students were being testing for smoking, they may have been less likely to start smoking. The special attention that students received may have been responsible for some of the changes attributed to the intervention.

In summarizing the fourth generation, Flay concludes that the confidence in which one could say that these programs reduce smoking initiation was now slightly greater. “The findings of the most rigorous studies to date suggest that the social influences approach to smoking prevention can be effective some of the time” (p. 473). After eight years of research, program components were well defined and fairly standardized, despite differences regarding length of program and additional topics.

Flay concluded his review by expressing that these psychosocial programs appear to “reduce smoking onset by about 50%” (p. 449). Because these evaluations were outcome oriented, with smoking status as the dependant variable and participation in a smoking prevention program as the independent variable, questions remain about the mechanism of change. These innovative programs have been repeatedly praised because of their theoretical foundation (Flay 1985; McCaul & Glasgow 1985), yet little investigation has been conducted to examine which of the constructs are altered by the intervention. As explained by Flay, “each component of a program is designed to
produce a particular effect, and it is the combination of all those effects that should prevent smoking" (p. 479). Future research, a fifth generation, should measure and describe the program in detail, measure changes in assumed mediating variables and attempt to link changes in these variables to behavior change.

Bruvold (1993) conducted a meta-analysis of tobacco prevention programs published in the 1970s and 1980s. This quantitative review included 84 studies of school age interventions. All reviewed studies had formal evaluations which included a comparison/control group that received no organized intervention.

Interventions were first categorized by orientation: rational, developmental, social norms and social reinforcements. *Rational* programs provide factual information about a drug and its consequences. The primary means of teaching is through lectures and question and answers. These programs are thought of as traditional, disease-oriented health education. *Developmental* programs focus on increasing self-esteem, decision-making skills and other interpersonal skills. Lecture, discussion and group problem-solving activities are the primary teaching techniques. *Social norms* programs have little focus on drug/tobacco education, but rather aim to decrease alienation via community involvement and recreational activities. The orientation is to present alternatives to drug use. Educational techniques include participating in community projects, vocational training, tutoring and recreational activities. *Social reinforcement* programs address social pressures. The focus is on recognizing social influences, develop skills to combat these pressures and identify short-term and long-term consequences of drug use.

39
Teaching techniques include discussion, behavior modeling and role playing. These social reinforcement programs are analogous to what Flay refers to as psychosocial programs.

The meta-analysis measured effect size for knowledge, attitude and smoking behavior. Outcome evaluations were conducted either immediately following the intervention or at one of the three follow-up periods. Very few studies reported evaluations at the third follow-up. Time was not uniform for these three follow-ups. Effect size was measured: $Me - Mc/SDc$; where $Me$ is the experimental group mean, $Mc$ is the mean for the control group and $SDc$ is the standard deviation of the control group. In addition, weighted average effect size were also calculated for all “better methodological studies.” Studies in which an effect size could not be calculated were included in a “vote-count estimate of effect size.” This nonparametric measure recorded the direction of change in behavior and constructs; either favoring (+) or not favoring (-) the intervention group. Thus, this method included all of the studies; however, Bruvold noted that the best estimate of true effect size was derived from the better methodological studies. In some cases, though, the number of better methodological studies included in these calculations were small.

All program types produced statistically significant increases in knowledge. Social reinforcement produced the largest effect size, but, also had the lowest number of studies ($n = 3$). At posttest follow-up, the effect size regarding increases in knowledge was 1.04 ($n = 2$), where rational was 0.64 ($n = 12$), social norms, 0.20 ($n = 5$) and developmental, 0.40 ($n = 6$). Effect sizes were calculated at different follow-ups.
intervals, yet each study only had one follow-up measure. Thus, for social reinforcement, there were two studies with measures immediately after posttest and one a first follow-up, totaling n = 3. For knowledge, effect size was consistent within the categories at different follow-up intervals. Bruvold noted these increases in knowledge were likely because of common practice to include knowledge information in health education programs.

Very little effect size was documented in altering attitudes, regardless of the type of program. Social reinforcement had an effect size of 0.33 (n = 1) immediately following intervention and 0.51 (n = 2) at first follow-up. Effect size for other programs classifications ranged between -0.03 (rational) and 0.15 (developmental). The number of studies included in these calculations ranged from three to eight. Bruvold noted that because of the small number of measures, making conclusions is difficult.

For the effect size on smoking, there were a greater number of measures and thus, increased confidence in the findings. Social reinforcement consistently produced the largest effect size. Immediately following the intervention, the effect size was 0.39 (n = 9): at first follow-up, 0.62 (n = 13) and at second follow-up, 0.30 (n = 10). Social norms produced positive and similar results at the first two follow-up measures: 0.30 (n = 8) and 0.55 (n = 3). Effect sizes were similar, yet slightly smaller, when looking at the “better social reinforcement and social norms methodological studies.” Development programs produced mixed results. When looking at all the developmental studies, effect size at first follow-up was 0.29 (n = 11) and 0.30 (n = 9) at second follow-up. When looking at just the “better methodological studies”, results appear to decay by first follow-up, with the effect size decreasing from 0.36 (n = 6) to 0.08 (n = 5). Effect sizes for
information based, rational programs were small and often negative; immediately after intervention effect size was 0.04 (n = 28) and then 0.17 (n = 16) at first follow-up.

This review indicates that social reinforcement programs produced the largest reduction in smoking initiation. Those programs which address social influences, develop refusal skills and address the short-term consequences of smoking to reduce the initiation of smoking more than other educational experiences. Social norm and development (life skills) also produce reductions in smoking initiation, though. Positive program impacts were also demonstrated for altering knowledge and attitudes through social influence programs. Bruvold summarized by calling for more research to further explore these three types of programming in preventing adolescents from smoking. As a reader, a next step appears to be identifying which components in these three programs are mediating a change in smoking behavior. There is overlap amongst the curriculum. If the overlapping activities were the ones mediating a change, then the similar content might explain the reduction in smoking initiation by all three curriculums.

In summarizing psychosocial tobacco prevention programs, both Bruvold and Flay conclude that these programs reduce the initiation of smoking. As a body of research, these results have been so convincing that the National Cancer Institute (Glynn, 1989) recommend these psychosocial components of short-term consequences, identification of social influences, including media and the development of refusal skills as “essential parts of school tobacco prevention programs.” However, as Flay noted as early as 1985, mechanisms as to how these programs work remain unclear. McCaul and Glasgow (1985) reported similar conclusions after reviewing psychosocial smoking
prevention programs for construct validity. "It is through such determination (construct validity) that we can confidently obtain theoretical understanding, program generalization and program improvement. There has been progress over the last decade in the development of effective smoking prevention programs. The groundwork has been laid; it is now time to develop an understanding of the techniques that will successfully prevent adolescent and subsequent adult smoking" (p. 382).

With confidence in the program effectiveness of these psychosocial smoking prevention programs, research activity began to examine variables which might mediate the reduction of adolescent smoking. These construct validity evaluations are the focus of the second part of this chapter.
PROCESS EVALUATIONS IN
SMOKING PREVENTION RESEARCH

Process evaluation, for the purpose of this chapter review and study, examines a program's impact on mediating variables. Hypothesized mediating variables are the dependent variable and are defined by a program's theoretical foundation and content. Figure 2.1 represents a model of the core of psychosocial smoking prevention programs. These programs tend to assume that youth have the intent not to smoke, and thus focus more on enabling and reinforcing factors such as skill development, efficacy and outcome expectation and expectancies.

Studies examining changes in the above constructs have been limited to 12 studies. Most of the early work in this area was small in scope and, with the exception of Schinke and Gilchrist (1983), examined the students' acquisition of refusal skills. The concluding part of this section and literature review addresses more recently published work in which other mediating variables are studied. In addition to refusal skill acquisition, variables most often examined were smoking intentions and refusal self-efficacy. Some of the larger studies, Flay et al. (1995); Botvin et al. (1990); De Vries et al. (1994), MacKinnon et al. (1991) and Sussman et al. (1993b, 1995) additionally measure smoking as an outcome measure. Also reviewed in this section is a different type of process evaluation; Sussman et al. (1993a, 1993b, 1995) focused on which three common program comments produced greater reductions in smoking initiation.
Figure 2.1
Mediating Variables in Psychosocial Smoking Prevention Programs
MEASUREMENT OF REFUSAL SKILLS

Hops et al. (1986) examined students’ acquisition of refusal skills after participating in a psychosocial smoking prevention program. Role play situations were introduced and then refusal skills were measured via audiotape. Subjects, 131 seventh graders, were volunteers who had completed a four session psychosocial tobacco prevention program, six months prior (Biglan, et al., 1985, 1986). Some of these students, the exact number was unreported, were in the control group and had not received the treatment. The taped situations consisted of 26 social and 4 solitary situations recorded on audio-tape. A sample situation and dialogue was a party in which a voice on the tape says “This is a great party. Are you having fun? Do you want a cigarette?” After a practice situation, the tape was played and students were instructed to respond to each of the questions and their responses were recorded and coded later. Responses were scored in three categories: (1) latency, how long it took the student to start their response (2) response time, the total time it took to emit their response (3) verbal content of response. The coding for verbal responses consisted of nine categories: (1) direct refusal (2) health facts (3) conciliatory/supportive (4) excuse/change of subjects (5) withdraw (6) external consequences (IE. I’ll get in trouble) (7) assertive (8) aggressive (9) accept. Inter-coder reliability ranged between 81 to 100%. Students who had participated in the intervention had longer response times \( F(26,88) = 2.20, p = .003 \). Students in the treatment were more likely to use direct responses (treatment mean \( \bar{X} = 20.02 \) verses control mean \( \bar{C} = 17.35 \)), provide excuses \( \bar{X} = 26.00 \) verses \( \bar{C} = 18.41 \) and mentioned external consequences \( \bar{X} = 4.98, \bar{C} = 2.99 \). Groups did not
differ statistically in giving health reasons, using a direct "I", being aggressive, withdrawing from situation or in accepting the cigarette offer. Additionally, Hops noted that both groups used excuses in higher than expected rates. Despite the increases in refusal skills, there was no significant change in smoking initiation at one year. Flay, in his review of this study, noted this as "intriguing given the demonstrated effects on presumed intervening constructs" (Flay, 1985 p.471). Limitations appear to be measurement of refusal skills, only auditory responses and characteristics were included. Additionally, refusal skills were never given a score, characteristic differences were noted, but the author can not say with confidence that the treatment groups had a higher level of refusal skills. The fact that volunteers from program participants may also limit generalizability; those with high skill-efficacy were likely more willing to participate. Flay, not Hops, also notes the high attrition rate of 32% likely limits the findings.

This study documents that students appear to have an existing level of refusal skills prior to program participation. With the exception of providing excuses and external consequences, the control group scored very similar to the treatment group in responses. Students appear to improve refusal skills modestly through program participation.

Sallis et al. (1990) used Hops’ method of assessing refusal skills, but modified it slightly to include smokeless tobacco offers, repeated offers in the same situation, group pressure to smoke and an additional categorical rating. Subjects (N = 78) were drawn from 3600 participants in the Project SHOUT. Project SHOUT was a large smoking prevention program in which 23 volunteering schools were randomly assigned to either
treatment or control. Twelve schools were randomly assigned to control, while the remaining 11 schools were assigned to the treatment. The SHOUT program was comprehensive and consisted of six, 50 minute sessions conducted in sequence during the Fall and then three booster sessions conducted in the Spring of the same school year. Program components consisted of learning social influences to use tobacco, rehearsing refusal skills and participating in role-plays, practice decision-making and earning prizes for practicing refusal skills. Refusal skills were taught in lessons four, five and six. Skills training activities (refusal and decision-making) comprised 30% of the total curriculum time (Elder, Sallis, Woodruff & Widley, 1993). The program was extended through grade nine; these results will be discussed in Elder, et al., 1993. The program was delivered by trained college-age students, teaching in pairs. All 3600 students completed a 110-item pre and post intervention questionnaire; the bogus-pipeline was used prior to distributing the pretest. For Sallis’ refusal skill acquisition study, four of the 23 schools were selected non-randomly, two from the intervention and two from the control schools. Students were asked to listen to 20 different audiotape situations in which they were offered tobacco or smokeless tobacco. Students then responded to each of these offers. The role-play scenarios were acted out and recorded by high-school drama students and were designed to cover a variety of environmental situations, gender differences in offers and the number of offers in one situation. This posttest consisted of 22 different offers. Students’ responses were coded for the following content and coded with the corresponding numbers: (1) simple, direct refusal (2) broken record (3) reason (4) supportive {a statement which supports another’s tobacco use} (5) withdraw (6)
aggressive (7) accepted (8) no response (9) did not follow directions (10) inaudible. The author explains that a response such as "No, thanks" would be coded as a "1". A response of "No thanks, I might get in trouble" would be coded as a "1" and "3". A second "overall quality" was also coded. Responses that included a "1" (a direct refusal) and a "2" or "3" received a "good" rating and coded a "3". A "fair" rating was given to those responses which included either a "1" or "3". These were coded with "2". Poor responses included "4", "5", "6" or "7" and were coded with a "1". Poor responses were also described by the author as those response which were nonassertive refusals, socially undesirable refusals or acceptances. Inter-rater reliability ranged from 67% to 95%, averaging 83%.

Scores were calculated as proportions; the number of responses by each student for a certain type of coded response, divided by 22 (the total number of offers). For example, if a student responded to seven of 22 of the offers by "simple direct refusal", category/code type #1, they received a score of .32 (7/22) for that category. Results were averaged for treatment and control. The largest differences existed for cigarette only refusals. Treatment subjects {Mean proportions (M) = .61} were more likely to use simple, direct responses than the control (M = .48) and control subjects (M = .03) were more likely to withdraw than the treatment subjects (M = .00). Regarding categorical responses, treatment subjects had more "good" responses (M = .39) verses the control (M = .26). The average scores were 2.20 and 2.01, out of 3, respectively. Control subjects were more likely to have "poor" responses (M = .25) verses the treatment (M = .17). No differences existed for refusing smokeless tobacco offers. With repeat offers in a
situation, control subjects were more likely to be rated as poor as offers/pressure continued; the treatment group were consistent in their refusals. In situations with repeat offers, the proportion of poor responses at first, second and third offer was .21, .26 and .35 for the control, while the treatment group proportions were .17, .17 and .18. Responses for group pressure situations were similar between the two groups.

This study documents that refusal skills are present in students not participating in refusal skill development programs. The control group score for “direct refusals” was .48; in almost half of the role play scenarios, participants responded with a direct “no.” Refusal skills, apparently, can be modestly increased via participation in a psychosocial smoking prevention program. Such an intervention also appears to strengthen a participant’s perceived ability to deny repeated offers and increased pressure.

More recently, Elder et al. (1994) examined student’s acquisition of refusal skills taught in Project SHOUT. The design and curriculum of Project SHOUT was discussed previously in the review of Sallis, et al. (1990). Unique components of this study was the evaluation of high risk students and the examination of the effects of quality of instruction and attendance. A sub-set of 389 high-risk middle/junior high students were selected from the 3600 students participating in Project SHOUT. High risk was operationalized by two ways: (1) those students who reported trying cigarettes for the first time in the past two years, but did not currently smoke cigarettes more than once a month, labeled “experimenters”; (2) “never-users” had not yet used tobacco, but because of responses on a 110-item questionnaire were thought to be at risk. This high-risk group was approximately 50% white, 26% Hispanic and 23% other. All 3600 students
completed a 110-item pretest questionnaire; the bogus pipeline was used prior to
distributing the pretest. The dependent variable of refusal skill scores was measured only
on the high-risk group. Refusal skills were measured exactly the same as in Sallis, et al.
(1990), but coding varied slightly. Responses were coded as follows: (1) simple, direct
refusal (2) reason for refusal (3) suggestion of an alternative activity (4) "I" statement (5)
supportive {a statement which supports another's tobacco use} (6) withdraw (7)
aggressive (8) accepted (9) no response (10) did not follow directions (11) inaudible
response. The author explains that a response such as "No, thanks" would receive a
score of "1". A response of "No thanks, I might get in trouble" would receive a score of
"1" and "3". Response types from item 8 through 11 were not included in analysis. Thus,
unacceptable or "really bad" answers were not included in the analysis, reducing
variability. The authors also did not report the number of responses that were not
included. A second "total refusal score" was also coded. Responses that included a "1"
(a direct refusal) and a "2", "3" or "4" received a "good" rating and coded a "3." A "fair"
rating was given to those responses which included either a "1" or one or more of
responses "2 through 4." These were coded with "2." Poor responses included "5", "6"
or "7" and were coded with a "1." It is unclear as to why the authors separated the
coding, since it is very similar to the way that "smoking refusal score" was scored.

The health facilitator performance was scored by an observer during lessons four,
five and six. Performance was scored on seven items on a four-point Likert scale. The
seven items were organization, maintaining class control, making class interesting,
communication with students, understandability, getting along with students and
A mean score was calculated (mean = 3.37, SD = 0.36). The authors reported a Cronbach's alpha of 0.84. Health facilitators were then dichotomized according to the median split of their performance score. It is unclear as to why the median was used and this value was unreported. For analysis, students were then coded as being taught by a poor facilitator or a better facilitator. The attendance score was students' attendance at the refusal skills portion of the program, lessons four, five and six. Students were put into two categories: those who attended all sessions (78%) and those that missed one or more of the three sessions.

The unit of analysis was each student. Comparisons were made between the control and treatment group regarding refusal skill scores. The exact size of these two groups is unreported. There were three measures of the dependent variable: total refusal score, smoking refusal score and smokeless refusal score.

Differences on refusal skills between the two groups were significant (p<.05), but small. Means were as follows: Total Refusal Score, 1.86 (treatment, X), 1.79 (Control, C); Smoking Refusal Score, 1.81 (X), 1.73 (C) and Smokeless Refusal Score, 1.96 (X), 1.87 (C). Standard deviations were also very similar ranging between 0.34 to 0.43 in all cases. These differences are small and of limited practical significance. Because of the large sample size (N = 389), small differences in sample group scores are more likely to be significant. Regarding other analysis, results of ANOVA reported main effects for refusal skills, for facilitator performance and attendance for Hispanics, only.

Elder et al., (1993) reported three year refusal skill and behavioral outcomes of Project SHOUT, high-risk subgroup. After the seventh grade intervention, described
above, students received eight more sessions in eighth grade and telephone boosters in ninth grade. The third year boosters were not intended to be telephone interventions, but because of school restraints, boosters for year three were four at home phone calls and five newsletters. Elder reports that approximately 15% of the home-based program was designed to review and practice refusal skills. The initial examining of high-risk students included 389 subjects. Because of limited resources, 35% of the 389 students (n=135) were randomly selected to test at the end of year three.

Similar to Elder et al. (1994), refusal scores had two measures: an overall score of quality and a cigarette refusal score. In each category, responses were coded as either "good", "fair" or "poor." The scoring mechanism is described above. The internal consistency for both measures was .80 and .72, respectively. Significant, yet small, differences existed for overall refusal skills at the end of year one, but had disappeared at years two and three. Mean overall refusal scores for the control group were 1.70, 1.69 and 1.70. For the treatment group, means were 1.76, 1.72 and 1.69. There were no differences for cigarette refusal skills only. Because of missing data, the number of subjects evaluated at the end of year three was only 105. Despite lack of differences in refusal skills, differences in percentages of smokers among the high-risk student sample existed. Smokers were defined as anyone who had smoked at least one cigarette in the last 30 days. Baseline, seventh, eighth and ninth grade percentages of smokers for the treatment group were 8.4%, 9.8%, 14% and 16.3%, while the treatment group percentages were 5.8%, 11.8%, 19.4% and 23.8%. These differences were not significant.

53
These studies clearly documented program implementation fidelity. However, the studies only document modest support for the importance of refusal skills in moderating a decrease in smoking initiation. When differences existed in refusal skills, they were small and it is interesting to note that the control group, without any intervention, scored very similar to those in a three-hour sub-set for refusal skills. Differences, at the end of year one, were significant, though, and measurement may have limited the magnitude of this recorded difference. Standard deviations were small, indicating little variability in the responses. Students were rated on verbiage only, not method of delivery. Skills training had decayed by year three, though, despite growing differences in smoking initiation. These results should be interpreted with caution for two notable reasons. First, these results are generalizable to high-risk students and this category of participants tend not to respond to health education interventions with the same magnitude as other groups. Additionally, skill development is one portion of the multi-component program and the development of these skills may have affected other unmeasured constructs.

Katz, Robisch and Telch (1989) also examined students development of refusal skills after participating in a refusal skills-focused prevention program. Sixty-three, seventh graders from a convenient sample were randomly assigned to either treatment or control group. All students were instructed that they were taking place in a project to educate them about the hazards of smoking. The treatment consisted of three, one-hour "Resisting Pressures to Smoke" videotape sessions. In session one, the immediate and long-term consequences of smoking and a discussion of social influences were presented. Refusal skill instruction and practice were the topics for lesson two. Refusals were
modeled via videotape and by the instructors. Students then participated in role-plays where they practiced the skills and received feedback and social reinforcement for their skills. Lesson three analyzed smoking advertisements. The dependant variable was the acquisition of refusal skills. Skills were measured both pre and post treatment in both groups. Students were individually observed by raters who scored their refusal response on five criteria: eye contact, posture, voice clarity and firmness, clarity of rejection and providing reasoning. One point was given for each criteria; scores could range from zero to five. Katz reported that inter-rater reliability was rated better than 90%. Results were presented graphically in this brief report; both groups appeared to have scored a little greater than three (out of five) on the pretest. At posttest, the control group showed a very slight improvement while the treatment group scored slightly better than four. Additionally, 41% of those in the treatment group received a perfect score of five, while only fifteen percent of students in the control group received a five. The authors reported main effects for groups (p<.05) and a statistically significant group by trial interaction (p<.01). This study, again, documents that students participating in a refusal skill program tend to improve existing refusal skills. The lack of greater statistical significance could be explained by several factors. Data analysis might be hindered by lack of variability. Both groups started at a three on a five point scale; there was little room left for variability between treatment and control. Additionally, it appears that when students already have acquired the skill, the treatment slightly improved the skill. The limited length of the program, refusal skills were covered in one hour, may have also limited the amount of improvement.
Turner et al. (1993) not only measured whether students acquired refusal skills, he examined which components of the traditional psychosocial tobacco prevention program produced larger gains in skill development and behavioral intentions. The three program components consisted of knowledge of refusal skills, practice of refusal skills or motivation to use refusal skills. A randomized, three group, within and between subjects design was used to assign subjects to a level of intervention. One class from four participating schools was randomly selected to participate in this study. Students from the participating class were then randomly assigned to one of the three levels of treatment. While the total number of participating subjects was not reported, based on information provided, an estimate of this number is 311 students. Turner reported that 77% of the eligible students were included in the study; 93 students were absent on the day of testing. The three levels of treatment were knowledge, practice and motivation. The knowledge component included instruction on ten different ways to say “no” to tobacco offers. In the practice component, the student was not taught precise ways to refuse an offer, but practiced saying “no” in 16 role playing situations. There was no feedback from the facilitator. Lastly, in the motivation component, the facilitator discussed the importance of “maintaining a positive attitude and demonstrating that one can do a task well” (p. 753). Additionally, “realistic sounding student (refusal) responses to a role play tobacco offer were rewarded with positive feedback” (p. 753). Students were individually removed from the classroom. The assessment for each student began with a written pretest and a role play situation. The written pretest was four items addressing: students’ intention to use cigarettes, students’ intentions to use smokeless
tobacco and their perceived self-efficacy to refuse a classmate's tobacco offer. Self-efficacy to refuse a friend's tobacco offer was scored from 1 to 5, with 1 = "not at all hard to refuse" to 5 = "extremely hard to refuse." Intentions to use tobacco ranged from 1 to 6, with 1 = "definitely will not use" to 6 = "yes, will definitely use." Coding for the complete scales was not supplied. Each pretest and posttest was evaluated by a facilitator (instructor) and a rater. After the pretesting, the rater left the room so that they remained blind to the level of intervention. After 30 instructional minutes, the rater and the instructor re-rated the students responses in the same pretest role play. A refusal skill checklist (Reardon, et al. 1989) rated students responses by degree of assertiveness, body posture and movement, facial expression, eye contact and duration and loudness of response. In examining the checklist instrument, responses were not dichotomized; most were recorded on a three or four point scale. For example, eye contact categories were (1) 0 to 20% of the time; (2) 25-75% of the time (3) 75-100% of the time.

Regarding students' intention and tobacco refusal self efficacy, students' self-efficacy to refuse cigarettes and smokeless tobacco offers remained high with no significant changes via intervention. Students reported it would be "a little hard to refuse a cigarette offer" while "definitely not hard to refuse a smokeless tobacco offer"; numerical scores were not reported. Students' intention to refuse cigarettes also remained high, ranging from 1.5 to 1.96 on a five point Likert scale, and statistically unchanged. The only statistically significant (p< .05) changes were for smokeless tobacco intention; the practice and knowledge components increased their intentions not to use smokeless tobacco. The effect size was small, though. For knowledge, the effect size was .36 (1.25
to 1.15 on a 6 point Likert scale). For practice, the effect size was .64 (1.39 to 1.13).

Regarding effects on refusal skill development, Turner concluded that knowledge and practice conditions appear more influential in developing refusal skills and that this study “indicates a need for ...knowledge components” (p. 759). However, regarding the three interventions, there were no statistically significant differences. Effect sizes were slightly different and the knowledge component had the largest effect size (0.56) on refusal skill pre and post rating (2.88 to 3.06). The effect sizes for practice and motivation were 0.36 and 0.11, respectively. Scores ranged from one for a weak response to four for a strong response. There was a 90% inter-rater reliability between the facilitator and the rater.

Several limitations exist with this study, some addressed by the author. Turner pointed out that the 1:1 student/teacher ratio limits the generalizability of the findings. The manner in which the program was taught, with very little of the traditional psychosocial tobacco prevention program (Glynn, 1989) being taught, also limits the findings. Additionally, the components were broken down incorrectly. The teaching of refusal skills or any skill involves all three components. Learn what to say, practice it and then receive feedback. These components then act synergistically. There was no knowledge component in the practice session and no coaching; this is not the intent of smoking prevention programs. More coaching was apparent in the motivation segment. Turner noted that the design could have been strengthen by adding a treatment group which received all three components. Lastly, Turner noted that knowledge components should be included in prevention curriculums. In every article reviewed for this chapter, knowledge referred to the harmful effects of smoking; the knowledge portion that he is
referred to is a foundation for teaching a skill and should never be omitted. Turner also noted power limitations in interpreting the data, yet he never reported the number of subjects. Because of the design and the inappropriate breakdown of skill components, it is unlikely that the practical significance of this work would differ greatly with more power.

This study supports the notion that students’ intentions to not use tobacco are high, prior to any intervention. Thus, supporting the model in Figure 2.1, programs should focus on developing enabling and reinforcing factors. These findings also seem to indicate, on a very limited basis, that refusal self-efficacy is not a global trait. Students did say that it would be easier to refuse smokeless tobacco than cigarettes. The refusal checklist appears more comprehensive and because of scaling, able to detect smaller differences much more so than previous measures. The next step from this study would be to measure refusal skills, when taught with all three components as well as explore tobacco refusal self-efficacy in a variety on context.

A slightly different question regarding refusal skill development was investigated by Biglan et al. (1987). If students develop refusal skills, do they then use them to refuse actual cigarette offers? Other than the brief mention in Schinke and Gilchrist (1983), this was the only study found published which addressed the question of student’s actual use of the these acquired refusal skills. Unfortunately, this study’s design was weak, with the posttest measurement occurring one week after the intervention. The program was implemented in three weeks and the posttest was conducted at the end of these three weeks. Program content and design was similar to all other programs. Three sessions
were delivered consecutively, then a booster session two weeks later. Of interest in this
study was that the authors asked students how many tobacco offers the students had
received during the past week and how many offers they had refused. The only comment
in the results section was "cigarette offers which were refused failed to reveal any
significant effects" (p. 622). Attrition was reported as 18.7% with 1541 total subjects.
The only significant finding was that those reporting smoking at pretest smoked less at
posttest (M = 19.4) than the control group (M = 29.6).

The short follow-up period is the most notable limitation. It is unlikely that in the
week following the intervention that many students received offers for tobacco. It might
have been interesting to examine the "experimenters" and their use of skills in the
subsequent weeks. Other than the identification of an important question, this study
documented little other significant results.

In summarizing refusal skill development and use studies, the measurement of
refusal skills has evolved and studies measuring refusal skills have been comprehensive.
Refusal skills have been measured through audiotape role plays (Hops, et al., 1986; Sallis,
et al., 1990; Elder, et al., 1994), role plays with other adolescents (Katz, et al., 1989;
Turner, et al., 1993; Schinke & Gilchrist, 1983) and through paper and pencil
measurement (MacKinnon, et al., 1991). Responses have been coded for learned verbal
responses (Hops, et al., 1986; Sallis, et al., 1990; Elder, et al., 1994), for body language
including eye contact, posture, facial expression and body movement, for assertiveness
(Sallis, et al., 1990; Turner, et al., 1993; Elder, et al., 1994), for response time and
latency of response (Hops, et al., 1986; Sallis, et al., 1990; Turner, et al., 1993) and ability
to refuse repeated offers (Sallis, et al., 1990). Responses have been scored either present or not present (Schinke & Gilchrist, 1983; Katz, et al., 1989) as well scored upon degrees of many of the above characteristics (Turner, et al., 1993). Refusal skills have been reported as numerical scores as well as put into categories of good, fair or poor (Sallis, et al., 1990; Elder, et al., 1994). Despite the method of measurement, students appear to moderately increase existing refusal skills via participation in a psychosocial smoking prevention program. When differences exist between treatment and control, differences are small and may decay with time. The lack of greater significant improvements and the small amount of variability in responses may be an issue of limited measurement tools, but might also support the underlying multi-component theory that refusal skill development is only a part of the change mechanism and that other variables should be examined.
PROCESS EVALUATION OF
DIFFERENT PROGRAM COMPONENTS

In a type of process evaluation different than those previously reviewed, Sussman et al. (1993a, 1993b, 1995) focused on which of the three common components of the traditional psychosocial tobacco prevention produced greater reductions in smoking initiation. While theoretical constructs were not examined, these studies did examine which program components mediate a change in adolescent smoking initiation. More specifically, these components were refusal skills, knowledge regarding the physical and social consequences and social/normative influences. The first publication from this longitudinal study (Sussman, et al. 1993a), described the curriculum in detail. Evaluations focused on documenting standardization of implementation and staff teaching. Changes in knowledge immediately following the intervention was the only outcome measure presented. Behavioral impacts at one year were reported in Sussman, et al. 1993b. Two-year behavioral outcomes are reported in Sussman, et al. 1995.

Program implementation data, from 4852 seventh graders, was collected via two methods; Cohort I, 20 schools, were followed as "a panel at an individual level", Cohort II, 28 schools, were followed as a repeated cross-sectional random sampling of seventh graders. Data were also collected from the health educators implementing the intervention and from teachers observing implementation. Schools were randomly assigned by blocks of region (urban, rural), school type (middle school, junior high) and compositive variable. This composite variable was a linear composite consisting of school size, socioeconomic status, English as a second language, median income by zip
code, academic status, demographic variables and estimates of tobacco prevalence by staff estimates and pilot data. There were four levels of treatment, normative social influences (including refusal skills), physical consequences, informational social influences and a combined curriculum. The four levels of treatment consisted of the following lesson plans:

**Combined:** active listening, consequences course, self-esteem, cognitive restructuring, effective communication, refusal learning, refusal practice, advertising images, social activism and public commitment.

**Informational Social Influences:** active listening, tobacco prevalence, values, advertising images, self-esteem, effective communication, maintaining conversations, social problem-solving, social image activism and public commitment.

**Normative Social Influences:** active listening, ingratiations, cognitive restructuring, refusal learning, avoidance, refusal practice, refusal practice, escape and stress management social activism and public commitment.

**Physical Consequences:** active learning, consequences, addiction, diseases, cost of addiction, horrific images, Sean Marsee memorial, risk of consequences, consequence advocacy and public commitment.

There were eight schools in each of the different levels. In the control group(s), 16 schools received their “traditional health education”; this typically consisted of no tobacco specific education. In five schools, five lessons were dedicated to drug use prevention. Data collection was extensive. A 20-page self report questionnaire was administered after the ten lessons were completed. When five minutes were remaining in the time allotted to complete the questionnaire, students were instructed to completed the program evaluation; “21 process evaluation adjective items ...and nine implementation or
process evaluation items” (p. 116). They were scored on a three point Likert scale, from “yes”, “somewhat” to “no.” Information collected prior to this point was described as demographic and behavioral information. Multiple choice knowledge items (n = 45) were also collected on a rotating basis in the core questionnaire. Completion rates ranged between 80 and 85%. Carbon monoxide and salvia biochemical measures were also collected from those seventh-graders, from 20 schools, followed at an individual level. Sussman gave no explanation for this method of data collection.

Data collected from the health educators consisted of ratings on the curriculum implementation and process. A process evaluation, for the purpose of this investigation, was described by Sussman as dealing with the quality of the curriculum that was delivered. Sussman’s process evaluation is more subjective than a implementation evaluation and addressed perceptions of class enthusiasm, class control, health educator effectiveness and enthusiasm, and overall perceived effectiveness of curriculum. This information was also collected from the teacher observers. The importance of documenting both implementation and process stability between the treatment groups, is that now differences are likely from the different levels of intervention, not from the instructor or class conditions. Sussman summarized the entire results by noting “adherence did not vary by condition (type of intervention). Exposure to the curricula did not vary by condition; all activities were completed in each curriculum” (p. 118). This documentation then adds weight to Sussman, et al. (1993b) findings in which behavioral outcomes by levels of intervention are evaluated.
Regarding the knowledge outcomes, results were as one might expect. Sussman broke knowledge down into three categories: social influences, normative information and physical consequences. The condition specific to that type of knowledge scored significantly higher than the other groups.

The day after the curriculum was completed, data were collected from 6716 seventh grade students; this number is higher than reported in the process evaluation, because the control group(s) are now being included. One year later, data were collected from 7052 students. Sussman reports the discrepancies because the students were tracked by school. Ninety-three percent of the students reported attending the same school the previous year. This discrepancy was adjusted for in the data analysis; school turnover was created as a covariate. The dependent variable, smoking status, was measured with four items; “have you tried cigarettes? (yes/no), “have you tried smokeless tobacco? (yes/no), “how often do you smoke cigarettes? (weekly use = a few times each month or more) and “how often do you use smokeless tobacco? (weekly use = a few times each month or more). Behavioral change measures were calculated by subtracting use (for tobacco and then for smokeless tobacco) at one-year from reported use immediately following the intervention. Change measures were calculated for those who have tried tobacco products and for the prevalence of weekly users. “The number of students measured at each school was then used as a weighing factor (small schools contributed less weight)” (p. 1247).

For both trying cigarettes and weekly use, the informational social influences (F = .071), physical consequences (F = .061) and combined conditions (F = .073) were
statistically superior ($p<.05$) to the normative social influence ($F = .102$) and control conditions ($F = .093$). For smokeless tobacco trials, all conditions, except the informational social influences, were statistically superior to the control group. For weekly smokeless tobacco use, the combined treatment was superior to all other treatments. Two of these findings are surprising and against previous research. The physical consequences condition faired just as well as the combined program. The traditional thought has been that it is the combination of the three components and that the knowledge portion of the physical consequences was not as important as the refusal skills. Sussman noted that the physical consequences portion was more than traditional information dissemination and included some social influences information such as correcting myths about experimentation and addiction, role-playing diseases and presenting probabilities of consequences relevant to youth. He hypothesized that students may be responding to the uniqueness of this curriculum. Additionally, Sussman noted that the success of the social influences condition may suggest that teaching students to recognize pressures and influences maybe more important than teaching them skills to combat them. One could also argue that this social influence programs addressed refusal skills by including units on effective communication and modeling. Sussman also noted that students were "flooded" with "Just Say No" and red ribbon week campaigns, both he perceived as normative in nature. He noted students may not have been interested in more normative type programming.

Two years after the initial intervention (a booster session, specific to prior condition was implemented in the eight grade) results were similar (Sussman, et al.,
1995). All conditions, now including the normative approach, scored significantly superior to the control (23% increase in smoking initiation) in reducing the onset of smoking initiation. Among the treatment groups, none of the groups were superior to one another (physical- 13%, social information- 15%, combined- 16%, normative-17%) in decreasing the initiation of smoking. However, the combined program (4%) was the only method which statistically differed from the control (9%) in reporting a lower number of weekly smokers. Hamm (1994) reported similar findings for long-term outcomes (five year post treatment) of the Minnesota Smoking Prevention Program: this combined approach did not decrease the number of new smokers, but did report a increase in the regular users that quit. Regarding smokeless tobacco, the physical consequences program was the only condition statically different than the others. Again, this difference was small; physical- 0% increase, whereas the others ranged between and 4 and 7%.

In summarizing Sussman’s findings, the combined program was the only treatment that decreased smoking initiation, as well as the number of weekly smokers; however, a variety of the approaches reduced the initiation of smoking. Results also indicated that teaching only refusal skills is not enough to produce behavior change. Documenting which variables changed through these components might help explain the similar effectiveness. Again, the same question still exists, how or what variables are changing to bring about the change in behavior.
MEASUREMENT OF HYPOTHESESIZED MEDIATING VARIABLES

The remaining section of this review includes studies that examined changes in mediating variables, other than, but often including refusal skills. As mentioned previously, those variables most often examined were students' smoking intentions and refusal self-efficacy. In limited number and scope, outcome expectations, normative expectations, assertiveness, self-esteem, communication skills and coping effort and skills were also measured. Of these studies, four measured and reported corresponding behavioral outcomes (Schinke & Gilchrist 1983; Botvin, et al., 1990; De Vries, et al., 1994; Flay, et al., 1995). MacKinnon, et al. (1991) was the only study which attempted to correlate changes in mediating variables to changes in behavior. Despite standardized curriculums, results regarding changes in mediating variables as well as effects on corresponding behavior were mixed.

As early as 1983, Schinke and Gilchrist (1983) documented treatment differences for changes in students' knowledge, awareness of tobacco problems, problem-solving, identification of the consequences of nonsmoking decisions, verbal and nonverbal refusal skills and intentions to abstain from tobacco use. The intervention consisted of eight, one-hour sessions. Lesson topics were described as factual information regarding smoking and its hazards, problem solving, decision making self-instruction and persuasive communication. Teaching methods included audio visual aids, modeling, behavioral rehearsal with peer and teacher feedback and homework assignments. Problem and decision making skills were developed via case studies. Students then practiced executing these decisions in role play situations until other students and the
teacher deemed their skills as sufficient to withstand peer pressure. Homework assignments focused on smoking patterns and media influences of their environment.

Using the Solomon four research design, 56 sixth graders were randomly assigned to one of the four treatment groups; pretest and intervention, intervention only, pretest only and neither pretest nor intervention. All groups were posttested at two months and six months. Pretest and the two month posttest consisted of a 35-item questionnaire administered orally. Items assessed "their ability to see different perspectives on tobacco use problems, to connect problems with satisfactory outcomes and to predict the consequences of nonsmoking decisions" (p. 417). Assistants, blind of treatment conditions, documented students' responses. As a verification of scoring agreement, Schinke and Gilchrist report that assistants coded 25% of the responses they had documented and 33% of responses documented by another assistant. Pearson product-moment correlation coefficients were .893 (SD = .022) and .908 (SD = .034) within and among the assistants. The six month follow-up then measured students' smoking as well as attitudes, intentions and students' exposure and practices around tobacco use. Data were collected under bogus pipeline conditions. No other instrument detailed was described by the authors.

There were no within-group differences for intervention and control, or for pretest and non-pretest. Therefore, further analysis consisted of t-tests between the treatment and control group. Regarding refusal skills, the treatment group had more eye contact (p<.05), use of the pronoun "I" (p<.02), the word "no" (p<.005) and assertion to their right not to smoke (p<.01). Treatment group students also "had superior insights to
predicting others' reactions to nonsmoking decisions (p<.005)" (pg. 418). At final follow-up (6 months), treatment group expressed stronger intentions not to use tobacco (p<.05), reported more actual refusals (p<.01), avoided more high-risk situations (p<.05) and reported less tobacco use, 8% verses 37.5% (p<.005).

The most obvious limitation of this study was the small sample size, n = 56. This sample size does not appear large enough to support the Solomon Four design. The authors never report the actual number in each of the levels of treatment. The instrument items and the constructs are not described in any detail, which also limits the generalizability of this study. Despite these limitations, this study was the first to try and assess mediating changes that could be attributed to decreases in student tobacco initiation. It appears that many of the Social Cognitive Theory were assessed: intentions, modeling, environment and outcome expectations. By documenting changes in these program constructs, this study was the first to support the underlying theory for these new and innovative tobacco prevention programs. This study was the only publication, in this comprehensive literature review, which touched upon the constructs of tobacco refusal outcome expectations, via "predicting others' reactions to nonsmoking decisions" and environmental influence, via "knowledge of environments" and "the avoidance of higher risk environments". Both of these Social Cognitive Theory constructs were statistically significant, yet appeared not to be researched any further, after this study.

Botvin et al. (1990) examined the long-term effectiveness of the LifeSkills program on decreasing the initiation of not only tobacco, but also marijuana and alcohol use. This study was designed to overcome methodological weakness in previous
LifeSkills and tobacco use prevention studies. Additionally, mediating variables of knowledge, attitudes, normative expectations, communication and assertiveness skills, skill efficacy and personality traits of self-esteem, general self-efficacy and social anxiety were measured for changes. The sample consisted of 56 schools, totaling 4,466 students. Prior to implementation, schools were surveyed to determine existing smoking levels. These levels were then used to categorize schools into high, medium or low usage.

Schools were then randomly assigned to one of three treatment conditions; the LifeSkills program (E1) facilitated by a instructor trained via workshop with feedback (n = 18), the LifeSkills program (E2) taught by an instructor trained via videotape with no feedback (n = 16) and a comparison group, C (n = 22). It is not clearly stated as to whether schools were randomly blocked into treatments, with a certain percentage of "high", "medium" and "low" schools in each level, but one might assume that this is the case. The LifeSkills Training program consists of 12 units. It has the same components as psychosocial tobacco prevention programs, but has a broader scope (Flay, 1985). In addition to addressing social influences, refusal skills and short-term consequences, it includes assertiveness training, self-esteem, relaxation and interpersonal communication. Skills were introduced through modeling, behavioral rehearsal, feedback and reinforcement. Social and communication skills were taught in three units while assertiveness received two instructional units. Students participated in the LST program in the seventh grade. Boosters were implemented in the eighth grade (10 sessions) and the ninth grade (five sessions). Topics during booster sessions included communication and social skills, assertiveness, anxiety management and media influences.
To assure fidelity of program implementation, observers randomly monitored classroom instruction of the program through the three years. Fifty-one teachers were observed an average of 2.8 times during year one, 89 teachers were observed an average of 2.85 times during year two and 87 teachers were observed an average of 2.16 times during year three. The interrater reliability was reported as 80%. Check sheets were used; if the topic was covered and the learning objective was met, it was checked-off. Botvin concluded that “the prevention program was not uniformly implemented” (p. 441). The amount of covered material ranged from 27% to 97%. The mean for program implementation was approximately 68% for both prevention treatment groups (E1 and E2). Further analysis noted by Botvin revealed that 75% of the students received 60% or more of the specified curriculum. This 75% of the students was used in the data analysis. Pretests were administered prior to implementation. The bogus pipeline was used to increased validity of self-reports. In addition to cigarette, marijuana and alcohol use, students were questioned regarding a number of hypothesized mediating variables. These variables were knowledge, substance use attitudes, normative beliefs, decision making skills, communication skills, assertiveness (includes substance refusal skills) and skill efficacy (to be assertive), relaxation skills and psychological traits of self-esteem, general self-efficacy (such as believing personal effort will help obtain personal goals) and social anxiety. For the purpose of this review, the discussion of alcohol and marijuana measures will be limited. Briefly, the variables were measured as listed below with available Cronbach's alpha's listed in parentheses.
Cigarette Smoking: a 10 point scale of 1 = never smoked, 2 = not in last 12 months, 3 = a few times in the last month, 4 = usually once per month, 5 = a few times per month, 6 = usually once per week, 7 = a few times per week, 8 = a few times most days, 9 = half a pack a day, 10 = more than a pack a day.

Knowledge: Three 10 item true/false measures regarding the short-term consequences, perceived prevalence and social acceptability of the three drugs.

Attitudes & Normative Beliefs: 10 items regarding tobacco use ($\alpha = .76$) derived from the Public Health Service (1974). Items were scored on a 5 point Likert scale ranging from strongly disagree to strongly agree. Two items, on a 6 point Likert scale, recorded perceptions about the perceived prevalence of smoking, alcohol and marijuana use among peers and adults.

Assertiveness & Skill Efficacy: measured with a shorten version, 18 items, of the Gambrill and Richey (1975) Assertiveness Inventory. This was broken down to reflect "resisting offers" ($\alpha = .82$) and general assertiveness ($\alpha = .70$). Skill efficacy, regarding students perceived confidence about their ability to use specific skills, was measured using 14 items ($\alpha = .78$) on a 5 point Likert scale. Responses ranged from not at all confident to very confident.

Skills: 16 true/false items were used to assess knowledge about communication and general social skills. Decision-making skills ($\alpha = .82$) were measured via 7 Likert type items. Relaxation skills for coping were measured via 5 items ($\alpha = .63$). Frequency of use of these skills was measured with a 5 point Likert scale, ranging from never (use) to almost always.

Psychological Characteristics: Self-efficacy ($\alpha = .67$) was measured by five Likert items. Self-esteem ($\alpha = .80$) was measured by a 10 item scale developed by Rosenberg (1965). Social anxiety was measured by 9 items ($\alpha = .82$) adapted from the Social Anxiety Inventory (Richardson & Tasto, 1976). Responses for all characteristics ranged from strongly agree to strongly disagree.

To limit to length of the questionnaire, but still maximize the amount of content covered, three different questionnaires were administered. Students were randomly selected in each class to receive one of the three questionnaires. Items regarding demographics and use of tobacco, alcohol and marijuana were the same on all three variations of the questionnaire.
First, to establish group similarity prior to intervention, a multivariate analysis of variance was conducted; no significant differences existed among the groups for the primary behavioral outcome variables; smoking, drinking frequency, drinking amount, drunkenness and marijuana use. Additionally, attrition can also be cause for misinterpretation of results. In this study, the original sample consisted of 5,954 students; final posttest information, three years later, was collected on 4,466 students. Because of the thought that tobacco users are more likely to drop-out, Botvin evaluated pretest tobacco and drug use of students for whom posttest data were not collected. Botvin noted that pretest smokers were more likely to drop-out (p<.0001). Thus, Botvin concludes “the net effect of the attrition accruing in this study, therefore, was to provide for a more conservative test of the interventions being evaluated (p.441).” To test for differences in mediating variables, a series of ANCOVAs were conducted. “In order to control for experientwise error rate, a Bonferroni’s correction was used (.05/23 =.0022).” Only p values less than .0022 were considered significant. Both E1 and E2 scored significantly (p<.0001) higher than the treatment for knowledge specific to prevalence rates (E1 = 1.10, E2 = 1.16, C = .93), negative consequences of smoking (E1 = 4.8, E2 = 4.60, C = 4.13) and the declining social acceptability of smoking (E1 = 1.49, E2 = 1.52, C = 1.37). Adjusted means are reflected in parentheses. More detail regarding these values, other than standard error rates, was not provided by the author.

Three years after the intervention, both groups receiving some level of intervention, E1 (teacher) and E2 (videotape) had significantly (p<.0001) lower normative expectations regarding adult smoking; differences regarding expectations of peer smoking
were also lower (p<.0047). Communication skills and interpersonal skills were significantly higher in both E1 and E2 verses the control; however, there were no significant differences in decision-making, assertiveness (which includes refusal skills), skill efficacy, relaxation, self-esteem, self-efficacy and social anxiety. Both E1 (X = 1.46) and E2 (X = 1.50) had significantly lower smoking levels than the control (X = 1.63). Botvin concludes that this comprehensive study demonstrates the long-term effectiveness of psychosocial tobacco prevention programs when programs are comprehensive and ongoing. Additionally, he notes that the changes in some of the mediating variables (normative beliefs and communication and interpersonal skills) provide some support to the construct validity of the program model. The mediating variable with the most change from the program was normative expectations. As a limitation and possibly a reason for undetected differences, Botvin cites the paper and pencil method of measuring skill acquisition.

This study documents the potential for long-term effectiveness of psychosocial tobacco prevention programs. On a ten-point scale, the effect size for cigarettes smoked was small, 1.46 verses 1.63, but because of the long follow-up period, results are still encouraging. Refusal skills and skill-efficacy remained statistical unchanged. Numerical values are not reported so the reader is unable to determine if levels were high and unchanging or otherwise. Additionally, students again documented a pre-existing intention to not use tobacco and the statistical change in normative expectation do support the underlying theory.
MacKinnon et al. (1991) similarly studied the effects of a drug use prevention curriculum on hypothesized mediating variables and consequently, tobacco, marijuana and alcohol use. The authors went a step further and calculated the percentage of change mediated by a particular variable. The mediating variables of interest were intentions, negative consequences of drug use, positive consequences of drug use, knowledge of external uses of drug use, resistance skills, communication skills, perceived norms and friends' reactions.

This study was part of a six-year community based study, the Midwestern Prevention Project. In addition to schools, program targets included mass media, parents, community organizations and policies. This psychosocial drug use prevention program addressed the correction of normative expectations, recognition and counteraction of social influences, peer resistance, assertiveness, problem-solving and a public commitment not to use tobacco. The intervention was taught by teachers after attending a two-day training session. Teaching techniques included role playing with practice, group feedback, peer leaders, group discussion and homework which center around environmental and social influences. Participants (n = 5,065) were sixth and seventh graders from 50 middle schools and junior high schools; schools were the unit of assignment, but because of scheduling and timing, they were not randomly assigned to level of treatment. No statistical differences existed in drug use and demographics between the treatment and control groups. Additionally, pre and post test data were available for 42 of the 50 schools.
To keep the length of the questionnaire manageable, subjects completed one of three questionnaires; there were 133 items on each version. As with Botvin et al. (1990), demographic information, drug use and intentions questions were identical on all three versions of the questionnaire; the remaining items were distributed such that all remaining mediating variables were measured on two-thirds of the subjects.

Questionnaires were re-administered one year later. Prior to completing the questionnaire, expired air was examined to determine the amount of carbon monoxide.

Descriptions of the instrument subscales for the measurement of mediating variables are listed below, with the alpha coefficient reported in parentheses. The coefficients appear to have been calculated from the sample used in the study. This calculation method is not clearly stated, but the authors report coefficient alphas from the time of posttest to one year follow-up. Calculating a coefficient of internal consistency from the sample, post intervention is incorrect. The alpha should have been figured from administering the questionnaire to another pre-program sample. When available, sample items are listed. Most responses were collected on a Likert scale, but then for analysis, all items were dicotomized.

**Intentions:** Three items specific to cigarette use: "I will smoke in the next couple months" and "What would you do if offered you a cigarette" were the only reported questions. From pre to post test ($\alpha = .72$).

**Negative Consequences of Drug Use:** Two items specific to cigarette use ($\alpha = .14$).

**Positive Effects of Drug Use:** Two cigarette items ($\alpha = .34$). Sample items: "Smoking makes it easier to be part of a group". "Smoking makes people less nervous".

77
Knowledge of External Influences on Drug Use: Three items, non-drug specific (α = .57).

Resistance Skills: Three items (α = .75).

Communication Skills: Two items (α = .74). Sample items: “It is easy to talk to my friends about a school problem”. “It is easy to talk to my friend about a drug problem”.

Perceived Norms: Three items (α = .83).

Friends’ Reaction to Drug Use: Five items (α = .78). Sample items: “My best friend would act friendly toward cigarette”, “I care very much about my friends’ reactions to drug or alcohol use” and “Friends would act friendly if I turned down a drug use offer”.

At the year one follow-up, MacKinnon reported significant treatment differences for cigarettes smoked in the past month (p<.05), intentions to use tobacco in 2 months (p<.01), positive consequences of drug use (p<.05), communication skills (p<.05) and friends’ reactions to drug use (p<.01). To report significant differences for intentions, the author calculated t-tests on the individual items measuring the variable; the two other items measuring intentions were not statistically significant. No other construct was broken down this way. Mean cigarette use increased from .103 to .155 (average proportions) in the treatment group verses .103 to .219 in the control group. Similarly, intentions to use cigarettes increased school wide in the treatment groups by 1% verses a 7% increase in the control groups. Communication skills increased similarly in the treatment group. Regarding the positive influences of drug use, MacKinnon reported that the treatment group appeared to have maintained their level of positive beliefs regarding use, while those beliefs increased in the control group. Participants’ perception of their friends’ reaction to drug use also varied by treatment. Those having participated in the
smoking prevention program were less likely to report that their best friend would act
friendly toward cigarette use; at posttest proportion differences were 0.326 verses 0.424.
No significant differences existed for negative consequences of drug use, external
influences, resistance skills and perceived norms. The author noted that for both groups,
the negative consequences of smoking were high; 94% of students believed smoking
caused bad breath and 96% believed that it caused lung cancer. Lastly, the authors
performed "a mediating variable analysis ...to determine the extent to which program
effects on drug use in the previous month could be due to effects on mediating variables"
(p. 168). To calculate this value, program effects were estimated with and without a
variable in a regression model. Only variables which were statistically different from the
control were included in the regression model; those variables were intentions to use
drugs, friends' reaction to drug use, perceived consequences of use and ease of
communication with friends. "The coefficient relating the program to the change in
substance use was compared to the coefficient from a model in which the change in the
mediating variable was included as another predictor. If the program effect is mediated,
then the program effect should be greatly reduced when the change in the mediating
variable is included. The value of the mediating variable or indirect effect equals the
difference in the program coefficient in the two regression models" (p. 167). By this
calculation, friends' reaction to drug use explained 45% of the program effect, yet "was
only marginally significant" in mediating cigarette use. A friend's reaction to drug use
was the only variable with statistically significant contributions to smoking program
effects or cigarette use.
MacKinnon discussed lack of statistical differences as a possible result of measurement. The paper and pencil method for assessing resistance skills and communication skills was the most notable. Additionally, the items appear to measure more skill efficacy rather than the skill. A sample resistance skills item was “Pretend someone you really want to be friends with offers you a cigarette. Do you know anything you could say that you could still be friends without smoking?” Responses were then categorized to “yes”, “unsure” and “no.” A sample communication skill questionnaire items was “It is easy to talk to friends about a drug problem.” For refusal skills, the MacKinnon reported that 50% of the adolescents reported knowing something to say to refuse a tobacco offer and thus, thought that the ceiling effect was not the reason for statistical differences. MacKinnon noted as a limitation, the potential of pretest nonequivalence, even though no differences in drug use and demographics existed. Additionally, he noted that constructs should be measure with more that three or four items.

This study documents program effect for decreasing cigarettes smoked in the past 30 days, despite not documenting significant changes in hypothesized mediating variables. One could argue that it is a combination of these social learning theory constructs that produced the reduction in smoking initiation or that other constructs of the theory need to be measured.

De Vries et al. (1994) also examined changes in the mediating variables of attitudes, social norms, tobacco refusal self-efficacy and intentions to use tobacco after students participated in a five lesson, videotaped psychosocial smoking prevention
program. The 45-minute lessons included the short-term effects of smoking, peer pressure, social influences such as parents and media and alternatives and decision-making. Tape content was organized in the following manner: an introduction to the topic, peer-led activities, presentation of real-life situations by adolescents on video, peer-led activities and then homework assignments. Peer-led activities were conducted in small groups led by trained peer leaders. The experimental group consisted of three vocational schools (343 students) and five high schools (585 students). Three vocational schools (217 students) and three high schools (384 students) served as the control group. Schools were randomly assigned with the type of school being the unit of assignment. In addition to pretests, posttests were conducted at nine months and at one year. The bogus pipeline was also used to increase the validity of self-report data. Attrition from pretest to the final posttest was 14.3%. Drop-outs were more likely to be smokers and males; this did not vary significantly between treatment levels. Variables were measured as listed below:

**Attitudes:** were measured by 28 items on a seven point Likert scale. Items assessed beliefs (b) and corresponding evaluations(e), described by Ajzen and Fishbein and calculate as the sum of beliefs multiplied by evaluations: b*e. (α = .84). Four subcategories developed: short-term disadvantages of smoking (α = .75), long-term disadvantages of smoking (α = .78), short-term advantages of smoking (α = .70) and social acceptance (α = .52). Short-term advantages were such things as boredom, sociable, grown-up, knowing what to do when with people, satisfying curiosity and discovering the taste. Social acceptance included being pestered less, making contacts, acceptance of friends, being "cool" and being more interesting.

**Knowledge:** assessed knowledge about the effects of smoking and was measured by 12 items (α = .17).
Social norms: also employed a Ajzen and Fishbein technique which assessed normative beliefs of important persons' (nb) and the corresponding motivations to comply with these opinions (mc). Eight items total items were used; normative beliefs were measured using a seven point scale and motivations were measured on a four point scale. To calculate the one social norms score, normative beliefs were multiplied by motivation to comply and then summed. (α = .84) A sample item was “My dad thinks I certainly should/ should/ should probably/ neutral/ probably should not/certainly should not smoke” and then a motivation level to comply with this expectation.

Self-Efficacy Expectations: were measured by eight items on a seven point scale and was defined as “perceived capacity to refrain from smoking (p. 367).” (α = .87). Items were “I find it difficult/easy: not to smoke when my friends smoke; to remain a non-smoker; knowing a reason to refuse a cigarette offered; to know what to say when people call me a coward because I don’t want to smoke; to explain to other people that I do not want to smoke.

Intentions: to smoke were measured by 12 questions regarding intent to smoke in a variety of social situations and context. (α = .96) Situations were home, school, parties, discos, my own room, in the street, with friends/parents, with non-smokers, where nobody sees me, within three years and in general.

Smoking Behavior: were self-report measures which categorized students: (1) never smoker (2) never smoked one (whole) cigarette (3) initial smoker, tried up to 5 times (4) occasional smoker; smokes occasionally, but not every week (5) weekly, regular smoker, smokes at least one cigarette per week (6) daily smoker, at least one cigarette per day.

Regarding effects on smoking initiation, few differences were observed at the nine month follow-up, six months after program completion. At nine months, there was a 47.3% increase in the number of new experimental smokers in the treatment group while the control group had a 53.2% increase in new experimental smokers. This percentage of difference was larger, 10%, when looking at just high school students. No program effects on regular smoking existed at nine months. Nine months following program completion, though, there was a 4.8% increase in the number of regular smokers in experimental group verses a 6.8% increase in the control. In this instance, the percentage of difference
was larger (7.1% versus 14.2%) when looking at just the vocational students. At nine months, differences between treatment and control were found for attitudes and knowledge. Significant differences for attitudes were noted specifically for short-term advantages and disadvantages of smoking, all differences but the long-term disadvantages of smoking attitudes had decayed by 12 months, though. Treatment verses comparison group differences in knowledge had also decayed by 12 months. Refusal self-efficacy differences were mixed and varied by student’s smoking status; there were no treatment main effects. Reported self-efficacy differences were the following: nonsmokers reported more self-efficacy than smokers at nine months and smokers in the treatment group had higher levels of self-efficacy than smokers in the control group at nine months. Both of these differences had decayed to nonstatistical differences at one year months. No significant differences for intentions were found. The author reported no values or discussed what the students’ intentions were. De Vries reported, though, that students with pretest smoking, positive intentions (p<0.01) and attitudes (p<0.01) were more likely to become regular smokers. Exact numbers and scores for any of these differences were not provided by the author. De Vries concluded that the program resulted in different outcomes for the different sub-categories of the sample. The program reduced the number of vocational students becoming regular smokers, while it reduced smoking initiation in high school students. Two limitations reported by the author were low educational levels of the sample and low levels of smoking prevalence. Because of the low prevalence, De Vries hypothesized that longer follow-ups may have documented larger differences in smoking. The lower educational levels of the students may have
limited their comprehension of the higher level materials. The limited program length, without boosters, may have also attributed to the small differences. Differences in refusal self-efficacy, knowledge and attitudes had decayed by the second follow-up.

Again, this study documents students' smoking intentions tend not to change significantly after participation in a smoking prevention program. By using 12 items and asking situation specific questions, De Vries' measure of intentions was the most comprehensive reported in this literature review. It is unfortunate that there is not more of a discussion on students' intentions; even if results remained unchanged. If students' intentions started and remain at high levels, or if intentions varied by situation, these would be findings of practical implications. De Vries also documented that smokers and nonsmokers score statistically vary post treatment for self-efficacy and attitudes. Additionally, the small, positive changes in attitudes and knowledge followed by small changes in either smoking initiation or regular smoking, support the theory of the existing psychosocial model. Also of interest is the unique method of delivery. Previous studies have documented the range of program infidelity (Botvin, et al., 1990); if results could be achieved via this videotape method, there might be wider program dissemination. A more comprehensive, repetitive program might produce desired differences and should be explored.

In the most comprehensive process evaluation, Flay et al. (1995) evaluated the addition of television into a traditional psychosocial tobacco prevention program and its effect on smoking prevention and smoking cessation. Mediating variables of health consequences knowledge, social influences knowledge, refusal skill-efficacy, coping
effort, smoking intentions, prevalence estimates and support of parental smoking were measured immediately after the intervention (referred to by author as point “B”), at year one (“C”) and year two (“D”).

The content of the Television, School and Family Prevention Cessation Project (TVSFP) curriculum was very similar to that of the previous evaluated psychosocial programs: correction of perceived norms, awareness of social pressures & influences (peer, family and media), development of refusal skills, social and physiological consequences of smoking and development of decision-making skills.

The initial sample consisted of 47 schools (340 classrooms) within the San Diego and Los Angeles areas. Pretest measures were collected from 7,351 students. Posttest data were collected immediately following the intervention, one year and then two years after completion of the program. There were five different levels of treatment: a social resistance curriculum, a television only intervention, a social resistance curriculum combined with a television component, a health based information “attention control” curriculum and a no treatment control group. The “attention control” group was a type of control group which received attention similar to a placebo. The content was described as health information. All five levels were implemented in Los Angeles schools (n = 35). The only levels implemented in San Diego were social resistance curriculum and no treatment control. The authors noted that these San Diego locations allowed them to test for possible contamination by inadvertent television exposure in the Los Angeles groups. Schools were the unit of randomized blocking assignment. Questionnaires, under bogus-pipeline conditions, were administered pre-program, immediately following the
intervention, at year one and year two. Mediating variables were measured as listed below and are reported with internal consistencies and test-retest values stabilities. As a note, one can see that Flay reported internal consistencies and coefficients of stability between evaluation periods in the actual study and sample. Test-retest stabilities were as calculated as follows; B-C wave is from the immediate measure after the treatment to the one year follow-up, while C-D is from the one year follow-up to year two. To measure a coefficient of stability from sample is incorrect and may be the reason for low values; very few of the coefficients come close to the often acceptable levels of .70 (Fraenkel & Wallen, 1993).

**Tobacco & health knowledge**: measured by seven items, the score was the number of correct answers. Test-retest stability was 0.30 (between B and C waves) and 0.37 (between C and D waves).

**Social influences/resistance skill knowledge**: measured with eight questionnaire items, scored as the number of right items. Items assessed knowledge of prevalence of smoking, social influences and resistance skills. Test-retest stability was 0.26(B-C) and 0.28(C-D).

**Refusal skill-efficacy**: Two items measured a student’s confidence to refuse tobacco offers. Test-retest stability was 0.33(B-C) and 0.35(C-D). Internal consistency was 0.33(A) and 0.46(D).

**Coping effort**: defined as “the effort a students exerts to resist smoking...(p. 32)”, was measured with three items. Test-retest stability was 0.35 (B-C) and 0.41(C-D). Internal consistency was 0.934 +/-0.002 from A to D.

**Intentions**: Two items assessed intentions to use cigarettes in the future. Test-retest stability was 0.48 (B-C) and 0.50 (C-D). Internal consistency was 0.78 (A) and 0.85(D).
Prevalence estimates: Students were asked of their estimate of adult and peer smoking rates. Three items, two specifically for peer estimates, measured this variable. Test-retest stability ranged between 0.33 to 0.39 for estimates of adolescents ever smoked and between 0.33 to 0.37 for estimates of weekly smoking. Internal consistency was 0.77(A), 0.75(B), 0.73(C).

Approval of parental smoking: This one item assessed the student’s approval of their parents smoking. Test-retest stability was 0.31(B-C) and 0.27(C-D).

Outcome variables were measured as listed below. Flay notes that base rates of smoking on a daily basis were low in the seventh grade and so comparisons between users and nonusers were made only between use in the past week and a lifetime. The discussion on specific items and the scoring was limited to the information below:

Lifetime use: Three items measured this variable. Test-retest was 0.71(B-C) and 0.72 (C-D).

Use in past week: One item measured this variable. Test-retest was 0.26(B-C) and 0.31(C-D).

Variables statistically controlled for were gender, father’s occupation, ethnicity, prior smoking history and intentions. There was no interaction between control variables and level of treatment. Intentions, coping effort and refusal skill self efficacy were distributed bimodally. Thus, the researchers divided the sample into three categorical groups: positive change, no change and negative change. Regarding changes in mediating variables, with exception of intention and refusal skill efficacy, variables changed as expected by the researchers and as directed by the underlying theory of the program. Knowledge was significantly higher (with a p value always <.001) in the health knowledge “attention control” group at all posttests (4.03, 3.76, 3.97 out of 7).

Unexpected by the researchers, there was also a significant increase in knowledge in the
San Diego social resistance program group immediately following the intervention (3.16), but results decayed by year two. It is interesting to note though, the mean knowledge score at year one and two increased to 3.40 and 3.56 in this social resistance program. These results were not significant; the other treatment group had the same numerical trend, indicating a small amount of learning from testing. Program effects on social influences/resistance skills knowledge were as somewhat expected; main effects were documented for the social resistance group (gains of 1.01 and 1.30) and the television only group (gain of .63). The authors note a negative interaction between the social resistance group and the television only group and hypothesis that this is why the main effect for the combined, TV and social resistance program, were “not as significant as expected.” There was still documented gain of 1.01, but had a smaller sample size (n = 248). Regarding students estimates of smoking prevalence, there were significant differences in the estimates between groups. The social resistance program, the TV only group and the social influences/TV combined groups reported lower estimated prevalence rates. Only the social influences group difference existed at year one. There were no significant program effects on refusal skill-efficacy. All groups documented approximately a one point improvement. Groups were scored very similar on the measure of skill-efficacy, with pretest scores averaging approximately 6.8. There were no treatment effects for support of parental smoking.

Lastly, no significant program related differences existed for either intentions or current smoking. No interactions existed. There was very little discussion of these findings. Because of the bimodal distribution, intentions were categorized and presented
graphically in histograms. It appears that approximately 30% of the treatment groups noted positive changes in intentions, 25% were shown as "worse" and the remaining 40-45% remained unchanged. To a reader, the data presentation of this section is very unclear and ambiguous. Current smoking is presented in the same fashion. It is unclear as to why this was done, possibly because of the lack of normal distribution, again. There may also be a printing error, by following the histogram key, only approximately 3% were not smoking at pre or post test.

The authors noted that they were successful in their program components, executing their design and developing reliable measures. Changes in mediating variables of knowledge and prevalence estimates were documented. The introduction of a placebo group receiving similar attention was also addition to this body of research. Limitations noted by the authors include low smoking adoption rates in the control group and low pretest behavioral intentions. Flay reports only 10% of the ninth graders report smoking within the last week. At pretest, 45% of students reported "definitely not" intending to smoke, 21% "probably would not" smoke. Both of these values, intentions and weekly smoking, are, noted by Flay, more conservative than previous studies. He explains that a "floor effect" may have reduced the chance of finding treatments affects.

Limitations not discussed by the author include low internal consistency for refusal skill-efficacy and low test-rests stabilities for all of the mediating variables, except intentions. Incorrect measurement likely affected these findings. The method in which smoking was measured may have limited variability in findings. Only lifetime and use in the past week were used as measures of smoking; most of the previous study also used
tobacco use in the past 30 days. Also the scope of this study was enormous, over ten publications have been generated by this one study. Objects of interest were mediating variables, smoking initiation, smoking cessation, parental involvement, television as a educational medium and geographic site responses. This lack of focus might have lead to implementation problems or loss of interest by students.

The authors concluded by noting "the fact that changes in mediating variables were not followed by behavioral change suggests that we have more to learn about how prevention programs work" (p. 39). One of the key findings was the unchanging smoking intentions of participants. This finding is not new to this body of literature, but the unique factor was that students' intentions to smoke were not high prior to enrolling in the program and yet still remained statistically unchanged. Again, this finding seems to support the underlying theory of psychosocial programs; students intent not to smoke, but need skills to refuse tobacco and execute their intention. Unchanging refusal self-efficacy was also a findings of this study that was consistent with previous research. Mean values were reported, but the scale was not, which makes it difficult to interpret students of refusal skill-efficacy. Health and social knowledge and norm perceptions increased positively in the treatment group, yet these significant changes were not followed by behavior change. This lack of change in smoking behavior implies that more than increasing knowledge and correcting norm perceptions may be required to produce a reduction in smoking initiation and cessation.
SUMMARY OF PSYCHOSOCIAL TOBACCO PREVENTION RESEARCH

Psychosocial tobacco programs can decrease the initiation of smoking by up to 50%. Additionally, these programs have also been shown to decrease the number of new regular smokers. Program content is standardized with main components remaining as knowledge of the short-term effects of tobacco, identification of social pressures and the development of refusal skills. Advances to the field and curriculum have included the addition of peer leaders, behavioral rehearsing, booster sessions and student public commitments not to use tobacco. Few advances have been made in explaining how these programs work.

SUMMARY OF PROCESS EVALUATIONS

Results from these construct evaluations produce no clear understanding as to how psychosocial smoking prevention programs work. Three program affects appear well documented: students' pre-existence of refusal skills, stable smoking intentions and stable refusal self (skill)-efficacy. The development of refusal skills has been measured well. Refusal skills have been measured through audiotape role plays (Hops, et al., 1986; Sallis, et al., 1990; Elder, et al., 1994), role plays with other adolescents (Katz, et al., 1989; Turner, et al., 1993; Schinke & Gilchrist, 1983) and through paper and pencil measurement (MacKinnon, et al., 1991). Responses have been coded for learned verbal responses (Hops, et al., 1986; Sallis, et al., 1990; Elder, et al., 1994), for body language including eye contact, posture, facial expression and body movement, for assertiveness (Sallis, et al., 1990; Turner, et al., 1993; Elder, et al., 1994), for response time and
latency of response (Hops, et al., 1986; Sallis, et al., 1990; Turner, et al., 1993) and ability to refuse repeated offers (Sallis, et al., 1990). Responses have been scored either present or not present (Schinke & Gilchrist, 1983; Katz, et al., 1989) as well scored upon degrees of many of the above characteristics (Turner, et al., 1993). Refusal skills have been reported as numerical scores as well as put into categories of good, fair or poor (Sallis, et al., 1990; Elder, et al., 1994). Thus, the measurement of the skills has evolved to be comprehensive and able to measure differences. Findings suggest that students enter these programs with a pre-existing level of these skills and psychosocial programs can increase them modestly (Hops et al., 1986; Sallis et al., 1990; Katz et al., 1989). Control groups have also shown modest improvements in refusal skills from pre to post test (Sallis, et al., 1990; Elder et al., 1994).

Refusal self-efficacy was measured in four of the twelve evaluations (Botvin, et al., 1990; De Vries, et al., 1994; Flay, et al., 1995; Turner, et al., 1993). Measurement of self-efficacy has not been as comprehensive nor as clearly defined as refusal skills. Previous measurement has not clearly define the construct being measured and as a result, has measured various types of efficacy. Most often, two types of efficacy are measured: students' perceived ability and confidence to refuse tobacco offers and student's self-efficacy to remain smoke-free. While three of the four studies documented no treatment effects for self-efficacy, preliminary findings have suggested that refusal self-efficacy is not a global factor. Two studies have documented instances where efficacy varies by situational influences. Turner et al. (1993) reported that students were more efficacious in refusing smokeless tobacco than cigarettes. De Vries (1994) documented a treatment
effect for smokers at nine months. The construct of efficacy should be looked at in more detail with specific definitions of self-efficacy and with further exploration of smokers’ differential response to treatment.

Lastly, students’ smoking intentions often remain unchanged by these programs (De Vries, et al., 1994; Flay, et al., 1995; MacKinnon, et al., 1991; Turner, et al., 1993). Whether smoking intentions (to not smoke) as a group are initially high (Turner, 1993) or low (Flay, et al., 1995), intentions remained unchanged through these programs. With the aggressive media messages and school education regarding the ill effects of smoking, it is likely that students have already formed firm intentions by sixth or seventh grade. This finding also supports the underlying theory of skill development and social inoculation.

Thus, the results from the twelve previous process evaluations have produced no clear understanding as to how psychosocial smoking prevention programs work (Flay, 1995). The exploration of new theoretical constructs as well as the improvement of previous measures are next steps for future research. The remaining section of this chapter identifies possible constructs to be measured.

In a skill development program, the development of a skill and the confidence to use this skill (self-efficacy) are key hypothesized mediating variables to impacting a behavior. Self-efficacy is skill specific and situation specific (Maibach & Murphy, 1995). In psychosocial smoking prevention programs, educational activities focus on students’ ability to identify social pressures to smoke cigarettes and to develop skills to overcome these pressures. Students are taught skills to refuse direct tobacco offers as well as to resist positive media images and adult modeling of smoking. Thus, students would
develop self-efficacy for each of these skills; to refuse tobacco (refusal skill-efficacy) and
to resist the positive images of smoking. The above mentioned research has not
examined refusal self-efficacy in this manner. Efficacy has been measured as a global
factor, not recognizing situational influences nor skill-specific efficacy. As that De Vries
(1994) documented differences in smoker verses nonsmoker scores for self-efficacy, the
potential interaction of a students’ smoking status with treatment should also be explored.
The constructs of outcome expectations and expectancies are tied closely to the construct
of self-efficacy (Maibach & Murphy, 1995). “People are motivated to perform behaviors
(skills) they believe will produce desired outcomes” (Maibach & Murphy, 1995, p. 38).
Thus, not only should students’ efficacy to use refusal skills be measured, what they
believe will happen when they use these skills (expectations) and the value they place on
the outcome (expectancies), should also be measured. Previous research has not
addressed the constructs of refusal outcome expectations and expectancies and their
impact on students’ refusal skill-efficacy.

The purpose of this study is to evaluate the impact of a psychosocial smoking
prevention curriculum on the Social Cognitive Theory constructs of behavioral capability
to resist positive images of smoking, refusal skill-efficacy, total positive refusal
expectations & importance and total negative refusal expectations & importance. A
secondary purpose of this study is to determine if a student’s smoking status interacts
with treatment for the constructs behavioral capability to resist positive images of
smoking, refusal skill-efficacy, total positive refusal expectations & importance and total
negative refusal expectations & importance.

94
CHAPTER 3

METHODS

This chapter describes the research design, methods and data analysis of a process evaluation of a psychosocial smoking prevention program. Process evaluations can be used to assess whether successful treatments are influencing the hypothesized theoretical mediating variables and whether these variables are associated with treatment outcomes (McCaul & Glasgow, 1985). Based upon the Social Cognitive Theory, psychosocial smoking prevention programs address the short-term consequences of smoking, refusal skill-development and the identification of social pressures (Flay, 1985; Glynn, 1989).

The purpose of this study is to evaluate the impact of a psychosocial smoking prevention curriculum on the Social Cognitive Theory constructs of behavioral capability to resist positive images of smoking, refusal skill-efficacy, total positive refusal expectations & importance and total negative refusal expectations & importance. A secondary purpose of this study is to determine if a student’s smoking status interacts with treatment for the constructs behavioral capability to resist positive images of smoking, refusal skill-efficacy, total positive refusal expectations & importance and total negative refusal expectations & importance.
RESEARCH QUESTIONS

1. Is there a statistically significant difference in behavioral capability to resist positive images of smoking score between the treatment group and the comparison group after the implementation of the intervention?

2. Is there a statistically significant difference in refusal skill-efficacy score between the treatment group and the comparison group after the implementation of the intervention?

3. Is there a statistically significant difference in total positive refusal expectations & importance score between the treatment group and the comparison group after the implementation of the intervention?

4. Is there a statistically significant difference in total negative refusal expectations & importance score between the treatment group and the comparison group after the implementation of the intervention?

5. Does a student’s smoking status interact with treatment for the variable behavioral capability to resist positive images of smoking?

6. Does a student’s smoking status interact with treatment for the variable refusal skill-efficacy?

7. Does a student’s smoking status interact with treatment for the variable total positive refusal expectations & importance?

8. Does a student’s smoking status interact with treatment for the variable total negative refusal expectations & importance?
RESEARCH DESIGN

The nonequivalent comparison group (Campbell & Stanley, 1963) is the design for this study. In this quasi-experimental design, both groups receive a pre and post test, yet only one group receives the intervention. The variables of interest were measured pre and post intervention in the treatment group and compared against pre and post scores of the comparison group (see Figure 3.1). The design is called nonequivalent because subjects are not randomly assigned to level of treatment, thus, equivalency can not be assumed. Pretesting allows the researcher to report some pre-intervention differences and similarities, and thus, the threat of selection to internal validity is empirically examined. The more similar the treatment and comparison groups, the stronger the design. Campbell and Stanley report that the interaction of selection and maturation or regression remains a threat to internal validity. By selecting groups of similar age, experiences, skills or academic achievement, the threat of interaction and selection and maturation can be minimized. For this study, both the treatment and the comparison group are sixth graders. External validity, to whom and under what conditions the research findings can be generalized, is limited. To control for potential extraneous variables, the comparison group was selected to be similar to the experimental group on the extraneous variables of grade level, geographic location (within the same school district), gender and race proportions, social economic status and perceived academic achievement. Use of this nonrandomized, somewhat homogeneous group increased the internal validity by limiting
extraneous variables, but decreased the external validity of the findings. Results are only generalizable to the study participants: sixth grade students, attending the participating Middletown City Schools.
Figure 3.1
Process Evaluation of Social Cognitive Theory Constructs
THE THEORETICAL MODEL OF

PSYCHOSOCIAL SMOKING PREVENTION PROGRAMS

The Social Cognitive Theory provides the theoretical framework for psychosocial smoking prevention programs. In this theory, individual behavior is believed to be influenced by the interaction of behavior, personal factors and environment (Perry, Baranowski & Parcel, 1990). Behavior is viewed as dynamic and is a product of the constant interaction of the three components: behavior, environment and the person. Environmental influences are both physical and social, both real and perceived. Behavior can be learned through observing the behavior in others and observing the rewards or punishments of the behavior. Through experience, the person develops anticipatory outcomes of the behavior as well as a perceived ability and true ability to execute a skill or behavior.

The theoretical model for psychosocial programs reflects such an interaction of the person, behavior and situational influences. Through knowledge of the short-term and long-term consequences of smoking and knowledge of the social norm, students develop intentions to smoke. Because of the vast media attention to smoking as well as the inclusion of knowledge-based tobacco education in prior grades, this knowledge likely exists prior to participation in the smoking prevention intervention. The hypothesis of pre-existing knowledge and intentions is supported by the findings of stable student smoking intentions after participating in such a smoking prevention program (De Vries, et al., 1994; Flay, et al., 1995; MacKinnon, et al., 1991; Turner, et al., 1993). As depicted by Figure 3.2, psychosocial smoking prevention programs assume that students intend to
not use tobacco. Learning activities are aimed at developing skills for refusing smoking. Through practice and role playing, confidence for using these skills is also developed. Actual use of these skills is influenced by students’ confidence to execute the skill, by their expectations as to what will happen when they do execute them, the value the student places on these expectations and by the reinforcements they receive for their decision. Use of the refusal skills then subsequently influences smoking behavior.

McGuire’s Social Inoculation Theory also influenced the development of the intervention (Evans, et al., 1978). McGuire’s Social Inoculation Theory parallels the concept of medical inoculation or vaccination: if a person is exposed to a small, controlled amount of a microorganism prior to a “real world” exposure, the person will have had time to develop antibodies to fight off the microorganism. Applied to an educational setting, a student is exposed to a small amount of social or peer pressure in a controlled environment. This practice session allows them to develop strategies and behavioral capabilities to refuse the “real” pressure.

The variables of interest in this study, behavioral capability to resist positive images of smoking, refusal skill-efficacy, refusal outcome expectations and refusal outcome expectancies, are constructs of the Social Cognitive Theory. Because these four constructs are educational targets of a psychosocial smoking prevention program, one would expect participation in a psychosocial smoking prevention program to increase students’ scores on behavioral capability to resist positive images of smoking, refusal skill-efficacy, refusal outcome expectations and refusal outcome expectancies. One would also anticipate nonsmokers to have higher scores than smokers for each of these
constructs. The theoretical model (Figure 3.2) hypothesizes that the development of skills to reject cigarette offers, skills to reject positive images of smoking, confidence to use refusal skills, increased expectations for positive outcomes and decreased expectations for negative outcomes decreases the likelihood of cigarette smoking. One would expect then, that students already experimenting with cigarettes would have lower levels of these skills, efficacy and expectations.
Figure 3.2
Mediating Variables in Psychosocial Smoking Prevention Programs

Knowledge of Short term & Long term Consequences of Smoking

Knowledge of Social Norm

Intentions to Smoke

Refusal Skill Capability

Refusal Skill Efficacy

Reinforcement of Decision

Use of Refusal Skills

Refusal Outcome Expectations

Smoking Behavior

Behavioral Capability to Resist Positive Images of Smoking
CONSTRUCT SELECTION

The theoretical constructs were selected by the researcher after conducting a review of the adolescent smoking prevention literature. In the studies evaluating mediating variables, students' smoking intentions, refusal self-efficacy and refusal skill development were most often examined. The development of refusal skills has been measured well. Findings suggest that students enter psychosocial smoking prevention programs with a moderate level of refusal skills and these programs can increase the refusal skills slightly (Hops, et al., 1986; Katz, et al., 1989; Sallis, et al., 1990). Testing only control groups have also shown modest improvements in refusal skills from pre to post test (Sallis, et al. 1990; Elder et al., 1994). Refusal self-efficacy was measured in four of the twelve evaluations (Botvin, et al., 1990; De Vries, et al., 1994; Flay, et al., 1995; Turner, et al., 1993). Measurement of self-efficacy has not been as comprehensive nor as clearly defined as refusal skills. Previous measurement has not clearly define the construct being measured and as a result, has measured various types of efficacy. Most often, two types of efficacy are measured: students' perceived ability and confidence to refuse tobacco offers and student's self-efficacy to remain smoke-free. While three of the four studies documented no treatment effects for self-efficacy, preliminary findings have suggested that refusal self-efficacy is not a global factor. Two studies have documented instances where efficacy varies by situational influences. Turner et al. (1993) reported that students were more efficacious in refusing smokeless tobacco than cigarettes. De Vries et al. (1994) documented a treatment effect for smokers at nine months. Lastly, students' smoking intentions often remain unchanged by these programs (De Vries, et al., 1994).
Whether smoking intentions (to not smoke) as a group are initially high (Turner, et al., 1993) or low (Flay, et al., 1995), intentions remained unchanged through these programs.

In a skill development program, the development of a skill and the confidence to use the skill (self-efficacy) are key hypothesized mediating variables to impacting a behavior. Self-efficacy is skill and situation specific (Maibach & Murphy, 1995). In psychosocial smoking prevention programs, educational activities focus on students' ability to identify social pressures to smoke cigarettes and to develop skills to overcome these pressures. Students are taught skills to refuse direct tobacco offers as well as to resist positive media images and adult modeling of smoking. Thus, students would develop self-efficacy for each of these skills: to refuse tobacco (refusal skill-efficacy) and to resist the positive images of smoking. Prior research has not examined refusal self-efficacy in this skill and situation specific manner. Self-efficacy has been measured as a global factor, not recognizing situational influences nor skill specific efficacy.

The constructs of outcome expectations and expectancies are tied closely to the construct of self-efficacy (Maibach & Murphy, 1995). "People are motivated to perform behaviors (skills) they believe will produce desired outcomes" (Maibach & Murphy, 1995, p. 38). Thus, not only should students' efficacy to use refusal skills be measured, what they believe will happen when they use these skills (expectations) and the value they place on the outcome (expectancies), should also be measured. Previous research has not addressed the constructs of refusal outcome expectations and expectancies and their impact on students' refusal skill-efficacy.
For the purpose of this study, the dependent variables are students' behavioral capability to resist positive images of smoking, refusal skill-efficacy, refusal outcome expectations and refusal outcome expectancies. Smoking status, nonsmoker versus experimental smoker, was also measured to assess whether smokers respond differently to the program.

SUBJECT SELECTION

The population for this study is sixth graders attending Middletown City Schools. The target sample consists of sixth graders attending Roosevelt, Amanda and Jefferson Elementaries. The accessible sample is those students whose parents consented to their participation, who attend greater than 50% of the intervention and who completed the pre and post questionnaires. Intact classes were be used. Students who had learning disabilities (LD) and were not mainstreamed into the classroom or were developmentally handicapped (DH) were excluded from the study. Because of teacher requests, these LD and DH students participated in the educational program, but because of vast reading and comprehension differences amongst these students, they were not included in the data analysis. Sixth grade classes were selected because of prior research. Nearly half, 44%, of eighth graders have tried cigarettes (Johnston, O'Malley & Bachman, 1993). In Flay's review (1985), six of the implemented programs were in the sixth grade. Fifteen programs were implemented at the seventh grade level, while four were implemented at other grades. Sixth and seventh grades are targeted because of an increase in tobacco initiation in these transitional school grades. Additionally, the curriculum selected, the
Minnesota Smoking Prevention Program, was written for sixth or seventh graders. The researcher chose sixth grade, verses seventh, because of school willingness to participate.

One school, verses multiple school sites, was chosen to receive the treatment to minimize the effects of history and to help the researcher with ease of implementation. Two schools were required for the comparison group in order to have an equal number of subjects. History refers to unplanned events which may influence the results of the study. Examples include the death of a student, enforcement of a new policy, or a national news event. While these events can not be controlled by the researcher, events can be recorded and discussed in the findings. By minimizing the number of locations involved in the study, subject exposure to historical events will be similar. Roosevelt Elementary was selected as the treatment school because of its large number of sixth grade classes (n = 5), status as a median school of academic achievement and school willingness to participate. Two schools similar to Roosevelt on the following variables were selected as the comparison group: similar gender and race rates, social economic status and perceived academic achievement. Sources of data were school records of gender and race, percentage of students on the free school lunch program and school status as neither an alternative school nor a school of excellence. Additionally, none of the participating sixth-grade classrooms had participated in a D.A.R.E. tobacco and substance abuse prevention program.
<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Roosevelt (treatment)</th>
<th>Amanda (comparison)</th>
<th>Jefferson (comparison)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Grade Level</td>
<td>sixth</td>
<td>sixth</td>
<td>sixth</td>
</tr>
<tr>
<td>Number of Sixth Grade Classes</td>
<td>5</td>
<td>3</td>
<td>2</td>
</tr>
<tr>
<td>Number of Sixth Grade Students</td>
<td>118</td>
<td>74</td>
<td>46</td>
</tr>
<tr>
<td>School Gender Proportions</td>
<td>50% male</td>
<td>52% male</td>
<td>50% male</td>
</tr>
<tr>
<td></td>
<td>50% female</td>
<td>48% female</td>
<td>50% female</td>
</tr>
<tr>
<td>School Race Proportions</td>
<td>94% white</td>
<td>99% white</td>
<td>99% white</td>
</tr>
<tr>
<td></td>
<td>6% other</td>
<td>1% other</td>
<td>1% other</td>
</tr>
<tr>
<td>Percentage of Students Receiving Free or</td>
<td>46%</td>
<td>36%</td>
<td>48%</td>
</tr>
<tr>
<td>Assisted Lunch (month of April)</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table 3.1
Characteristics of Target Sample
SAMPLE SIZE

Primary considerations for determining sample size are power, alpha level and effect size (Keppel, 1991). Because of the lack of prior research of the variables of interest, the alpha level was set at 0.05. Power, the probability of correctly rejecting the null hypothesis, was set at .80. Effect size, often unknown by the researcher should be estimated from previous research. Because few of the reviewed studies reported effect size on mediating variables, an effect size was estimated from instrument pilot data. The mean score (46.8) and standard deviation (15.8) for refusal skill-efficacy was used. The researcher estimated $\mu_0$ as a five point increase at posttest for refusal skill-efficacy. The following calculations, as specified by Kraemer and Thiemann (1987), were then used to calculated effect size and sample size.

$$\delta = \Delta \text{ (effect size)}$$

$$\delta = (\mu - \mu_0)/\sigma$$

$$\delta = (46.8 - 51.8)/15.8$$

$$\delta = .32$$

$$\Delta = .32$$

For alpha of 0.05, power of 0.80 and estimated effect size of 0.32, sample size equals 73 (Kraemer & Thieman, 1987).

The need to further stratify the sample for data analysis was also a consideration in sample size. One purpose of the study is to examine changes in the theoretical constructs with respect to students' smoking status. The sampling would need to include enough “experimental smokers” to maintain a power of .80. The first step was to
estimate the percentage of experimental smokers in the population. Butler County, the
county of residence for Middletown City Schools, reported that 15.5% of sophomores in
1995 reported their first use of cigarettes occurred in the fifth or sixth grade and 6%
reported first use prior to fifth or sixth grade (Alcohol & Drug Addiction Services of
Butler County, 1996). Because the definition of experimental smoker was broad, any
cigarette use in the past year, the percentage of experimental smokers in the population
was conservatively increased to 30%. One other assumption made by the researcher was
that the effect size for experimental smokers would be greater than the effect size for
nonsmokers. Based upon a seven point increase in refusal skill-efficacy scores at posttest
and a percentage of 30% experimental smokers, the following calculations were made to
determine sample size.

\[
\delta = \Delta \text{ (effect size)}
\]
\[
\delta = (\mu - \mu_0)/\sigma
\]
\[
\delta = (46.8 - 53.8)/15.8
\]
\[
\delta = .45
\]
\[
\Delta = .45
\]

For alpha of 0.05, power of 0.80 and estimated effect size of 0.45, sample size equals 35
(Kraemer & Thieman, 1987). Lastly, it was calculated that for 30% of sample to equal
35, the total treatment group sample should equal 116.
INSTRUMENT DEVELOPMENT

Because the variables of interest had yet to be studied in the area of smoking prevention, instrument or questionnaire items had not previously been developed. Refusal self-efficacy items exist on a limited basis. More detailed measures were developed. The researcher, with feedback from a panel of experts, developed an instrument to measure the following variables: behavioral capability to resist positive images of smoking, refusal skill-efficacy, refusal outcome expectations and refusal outcome expectancies. Appendix A contains a complete description of the sequence of events and resulting actions in the instrument development process.

The panel of experts consisted of the following individuals with their area of expertise noted in parentheses: Jeff Hallam, Ph.D. (process evaluations and Social Cognitive Theory); Anne Haye (adolescent smoking); Jan Henderson, Ph.D. (instrument development) and Rick Petosa, Ph.D. (Social Cognitive Theory and adolescent research). Each panel member received a description of the purpose of the study, purpose of the instrument and constitutive definitions for each theoretical construct. Panel members were asked to assess the face validity and content validity for each subscale. Specifically, they were asked to comment on each item for readability and clarity of the question and the face validity. Panel members were also asked to comment on the overall content validity; was the item sampling likely to measure the constitutive definition of the construct. Questionnaire items were delivered to each panel member with directions to forward comments back to the researcher within five days. Comments were incorporated into the instrument and then draft two was sent to the panel members. Comments from
the second draft were incorporated to the instrument. Recognizing that all four panel members were unlikely to agree on all comments, any similar comment made by two or more panel members was incorporated into the instrument. See Appendix B for communication and instrument sent to panel of experts.

A Fog Index, to determine the level of readability, was also calculated prior to the instrument field test and pilot test (Regents of University of Minnesota, 1997). Randomly, a section of 100 words was selected from the instrument. The number of sentences or items in the selected section were counted. This total number of sentences was divided by the number of words, 100, to determine Average Sentence Length (ASL). The percentage of Hard Words (HW) was then calculated by totaling the number of words with greater than three syllables. The following were not counted in the total of hard words: capitalized words; combinations of short, easy words such as fireman; and verb forms made to three syllables by added “ed” or “es”. The Fog Index equals the sum ASL plus HW, multiplied by 0.40 \((ASL + HW) \times 0.40\). The answer represents the years of education needed to understand the instrument. For the purpose of this study, the Fog Index was not to exceed five years. The Fog Index, calculated in three separate parts of the instrument, equaled four.

During the second round of receiving comments from the panel of experts, the instrument was field tested with three sixth graders from outside the participating school district. The researcher sat down with each student, one on one. The student was asked to read each item and then repeat back to the researcher in his or her own words what he or she thought that item was asking. The student then picked his or her answer. For the
first two to three questions in each section, the student was asked to give a rationale for their response. Students were asked to only give their response rationale for the first two to three questions in each section because of the repetitiveness of the questionnaire items. Questionnaire items in the same sections are very similar. The items differ by descriptions of the situation. Thus, the rationale for subjects' answer would not change. For example, question number 38 asked “How sure are you that you could continue to say “no” and not smoke if your best friend kept asking you to smoke even after you said “no”? Question number 39 reads “How sure are you that you could continue to say “no” and not smoke if an older student you admire kept asking you to smoke even after you said “no”?

Panel of experts' second cycle comments and comments from the field test were incorporated to finalize the instrument; see Appendix A for specific instrument revisions. The finalized instrument was then piloted for the purpose of documenting a valid and reliable instrument. The pilot group was a class of sixth graders, consisting of 25 students from a school not included in the target sample. These students were read the same directions as developed for the study sample (Appendix C). The range of time to complete the questionnaire was 12 to 25 minutes. All students were given a pencil for their participation. Seven days later, the researcher returned and had the pilot sample complete the same questionnaire, following the same procedures. Results are tabled in Appendix D. A coefficient of stability was calculated; the Pearson Product Moment Correlation represents the correlation between students' first and second score to the same subscale. All correlation coefficients were 0.63 or higher and were significant at a p
of <.002. For the number of cigarettes smoked in the past 30 days, one student reported an increase of 15 cigarettes. The researcher interpreted this as more of a change in behavior other than an unstable answer. Thus, this answer was not included in data analysis. A coefficient of internal consistency, Cronbach's alpha, was also reported for each construct. Cronbach's alpha is a correlation coefficient used for summated scores and is a measure for how a group of items correlate with each other. All alpha's were greater than 0.65 and significant at a p of <.001. From the pilot study, there were no changes in the instrument. The final instrument and the coding sheet are in Appendices E and F, respectively.

A confirmatory factor analysis for construct validity uses data from a sample other than the study sample to confirm that the instrument measures the constructs of interest. Items from construct subscales should load together. Initially, a predetermined loading factor of >.30 was set for an item to remain included in analysis. From a practical perspective for the purpose of this study, a confirmatory factor analysis was conducted on sample pretest data. Gorsuch (1983) recommends a minimum of five subjects for each questionnaire item included in the factor analysis, with no less than 100 subjects. The five subjects per item ratio should be used only when commonality amongst the factors is assumed high; otherwise, the number of subjects should be increased. The factors being tested by this study's instrument are theorized to exist in relationship to one another; thus, for a 78-item questionnaire, 390 subjects are recommended. The actual number of pretest subjects with useable data was 166. The discrepancy of subjects for the confirmatory factor analysis is listed as a limitation of the study. Additionally, because of the
discrepancy of subjects, the researcher did not feel that the data provided by the confirmatory factor analysis could be used to exclude questionnaire items. Recognizing the limitations of the too few subjects, information from the confirmatory factor analysis is provided in Appendix G to give the reader information about the quality of the instrument, not to exclude questionnaire items. The oblique rotation method assumes that there is a relationship amongst the constructs, and thus, this method was used. Six factors were expected to load together: behavioral capability to resist positive images of smoking, refusal skill-efficacy, positive refusal expectations, negative refusal expectations, positive refusal expectancies and negative refusal expectancies. As indicated by Table A.2, positive and negative expectations loaded together and positive and negative expectancies loaded together. For refusal skill-efficacy, all questionnaire items had a loading factor of >.30. For behavioral capability to resist positive images of smoking, eight of the twelve questionnaire items had loading factors >.30. The four items which did not have a loading factor >.30 were the four items from the subscale ability to identify the media message. For refusal expectancies, 20 of the 21 questionnaire items had loading factors >.30. For refusal expectations, 14 of the 21 questionnaire items had loading factors >.30 with three items having loading factors >.25.
DEFINITION OF TERMS

Theoretical constructs are constitutively and operationally defined in the first part of this section. Part two of this section includes constitutive definitions of terms related to the purpose of this study.

I. Theoretical Constructs

A. Behavioral Capability to Resist the Positive Images of Smoking: is one’s ability to identify, evaluate the truthfulness and reject favorable images of smoking presented through media and adult modeling. Operationally, this variable is measured as one’s score on a 12-item subscale, with possible scores ranging from 0 to 36. The higher the score, the higher the behavioral capability to resist positive images of smoking. Cronbach’s alpha equals 0.80 and the coefficient of stability equals 0.89.

B. Refusal Skill Efficacy: one’s perceived ability to resist direct, indirect, hassle and put down type cigarettes offers made by best friends, groups of friends and older students. Operationally, this variable is measured by one subscale of 20 Likert-type items. Possible scores range from 0 to 60. The higher the score, the higher the student’s skill efficacy to refuse cigarette offers. Cronbach’s alpha equals 0.97 and the coefficient of stability equals 0.80.

C. Refusal Outcome Expectations: expected outcomes, positive and negative social consequences, from refusing cigarette offers. This variable is measured as two subscales: (1) positive expectations; scores range from 9 to 36. Cronbach’s alpha equals 0.65 and the coefficient of stability equals 0.69. The higher the score, the higher the student’s expectations for positive outcomes from refusing cigarette offers. (2) Negative expectations; scores range from 12 to 48. The higher the score, the higher the student’s expectations for negative outcomes from refusing cigarette offers. Cronbach’s alpha equals 0.88 and the coefficient of stability equals 0.64.

D. Refusal Outcome Expectancies: are the values, important or unimportant, that an individual places on refusal outcome expectations. This variable is measured as two subscales: (1) Values for positive expectations; scores range from 9 to 36. Cronbach’s alpha equals 0.86 and the coefficient of stability equals 0.85. The higher the score, the more the student values these outcomes. (2) Values for negative expectations; scores range from 12 to 48. The higher the score, the more the student values the avoidance of the negative outcomes. Cronbach’s alpha equals 0.88 and the coefficient of stability equals 0.64.
E. **Total Positive Refusal Expectations & Importance**: is the multiplicative function of positive refusal outcome expectations and expectancies. Operationally, this variable is the sum of the nine refusal outcome expectations multiplied by the corresponding refusal outcome expectancy. Scores for this subscale range from 9 to 144. Cronbach’s alpha equals 0.74 and the coefficient of stability equals 0.74.

F. **Total Negative Refusal Expectations & Importance**: is the multiplicative function of negative refusal outcome expectations and expectancies. Operationally, this variable is the sum of the 12 refusal outcome expectations multiplied by the corresponding refusal outcome expectancy. Scores for this subscale range from 12 to 192. Cronbach’s alpha equals 0.89 and the coefficient of stability equals 0.74.

G. **Smoking Status**:
   - **Nonsmoker**: no reported cigarettes use in the past 365 days.
   - **Experimental Smoker**: any reported cigarette use in the past 365 days.

II. Additional Definitions

A. **Psychosocial Smoking Prevention Program**: also referred to as “social influence programs”, are educational programs directed toward adolescents and designed to decrease the number of new smokers. They address the psychological aspect of smoking initiation as well as the social influences to smoke and range in length from 4 to 12, 45-minute sessions. As reported by Glynn (1989) and Flay (1985), they include three minimum components:
   a) discussion of short-term consequences of smoking
   b) refusal skill development
   c) identification of social pressures, including media
For the purpose of this study, the Minnesota Smoking Prevention Program was chosen as the treatment psychosocial smoking prevention program.

B. **Refusal Skill Capability**: is the ability and the manner in which a participant rejects cigarettes offers. Learned strategies include just say “no”, hang out with kids who do not use tobacco, suggest something else, give a reason, add some humor, standing up for yourself and avoiding high risk environments.

C. **Self-Efficacy**: is a person’s perceived ability and confidence to perform a skill (Perry, et al., 1990).

D. **Outcome Expectations**: are expected outcomes of behavior (Perry, et al., 1990).
E. **Outcome Expectancies**: are the values the individual places on these expectations (Perry, et al., 1990).

F. **High-Risk Environments**: are situations in which the use of tobacco is increased due to availability, presence of peers, increased social pressures or lack of adult supervision.
DATA COLLECTION

Data were collected by a paper and pencil questionnaire, distributed and completed in the classroom. Historically in smoking prevention research, paper and pencil questionnaires have been the primary means of data collection. The only exception has been the measurement of refusal skills, which are not a variable of interest in this study. One week prior to the first educational lesson, the questionnaire was completed by both the treatment and comparison group. Because of scheduling conflicts, though, one of the comparison schools, Jefferson, did not complete the pretest until the first day of the intervention. The posttest was given four weeks after the completion of the smoking prevention program, eight weeks after the pretest. All schools completed the posttest on the same day. All students completed the questionnaire in a range of 10 to 25 minutes. In both the pre and post test distribution, the researcher or a trained assistant distributed the questionnaires to the students and read aloud the same directions for completing the questionnaire; instructions are listed in Appendix C.

To increase the honesty of students’ answers, students were not asked to put their name on the questionnaire. Pre and post questionnaires were matched by three identifier questions: number of older brothers, number of older sisters and month of birth date. Questions were chosen based upon stability of answers and students’ likelihood of remembering the answer. Three questions were used because of the possibility of duplication on a single question. In ten instances, the sex and race of the student were also used to match scores. In one of the comparison schools, classes were combined for data collection.
Students from the treatment group who were absent the day of pretest collection completed the pretest on the first day of intervention, prior to beginning the intervention. Once completed, the student placed the questionnaire in that class' envelope with the other questionnaires. One student from the treatment group was absent and her pretest questionnaire was collected on the first day of the intervention. Three students from the comparison group were absent from the pretest. There was no method for collecting pretest responses from these students.

For all students absent the day of posttest data collection, the researcher left with each teacher a packet which included a questionnaire, a manilla envelope and note to each student (Appendix H). The student was asked to complete the questionnaire, place the completed questionnaire in the envelope and return the envelope to their teacher. The researcher picked up the envelopes three days later. While absences at pretest were consistent across the groups, the number of absent students varied at the posttest. Posttest data was collected the day after Memorial Day, during the last week of school. This may account for the large number of absences (n = 15) in the treatment group. In the comparison schools, posttest collection day was also "Field Day" for students. This is a popular outdoor activity for students and only three students were absent from both groups; one of students was suspended for the remainder of the school year.

Only students who received greater than 50% of the intervention (four out of the six sessions) were included in the data analysis. Attendance at each educational session was recorded by asking the teacher the name of absent students and recording absences in that class' folder of implementation notes. Prior to the posttest, the researcher created a
list of those students who were to be excluded from the posttest. This excluded five students from data analysis; three of which were absent on the day of posttest data collection. The other two students completed the questionnaire, but as they turned the questionnaire in, the researcher placed his or her questionnaire in the front of the collection envelope. After the class, these questionnaires were marked to be excluded from data analysis.

Passive, informed consent was obtained for each student. A letter explaining the curriculum and the evaluation was sent home with each child, 14 days prior to the beginning of the intervention. As with other school based educational research, the parents were asked to communicate to the researcher if they did not want their child to participate; otherwise consent was implied (Appendix I). No parent contacted the researcher or the teachers to deny consent. Human Subjects Review Committee was obtained, protocol number 97B0136 (Appendix J).

Twenty-two percent of the pretest subjects were not included in data analysis. Only 6% (13 out of 207) of the pretest subjects were excluded and or lost because of absences by the student. Of the 46 lost cases, 67% (31) of the pretest subjects were excluded because of inability to match identifier questions, pretest to posttest. The percentage of total subjects lost by the treatment and comparison group was similar. The comparison group lost 20% of their pretest subjects. The treatment group experienced a 24% loss of subject rate. See Table 3.2 for an overview of sample sizes and frequencies of subjects lost. Further analysis revealed that pretest subjects lost from the comparison
group reported more pretest smoking: 47% of the treatment and 60% of the comparison
group lost pretest subjects were categorized as experimental smokers.

One would assume that the differential loss of smokers between the treatment and
comparison groups would threaten the internal validity of the study. This is not the case,
though, because only complete data sets were included in analysis. Treatment affects
could not have been produced because more (or less) smokers dropped out of the
treatment group. Having treatment and comparison group samples which differed from
one another at the pretest would have decreased the internal validity of the program. Data
from the responding sample indicates, though, that the proportion of smokers in the
treatment group is similar; 35% of the treatment and 39% of comparison. Thus, the 22%
loss of subject rate does not threaten the internal validity of the study. The loss of
subjects is an external threat to validity, known as non-response error. Study findings
should only be generalized to those students who participated in the study and who had
complete data sets.
### Table 3.2
Overview of Sample Sizes

<table>
<thead>
<tr>
<th>Number of Students</th>
<th>Roosevelt (treatment)</th>
<th>Amanda (comparison)</th>
<th>Jefferson (comparison)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Present at Pretest</td>
<td>107</td>
<td>58</td>
<td>42</td>
</tr>
<tr>
<td>Absent at Pretest, as reported by teacher</td>
<td>1</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>Pretest Absentees Collected</td>
<td>1</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Excluded Because of Lack of Consent</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Present at Posttest</td>
<td>82</td>
<td>64</td>
<td>41</td>
</tr>
<tr>
<td>Absent at Posttest, as reported by teacher</td>
<td>15</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>Posttest Absentees Collected</td>
<td>13</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Excluded Because of Missing Data 10%</td>
<td>0</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>Excluded Because of No Matching Test</td>
<td>12</td>
<td>10</td>
<td>10</td>
</tr>
<tr>
<td>Pretests not included</td>
<td>10</td>
<td>15</td>
<td>7</td>
</tr>
<tr>
<td>Posttests not included</td>
<td>10</td>
<td>15</td>
<td>7</td>
</tr>
<tr>
<td>Excluded Because Questionnaire Was Missing Pages</td>
<td>1</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Excluded Because of Attendance ≤50% at Educational Sessions</td>
<td>5</td>
<td>N/A</td>
<td>N/A</td>
</tr>
<tr>
<td>Total Number of Complete Data Sets</td>
<td>81</td>
<td>49</td>
<td>31</td>
</tr>
</tbody>
</table>

Note. Comparison group information is provided by school to document that loss of subjects occurred across all participating schools and was not differential by school.
TREATMENT

The purpose of this study was to determine the impact of a psychosocial smoking prevention curriculum on the Social Cognitive Theory constructs of behavioral capability to resist positive images of smoking, refusal skill-efficacy, total positive refusal expectations & importance and total negative refusal expectations & importance. The independent variable, the Minnesota Smoking Prevention Program, is a six-lesson psychosocial smoking prevention curriculum. This curriculum was selected because of its documented program effectiveness and program length. Two-year follow-up data documented a 20% lower rate of smoking reduction between this peer-led, social influences program and a lecture, health consequences type comparison program (Murray, et al., 1987). One scheduled difference between the written curriculum and the implemented program was the use of the "The Big Dipper" video. This video was produced in the 1986. The curriculum is written such that the video is optional. Because of the datedness of the video, another video segment, presenting similar information was substituted. The substitute video was a "Tobacco: Its The Pushers & The Victims" by Doctors Ought to Care. A sixteen minute segment on the consequences of tobacco was shown to students.

Documentation of program implementation was accomplished by the completion of lesson checklists as well as limiting the number of program instructors to two. The researcher and a health educator from her office, were the only program instructors. Each instructor was assigned a class, while the other instructor's role was to observe, help pass out hand-outs and monitor small group progress. After each class, the instructor
completed a checklist of session objectives, see Appendix K for checklists. Only those classes which received 80% of the curriculum were included in data analysis. Additionally, before each lesson and the peer leader training, the instructors met to review the lessons and methods.

The comparison group was scheduled to receive no other educational programs, other than their usual health education. This traditional education is knowledge-based, with no focus on refusal skills or social pressures to smoke cigarettes.

<table>
<thead>
<tr>
<th>Content</th>
<th>Educational Process</th>
<th>Social Cognitive Theory Construct</th>
<th>Minutes of Time</th>
</tr>
</thead>
<tbody>
<tr>
<td>Introduction to Program</td>
<td>lecture</td>
<td></td>
<td>5</td>
</tr>
<tr>
<td>Consequences of Smoking</td>
<td>peer group discussion</td>
<td>-smoking outcome expectations</td>
<td>15</td>
</tr>
<tr>
<td>-negative health consequences</td>
<td></td>
<td>-knowledge</td>
<td></td>
</tr>
<tr>
<td>Consequences of Smoking</td>
<td>videotape: “Tobacco: The Pushers &amp; the Victims”. By Doctors Ought to Care. Section on the Consequences of Tobacco Use.</td>
<td>-smoking outcome expectations</td>
<td>20</td>
</tr>
<tr>
<td>-long term health consequences</td>
<td></td>
<td>-knowledge</td>
<td></td>
</tr>
<tr>
<td>-immediate physical consequences</td>
<td>discussion of videotape</td>
<td></td>
<td>5</td>
</tr>
<tr>
<td>-undesirable social consequences</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table 3.3
Overview of Lesson 1 of the Minnesota Smoking Prevention Program
### Table 3.4
Overview of Lesson 2 of the Minnesota Smoking Prevention Program

<table>
<thead>
<tr>
<th>Content</th>
<th>Educational Process</th>
<th>Social Cognitive Theory</th>
<th>Minutes of Time</th>
</tr>
</thead>
<tbody>
<tr>
<td>Introduction to Lesson</td>
<td>lecture</td>
<td></td>
<td>5</td>
</tr>
<tr>
<td>Why People Start Smoking</td>
<td>peer group discussion</td>
<td>-smoking outcome expectations</td>
<td>12</td>
</tr>
<tr>
<td></td>
<td></td>
<td>-observational learning</td>
<td></td>
</tr>
<tr>
<td>Positive Alternatives to Smoking</td>
<td>peer group discussion</td>
<td></td>
<td>12</td>
</tr>
<tr>
<td>Estimation of Number of Adolescent Smokers</td>
<td>large group discussion</td>
<td>-environment &amp; situation</td>
<td>12</td>
</tr>
<tr>
<td></td>
<td>homework assignment: adult smoker interview</td>
<td>-observational learning</td>
<td>6</td>
</tr>
<tr>
<td>Content</td>
<td>Educational Process</td>
<td>Social Cognitive Theory</td>
<td>Minutes of Time</td>
</tr>
<tr>
<td>-------------------------------</td>
<td>------------------------------</td>
<td>----------------------------------------------------------------------------------------</td>
<td>-----------------</td>
</tr>
</tbody>
</table>
| Adult Interviews & Helping People Quit | large group discussion       | -observational learning  
-smoking outcome expectancies  
-behavioral capability (quitting)  
-behavioral capability to resist the positive images of smoking | 15              |
| Where People Start            | peer group discussion        | -environment & situation  
-refusal skills (environment avoidance) | 8               |
| Pressure Stories              | peer group discussion        | -environment & situation  
-observational learning  
-refusal behavioral capability  
-refusal skill-efficacy | 12              |
| Refusal Strategies            | peer group discussion        | -situation  
-refusal behavioral capability  
-refusal skill-efficacy  
-observational learning | 10              |
|                               | homework: bring in smoking advertising |                                                                        | 3               |

Table 3.5
Overview of Lesson 3 of the Minnesota Smoking Prevention Program
<table>
<thead>
<tr>
<th>Content</th>
<th>Educational Process</th>
<th>Social Cognitive Theory</th>
<th>Minutes of Time</th>
</tr>
</thead>
<tbody>
<tr>
<td>Review Refusal Strategies &amp; Secondhand Smoke</td>
<td>large group discussion</td>
<td>-behavioral capability -situation</td>
<td>5</td>
</tr>
<tr>
<td>Practice Refusing Tobacco</td>
<td>role playing, peer groups</td>
<td>-refusal behavioral capability -refusal skill-efficacy -refusal outcome expectations -refusal outcome expectancies -situation -observational learning</td>
<td>20</td>
</tr>
<tr>
<td></td>
<td>role play, large group</td>
<td></td>
<td>15</td>
</tr>
<tr>
<td>Summary</td>
<td>peer group discussion</td>
<td>-refusal behavioral capability -refusal skill-efficacy -refusal outcome expectations -refusal outcome expectancies -situation -situations</td>
<td>10</td>
</tr>
</tbody>
</table>

Table 3.6
Overview of Lesson 4 of the Minnesota Smoking Prevention Program
<table>
<thead>
<tr>
<th>Content</th>
<th>Educational Process</th>
<th>Social Cognitive Theory</th>
<th>Minutes of Time</th>
</tr>
</thead>
<tbody>
<tr>
<td>Advertising Pressures</td>
<td>peer group discussion</td>
<td>-observational learning -behavioral capability to resist the positive images of smoking</td>
<td>10</td>
</tr>
<tr>
<td>Advertising Analysis</td>
<td>peer group discussion</td>
<td>-environment &amp; situation -observational learning -behavioral capability to resist the positive images of smoking</td>
<td>12</td>
</tr>
<tr>
<td></td>
<td>discussion</td>
<td></td>
<td>5</td>
</tr>
<tr>
<td>Promoting Non-Use of Tobacco- Ad Projects</td>
<td>peer group - preparing own ads</td>
<td>-reinforcement -behavioral capability to resist the positive images of smoking</td>
<td>20</td>
</tr>
</tbody>
</table>

Table 3.7
Overview of Lesson 5 of the Minnesota Smoking Prevention Program
<table>
<thead>
<tr>
<th>Content</th>
<th>Educational Process</th>
<th>Social Cognitive Theory</th>
<th>Minutes of Time</th>
</tr>
</thead>
<tbody>
<tr>
<td>Presentation of Ads</td>
<td>peer group project: lifesaver candies to best presentation</td>
<td>reinforcement</td>
<td>15</td>
</tr>
<tr>
<td>Decision Not to Smoke</td>
<td>individual declaration</td>
<td>environment &amp; situation</td>
<td>15</td>
</tr>
<tr>
<td></td>
<td></td>
<td>reinforcement</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>self-control</td>
<td></td>
</tr>
<tr>
<td>Summary Points (not mentioned in student declarations)</td>
<td>lecture with discussion</td>
<td></td>
<td>5</td>
</tr>
<tr>
<td>Certificates of Completion</td>
<td>certificates &amp; rulers to peer leaders.</td>
<td>-reinforcements</td>
<td>10</td>
</tr>
<tr>
<td></td>
<td>“Smoking Stinks” stickers &amp; pencils to students who read their statement.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table 3.8
Overview of Lesson 6 of the Minnesota Smoking Prevention Program

IMPLEMENTATION

Peer leader training was conducted five days prior to the first educational session, two days after the pretest. As suggested by the curriculum, peer leaders were voted in by their fellow classmates. Students were asked to select student leaders to help implement a special educational program. Alternate peer leaders were also selected to cover for absences. All peer leaders were present during the 45-minute training session. Peer leader training consisted of the following activities: congratulating students for being selected and respected by peers, an overview of the Minnesota Smoking Prevention Program, responsibilities of a group leader, observe a role play of session number one and participate in a role play of session number two. Peer leaders facilitated teams consisting of four fellow students. In only one instance was a peer leader replaced by the alternate.
The original peer leader, from classroom number one, was suspended during the first two lessons and sent to the hall during the third session. Students were assigned to teams by the classroom teacher.

The program was implemented on Tuesdays and Thursdays, in 45-minute sessions, over a three-week period. In class number one, students acting out and lack of following directions was consuming class time. Starting with session number three, this class started 15 minutes earlier so that there was 60 instructional minutes. In the checklist notes, the researcher wrote “this (additional time) made a huge difference”. The five classes were scheduled back to back, starting at 9:30 a.m., finishing at 3:15 p.m.. Because of time constraints, a few activities were not implemented. Percentage of program implemented as well as learning activities omitted are listed in Table 3.9. The percentage of program implemented was calculated by dividing the number of implemented learning activities by the total number of scheduled activities. The total number of scheduled activities equaled 50. The detail of the scheduled activities is given in the checklists, Appendix K. All classes had a 90% or greater percentage of program implementation. There is consistency in the activities not discussed, as that the facilitators identified these sections as optional prior to each implemented lesson plan. In addition to the written curriculum, a 30-minute “work session” was added after session five. Students were given this time to work on their team tobacco advertisement and their “Choose Not to Use” statement.
COMPARISON GROUP EDUCATION

Effort by the researcher was made to report smoking prevention and health education of the comparison group during the time of this study. The sixth grade classrooms, as part of a elementary school and not a middle school, did not have distinct class periods, such as health. The researcher was unable to collect information on health topics taught during the eight weeks of the study from the five teachers involved in the comparison group.
<table>
<thead>
<tr>
<th>Class</th>
<th>Percentage of Program Implemented</th>
<th>Activities/Content Omitted</th>
<th>Estimated Time Involved in Omitted Activities</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number 1</td>
<td>94%</td>
<td>(1) Defining Secondhand Smoke (2) Consequences of Secondhand Smoke (3) Helping People Quit</td>
<td>8</td>
</tr>
<tr>
<td>Number 2</td>
<td>92%</td>
<td>(1) Defining Secondhand Smoke (2) Consequences of Secondhand Smoke (3) Helping People Quit (4) Barriers to Using Refusal Skills *</td>
<td>13</td>
</tr>
<tr>
<td>Number 3</td>
<td>92%</td>
<td>(1) Defining Secondhand Smoke (2) Consequences of Secondhand Smoke (3) Helping People Quit (4) Barriers to Using Refusal Skills *</td>
<td>13</td>
</tr>
<tr>
<td>Number 4</td>
<td>90%</td>
<td>(1) Defining Secondhand Smoke (2) Consequences of Secondhand Smoke (3) Helping People Quit (4) Barriers to Using Refusal Skills * (5) Refusal Outcome Expectations *</td>
<td>18</td>
</tr>
<tr>
<td>Number 5</td>
<td>96%</td>
<td>(2) Consequences of Secondhand Smoke (3) Helping People Quit</td>
<td>7</td>
</tr>
</tbody>
</table>

*Note: *These activities were discussed, but not in the detail as planned or covered in the other classes.

Table 3.9
Percentages of Program Implemented by Classroom
DATA ANALYSIS

Data was analyzed using the Statistical Analysis Software (SAS) package at the Ohio State University, see Appendix L for job control language. A three-way analysis of variance, with an alpha level of .05 level of significance, was conducted. The three factors built into this design are treatment, smoking status and time of testing.

The two variables of treatment and smoking status each have two levels and are between factors, meaning a subject belongs only to one level. The two levels for treatment are treatment or comparison. For the smoking status factor, subjects are either categorized as a nonsmoker or an experimental smoker. The factor of treatment is built into the design to answer the research questions of does the treatment impact the four theoretical constructs. Smoking status is included in the design to address the secondary purpose of this study; does a student’s smoking status interact with treatment for the four theoretical constructs.

Time of testing was included in the design to improve the internal validity of the study, not to answer a specific research question. By having time of testing built into the analysis, changes in scores from pre to post test can be reported. This will allow a researcher to report possible testing effects and maturation effects. Group differences at pre or post test can also be reported. The factor of time of testing is a within factor, meaning that subjects are in both levels; the two levels are pretest and posttest.

The three-way design allows the researcher to report three main effects; for treatment (a comparison between the treatment and comparison group on the four constructs), for smoking status (a comparison between experimental smokers and
nonsmokers on the four constructs) and for time of testing (a comparison of scores pretest and posttest). The main effect of treatment measures whether the smoking prevention program made a difference in scores for the four Social Cognitive Theory constructs. The main effect of smoking status measures whether mean scores of nonsmokers differ from mean scores of experimental smokers. The factor of smoking status is primarily in the design not to measure the main effect of smoking status, but to measure the interaction of smoking status and treatment. The third main effect of time of testing measures whether mean pretest and posttest scores differ. The time of testing main effect will allow a researcher to report statistical pretest (or posttest) differences and to report possible testing or maturation effects.

ANOVA also allows one to examine the interaction amongst the factors. The primary interaction of interest for the purpose of this study is the interaction of treatment and smoking status. A significant interaction of treatment and smoking status indicates that the effect of treatment is influenced by a student's status as a nonsmoker or experimental smoker.

Least squares means were used to adjust for unequal sample sizes. For statistically significant main or interaction effects, individual t-tests were conducted, post hoc, to identify which pairs of means differ significantly. As explained below by Welkowitz, Ewen and Cohen (1976), this post hoc procedure is appropriate.
If and only if an ANOVA $F$ test has resulted in the rejection of the overall null hypothesis that all $k$ means are equal, any (or all) of the paired means may be compared by t tests using the usual decision rule. These t tests take advantage of the more stable estimate of the population variance provided by the pooling of all the samples variances provided by ANOVA's $M_{sw}$, and are thus based on $df = N-k$. By requiring that the ANOVA $F$ be significant, we protect the resulting ts from large experimentwise Type I error rate of spurious “findings” which can otherwise occur (p. 221-222).

To further protect from spurious findings, only pre-planned post hoc group comparisons were conducted. The group comparisons to be examined were: (1) treatment and comparison, (2) treatment experimental smoker and treatment nonsmoker, (3) comparison experimental smoker and comparison nonsmoker, (4) treatment experimental smoker and comparison experimental smoker and (5) treatment nonsmoker and comparison nonsmoker.

Correction of the experimentwise alpha rate was considered for data analysis. Stevens (1992) argues that multiple univariate testing following an ANOVA or MANOVA increases the alpha level of an experiment. When a researcher sets an alpha level of 0.05, 0.05 is the alpha level for one test. Repeated univariate t-tests increases the likelihood of reporting spurious results as significant (type I error). In the case of ANOVA or MANOVA, Stevens (1992) suggests, as an acceptable post hoc method of minimizing the type I error rate, to divide the alpha level by the number of dependant variables. Thus, the level of significance for this study would be $0.05/4$, or 0.0125. The Boneferroni's correction is an additional method for adjusting an experimentwise error rate (Keppel, 1991). Boneferroni's correction takes the desired alpha level and divides it by the number of planned comparisons. The number of comparisons is not the number of
hypotheses, driven by the design of the study, but is rather the number of "meaningful and theoretically focused questions" that the research plan has identified (Keppel, 1991, p. 167). Of the twelve published process evaluations, one researcher (Botvin, et al., 1990) used Boneferroni's correction. Botvin tested 23 dependant variables. To balance type I and type II error rates, Keppel argues against adjusting experimentwise error rates "for a reasonable number of planned comparisons" (p.167). By decreasing the experimentwise alpha rate, one decreases the likelihood of reporting spurious findings as significant (type I error); however, a researcher also decreases the likelihood of detecting significant findings (type II error). In this study, balancing type I with type II errors was of importance. Three of the four constructs in this study had not previously been examined. The researcher did not want to adjust the experimentwise error rate and possibly have initial findings go undetected. The experimentwise error rate was also not adjusted because of the impact on decreased power (Keppel, 1991). In this study, there was an unanticipated 22% loss of subject rate. The loss of subjects reduced the power of the study. To further reduce the power by lowering the experimentwise error rate would further increase the likelihood of type II error.

Because the four constructs are theorized to exist in relationship to one another, a Multivariate Analysis of Variance (MANOVA) was considered for analysis. ANOVA was considered a better choice, though, because the research questions seek to answer which individual variables change and seek to explore the interaction of smoking and treatment. There is no research questions regarding a change in the four variables, simultaneously.
MISSING DATA

Only questionnaires with greater than or equal to 90% of completed data were included in the analysis; one questionnaire was omitted because of missing data. There were 36 questionnaires included in the analysis that were not 100% complete.

Various options exist to manage missing data (Keppel, 1991; Goursuch, 1983). The researcher chose to replace missing data with mean scores. Mean scores were substituted for the questionnaire item(s) left blank. Substituting the mean for missing items is an acceptable technique, leaves the mean unaffected, maintains power and was within the skills of the researcher. The disadvantages of replacing missing data with the mean can be a reduction in correlations to other items/variables and a reduction in response variability (Gorsuch, 1983). For the treatment group, 14 (of 161) questionnaires had items in which the mean was substituted for blank responses and 22 (of 160) comparison group questionnaires had items in which the mean was substituted.

The effects of substituting the mean on the findings of this study are hypothesized to be minimal. Only 9% of the treatment and 14% of the comparison group had items in which the mean was substituted. The reader should also consider that the scales for all questionnaire items were four point scales. The most that a substituted mean could vary from a “real” response was three points. In that no item mean scores were at the bottom or top of the scales, the maximum variation was less than three points. Additionally, each construct was measured with a range of 12 to 20 items. To replace one of twelve (or 20) items with a mean score, alters the true score and restricts variability minimally.
For the four knowledge items of behavioral capability to resist the positive images of smoking, numbers 63-66, the items were scored either correct (3) or incorrect (0) and the mean could not be substituted. If a student did not answer one of these items, it was scored as incorrect. One student in the treatment group and eight students in the comparison group failed to answer all of the knowledge items.
I. Hypotheses to Test Research Questions

Main Effect of Treatment:

H0: Treatment group mean score on behavioral capability to resist positive images of smoking will be equal to the comparison group mean score.

H1: Treatment group mean score on behavioral capability to resist positive images of smoking will not be equal to the comparison group mean score.

H0: Treatment group mean score on refusal skill-efficacy will be equal to the comparison group mean score.

H1: Treatment group mean score on refusal skill-efficacy will not be equal to the comparison group mean score.

H0: Treatment group mean score on total positive refusal expectations & importance will be equal to the comparison group mean score.

H1: Treatment group mean score on total positive refusal expectations & importance will not be equal to the comparison group mean score.

H0: Treatment group mean score on total negative refusal expectations & importance will be equal to the comparison group mean score.

H1: Treatment group mean score on total negative outcome expectations & importance will not be equal to the comparison group mean score.

Treatment by Smoking Status Interaction:

H0: Treatment and smoking status will not interact for behavioral capability to resist positive images of smoking.

H1: Treatment and smoking status will interact for behavioral capability to resist positive images of smoking.

H0: Treatment and smoking status will not interact for refusal skill-efficacy.

H1: Treatment and smoking status will interact for refusal skill-efficacy.

H0: Treatment and smoking status will not interact for total positive refusal expectations & importance.
H1: Treatment and smoking status will interact for total refusal expectations & importance.

H0: Treatment and smoking status will not interact for total negative refusal expectations & importance.

H1: Treatment and smoking status will interact for total negative refusal expectations & importance.

II. Hypotheses Developed from Design of the Study

Main Effect of Smoking Status:

H0: Nonsmoker group mean score on behavioral capability to resist positive images of smoking will be equal to the experimental smoker group mean score.

H1: Nonsmoker group mean score on behavioral capability to resist positive images of smoking will not be equal to the experimental smoker group mean score.

H0: Nonsmoker group mean score on refusal skill-efficacy will be equal to the experimental smoker group mean score.

H1: Nonsmoker group mean score on refusal skill-efficacy will not be equal to the experimental smoker group mean score.

H0: Nonsmoker group mean score on total positive refusal expectations & importance will be equal to the experimental smoker group mean score.

H1: Nonsmoker group mean score on total positive refusal expectations & importance will not be equal to the experimental smoker group mean score.

H0: Nonsmoker group mean score on total negative refusal expectations & importance will be equal to the experimental smoker group mean score.

H1: Nonsmoker group mean score on total negative outcome expectations & importance will not be equal to the experimental smoker group mean score.
Main Effect of Time of Testing:

**H_0**: Behavioral capability to resist positive images of smoking mean score measured at pretest (time 1) will be equal to behavioral capability to resist positive images of smoking mean score at posttest (time 2).

**H_1**: Behavioral capability to resist positive images of smoking mean score measured at pretest (time 1) will be equal to behavioral capability to resist positive images of smoking mean score at posttest (time 2).

**H_0**: Refusal skill-efficacy mean score measured at pretest (time 1) will be equal to refusal skill-efficacy mean score at posttest (time 2).

**H_1**: Refusal skill-efficacy mean score measured at pretest (time 1) will be equal to refusal skill-efficacy mean score at posttest (time 2).

**H_0**: Total positive refusal expectations & importance mean score measured at pretest (time 1) will be equal to total positive refusal expectations & importance mean score at posttest (time 2).

**H_1**: Total positive refusal expectations & importance mean score measured at pretest (time 1) will be equal to total positive refusal expectations & importance mean score at posttest (time 2).

**H_0**: Total negative refusal expectations & importance mean score measured at pretest (time 1) will be equal to total negative refusal expectations & importance mean score at posttest (time 2).

**H_1**: Total negative refusal expectations & importance mean score measured at pretest (time 1) will be equal to total negative refusal expectations & importance mean score at posttest (time 2).

Treatment by Time of Testing Interaction:

**H_0**: Treatment and time of testing will not interact for behavioral capability to resist positive images of smoking.

**H_1**: Treatment and time of testing will interact for behavioral capability to resist positive images of smoking.

**H_0**: Treatment and time of testing will not interact for refusal skill-efficacy.

**H_1**: Treatment and time of testing will interact for refusal skill-efficacy.
H0: Treatment and time of testing will not interact for total positive refusal expectations & importance.

H1: Treatment and time of testing will interact for total refusal expectations & importance.

H0: Treatment and time of testing will not interact for total negative refusal expectations & importance.

H1: Treatment and time of testing will interact for total negative refusal expectations & importance.

**Smoking Status by Time of Testing Interaction:**

H0: Smoking status and time of testing will not interact for behavioral capability to resist positive images of smoking.

H1: Smoking status and time of testing will interact for behavioral capability to resist positive images of smoking.

H0: Smoking status and time of testing will not interact for refusal skill-efficacy.

H1: Smoking status and time of testing will interact for refusal skill-efficacy.

H0: Smoking status and time of testing will not interact for total positive refusal expectations & importance.

H1: Smoking status and time of testing will interact for total refusal expectations & importance.

H0: Smoking status and time of testing will not interact for total negative refusal expectations & importance.

H1: Smoking status and time of testing will interact for total negative refusal expectations & importance.
CHAPTER 4

RESULTS

This chapter presents the results of a process evaluation of a psychosocial smoking prevention program. Psychosocial smoking prevention programs can reduce adolescent smoking initiation by 30 to 50%, up to one year following program implementation (Flay, 1993). Evaluations of program effects longer than one year are understudied and of mixed findings. Two years post treatment, Murray et al. (1987) documented a 20% difference in group smoking initiation rates; two studies documented no difference in the percentage of nonsmokers at two years (Hamm, 1994) and four years (Murray, et al., 1989). Based upon the Social Cognitive Theory, psychosocial smoking prevention programs address the short-term consequences of smoking, refusal skill-development and the identification of social pressures (Flay, 1985; Glynn, 1989). Process evaluations can be used to assess whether successful treatments are influencing the hypothesized theoretical mediating variables and whether these variables are associated with treatment outcomes (McCaul & Glasgow, 1985).

The purpose of this study is to evaluate the impact of a psychosocial smoking prevention curriculum on the Social Cognitive Theory constructs of behavioral capability to resist positive images of smoking, refusal skill-efficacy, total positive refusal
expectations & importance and total negative refusal expectations & importance. A secondary purpose of this study is to determine if a student’s smoking status interacts with treatment for the constructs behavioral capability to resist positive images of smoking, refusal skill-efficacy, total positive refusal expectations & importance and total negative refusal expectations & importance.

This chapter presents the results of a process evaluation of a six-lesson smoking prevention program. Pre and post test questionnaires were administered eight weeks apart; one week prior to the intervention and four weeks after the conclusion of the intervention. Detailed descriptions of the sample are given in chapter 3, see Tables 3.1 and 3.2. The first section of this chapter presents descriptive data of the responding sample. Section two of this chapter presents descriptive data on the theoretical constructs by: (1) treatment verses comparison group, (2) nonsmoker verses experimental smoker in treatment group and (3) nonsmoker verses experimental smoker in comparison group. The third section of this chapter presents the hypotheses testing and the results from the ANOVA calculated for each of the four dependant variables. This chapter concludes with the post hoc analysis for statistically significant ANOVA $F$ values.
DESCRIBING THE SAMPLE

Table 4.1 represents demographic information and pretest smoking status of the sample. For the purpose of demonstrating that the comparison schools are similar, information is shown by school. For the remainder of this chapter, as well as dissertation, the two comparison schools are combined to one group. As an entire group, the sample consists of sixth graders, mean age of 12, primarily white, with slightly more males than females. A majority of the students are nonsmokers. Comparison schools have only two minority students, verses the seven in the treatment school. The comparison school of Jefferson does appear to have more experimental smokers than the two other schools; however once comparison schools are combined, the percentages of nonsmokers at pretest is similar: 61% for the comparison and 65% for the treatment.
<table>
<thead>
<tr>
<th>Variables</th>
<th>Treatment (n = 81)</th>
<th>Comparison-A (n = 49)</th>
<th>Comparison-J (n = 31)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Mean Age</strong></td>
<td>11.9</td>
<td>11.9</td>
<td>12.1</td>
</tr>
<tr>
<td><strong>Age Frequencies</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>11</td>
<td>20</td>
<td>10</td>
<td>6</td>
</tr>
<tr>
<td>12</td>
<td>52</td>
<td>35</td>
<td>17</td>
</tr>
<tr>
<td>13</td>
<td>9</td>
<td>4</td>
<td>8</td>
</tr>
<tr>
<td><strong>Race</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>African American</td>
<td>4</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>White</td>
<td>74</td>
<td>49</td>
<td>27</td>
</tr>
<tr>
<td>Asian American</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>American Indian</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Hispanic</td>
<td>1</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>Other</td>
<td>6</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td><strong>Gender</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>43</td>
<td>19</td>
<td>20</td>
</tr>
<tr>
<td>Female</td>
<td>38</td>
<td>20</td>
<td>11</td>
</tr>
<tr>
<td>Frequency of Nonsmokers</td>
<td>53</td>
<td>36</td>
<td>13</td>
</tr>
<tr>
<td>Frequency of Experimental Smokers</td>
<td>28</td>
<td>13</td>
<td>18</td>
</tr>
</tbody>
</table>

**Note.** For the purpose of demonstrating that the comparison schools are similar, information is shown by school. For the remainder of this chapter, the two comparison schools are combined to one group.

Table 4.1
Demographic and Smoking Variables for the Treatment and Comparison Groups, as Measured at Pretest
Tables 4.2 through 4.5 report pre and post self-reported smoking behavior. While smoking is not a variable of interest in this process evaluation, tables reporting cigarette smoking are presented to describe the sample.

For those students reporting cigarette smoking, the tobacco use appears to be experimental. The number of cigarettes smoked on a weekly and monthly basis is low. Table 4.2 reports cigarette use in the past seven days. Ninety-percent of the treatment group had not smoked at pretest in the past week, while 84% of the comparison group had not smoked in the past week. Only three students in the treatment group and six in the comparison group smoked a quarter pack of cigarettes or more. At posttest, the number of students smoking a quarter of a pack or more had stayed the same for the treatment and increased by one, to seven, in the comparison group.
### Table 4.2
Pretest and Posttest Frequency Distribution and Mean Scores of Cigarettes Smoked During Past Seven Days for Treatment Group & Comparison Group

<table>
<thead>
<tr>
<th>Cigarettes Smoked in Past Seven Days</th>
<th><strong>TREATMENT (n = 81)</strong></th>
<th></th>
<th><strong>COMPARISON (n = 80)</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Pretest</td>
<td>Posttest</td>
<td>Pretest</td>
</tr>
<tr>
<td></td>
<td>Freq</td>
<td>Cum %</td>
<td>Freq</td>
</tr>
<tr>
<td>None</td>
<td>73</td>
<td>90.1</td>
<td>75</td>
</tr>
<tr>
<td>1</td>
<td>2</td>
<td>92.6</td>
<td>3</td>
</tr>
<tr>
<td>2 to 4</td>
<td>3</td>
<td>96.2</td>
<td>0</td>
</tr>
<tr>
<td>5 to 19</td>
<td>1</td>
<td>97.5</td>
<td>1</td>
</tr>
<tr>
<td>≥ 1 Pack</td>
<td>2</td>
<td>100</td>
<td>2</td>
</tr>
<tr>
<td><strong>Mean</strong></td>
<td>0.93</td>
<td>1.19</td>
<td></td>
</tr>
<tr>
<td><strong>Std Dev</strong></td>
<td>4.98</td>
<td>7.10</td>
<td></td>
</tr>
<tr>
<td><strong>Range</strong></td>
<td>0 - 40</td>
<td>0 - 60</td>
<td></td>
</tr>
</tbody>
</table>
For those students reporting cigarette smoking, the tobacco use appears to be experimental. The number of cigarettes smoked on a weekly and monthly basis is low. Table 4.3 reports cigarette use in the past 30 days. Eighty-six percent of the treatment group had not smoked at pretest in the past 30 days, while 80% of the comparison group had not smoked in the past 30 days. Similar to smoking in the past week, only three students in the treatment group and seven in the comparison group smoked a quarter pack of cigarettes or more. At posttest, the percentage of students who had not smoked in the past 30 days stayed the same in the treatment group, 86%, but had decreased to 73% in the comparison group. Additionally, the number of students smoking a quarter of a pack or more had stayed the same for the treatment and increased by seven, to 13 in the comparison group.
## Cigarettes Smoked in Past 30 Days

<table>
<thead>
<tr>
<th>Cigarettes Smoked in Past 30 Days</th>
<th>TREATMENT (n = 81)</th>
<th></th>
<th>COMPARISON (n = 80)</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Pretest</td>
<td>Posttest</td>
<td>Pretest</td>
<td>Posttest</td>
</tr>
<tr>
<td></td>
<td>Freq</td>
<td>Cum %</td>
<td>Freq</td>
<td>Cum %</td>
</tr>
<tr>
<td>None</td>
<td>70</td>
<td>86.4</td>
<td>70</td>
<td>86.4</td>
</tr>
<tr>
<td>1</td>
<td>4</td>
<td>91.4</td>
<td>4</td>
<td>91.4</td>
</tr>
<tr>
<td>2 to 4</td>
<td>2</td>
<td>93.8</td>
<td>3</td>
<td>95.1</td>
</tr>
<tr>
<td>5 to 19</td>
<td>1</td>
<td>95.1</td>
<td>2</td>
<td>97.5</td>
</tr>
<tr>
<td>≥ 1 Pack</td>
<td>2</td>
<td>97.5</td>
<td>1</td>
<td>98.8</td>
</tr>
<tr>
<td>unknown</td>
<td>2</td>
<td>100</td>
<td>1</td>
<td>100</td>
</tr>
<tr>
<td><strong>Mean</strong></td>
<td>1.15</td>
<td>3.03</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Std Dev</strong></td>
<td>6.01</td>
<td>22.30</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Range</strong></td>
<td>0 - 50</td>
<td>0 - 200</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table 4.3
Pretest and Posttest Frequency Distribution and Mean Scores of Cigarettes Smoked During Past 30 Days for Treatment Group & Comparison Group
For the purpose of this study, an experimental smoker is defined as a student with any reported cigarette smoking in the past 365 days. As indicated by Table 4.4, 65% of the treatment group and 63% of the comparison group were categorized as nonsmokers at the pretest; 61% and 50%, respectively at the posttest. Time elapsed from the pre to post test was eight weeks. This table does appear to show the progressive nature tobacco use. The number of students reporting smoking greater than a pack of cigarettes increased by 100% in the treatment group and by 57% in the comparison group, while the number of students reporting smoking equal to or less than one cigarette decreased.

<table>
<thead>
<tr>
<th>Cigarettes Smoked in Past 365 Days</th>
<th>TREATMENT (n = 81)</th>
<th>COMPARISON (n = 80)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Pretest</td>
<td>Posttest</td>
</tr>
<tr>
<td></td>
<td>Freq</td>
<td>Cum %</td>
</tr>
<tr>
<td>None</td>
<td>53</td>
<td>65.4</td>
</tr>
<tr>
<td>One Puff</td>
<td>10</td>
<td>77.8</td>
</tr>
<tr>
<td>Part or All of One</td>
<td>3</td>
<td>81.5</td>
</tr>
<tr>
<td>2 to 4</td>
<td>6</td>
<td>88.9</td>
</tr>
<tr>
<td>5 to 19</td>
<td>6</td>
<td>96.3</td>
</tr>
<tr>
<td>≥ 1 Pack</td>
<td>3</td>
<td>100</td>
</tr>
</tbody>
</table>

Table 4.4
Pretest and Posttest Frequency Distribution of Cigarettes Smoked During Past 365 Days for Treatment Group & Comparison Group
As indicated by Table 4.5, 57% of the treatment group and 50% of the comparison group reported, at pretest, some level of smoking in their lifetime. At posttest, students reporting lifetime smoking increased to 61% in the treatment and 56% in the comparison.

<table>
<thead>
<tr>
<th>Cigarettes Smoked in Lifetime</th>
<th>TREATMENT (n = 81)</th>
<th>COMPARISON (n = 80)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Pretest</td>
<td>Posttest</td>
</tr>
<tr>
<td></td>
<td>Freq</td>
<td>Cum%</td>
</tr>
<tr>
<td>None</td>
<td>34</td>
<td>42.0</td>
</tr>
<tr>
<td>One Puff</td>
<td>13</td>
<td>58.0</td>
</tr>
<tr>
<td>Part or All of One 2 to 4</td>
<td>15</td>
<td>76.5</td>
</tr>
<tr>
<td>5 to 19</td>
<td>5</td>
<td>82.7</td>
</tr>
<tr>
<td>≥ 1 Pack</td>
<td>7</td>
<td>100</td>
</tr>
</tbody>
</table>

Table 4.5
Pretest and Posttest Frequency Distribution of Cigarettes Smoked in Lifetime for Treatment Group & Comparison Group
DESCRIPTIVE DATA OF SOCIAL COGNITIVE THEORY

CONSTRUCTS BY TREATMENT

Table 4.6 reports pre and post test scores for the four theoretical constructs by treatment and comparison group. Time elapsed from pre to post test was eight weeks. Behavioral capability to resist the positive images of smoking mean scores started just below 27, on a 36-point scale, and increased by two points in the treatment and half a point in the comparison group. Refusal skill-efficacy mean scores decreased in both groups, from pre to post test. The treatment decreased by half a point to 48.72 on a 60-point scale while the comparison group decreased by two and a half points to 43.20. Variation in comparison group responses also increased at posttest; the standard deviation increased by three points to 16.66. Total positive refusal expectations & importance mean scores increased by three points to 77.78 for the treatment group and decreased by one point to 69.15 in the comparison group; maximum possible score was 144. Scores for total negative refusal expectations & importance increased by three fourths of a point for both groups; however, the means should be interpreted with caution in that the standard deviations are larger than 30 points. The comparison group posttest standard deviation also increased eight points to reach 41.14. In summarizing pre to post test changes, treatment and comparison group mean scores appear to change in the same direction, increasing or decreasing. When mean scores increased, there was a greater increase in the treatment group scores. When mean scores decreased, greater decreases occurred in the comparison group. Tables 4.7 through 4.17 review each of the constructs.
<table>
<thead>
<tr>
<th>Variables</th>
<th>Pretest</th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Mean</td>
<td>Std Dev</td>
<td>Min</td>
<td>Max</td>
<td>Mean</td>
<td>Std Dev</td>
<td>Min</td>
<td>Max</td>
<td></td>
</tr>
<tr>
<td>Behavioral Capability to Resist Positive Images</td>
<td>26.73</td>
<td>6.25</td>
<td>9.0</td>
<td>36.0</td>
<td>28.81</td>
<td>7.09</td>
<td>3.0</td>
<td>36.0</td>
<td></td>
</tr>
<tr>
<td>Refusal Skill-Efficacy</td>
<td>49.18</td>
<td>11.46</td>
<td>14.0</td>
<td>60.0</td>
<td>48.72</td>
<td>12.64</td>
<td>0</td>
<td>60.0</td>
<td></td>
</tr>
<tr>
<td>Total Positive Refusal Expectations &amp; Importance</td>
<td>74.65</td>
<td>25.37</td>
<td>27.0</td>
<td>144.0</td>
<td>77.78</td>
<td>26.02</td>
<td>12.0</td>
<td>140.0</td>
<td></td>
</tr>
<tr>
<td>Total Negative Refusal Expectations &amp; Importance</td>
<td>87.61</td>
<td>30.26</td>
<td>32.0</td>
<td>162.0</td>
<td>88.41</td>
<td>33.96</td>
<td>12.0</td>
<td>192.0</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Mean</td>
<td>Std Dev</td>
<td>Min</td>
<td>Max</td>
<td>Mean</td>
<td>Std Dev</td>
<td>Min</td>
<td>Max</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>COMPARISON</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Behavioral Capability to Resist Positive Images</td>
<td>26.99</td>
<td>6.84</td>
<td>7.0</td>
<td>36.0</td>
<td>27.58</td>
<td>7.34</td>
<td>3.0</td>
<td>36.0</td>
<td></td>
</tr>
<tr>
<td>Refusal Skill-Efficacy</td>
<td>46.98</td>
<td>13.92</td>
<td>0</td>
<td>60.0</td>
<td>43.20</td>
<td>16.66</td>
<td>3.0</td>
<td>60.0</td>
<td></td>
</tr>
<tr>
<td>Total Positive Refusal Expectations &amp; Importance</td>
<td>70.19</td>
<td>23.63</td>
<td>32.0</td>
<td>140.0</td>
<td>69.15</td>
<td>23.84</td>
<td>28.0</td>
<td>132.0</td>
<td></td>
</tr>
<tr>
<td>Total Negative Refusal Expectations &amp; Importance</td>
<td>93.63</td>
<td>33.27</td>
<td>40.0</td>
<td>192.0</td>
<td>94.14</td>
<td>41.14</td>
<td>28.0</td>
<td>192.0</td>
<td></td>
</tr>
</tbody>
</table>

Table 4.6
Pretest and Posttest Mean Scores of Dependant Variables: Behavioral Capability to Resist the Positive Images of Smoking, Refusal Skill-Efficacy, Total Positive Refusal Expectations and Importance & Total Negative Refusal Expectations & Importance for Treatment Group & Comparison Group
Table 4.7 reports pre and post test scores for behavioral capability to resist positive images of smoking by treatment and comparison. The higher the score, the higher the student’s ability to resist positive images of smoking. Students appear to have pre-existing behavioral skills for resisting positive media images. Pretest scores for the treatment group were 26.73 and 26.99 for the comparison group. Possible scores ranged from 0 to 36. The average pretest response indicates that students were able to identify half of the media messages in the cigarette advertisements, thought that half of the messages were untruthful with the remaining half being a little untruthful, and rejected all the positive media messages, with half of the messages being strongly rejected. Posttest scores increased by two points for treatment group and by half a point in the comparison group. Changes in overall mean scores appear to come from changes the subscale of rejecting favorable images.
<table>
<thead>
<tr>
<th>Variables</th>
<th>TREATMENT (n = 81)</th>
<th></th>
<th>COMPARISON (n = 80)</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Pretest</td>
<td>Posttest</td>
<td>Pretest</td>
<td>Posttest</td>
</tr>
<tr>
<td></td>
<td>Mean</td>
<td>Std Dev</td>
<td>Mean</td>
<td>Std Dev</td>
</tr>
<tr>
<td>Behavioral Capability to Resist Positive Images</td>
<td>26.73</td>
<td>6.25</td>
<td>28.81</td>
<td>7.09</td>
</tr>
<tr>
<td>Ability to Identify Messages</td>
<td>6.70</td>
<td>3.98</td>
<td>6.70</td>
<td>3.98</td>
</tr>
<tr>
<td>Evaluate Truthfulness of Message</td>
<td>9.86</td>
<td>2.86</td>
<td>9.77</td>
<td>3.28</td>
</tr>
<tr>
<td>Reject Favorable Images</td>
<td>10.16</td>
<td>2.17</td>
<td>10.48</td>
<td>2.57</td>
</tr>
</tbody>
</table>

Table 4.7
Pretest and Posttest Mean Scores of Behavioral Capability to Resist the Positive Images of Smoking for Treatment Group & Comparison Group
Table 4.8 reports the frequency distribution and range of scores for behavioral capability to resist the positive images of smoking by treatment and comparison group. From pre to post test, scores notably shift upward. While both groups’ scores shift upward, the increased number of scores in the higher categories is more dramatic in the treatment group. The increase in posttest scores, particularly for the treatment group scores, appears that start with median scores, in or above the 18+ category. At posttest, 63% of the treatment group reported scores in the highest category; this is up from 37% at pretest. The percentage of comparison group students reporting answers in the highest category increased from 47% at pretest to 51% at posttest. Also reflective of the shift upward in posttest scores is the increase in number of students scoring the maximum number of points. Again, the increase is larger in the treatment group: the treatment group had ten students at posttest, an increase of four students from pre, while the comparison group had an additional two students scoring the maximum points at posttest, totaling seven.
<table>
<thead>
<tr>
<th>Scores</th>
<th>TREATMENT (n = 81)</th>
<th></th>
<th>COMPARISON (n = 80)</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Pretest</td>
<td>Posttest</td>
<td>Pretest</td>
<td>Posttest</td>
</tr>
<tr>
<td></td>
<td>Freq</td>
<td>Cum %</td>
<td>Freq</td>
<td>Cum %</td>
</tr>
<tr>
<td>0 - 5</td>
<td>0 0</td>
<td>0 0</td>
<td>1 1.2</td>
<td>0 0</td>
</tr>
<tr>
<td>6 - 11</td>
<td>3 3.7</td>
<td>2 3.7</td>
<td>5 9.9</td>
<td>2 3.8</td>
</tr>
<tr>
<td>12 - 17</td>
<td>4 8.6</td>
<td>5 9.9</td>
<td>10 22.5</td>
<td>11 22.5</td>
</tr>
<tr>
<td>18 - 23</td>
<td>12 23.5</td>
<td>3 13.6</td>
<td>24 52.5</td>
<td>21 48.8</td>
</tr>
<tr>
<td>24 - 29</td>
<td>32 63.0</td>
<td>19 37.0</td>
<td>38 100</td>
<td>41 100</td>
</tr>
<tr>
<td>30 - 36</td>
<td>30 100</td>
<td>51 100</td>
<td>Maximum Score</td>
<td>6 10</td>
</tr>
<tr>
<td>Mean</td>
<td>26.73</td>
<td>28.81</td>
<td>26.99</td>
<td>27.58</td>
</tr>
<tr>
<td>Actual Range</td>
<td>9 - 36</td>
<td>3 - 36</td>
<td>7 - 36</td>
<td>3 - 36</td>
</tr>
</tbody>
</table>

Table 4.8
Pretest and Posttest Frequency Distribution of Behavioral Capability to Resist Positive Images of Smoking for Treatment Group & Comparison Group
Table 4.9 reports pre and post test scores for refusal skill-efficacy. The higher the score, the higher the student's skill-efficacy or perceived confidence to refuse cigarette offers. Refusal skill-efficacy was measured with three subscales: by person making the offer; by situation or location; and by type of pressure. Students report having a pre-existing level of efficacy to refuse cigarette offers. On a scale of 0 to 60, pretest scores are 49.18 for the treatment and 46.98 for the comparison. In interpreting the pretest mean, students on average, were somewhat sure that could say “no” in 55% (11 out of 20) of the situations and were very sure that they could say “no” in 45% of the situations. The comparison group's mean interpret as students were somewhat sure they could say “no” in 65% of the situations and very sure that they could “no” in 35% of the situations. The treatment group posttest score decreased by less than half a point while the comparison group decreased in confidence by three and a half points. The decrease in overall refusal skill-efficacy scores for the comparison group appears to reflect a decrease in refusal skill-efficacy across all subscales, Tables 4.11 through 4.13, and not explained by changes in only by the person making the offer, the situation or the type of pressure.

<table>
<thead>
<tr>
<th>Variables</th>
<th>TREATMENT (n = 81)</th>
<th></th>
<th>COMPARISON (n = 80)</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Pretest</td>
<td>Posttest</td>
<td>Pretest</td>
<td>Posttest</td>
</tr>
<tr>
<td></td>
<td>Mean</td>
<td>Std Dev</td>
<td>Mean</td>
<td>Std Dev</td>
</tr>
<tr>
<td>Refusal Skill-Efficacy</td>
<td>49.18</td>
<td>11.46</td>
<td>48.72</td>
<td>12.64</td>
</tr>
</tbody>
</table>

Table 4.9
Pretest and Posttest Mean Scores of Refusal Skill-Efficacy

160
Table 4.10 reports the frequency distribution and range of scores for refusal skill-efficacy. Treatment scores appear stable with scores changing by less than three scores per frequency category at posttest. The most notable change at posttest in treatment scores is the addition of two scores to the lowest category. These two low scores could account for the half a point decrease in mean score for the treatment group. The distribution of comparison group scores shifts downward at posttest. In addition to four fewer students in the highest category of scores, there is a doubling of students reporting scores lower than the midpoint, at posttest. Lastly, for both groups, greater than half the students report scores in the 50 to 60 category at pretest: 59% of the treatment group and 51% of the comparison group. At posttest, the percentage of students scoring in the highest group decreased by approximately 3% on the treatment and 6% in the comparison group.
<table>
<thead>
<tr>
<th>Scores</th>
<th>TREATMENT (n = 81)</th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th>COMPARISON (n = 80)</th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Pretest</td>
<td>Posttest</td>
<td>Pretest</td>
<td>Posttest</td>
<td>Pretest</td>
<td>Posttest</td>
<td>Pretest</td>
<td>Pretest</td>
<td>Posttest</td>
<td>Pretest</td>
<td>Posttest</td>
</tr>
<tr>
<td></td>
<td>Freq</td>
<td>Cum %</td>
<td>Freq</td>
<td>Cum %</td>
<td>Freq</td>
<td>Cum %</td>
<td>Freq</td>
<td>Cum %</td>
<td>Freq</td>
<td>Cum %</td>
<td>Freq</td>
</tr>
<tr>
<td>0 - 9</td>
<td>0</td>
<td>0</td>
<td>2</td>
<td>2.5</td>
<td>0</td>
<td>2.5</td>
<td>0</td>
<td>1.3</td>
<td>3</td>
<td>3.8</td>
<td>1</td>
</tr>
<tr>
<td>10 - 19</td>
<td>2</td>
<td>2.5</td>
<td>0</td>
<td>2.5</td>
<td>0</td>
<td>2.5</td>
<td>0</td>
<td>3.8</td>
<td>7</td>
<td>12.5</td>
<td>1</td>
</tr>
<tr>
<td>20 - 29</td>
<td>5</td>
<td>8.6</td>
<td>4</td>
<td>7.4</td>
<td>6</td>
<td>11.3</td>
<td>10</td>
<td>14.3</td>
<td>1</td>
<td>2.5</td>
<td>6</td>
</tr>
<tr>
<td>30 - 39</td>
<td>7</td>
<td>17.3</td>
<td>10</td>
<td>19.8</td>
<td>13</td>
<td>27.5</td>
<td>19</td>
<td>37.5</td>
<td>1</td>
<td>2.5</td>
<td>13</td>
</tr>
<tr>
<td>40 - 49</td>
<td>19</td>
<td>40.7</td>
<td>19</td>
<td>43.2</td>
<td>17</td>
<td>48.8</td>
<td>16</td>
<td>55.0</td>
<td>1</td>
<td>2.5</td>
<td>17</td>
</tr>
<tr>
<td>50 - 60</td>
<td>48</td>
<td>100</td>
<td>46</td>
<td>100</td>
<td>41</td>
<td>100</td>
<td>36</td>
<td>100</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Mean</td>
<td>49.18</td>
<td>48.72</td>
<td>46.98</td>
<td>43.20</td>
<td>49.18</td>
<td>48.72</td>
<td>46.98</td>
<td>43.20</td>
<td>46.98</td>
<td>43.20</td>
<td>46.98</td>
</tr>
<tr>
<td>Frequency at</td>
<td>13</td>
<td>16</td>
<td>20</td>
<td>21</td>
<td>13</td>
<td>16</td>
<td>20</td>
<td>21</td>
<td>20</td>
<td>21</td>
<td>20</td>
</tr>
<tr>
<td>Maximum Score</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Actual Range</td>
<td>14 - 60</td>
<td>0 - 60</td>
<td>0 - 60</td>
<td>3 - 60</td>
<td>14 - 60</td>
<td>0 - 60</td>
<td>0 - 60</td>
<td>3 - 60</td>
<td>0 - 60</td>
<td>3 - 60</td>
<td>0 - 60</td>
</tr>
</tbody>
</table>

Table 4.10
Pretest and Posttest Frequency Distribution of Refusal Skill-Efficacy by Treatment Group & Comparison Group
While no statistical analysis was conducted on the subscales for any of the theoretical constructs, descriptive data for the subscales is reported to give the reader a better understanding of the data. Table 4.11 represents the subscale of refusal skill-efficacy by person making the offer. With a possible range of scores of 0 to 18, all “person situations” were scored at pretest between 13 and 16 points. In interpreting these pretest means, a score of 15 could be obtained by a student reporting being very sure that they could say “no” in half the situations and somewhat sure in the remaining situations.

At posttest, treatment subscale scores changed little, with the largest decrease being 0.12 of a point. Comparison group subscale scores decreased by 1.13, 1.03 and 1.57, respectively. The rank order of these measures is consistent throughout pretest, posttest, treatment and comparison group measures; students report being most confident in saying “no” to a best friend and least confident in saying “no” to a group of friends.

<table>
<thead>
<tr>
<th>Variables</th>
<th>TREATMENT (n = 81)</th>
<th></th>
<th></th>
<th>COMPARISON (n = 80)</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Pretest</td>
<td>Posttest</td>
<td>Pretest</td>
<td>Posttest</td>
<td>Pretest</td>
<td>Posttest</td>
</tr>
<tr>
<td></td>
<td>Mean</td>
<td>Std Dev</td>
<td>Mean</td>
<td>Std Dev</td>
<td>Mean</td>
<td>Std Dev</td>
</tr>
<tr>
<td>Refusal Skill-Efficacy</td>
<td>49.18</td>
<td>11.46</td>
<td>48.72</td>
<td>12.64</td>
<td>46.98</td>
<td>13.92</td>
</tr>
<tr>
<td>Offer By Best Friend</td>
<td>15.46</td>
<td>3.27</td>
<td>15.34</td>
<td>3.90</td>
<td>14.43</td>
<td>4.18</td>
</tr>
<tr>
<td>Offer by Group of Friends</td>
<td>14.09</td>
<td>4.21</td>
<td>14.06</td>
<td>4.53</td>
<td>13.84</td>
<td>4.65</td>
</tr>
<tr>
<td>Offer by Older Student</td>
<td>14.96</td>
<td>3.73</td>
<td>14.94</td>
<td>3.84</td>
<td>14.41</td>
<td>4.20</td>
</tr>
</tbody>
</table>

Table 4.11
Pretest and Posttest Mean Scores of Refusal Skill-Efficacy and By Person Making the Cigarette Offer for Treatment Group & Comparison Group
Table 4.12 represents the subscale of refusal skill-efficacy by situation or location. With a possible range of scores of 0 to 30, the treatment group at pretest scored a 23.0 for confidence in saying “no” at school and a 23.62 for confidence in saying “no” at a friend’s house. In interpreting these mean scores, a 23.0 represent a student being very sure in 30% (three out of ten) of the situations and somewhat sure in 70% of the situations. The comparison group’s mean pretest scores are 21.84 for at school situations and 22.63 for at a friend’s house. A mean score of 22.0 represents a student being very sure in 20% of the situations and somewhat sure in 80% of the situations. Posttest scores for in school situations decreased by three fourths of a point in the treatment and two points in the comparison. Scores decreased in a similar pattern for at a friend’s house; the treatment group’s mean score decreased by a quarter of a point and the comparison group decreased by one and a quarter point.

<table>
<thead>
<tr>
<th>Variables</th>
<th>TREATMENT (n = 81)</th>
<th>COMPARISON (n = 80)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Pretest</td>
<td>Posttest</td>
</tr>
<tr>
<td></td>
<td>Mean</td>
<td>Std Dev</td>
</tr>
<tr>
<td>Refusal Skill-Efficacy</td>
<td>49.18</td>
<td>11.46</td>
</tr>
<tr>
<td>In School Hallway</td>
<td>23.0</td>
<td>4.56</td>
</tr>
<tr>
<td>After School, at a Friend’s House</td>
<td>23.62</td>
<td>7.01</td>
</tr>
</tbody>
</table>

Table 4.12
Pretest and Posttest Mean Scores of Refusal Skill-Efficacy and By Situation for Treatment Group & Comparison Group
Table 4.13 represents the subscale of refusal skill-efficacy by type of pressure. Scores could range from 0 to 18 for direct, hassle and put down type pressure. Indirect pressure scores could range from 0 to 6. For direct, hassle and put down pressure, all pretest scores were between 13 and 16 points. In interpreting these pretest means, a score of 15 could be obtained by a student reporting being very sure that they could say “no” in half the situations and somewhat sure in the remaining situations. For indirect pressure, a score of four could be obtained by also being very sure in half the situations and somewhat sure in the remaining half. Posttest scores followed a pattern similar to the previous subscales: treatment scores changed by less than half a point while comparison group scores decreased by a point or more. The exception is indirect pressure, the decreases were .30 for treatment and .29 for comparison. As with previous subscales, rank order of items remained the same through various measurement points. Students reported hassling as the type of pressure in which they are least confident in saying “no.”
<table>
<thead>
<tr>
<th>Variables</th>
<th>TREATMENT (n = 81)</th>
<th></th>
<th></th>
<th>COMPARISON (n = 80)</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Pretest</td>
<td>Posttest</td>
<td>Pretest</td>
<td>Posttest</td>
<td>Pretest</td>
<td>Posttest</td>
</tr>
<tr>
<td></td>
<td>Mean</td>
<td>Std Dev</td>
<td>Mean</td>
<td>Std Dev</td>
<td>Mean</td>
<td>Std Dev</td>
</tr>
<tr>
<td>Refusal Skill-Efficacy</td>
<td>49.18</td>
<td>11.46</td>
<td>48.72</td>
<td>12.64</td>
<td>46.98</td>
<td>13.92</td>
</tr>
<tr>
<td>Direct Pressure</td>
<td>15.25</td>
<td>3.28</td>
<td>14.96</td>
<td>3.62</td>
<td>14.40</td>
<td>4.01</td>
</tr>
<tr>
<td>Indirect Pressure</td>
<td>4.67</td>
<td>1.43</td>
<td>4.37</td>
<td>1.68</td>
<td>4.29</td>
<td>1.86</td>
</tr>
<tr>
<td>Hassle</td>
<td>14.26</td>
<td>4.34</td>
<td>14.27</td>
<td>4.85</td>
<td>13.93</td>
<td>5.01</td>
</tr>
<tr>
<td>Put Down</td>
<td>14.85</td>
<td>4.13</td>
<td>15.06</td>
<td>4.03</td>
<td>14.23</td>
<td>4.48</td>
</tr>
</tbody>
</table>

Table 4.13
Pretest and Posttest Mean Scores of Refusal Skill-Efficacy and By Type of Pressure for Treatment Group & Comparison Group
Table 4.14 reports positive and negative refusal outcome expectations. Refusal outcome expectations are students' expected outcomes from refusing cigarettes offers. Expectations were categorized into two groups: positive and negative. The higher the score for positive refusal expectations, the higher the student's expectation for positive outcomes from refusing cigarette offers. The higher the score for negative refusal expectations, the higher the student's expectations for negative outcomes from refusing cigarettes offers. The possible range for positive expectations is 9 to 36, with a midpoint of 22.5. On the pretest, the treatment and comparison group scored 22.26 and 22.19, respectively. The average student, at pretest, expected that half the positive outcomes might happen and half of the positive outcomes might not happen. The treatment group's positive expectations increased, at posttest, by one point to 23.40 while the comparison group decreased less than half a point to 22.06. Negative expectations, at pretest, were 25.72 for the treatment and 27.70 for the comparison group. The possible range is 12 to 48, with a midpoint of 30. The average response for the treatment group indicates that in 83% (10 out of 12 items) of the items, students expected that the negative outcome might not happen and the remaining 17% of the time, the negative outcome might happen. For the comparison group, the percentages are 75% and 25%, respectively. The means for negative outcome expectations should be interpreted with caution, though, as that the standard deviations for both groups are large, eight points or greater, indicating a large variation in responses. Both groups increased in their expectation of negative outcomes at posttest by less than one point.
<table>
<thead>
<tr>
<th>Variables</th>
<th></th>
<th>Pretest</th>
<th>Posttest</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Mean</td>
<td>Std Dev</td>
<td>Min</td>
</tr>
<tr>
<td><strong>Refusal Outcome Expectations</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Positive Expectations</td>
<td>22.26</td>
<td>5.73</td>
<td>9.0</td>
</tr>
<tr>
<td>Negative Expectations</td>
<td>25.72</td>
<td>8.48</td>
<td>12.0</td>
</tr>
<tr>
<td><strong>COMPARISON (n = 80)</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Mean</td>
<td>Std Dev</td>
<td>Min</td>
</tr>
<tr>
<td>Refusal Outcome Expectations</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Positive Expectations</td>
<td>22.19</td>
<td>5.35</td>
<td>13.0</td>
</tr>
<tr>
<td>Negative Expectations</td>
<td>27.70</td>
<td>9.03</td>
<td>12.0</td>
</tr>
</tbody>
</table>

Table 4.14
Pretest and Posttest Mean Scores of Refusal Outcome Expectations for Treatment Group & Comparison Group
Table 4.15 reports positive and negative refusal outcome expectancies. Refusal outcomes expectancies are the values, important or unimportant, that a student places upon the refusal outcome expectation. The higher the positive refusal expectancies score, the more the student values the positive outcomes. The higher the negative outcome expectancies score, the more the student values the avoidance of the negative outcome. For example, a score of four on a questionnaire item may mean that a student finds it very important to not be called a "wimp" by their best friend; a score of one indicates that a student feels that it is unimportant whether his best friend calls them "wimp". From a smoking prevention standpoint, one would want positive outcome expectancies high, meaning students value the potential positive outcomes of refusing cigarettes. With a possible range of 9 to 36 points for positive outcome expectancies, students averaged 29.83 in the treatment and 28.57 in the comparison. In interpreting the mean, students on average, report that all the potential positive outcomes were important, at least. From a smoking prevention standpoint, one would want negative outcome expectancies low, meaning students do not value the avoidance of the potential negative outcomes of refusing cigarettes. With a possible range of 12 to 48 points for negative outcome expectancies, students averaged 41.54 in the treatment and 40.97 in the comparison. This score indicates that the average student reported that avoiding the potential negative outcomes was very important in half of the questionnaire items, while the other half of the items were scored as important. Pretest scores changed by less than half a point at posttest for all conditions, with the one exception of a point and a half decrease for negative expectancies in the comparison group. One would expect little changes in
expectancies in that these are students’ values as to what is important and not important to them. Values are theorized as stable.

<table>
<thead>
<tr>
<th>Variables</th>
<th>TREATMENT (n = 81)</th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Pretest</td>
<td></td>
<td>Posttest</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Mean</td>
<td>Std Dev</td>
<td>Min</td>
<td>Max</td>
<td>Mean</td>
<td>Std Dev</td>
<td>Min</td>
<td>Max</td>
<td></td>
</tr>
<tr>
<td>Refusal Outcome Expectancies</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Positive Expectancies</td>
<td>29.83</td>
<td>4.59</td>
<td>19.0</td>
<td>36.0</td>
<td>29.73</td>
<td>5.58</td>
<td>9.0</td>
<td>36.0</td>
<td></td>
</tr>
<tr>
<td>Negative Expectancies</td>
<td>41.54</td>
<td>6.17</td>
<td>20.0</td>
<td>48.0</td>
<td>41.05</td>
<td>6.79</td>
<td>12.0</td>
<td>48.0</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Variables</th>
<th>COMPARISON (n = 80)</th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Pretest</td>
<td></td>
<td>Posttest</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Mean</td>
<td>Std Dev</td>
<td>Min</td>
<td>Max</td>
<td>Mean</td>
<td>Std Dev</td>
<td>Min</td>
<td>Max</td>
<td></td>
</tr>
<tr>
<td>Refusal Outcome Expectancies</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Positive Expectancies</td>
<td>28.57</td>
<td>5.06</td>
<td>15.0</td>
<td>36.0</td>
<td>27.99</td>
<td>5.56</td>
<td>15.0</td>
<td>36.0</td>
<td></td>
</tr>
<tr>
<td>Negative Expectancies</td>
<td>40.97</td>
<td>5.28</td>
<td>28.0</td>
<td>48.0</td>
<td>39.59</td>
<td>6.29</td>
<td>22.0</td>
<td>48.0</td>
<td></td>
</tr>
</tbody>
</table>

Table 4.15
Pretest and Posttest Mean Scores of Refusal Outcome Expectancies for Treatment Group & Comparison Group
Table 4.16 reports the frequency distribution and means for total positive refusal expectations & importance. This variable was calculated by multiplying a positive refusal outcome expectations by its respective refusal outcome expectancy. Values were then summed for total positive expectations & importance. The higher the score, the higher the expected outcome from refusing cigarettes are positive and of importance to the student. From a smoking prevention standpoint, one would want this score high, meaning students believe valued, good things will happen if they refuse cigarettes offers. On average, students at pretest, thought either positive outcomes might occur and these positive outcomes are somewhat important or that these positive outcomes might not occur, yet they did value these outcomes. The distribution in both groups is also similar to a normal distribution curve. There are a few responses on the ends, but there is a large cluster of answers in the middle, around the mean and median. The treatment group’s mean of 74.65 is close to the mid point of the range of 76.50, while the comparison group’s mean is slightly lower at 70.19. At posttest, the comparison group’s mean score decreased by a point to 69.15. The treatment group not only maintained their positive expectations and values, but the mean increased by three points to 77.78. This increase in the mean appears to come from a general shift up in all the treatment group scores, including the addition of six more students entering values of greater than 105.
<table>
<thead>
<tr>
<th>Scores</th>
<th>TREATMENT (n = 81)</th>
<th>COMPARISON (n = 80)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Pretest</td>
<td>Posttest</td>
</tr>
<tr>
<td></td>
<td>Freq</td>
<td>Cum %</td>
</tr>
<tr>
<td>9 - 24</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>25 - 40</td>
<td>5</td>
<td>6.2</td>
</tr>
<tr>
<td>41 - 56</td>
<td>14</td>
<td>23.5</td>
</tr>
<tr>
<td>57 - 72</td>
<td>25</td>
<td>54.3</td>
</tr>
<tr>
<td>73 - 88</td>
<td>10</td>
<td>66.7</td>
</tr>
<tr>
<td>89 - 104</td>
<td>18</td>
<td>88.9</td>
</tr>
<tr>
<td>105 - 120</td>
<td>7</td>
<td>97.5</td>
</tr>
<tr>
<td>121 - 136</td>
<td>0</td>
<td>97.5</td>
</tr>
<tr>
<td>137 - 144</td>
<td>2</td>
<td>100</td>
</tr>
</tbody>
</table>

| Mean    | 74.65 | 77.78 | 70.19 | 69.15 |
| Std Dev | 25.37 | 26.02 | 23.63 | 23.84 |
| Frequency at Maximum Score | 2 | 0 | 0 | 0 |
| Actual Range | 27 - 144 | 12 - 140 | 32 - 140 | 28 - 132 |

Table 4.16
Pretest and Posttest Frequency Distribution of Total Positive Refusal Expectations & Importance for Treatment Group & Comparison Group
Table 4.17 reports the frequency distribution and means for total negative refusal expectations & importance. This variable was calculated by multiplying a negative refusal outcome expectations by its respective refusal outcome expectancy. Values were then summed for total negative expectations & importance. A high score indicates the student expects negative outcomes, such as being called "wimp", and that the avoidance of the negative outcome is important. From a smoking prevention standpoint, one would want median to low scores for this variable; meaning students do not believe bad things will happen if they refuse cigarettes offers, nor is it important for the student to avoid these negative outcomes. With means below the midpoint of the scale, students on average at pretest, thought either negative outcomes might occur, and avoiding these negative outcomes are unimportant or that these negative outcomes might not occur, yet they did value avoiding these outcomes. At posttest, mean scores increased in both groups by less than a full point: the treatment group increased from 87.61 to 88.41, comparison group, 93.63 to 94.14. The means should be interpreted with caution in that the standard deviations are greater than 30 points. The look of the distribution changed in both instances. While the distribution was normal at pretest, at posttest, more scores were located at the lower and higher ends. In both groups, the number of students scoring 112 or above increased; from 16 to 24 in the treatment and from 22 to 28 in the comparison. Thus, it appears a posttest that students were developing stronger, more polar expectations about negative outcomes. The increase in the standard deviation, by eight points in the comparison group, also indicates larger variance in student responses.
<table>
<thead>
<tr>
<th>Scores</th>
<th>TREATMENT (n = 81)</th>
<th>COMPARISON (n = 80)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Pretest</td>
<td>Posttest</td>
</tr>
<tr>
<td></td>
<td>Freq</td>
<td>Cum %</td>
</tr>
<tr>
<td>12 - 31</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>32 - 51</td>
<td>11</td>
<td>13.6</td>
</tr>
<tr>
<td>52 - 71</td>
<td>15</td>
<td>32.1</td>
</tr>
<tr>
<td>72 - 91</td>
<td>18</td>
<td>54.3</td>
</tr>
<tr>
<td>92 - 111</td>
<td>21</td>
<td>80.2</td>
</tr>
<tr>
<td>112 - 131</td>
<td>8</td>
<td>90.1</td>
</tr>
<tr>
<td>132 - 151</td>
<td>5</td>
<td>96.3</td>
</tr>
<tr>
<td>152 - 171</td>
<td>3</td>
<td>100</td>
</tr>
<tr>
<td>172 - 192</td>
<td>0</td>
<td>100</td>
</tr>
</tbody>
</table>

| Mean  | 87.61 | 88.41  | 93.63 | 94.14  |
| Std Dev | 30.26 | 33.96  | 33.27 | 41.14  |
| Frequency at Maximum Score | 0 | 1 | 1 | 2 |
| Actual Range | 32 - 162 | 12 - 192 | 40 - 192 | 28 - 192 |

Table 4.17
Pretest and Posttest Frequency Distribution of Total Negative Refusal Expectations & Importance for Treatment Group & Comparison Group
DESCRIPTIVE DATA OF SOCIAL COGNITIVE THEORY

CONSTRUCTS BY SMOKING STATUS

The following section presents descriptive data with the treatment and comparison groups stratified by nonsmoker and experimental smoker. One of the research questions of this study is whether experimental smokers respond equally to the psychosocial smoking prevention program. Hypothesis testing examined the effective of a student's smoking status on the four theoretical constructs. Descriptive data is provided by smoking status to give the reader a better understanding of the data.

Table 4.18 reports pre and post test scores for the four constructs by smoking status in the treatment group. Time elapsed from pre to post test was eight weeks. On a 36-point scale, behavioral capability to resist the positive images of smoking mean scores for nonsmokers started at 27.51 while smokers started at 25.25. Both nonsmokers and smokers increased by two points at posttest. Refusal skill-efficacy mean score for nonsmokers at pretest was 51.51 and decreased to 49.15 at posttest. Refusal skill-efficacy mean scores for smokers started four points below nonsmokers at 47.76 and increased to 47.89 at posttest. Total positive refusal expectations & importance mean scores increased by six points to 78.61 for the nonsmokers and decreased by two and a half points to 76.21 for the smokers; maximum possible score was 144. Scores for total negative refusal expectations & importance decreased by seven points for nonsmokers to 87.67 and increased by five points to 89.82 in the smokers at posttest. Mean scores for total negative refusal expectations & importance should be interpreted with caution in that the standard deviations are large. The smokers posttest standard deviation increased 15 points...
to reach 41.20. In summarizing treatment group pre to post test changes, nonsmoker
versus smoker, group mean scores appear to gravitate toward each other at posttest. At
pretest, mean scores differed by 2 to 20 points. At posttest, mean scores differed by
approximately two points, for each variable of interest. Tables 4.20 through 4.40, review
each of the variables of interest by nonsmokers and smoker.
<table>
<thead>
<tr>
<th>Variables</th>
<th>Pretest</th>
<th>Posttest</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Behavioral Capability to Resist Positive Images</strong></td>
<td>Mean</td>
<td>Std Dev</td>
</tr>
<tr>
<td>Non-Smokers (n = 53)</td>
<td>27.51</td>
<td>6.27</td>
</tr>
<tr>
<td><strong>Refusal Skill-Efficacy</strong></td>
<td>51.51</td>
<td>9.77</td>
</tr>
<tr>
<td><strong>Total Positive Refusal Expectations &amp; Importance</strong></td>
<td>72.97</td>
<td>24.60</td>
</tr>
<tr>
<td><strong>Total Negative Refusal Expectations &amp; Importance</strong></td>
<td>94.66</td>
<td>30.23</td>
</tr>
<tr>
<td><strong>EXPERIMENTAL SMOKERS (n = 28)</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Behavioral Capability to Resist Positive Images</strong></td>
<td>25.25</td>
<td>7.81</td>
</tr>
<tr>
<td><strong>Refusal Skill-Efficacy</strong></td>
<td>47.76</td>
<td>14.21</td>
</tr>
<tr>
<td><strong>Total Positive Refusal Expectations &amp; Importance</strong></td>
<td>76.21</td>
<td>29.71</td>
</tr>
<tr>
<td><strong>Total Negative Refusal Expectations &amp; Importance</strong></td>
<td>89.82</td>
<td>41.20</td>
</tr>
</tbody>
</table>

Table 4.18
Pretest and Posttest Mean Scores of Dependant Variables: Behavioral Capability to Resist the Positive Images of Smoking, Refusal Skill-Efficacy, Total Positive Refusal Expectations & Importance and Total Negative Refusal Expectations & Importance for Treatment Group, Non-smokers and Experimental Smokers
Table 4.19 reports pre and post test scores for the four constructs by smoking status in the comparison group. On a 36-point scale, behavioral capability to resist the positive images of smoking mean scores for nonsmokers started at 28.09 while smokers started at 25.26. Both nonsmokers and smokers increased by less than a point at posttest. Refusal skill-efficacy mean score for nonsmokers at pretest was 52.98 and decreased to 45.41 at posttest. Refusal skill-efficacy mean scores for smokers started 15.50 points below nonsmokers at 37.48 and increased to 39.72 at posttest. Total positive refusal expectations & importance mean scores decreased by less than two points to 67.32 for the nonsmokers and decreased by less than half a point to 72.04 for the smokers; maximum possible score was 144. Scores for total negative refusal expectations & importance decreased by three points for nonsmokers to 101.95 and increased by six points to 81.78 in the smokers at posttest. Mean scores for total negative refusal expectations & importance should be interpreted with caution in that the standard deviations are large. The nonsmokers posttest standard deviation increased 12 points to reach 45.94. In summarizing comparison group pre to post test changes, nonsmoker verses smoker, group mean scores appear to gravitate toward each other at posttest, similar to the treatment group posttest changes (Table 4.18). Because the changes in mean posttest scores are not large, large point differences still exist at posttest between the nonsmokers and smokers. One such example is total positive negative expectations and importance. Nonsmokers’ mean score decreased while smokers’ mean score increased; at posttest, though, there is still a 20-point difference in mean scores.
<table>
<thead>
<tr>
<th>Variables</th>
<th>NONSMOKERS (n = 49)</th>
<th>EXPLOSERS (n = 31)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Pretest</td>
<td>Posttest</td>
</tr>
<tr>
<td></td>
<td>Mean    Std Dev    Min  Max</td>
<td>Mean    Std Dev    Min  Max</td>
</tr>
<tr>
<td>Behavioral Capability to Resist Positive Images</td>
<td>28.09   6.67      7.0  36.0</td>
<td>28.49   6.78      6.0  36.0</td>
</tr>
<tr>
<td>Refusal Skill-Efficacy</td>
<td>52.98   10.90     10.0  60.0</td>
<td>45.41   15.17     6.0  60.0</td>
</tr>
<tr>
<td>Total Positive Refusal Expectations &amp; Importance</td>
<td>68.78  21.97     32.0  140.0</td>
<td>67.32   23.01     31.0  132.0</td>
</tr>
<tr>
<td>Total Negative Refusal Expectations &amp; Importance</td>
<td>105.33 33.73     41.0  192.0</td>
<td>101.95   45.94     29.0  192.0</td>
</tr>
</tbody>
</table>

Table 4.19
Pretest and Posttest Mean Scores of Dependant Variables: Behavioral Capability to Resist the Positive Images of Smoking, Refusal Skill-Efficacy, Total Positive Refusal Expectations & Importance and Total Negative Refusal Expectations & Importance for Comparison Group, Non-smokers and Experimental Smokers
Table 4.20 reports pre and post test mean scores for behavioral capability to resist positive images of smoking by smoking status in the treatment group. The higher the score, the higher the student's ability to resist positive images of smoking. Students appear to have pre-existing behavioral skills for resisting positive media images. Pretest means for nonsmokers were 27.51 and 25.25 for the smokers. Possible scores ranged from 0 to 36. The average nonsmoker pretest response indicates that students were able to identify slightly greater than half of the media messages in the cigarette advertisements, thought that half of the messages were untruthful with the remaining half being a little untruthful, and rejected all the messages, with half of the messages being strongly rejected. The mean pretest smokers scores indicates that smokers rejected all the images and only one image was strongly rejected. Posttest scores increased by two points for both groups. Changes in the mean score appear to come from the subscale of rejecting favorable images. For nonsmokers, an increase of two points reflects, on average, students strongly rejected all but one of the media messages. For smokers a two point increase indicates student strongly rejecting two of the four positive media messages.
Table 4.20
Pretest and Posttest Mean Scores of Behavioral Capability to Resist the Positive Images of Smoking for Treatment Group, Nonsmokers and Experimental Smokers

<table>
<thead>
<tr>
<th>Variables</th>
<th>NONSMOKERS (n = 53)</th>
<th>EXPERIMENTAL SMOKERS (n = 28)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Pretest</td>
<td>Posttest</td>
</tr>
<tr>
<td></td>
<td>Mean</td>
<td>Std Dev</td>
</tr>
<tr>
<td>Behavioral Capability to Resist Positive Images</td>
<td>27.51</td>
<td>6.27</td>
</tr>
<tr>
<td>Ability to Identify Messages</td>
<td>7.02</td>
<td>4.03</td>
</tr>
<tr>
<td>Evaluate Truthfulness of Message</td>
<td>9.96</td>
<td>2.69</td>
</tr>
<tr>
<td>Reject Favorable Images</td>
<td>10.53</td>
<td>1.97</td>
</tr>
</tbody>
</table>
Table 4.21 reports the frequency distribution and range of scores for behavioral capability to resist the positive images of smoking by smoking status, for the treatment group. From pre to post test, nonsmokers and smokers scores shift notably upward. At posttest, 64% of the nonsmokers scored in the highest category while 61% of the nonsmokers scored in the highest category (30 to 36 points), up from 43% and 25% respectively. At posttest, the distribution and range of scores for the nonsmokers and smokers are similar, with the exception of more smokers scoring in the midpoint category of 18 to 23. This higher percentage of midpoint scores could account for the two point lower mean score of smokers.

<table>
<thead>
<tr>
<th>Scores</th>
<th>NONSMOKERS (n = 53)</th>
<th>EXPERIMENTAL SMOKERS (n = 28)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Pretest</td>
<td>Posttest</td>
</tr>
<tr>
<td></td>
<td>Freq    Cum %</td>
<td>Freq    Cum %</td>
</tr>
<tr>
<td>0 - 5</td>
<td>0        0</td>
<td>0        0</td>
</tr>
<tr>
<td>6 - 11</td>
<td>2        3.8</td>
<td>1        1.9</td>
</tr>
<tr>
<td>12 - 17</td>
<td>2        7.5</td>
<td>4        9.4</td>
</tr>
<tr>
<td>18 - 23</td>
<td>9        22.6</td>
<td>0        9.4</td>
</tr>
<tr>
<td>24 - 29</td>
<td>18       56.6</td>
<td>14       35.8</td>
</tr>
<tr>
<td>30 - 36</td>
<td>23       100</td>
<td>34       100</td>
</tr>
<tr>
<td>Mean</td>
<td>27.51    29.54</td>
<td>25.25    27.44</td>
</tr>
<tr>
<td>Frequency at Maximum Score</td>
<td>5       7</td>
<td>1       3</td>
</tr>
<tr>
<td>Actual Range</td>
<td>9 - 36</td>
<td>6 - 36</td>
</tr>
</tbody>
</table>

Table 4.21
Pretest and Posttest Frequency Distribution of Behavioral Capability to Resist Positive Images of Smoking, for Treatment Group, Nonsmoker and Smoker
Table 4.22 reports pre and post test mean scores for behavioral capability to resist positive images of smoking by smoking status in the comparison group. The higher the score, the higher the student's ability to resist positive images of smoking. Pretest scores for nonsmokers were 28.09 and 25.26 for the smokers. Possible scores ranged from 0 to 36. The average nonsmoker pretest response indicates that students were able to identify slightly greater than half of the media messages in the cigarette advertisements, thought that half of the messages were untruthful with the remaining half being a little untruthful, and rejected all the positive messages, with three of the four messages being strongly rejected. The average smoker response indicates that students were able to identify half of the media messages, thought that three of the four messages were a little untruthful, and rejected all the positive messages, with half the messages being strongly rejected. All posttest scores, except nonsmokers score for rejecting favorable images, changed by less than one point. In interpreting the nonsmokers' decrease in rejecting favorable images, on average, nonsmokers strongly rejected one less media message.
<table>
<thead>
<tr>
<th>Variables</th>
<th>NONSMOKERS (n = 49)</th>
<th>EXPERIMENTAL SMOKERS (n = 31)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Pretest</td>
<td>Posttest</td>
</tr>
<tr>
<td></td>
<td>Mean</td>
<td>Std Dev</td>
</tr>
<tr>
<td>Ability to Identify Messages</td>
<td>6.85</td>
<td>3.77</td>
</tr>
<tr>
<td>Evaluate Truthfulness of Message</td>
<td>10.18</td>
<td>3.23</td>
</tr>
<tr>
<td>Reject Favorable Images</td>
<td>11.04</td>
<td>2.23</td>
</tr>
</tbody>
</table>

Table 4.22
Pretest and Posttest Mean Scores of Behavioral Capability to Resist the Positive Images of Smoking for Comparison Group, Nonsmokers and Experimental Smokers
Table 4.23 reports the frequency distribution and range of scores for behavioral capability to resist positive images of smoking by smoking status, for the comparison group. From pre to post test, the distribution of nonsmoker scores changes little. At pre and posttest, 57% of nonsmokers reported scores in the highest category. Additionally, only three scores changed categories from pre to post. This small change in posttest scores is also reflected by the mean increasing by less than half a point. The distribution of smokers score shifted upward: at pretest 32% of smokers reported scores in the highest category while at posttest the percentage of smokers’ score in the 30 to 36 point category increased to 42%. The frequency of smoker scores below the midpoint of 18 stayed the same, while four scores above the mean move to a higher scoring category. This modest shift upward also included two smokers scoring the maximum score at posttest.
<table>
<thead>
<tr>
<th>Scores</th>
<th>NONSMOKERS</th>
<th>EXPERIMENTAL SMOKERS</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Pretest</td>
<td>Posttest</td>
</tr>
<tr>
<td></td>
<td>Freq</td>
<td>Cum %</td>
</tr>
<tr>
<td>0 - 5</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>6 - 11</td>
<td>1</td>
<td>2.0</td>
</tr>
<tr>
<td>12 - 17</td>
<td>4</td>
<td>10.2</td>
</tr>
<tr>
<td>18 - 23</td>
<td>3</td>
<td>16.3</td>
</tr>
<tr>
<td>24 - 29</td>
<td>13</td>
<td>42.9</td>
</tr>
<tr>
<td>30 - 36</td>
<td>28</td>
<td>100</td>
</tr>
<tr>
<td>Mean</td>
<td>28.09</td>
<td>28.49</td>
</tr>
<tr>
<td>Frequency at Maximum Score</td>
<td>5</td>
<td>5</td>
</tr>
<tr>
<td>Actual Range</td>
<td>7 - 36</td>
<td>6 - 36</td>
</tr>
</tbody>
</table>

Table 4.23
Pretest and Posttest Frequency Distribution of Behavioral Capability to Resist Positive Images of Smoking for Comparison Group, Nonsmoker and Smoker
Table 4.24 reports pre and post test scores for refusal skill-efficacy by smoking status for the treatment group. The higher the score, the higher the student’s skill-efficacy or perceived confidence to refuse cigarette offers. Refusal skill-efficacy was measured with three subscales: by person making the offer; by situation or location; and type of pressure. Students report having a pre-existing level of efficacy to refuse cigarette offers. On a scale of 0 to 60, treatment group pretest scores are 51.51 for the nonsmokers and 44.76 for the smokers. In interpreting the pretest means, nonsmokers on average, were very sure that they could say “no” to 55% (11 out of 20) of the situations and were somewhat sure that they could say “no” in 45% of the situations. The smokers’ mean interpret as in 25% of the situations the smokers were very sure they could say “no” and in 75% of the situations they were somewhat sure that they could “no.” The six point difference between the two treatment groups decreased to a 1.26 difference at posttest; the smokers’ mean score increased by three points while the nonsmokers’ mean score decreased by 2.36 points. Smokers’ responses have more variation at both points of measure. Increases and decreases in mean scores for the treatment group appears to reflect a decrease in refusal skill-efficacy across all subscales, Tables 4.28, 4.30 and 4.32, and not explained by changes in only by the person making the offer, the situation or the type of pressure.
<table>
<thead>
<tr>
<th>Variables</th>
<th>NONSMOKERS (n = 53)</th>
<th>EXPERIMENTAL SMOKERS (n = 28)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Pretest</td>
<td>Posttest</td>
</tr>
<tr>
<td></td>
<td>Mean</td>
<td>Std Dev</td>
</tr>
<tr>
<td>Refusal Skill-Efficacy</td>
<td>51.51</td>
<td>9.77</td>
</tr>
</tbody>
</table>

Table 4.24
Pretest and Posttest Mean Scores of Refusal Skill-Efficacy for Treatment Group, Nonsmoker and Experimental Smoker
Table 4.25 reports the frequency distribution and range of scores for refusal skill-efficacy by smoking status in the treatment group. At pretest, nonsmoker and smoker frequency distributions differ noticeably. Sixty-eight percent of nonsmokers report scores in the highest category while 43% of smokers report scores in the 50 to 60 score category. Additionally, 17.9% of smokers report scores below the midpoint, while only 3.8% of nonsmokers report scores below the midpoint. At posttest, nonsmokers’ distribution of scores shift downward while smokers’ scores shift upward, resulting in similar posttest distributions. At posttest, 58% of nonsmokers and 54% of smokers report scores in the 50 to 60 point category.

<table>
<thead>
<tr>
<th>Scores</th>
<th>NONSMOKERS (n = 53)</th>
<th>EXPERIMENTAL SMOKERS (n = 28)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Pretest</td>
<td>Posttest</td>
</tr>
<tr>
<td></td>
<td>Freq</td>
<td>Cum %</td>
</tr>
<tr>
<td>0 - 9</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>10 - 19</td>
<td>1</td>
<td>1.9</td>
</tr>
<tr>
<td>20 - 29</td>
<td>1</td>
<td>3.8</td>
</tr>
<tr>
<td>30 - 39</td>
<td>5</td>
<td>13.2</td>
</tr>
<tr>
<td>40 - 49</td>
<td>10</td>
<td>32.1</td>
</tr>
<tr>
<td>50 - 60</td>
<td>36</td>
<td>100</td>
</tr>
<tr>
<td>Mean</td>
<td>51.51</td>
<td></td>
</tr>
<tr>
<td>Frequency at Maximum Score</td>
<td>10</td>
<td>10</td>
</tr>
<tr>
<td>Actual Range</td>
<td>18 - 60</td>
<td>0 - 60</td>
</tr>
</tbody>
</table>

Table 4.25
Pretest and Posttest Frequency Distribution of Refusal Skill-Efficacy, for Treatment Group, Nonsmoker and Smoker
Table 4.26 reports mean scores for refusal-skill efficacy by smoking status in the comparison group. On a scale of 0 to 60, pretest scores are 52.98 for the nonsmokers and 37.48 for the smokers. In interpreting the pretest means, nonsmokers on average, were very sure that could say “no” to 65% (13 out of 20) of the situations and were somewhat sure that they could say “no” in 35% of the situations. The smokers’ mean interpret as in 0% of the situations the smokers were very sure they could say “no”, were somewhat sure in 90% (18 out of 20) of the situations and were somewhat unsure that they could “no” in 10% of the situations. The 15.5 point difference between the two groups decreased to a 5.69 difference at posttest; the smokers’ mean score increased by 2.24 points while the nonsmokers’ mean score decreased by 7.57 points. Variation in responses appears large, smokers’ standard deviation at posttest equals 18.50.

<table>
<thead>
<tr>
<th>Variables</th>
<th>NONSMOKERS (n=49)</th>
<th>EXPERIMENTAL SMOKERS (n=31)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Pretest</td>
<td>Posttest</td>
</tr>
<tr>
<td></td>
<td>Mean  Std Dev</td>
<td>Mean  Std Dev</td>
</tr>
<tr>
<td>Refusal Skill-Efficacy</td>
<td>52.98  10.90</td>
<td>45.41  15.17</td>
</tr>
</tbody>
</table>

Table 4.26
Pretest and Posttest Mean Scores of Refusal Skill-Efficacy for Comparison Group, Nonsmoker and Experimental Smoker
Table 4.27 reports the frequency distribution and range of scores for refusal skill-efficacy by smoking status for the comparison group. In addition to pretest nonsmoker smokers' means differing by greater than 15 points, the distribution of scores also varies. At pretest, 75% of nonsmokers report scores in the highest category while 13% of smokers report pretest score in the 50 to 60 point category. Additional 22.6% of smokers scores fall below the midpoint while 4.1% of nonsmoker scores fall below the mean. Similar to treatment group posttest changes, the distribution of nonsmokers' scores shifts downward toward the midpoint, with only 55% of nonsmokers reporting scores in the 50 to 60 point category. Smokers' scores at posttest appear to become bimodal: there is a 10% increase in scores below the mean and a 20% increase of scores in the highest category, totaling 32%.
<table>
<thead>
<tr>
<th>Scores</th>
<th>NONSMOKERS</th>
<th></th>
<th>EXPERIMENTAL SMOKERS</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Pretest</td>
<td>Posttest</td>
<td>Pretest</td>
</tr>
<tr>
<td></td>
<td>Freq</td>
<td>Cum %</td>
<td>Freq</td>
</tr>
<tr>
<td>0 - 9</td>
<td>0</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>10 - 19</td>
<td>1</td>
<td>2.0</td>
<td>2</td>
</tr>
<tr>
<td>20 - 29</td>
<td>1</td>
<td>4.1</td>
<td>7</td>
</tr>
<tr>
<td>30 - 39</td>
<td>4</td>
<td>12.2</td>
<td>6</td>
</tr>
<tr>
<td>40 - 49</td>
<td>6</td>
<td>24.5</td>
<td>7</td>
</tr>
<tr>
<td>50 - 60</td>
<td>37</td>
<td>100</td>
<td>26</td>
</tr>
<tr>
<td>Mean</td>
<td>52.98</td>
<td></td>
<td>45.41</td>
</tr>
<tr>
<td>Frequency at Maximum Score</td>
<td>18</td>
<td></td>
<td>13</td>
</tr>
<tr>
<td>Actual Range</td>
<td>10 - 60</td>
<td></td>
<td>6 - 60</td>
</tr>
</tbody>
</table>

Table 4.27
Pretest and Posttest Frequency Distribution of Refusal Skill-Efficacy, for Comparison Group, Nonsmoker and Smoker
While no statistical analysis was conducted on the subscales of any of the theoretical constructs, descriptive data for the subscales is reported to give the reader a better understanding of the data. Table 4.28 represents the subscale of refusal skill-efficacy by person making the offer for the treatment group. With a possible range of scores of 0 to 18, nonsmokers’ pretest scores for all “person situations” were two points higher than mean smokers’ pretest scores. In interpreting these pretest means, a score of 15 could be obtained by a student reporting being very sure they could say “no” in half the situations and somewhat sure in the remaining situations. A score of 13 could be obtained from students reporting being somewhat sure in five of the six situations and being very sure in one of the situations. At posttest, the two point difference in mean scores between nonsmokers and smokers decreased to a difference of no greater than half a point for each subscale measure. The rank order of these measures is consistent throughout pretest, posttest, smoker and nonsmoker measures; students report being most confident in saying “no” to a best friend and least confident in saying “no” to a group of friends.
<table>
<thead>
<tr>
<th>Variables</th>
<th>NONSMOKERS (n = 53)</th>
<th>EXPERIMENTAL SMOKERS (n = 28)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Pretest</td>
<td>Posttest</td>
</tr>
<tr>
<td></td>
<td>Mean</td>
<td>Std Dev</td>
</tr>
<tr>
<td>--------------------------------</td>
<td>---------</td>
<td>---------</td>
</tr>
<tr>
<td>Refusal Skill- Efficacy</td>
<td>51.51</td>
<td>9.77</td>
</tr>
<tr>
<td>Offer By Best Friend</td>
<td>16.13</td>
<td>2.72</td>
</tr>
<tr>
<td>Offer by Group of Friends</td>
<td>14.75</td>
<td>3.73</td>
</tr>
<tr>
<td>Offer by Older Student</td>
<td>15.70</td>
<td>3.27</td>
</tr>
</tbody>
</table>

Table 4.28
Pretest and Posttest Mean Scores of Refusal Skill-Efficacy and By Person Making the Cigarette Offer for Treatment Group, Nonsmoker and Experimental Smoker
Table 4.29 represents the subscale of refusal skill-efficacy by person making the offer for the comparison group. With a possible range of scores of 0 to 18, nonsmokers' pretest scores for all "person situations" were four to five points higher than mean smokers' pretest scores. In interpreting these pretest means, a score of 15 could be obtained by a student reporting being very sure they could say "no" in half the situations and somewhat sure in the remaining situations. A score of 13 could be obtained from students reporting being somewhat sure in five of the six situations and being very sure in one of the situations. A score of 11 could be obtained from students report being somewhat sure in five of the six situations and somewhat unsure in one of the six situations. At posttest, the point difference in scores between nonsmokers and smokers decreased by half and was no greater than two and a half points.

<table>
<thead>
<tr>
<th>Variables</th>
<th>NONSMOKERS (n = 49)</th>
<th>EXPERIMENTAL SMOKERS (n = 31)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Pretest</td>
<td>Posttest</td>
</tr>
<tr>
<td></td>
<td>Mean</td>
<td>Std Dev</td>
</tr>
<tr>
<td>Refusal Skill-Efficacy</td>
<td>52.98</td>
<td>10.90</td>
</tr>
<tr>
<td>Offer by Best Friend</td>
<td>16.32</td>
<td>2.85</td>
</tr>
<tr>
<td>Offer by Group of Friends</td>
<td>15.71</td>
<td>3.65</td>
</tr>
<tr>
<td>Offer by Older Student</td>
<td>16.01</td>
<td>3.45</td>
</tr>
</tbody>
</table>

Table 4.29
Pretest and Posttest Mean Scores of Refusal Skill-Efficacy and By Person Making the Cigarette Offer for Comparison Group, Nonsmoker and Experimental Smoker
Table 4.30 represents the subscale of refusal skill-efficacy by situation or location for the treatment group. With a possible range of scores of 0 to 30, nonsmokers, on average at pretest, scored a 23.77 for confidence in saying “no” at school and a 25.21 for confidence in saying “no” at a friend’s house. In interpreting these mean scores, a 24.0 could represent a student being very sure in 40% (four out of ten) of the situations and somewhat sure in 60% of the situations. The smokers’ mean pretest scores are 21.55 for school situations and 20.61 for at a friend’s house. A mean score of 22.0 represents a student being very sure in 20% of the situations and somewhat sure in 80% of the situations. A mean of 21.0 represents a student being very sure in 10% of the situations and somewhat sure in 90% of the situations. Posttest scores for smokers’ confidence in saying “no” at a friend’s house increased by three points; this represents students being very sure in 40% of the situations, verse 10% at pretest. All other scores decreased by approximately one and a quarter point. One other notable trend in posttest scores was the increase in the range of actual scores. Scores were reported at posttest at the minimum of the range for both groups.
Table 4.30
Pretest and Posttest Mean Scores of Refusal Skill-Efficacy and By Situation for Treatment Group, Nonsmoker and Experimental Smoker.

<table>
<thead>
<tr>
<th>Variables</th>
<th>NONSMOKERS (n = 53)</th>
<th>EXPERIMENTAL SMOKERS (n = 28)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Pretest</td>
<td>Posttest</td>
</tr>
<tr>
<td></td>
<td>Mean</td>
<td>Std Dev</td>
</tr>
<tr>
<td>Refusal Skill-Efficacy</td>
<td>51.51</td>
<td>9.77</td>
</tr>
<tr>
<td>In School Hallway</td>
<td>23.77</td>
<td>3.99</td>
</tr>
<tr>
<td>After School, at Friend’s House</td>
<td>25.21</td>
<td>5.38</td>
</tr>
</tbody>
</table>

197
Table 4.31 represents the subscale of refusal skill-efficacy by situation or location for the comparison group. With a possible range of scores of 0 to 30, nonsmokers, on average at pretest, scored a 24.43 for confidence in saying “no” at school and a 25.97 for confidence in saying “no” at a friend’s house. In interpreting these mean scores, a 24.0 represents a student being very sure in 40% (4 out of 10) of the situations and somewhat sure in 60% of the situations. A mean score of 26.0 indicates that students are very sure that they could say “no” at a friend’s house in 60% of the situations presented. The smokers’ mean pretest scores are 17.74 for school situations and 17.35 for at a friend’s house. A mean score of 18 represents a student being very sure in 0% of the situations and somewhat sure in 80% of the situations. A mean of 17 represents a student being very sure in 0% of the situations and somewhat sure in 70% of the situations. Posttest scores for nonsmokers’ decreased by four and three while smokers’ mean scores increased by one and two points.

<table>
<thead>
<tr>
<th>Variables</th>
<th>NONSMOKERS (n = 49)</th>
<th></th>
<th>EXPERIMENTAL SMOKERS (n = 31)</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Pretest</td>
<td>Posttest</td>
<td>Pretest</td>
<td>Posttest</td>
</tr>
<tr>
<td></td>
<td>Mean</td>
<td>Std Dev</td>
<td>Mean</td>
<td>Std Dev</td>
</tr>
<tr>
<td>Refusal Skill-Efficacy</td>
<td>52.98</td>
<td>10.90</td>
<td>45.41</td>
<td>15.17</td>
</tr>
<tr>
<td>In School Hallway</td>
<td>24.43</td>
<td>4.65</td>
<td>20.59</td>
<td>6.85</td>
</tr>
<tr>
<td>After School, at Friend’s House</td>
<td>25.97</td>
<td>5.95</td>
<td>22.62</td>
<td>7.70</td>
</tr>
</tbody>
</table>

Table 4.31
Pretest and Posttest Mean Scores of Refusal Skill-Efficacy and By Situation for Comparison Group, Nonsmoker Verses Experimental Smoker
Table 4.32 represents treatment group scores for the subscale of refusal-skill efficacy by type of pressure. Scores could range from 0 to 18 for direct, hassle and put down type pressure. Indirect pressure scores could range from 0 to 6. Nonsmoker mean pretest scores for direct, hassle and put down pressure, were between 15 and 16 points. In interpreting these pretest means, a score of 15 could be obtained by a student reporting being very sure that they could say “no” in half the situations and somewhat sure in the remaining situations. For indirect pressure, a score of four could be obtained by also being very sure in half the situations and somewhat sure in the remaining half. Smoker pretest scores for direct, hassle and put down pressure ranged 1.5 to 2.9 points lower than the nonsmokers’ scores. In interpreting the mean of 12.37 for smokers’ pretest hassle score, on average, smokers were very sure of their ability to say “no” to hassle pressure in 0% of the situations and somewhat sure in 100% of the situations. All nonsmoker posttest scores decreased by less than a point. Changes in smoker posttest scores were mixed. Direct and indirect pressure scores decreased by less than half a point. Scores for hassle and put down pressure increased by 2.0 and 1.43, respectively. An increase of 2.0 for hassle pressure indicates that students, on average, report increasing their confidence from somewhat sure to very sure in two of the six situations.
<table>
<thead>
<tr>
<th>Variables</th>
<th>NONSMOKERS (n = 53)</th>
<th>EXPERIMENTAL SMOKERS (n = 28)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Pretest</td>
<td>Posttest</td>
</tr>
<tr>
<td></td>
<td>Mean</td>
<td>Std Dev</td>
</tr>
<tr>
<td>Refusal Skill-Efficacy</td>
<td>51.51</td>
<td>9.77</td>
</tr>
<tr>
<td>Direct Pressure</td>
<td>15.79</td>
<td>2.66</td>
</tr>
<tr>
<td>Indirect Pressure</td>
<td>4.92</td>
<td>1.37</td>
</tr>
<tr>
<td>Hassle</td>
<td>15.26</td>
<td>3.57</td>
</tr>
<tr>
<td>Put Down</td>
<td>15.49</td>
<td>3.46</td>
</tr>
</tbody>
</table>

Table 4.32
Pretest and Posttest Mean Scores of Refusal Skill-Efficacy and By Type of Pressure for Treatment Group, Nonsmoker and Experimental Smoker
Table 4.33 represents comparison group scores for the subscale of refusal skill-efficacy by type of pressure. Scores could range from 0 to 18 for direct, hassle and put down type pressure. Indirect pressure scores could range from 0 to 6. Nonsmoker mean pretest scores for direct, hassle and put down pressure, were between 15 and 16.5 points. In interpreting these pretest means, a score of 15 could be obtained by a student reporting being very sure that they could say “no” in half the situations and somewhat sure in the remaining situations. For indirect pressure, a score of four could be obtain by also being very sure in half the situations and somewhat sure in the remaining half. Smoker pretest scores for direct, hassle and put down pressure ranged 3.93 to 6.06 points lower than the nonsmokers’ scores. In interpreting the mean of 10.22 for smokers’ pretest hassle score, on average, smokers were very sure of their ability to say “no” to hassle pressure in 0% of the situations, somewhat sure in 67% (4 out of 6) of the situations and somewhat unsure in 33% of the situations. All mean nonsmoker posttest scores decreased. Direct, hassle and put down pressure scores decreased by two to two and a half points each. As with the treatment group changes noted in Table 4.32, smoker posttest scores were mixed. Direct and hassle pressure scores increased by one to one and a half points. Put down mean score for smokers decreased by a quarter of a point.
<table>
<thead>
<tr>
<th>Variables</th>
<th>NONSMOKERS (n = 49)</th>
<th>EXPERIMENTAL SMOKERS (n = 31)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Pretest</td>
<td>Posttest</td>
</tr>
<tr>
<td></td>
<td>Mean</td>
<td>Std Dev</td>
</tr>
<tr>
<td>Refusal Skill-Efficacy</td>
<td>52.98</td>
<td>10.90</td>
</tr>
<tr>
<td>Direct Pressure</td>
<td>15.92</td>
<td>3.21</td>
</tr>
<tr>
<td>Indirect Pressure</td>
<td>4.95</td>
<td>1.56</td>
</tr>
<tr>
<td>Hassle</td>
<td>16.28</td>
<td>3.13</td>
</tr>
</tbody>
</table>

Table 4.33
Pretest and Posttest Mean Scores of Refusal Skill-Efficacy and By Type of Pressure for Comparison Group, Nonsmoker and Experimental Smoker
Table 4.34 reports **treatment group** positive and negative refusal outcome expectations by smoking status. Refusal outcome expectations are students' expected outcomes from refusing cigarettes offers. Expectations were categorized into two groups: positive and negative. The higher the score for positive refusal expectations, the higher the student's expectation for positive outcomes from refusing cigarette offers. The higher the score for negative refusal expectations, the higher the student's expectations for negative outcomes from refusing cigarettes offers. The possible range for positive expectations is 9 to 36, with a midpoint of 22.5. On the pretest, the nonsmokers and smokers scored 21.87 and 23.00, respectively. The average nonsmoker, at pretest, expected that half the positive outcomes might happen and half of the positive outcomes might not happen. The average smoker expected slightly more than half of the positive outcomes to happen. At posttest, positive refusal expectations mean scores increased to 23.55 for nonsmokers and to 23.11 for smokers. Negative expectations, at pretest, were 27.50 for nonsmokers and 22.34 for nonsmokers. The possible range is 12 to 48, with a midpoint of 30. In interpreting the average nonsmoker pretest response, nonsmokers reported that in 75% (9 out of 12 items) of the situations, they would expect that negative outcomes might not happen and in 25% of the situations the negative outcome might happen. The average pretest smoker response, 22.34, can be interpreted that in 84% of the situations, the smokers states the negative outcome might not happen and in the remaining 16% of situations expect that the negative outcome would definitely not happen. From the mean scores, it appears that smokers do not expect negative outcomes from refusing cigarette offers. Posttest negative outcome expectations increased by 4.55.
points for smokers and decreased by 1.73 in the non-smokers. At posttest, the two groups mean scores of 25.77 and 26.89 are less than a point apart, indicating that the average respondent expects that negative outcomes might not happen in greater than 75% of the situations presented.

<table>
<thead>
<tr>
<th>Variables</th>
<th>NONSMOKERS (n = 53)</th>
<th>EXPERIMENTAL SMOKERS (n = 28)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Pretest</td>
<td>Posttest</td>
</tr>
<tr>
<td></td>
<td>Mean</td>
<td>Std Dev</td>
</tr>
<tr>
<td>Refusal Outcome Expectations</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Positive Expectations</td>
<td>21.87</td>
<td>5.45</td>
</tr>
<tr>
<td>Negative Expectations</td>
<td>27.50</td>
<td>8.27</td>
</tr>
</tbody>
</table>

Table 4.34
Pretest and Posttest Mean Scores of Refusal Outcome Expectations for Treatment Group, Nonsmokers and Experimental Smokers

204
Table 4.35 reports comparison group positive and negative refusal outcome expectations by smoking status. The higher the score for positive refusal expectations, the higher the student’s expectation for positive outcomes from refusing cigarette offers. The higher the score for negative refusal expectations, the higher the student’s expectations for negative outcomes from refusing cigarettes offers. The possible range for positive expectations is 9 to 36, with a midpoint of 22.5. On the pretest, the nonsmokers and smokers scored 21.91 and 22.63, respectively. The average student at pretest expected that half the positive outcomes might happen and half of the positive outcomes might not happen. At posttest, positive refusal expectations mean scores, for both nonsmokers and smokers, decreased by less that a fourth of a point. Negative expectations, at pretest, were 31.02 for nonsmokers. This mean interprets similar to the positive expectations; in half the situations presented, students expected the negative outcome might happen and in the remaining half of the situations, the negative outcome might not happen. Smokers, on average with a pretest score of 22.45, expected that in 84% of the situations the negative outcome might not happen and in the remaining 16% of situations expected that the negative outcome would definitely not happen. Similar to smokers in the treatment group (Table 4.34), comparison group responses reflect that smokers do not expect negative outcomes from refusing cigarettes offers. Also similar to changes in the treatment group, mean posttest scores increased for smokers and decreased for nonsmokers. Smokers scores increased by three points for while nonsmokers scores decreased by a point and a half.
### Table 4.35
Pretest and Posttest Mean Scores of Refusal Outcome Expectations for Comparison Group, Nonsmokers and Experimental Smokers

<table>
<thead>
<tr>
<th>Variables</th>
<th>Pretest</th>
<th></th>
<th></th>
<th></th>
<th>Posttest</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Mean</td>
<td>Std Dev</td>
<td>Min</td>
<td>Max</td>
<td>Mean</td>
<td>Std Dev</td>
<td>Min</td>
</tr>
<tr>
<td>Refusal Outcome Expectations</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Positive Expectations</td>
<td>21.91</td>
<td>5.28</td>
<td>13.0</td>
<td>36.0</td>
<td>21.78</td>
<td>5.72</td>
<td>9.0</td>
</tr>
<tr>
<td>Negative Expectations</td>
<td>31.02</td>
<td>8.69</td>
<td>12.0</td>
<td>48.0</td>
<td>29.88</td>
<td>10.58</td>
<td>12.0</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>EXPERIMENTAL SMOKERS (n = 31)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Refusal Outcome Expectations</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Positive Expectations</td>
<td>22.63</td>
<td>5.51</td>
<td>13.0</td>
<td>33.0</td>
<td>22.53</td>
<td>6.44</td>
<td>9.0</td>
</tr>
<tr>
<td>Negative Expectations</td>
<td>22.45</td>
<td>6.89</td>
<td>12.0</td>
<td>36.0</td>
<td>25.64</td>
<td>9.21</td>
<td>12.0</td>
</tr>
</tbody>
</table>
Table 4.36 reports treatment group positive and negative refusal outcome expectancies by smoking status. Refusal outcome expectancies are the values, important or unimportant, that a student places upon the refusal outcome expectation. The higher the positive refusal expectancies score, the more the student values these positive outcomes. The higher the negative outcome expectancies score, the more the student values the avoidance of this outcome. From a smoking prevention standpoint, one would want positive outcome expectancies high, meaning students value the potential positive outcomes of refusing cigarettes. With a possible range of 9 to 36 points for positive outcome expectancies, nonsmokers averaged 29.70 and the smokers averaged 30.07. In interpreting the mean, students, on average, reported that all the potential positive outcomes were, at minimum, important. From a smoking prevention standpoint, one would want negative outcome expectancies low, meaning students do not value the avoidance of the potential negative outcomes of refusing cigarettes. With a possible range of 12 to 48 points for negative outcome expectancies, nonsmokers averaged 41.70 at pretest and smokers averaged 41.25. This score indicates that the average student reported that avoiding the potential negative outcomes was very important in half of the questionnaire items, while the other half of the items were scored as important. Pretest scores changed by less than a point at posttest for all conditions. One would expect little changes in expectancies in that these are students' values as to what is important and not important to them. Values are theorized as stable.
<table>
<thead>
<tr>
<th>Variables</th>
<th>NONSMOKERS (n = 53)</th>
<th>EXPERIMENTAL SMOKERS (n = 28)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Pretest</td>
<td>Posttest</td>
</tr>
<tr>
<td></td>
<td>Mean</td>
<td>Std Dev</td>
</tr>
<tr>
<td>Refusal Outcome</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Expectancies</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Positive Expectancies</td>
<td>29.70</td>
<td>4.47</td>
</tr>
<tr>
<td>Negative Expectancies</td>
<td>41.70</td>
<td>6.31</td>
</tr>
</tbody>
</table>

Table 4.36
Pretest and Posttest Mean Scores of Refusal Outcome Expectancies for Treatment Group, Nonsmokers and Experimental Smokers
Table 4.37 reports comparison group positive and negative refusal outcome expectancies by smoking status. Refusal outcomes expectancies are the values, important or unimportant, that a student places upon the refusal outcome expectation. The higher the positive refusal expectancies score, the more the student values these positive outcomes. The higher the negative outcome expectancies score, the more the student values the avoidance of this outcome. From a smoking prevention standpoint, one would want positive outcome expectancies high, meaning students value the potential positive outcomes of refusing cigarettes. With a possible range of 9 to 36 points for positive outcome expectancies, nonsmokers averaged 28.47 and the smokers averaged 28.72. In interpreting the mean, students, on average, reported that all the potential positive outcomes were, at minimum, important. From a smoking prevention standpoint, one would want negative outcome expectancies low, meaning students do not value the avoidance of the potential negative outcomes of refusing cigarettes. With a possible range of 12 to 48 points for negative outcome expectancies, nonsmokers averaged 40.94 at pretest and smokers averaged 41.01. This score indicates that the average student reported that avoiding the potential negative outcomes was very important in half of the questionnaire items, while the other half of the items were scored as important. Pretest scores changed by less than a point at posttest for positive expectancies. Posttest negative expectancies decreased by 1.11 point for nonsmokers and 1.83 for smokers. The stability in responses is expected in that expectancies are students’ values as to what is important and not important to them. Values are theorized as stable.
<table>
<thead>
<tr>
<th>Variables</th>
<th>NONSMOKERS (n = 49)</th>
<th></th>
<th>EXPERIMENTAL SMOKERS (n = 31)</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Pretest</td>
<td>Posttest</td>
<td>Pretest</td>
<td>Posttest</td>
</tr>
<tr>
<td></td>
<td>Mean    Std Dev  Min  Max</td>
<td>Mean    Std Dev  Min  Max</td>
<td>Mean    Std Dev  Min  Max</td>
<td>Mean    Std Dev  Min  Max</td>
</tr>
<tr>
<td>Refusal Outcome Expectancies</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Positive Expectancies</td>
<td>28.47   4.90  17.0  36.0</td>
<td>27.91   5.84  18.0  36.0</td>
<td>28.72   5.38  15.0  36.0</td>
<td>28.13   5.18  15.0  36.0</td>
</tr>
<tr>
<td>Negative Expectancies</td>
<td>40.94   5.90  28.0  48.0</td>
<td>39.83   6.73  22.0  48.0</td>
<td>41.01   4.22  30.0  48.0</td>
<td>39.19   5.62  27.0  48.0</td>
</tr>
</tbody>
</table>

Table 4.37
Pretest and Posttest Mean Scores of Refusal Outcome Expectancies for Comparison Group, Nonsmokers and Experimental Smokers
Table 4.38 reports the treatment group frequency distribution and means for total positive refusal expectations & importance. This variable was calculated by multiplying a positive refusal outcome expectations by its respective refusal outcome expectancy. Values were then summed for total positive expectations & importance. The higher the score, the higher the expected outcome from refusing cigarettes are positive and of importance to the student. From a smoking prevention standpoint, one would want this score high, meaning students believe valued, good things will happen if they refuse cigarettes offers. With means of 72.97 and 77.82 at pretest, on average, nonsmokers and smokers thought either positive outcomes might occur and these positive outcomes are somewhat important or that these positive outcomes might not happen, but were very important in terms of value. At pretest, the distribution in both groups is also similar to a normal distribution curve. There are a few responses on the ends, but there is a large cluster of answers in the middle, around the mean and median. At posttest, the nonsmokers' mean score increased by 5.64 points. The increase in the mean appears to come from nine fewer scores below the midpoint category and five more scores in the upper category 105 to 102. Smokers at posttest decreased by 1.61 point with no notable changes in the distribution of scores.
<table>
<thead>
<tr>
<th>Scores</th>
<th>NONSMOKERS ( (n=53) )</th>
<th>EXPERIMENTAL SMOKERS ( (n=28) )</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Pretest</td>
<td>Posttest</td>
</tr>
<tr>
<td></td>
<td>Freq</td>
<td>Cum %</td>
</tr>
<tr>
<td>9 - 24</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>25 - 40</td>
<td>3</td>
<td>5.7</td>
</tr>
<tr>
<td>41 - 56</td>
<td>11</td>
<td>26.4</td>
</tr>
<tr>
<td>57 - 72</td>
<td>19</td>
<td>56.6</td>
</tr>
<tr>
<td>73 - 88</td>
<td>6</td>
<td>67.9</td>
</tr>
<tr>
<td>89 - 104</td>
<td>12</td>
<td>90.6</td>
</tr>
<tr>
<td>105 - 120</td>
<td>4</td>
<td>98.1</td>
</tr>
<tr>
<td>121 - 136</td>
<td>1</td>
<td>100</td>
</tr>
<tr>
<td>137 - 144</td>
<td>0</td>
<td>100</td>
</tr>
<tr>
<td>Mean</td>
<td>72.97</td>
<td>78.61</td>
</tr>
<tr>
<td>Std Dev</td>
<td>24.60</td>
<td>24.01</td>
</tr>
<tr>
<td>Frequency at Maximum Score</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Actual Range</td>
<td>27 - 144</td>
<td>32 - 124</td>
</tr>
</tbody>
</table>

Table 4.38
Pretest and Posttest Frequency Distribution and Mean Scores of Total Positive Refusal Expectations & Importance for Treatment Group, Nonsmokers and Experimental Smokers
Table 4.39 reports the **comparison group** frequency distribution and means for total positive refusal expectations & importance. This variable was calculated by multiplying a positive refusal outcome expectations by its respective refusal outcome expectancy. Values were then summed for total positive expectations & importance. The higher the score, the higher the expected outcome from refusing cigarettes are positive and of importance to the student. From a smoking prevention standpoint, one would want this score high, meaning students believe valued, good things will happen if they refuse cigarettes offers. With means of 68.78 and 72.44 at pretest, on average, nonsmokers and smokers thought either positive outcomes might occur, and these positive outcomes are somewhat important or that these positive outcomes might not happen, but were very important in terms of value. Mean scores change by less than two points at posttest with no notable changes in the distribution of scores.
<table>
<thead>
<tr>
<th>Scores</th>
<th>NONSMOKERS (n = 49)</th>
<th>EXPERIMENTAL SMOKERS (n = 31)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Pretest</td>
<td>Posttest</td>
</tr>
<tr>
<td></td>
<td>Freq</td>
<td>Cum %</td>
</tr>
<tr>
<td>9 - 24</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>25 - 40</td>
<td>3</td>
<td>6.1</td>
</tr>
<tr>
<td>41 - 56</td>
<td>12</td>
<td>30.6</td>
</tr>
<tr>
<td>57 - 72</td>
<td>15</td>
<td>61.2</td>
</tr>
<tr>
<td>73 - 88</td>
<td>13</td>
<td>87.8</td>
</tr>
<tr>
<td>89 - 104</td>
<td>3</td>
<td>93.9</td>
</tr>
<tr>
<td>105 - 120</td>
<td>1</td>
<td>95.9</td>
</tr>
<tr>
<td>121 - 136</td>
<td>1</td>
<td>98.0</td>
</tr>
<tr>
<td>137 - 144</td>
<td>1</td>
<td>100</td>
</tr>
<tr>
<td>Mean</td>
<td>68.78</td>
<td>67.32</td>
</tr>
<tr>
<td>Std Dev</td>
<td>21.97</td>
<td>23.01</td>
</tr>
<tr>
<td>Frequency at Maximum Score</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Actual Range</td>
<td>32 - 140</td>
<td>31 - 132</td>
</tr>
</tbody>
</table>

Table 4.39
Pretest and Posttest Frequency Distribution and Mean Scores of Total Positive Refusal Expectations & Importance for Comparison Group, Nonsmokers and Experimental Smokers
Table 4.40 reports the **treatment group** frequency distribution and means for total negative refusal expectations & importance. This variable was calculated by multiplying a negative refusal outcome expectations by its respective refusal outcome expectancy. Values were then summed for total negative expectations & importance. A high score indicates that the student expects negative outcomes, such as being called "wimp", and that the avoidance of this outcome is important. From a smoking prevention standpoint, one would want median to low scores for this variable; meaning students do not believe bad things will happen if they refuse cigarettes offers, nor is it important for the student to avoid these negative outcomes. The midpoint of this scale is 90.0 With the mean pretest score of 94.66, nonsmokers, on average, thought either negative outcomes might occur, and avoiding these negative outcomes are unimportant or that these negative outcomes might not occur, but avoiding these negative outcomes is important. This mean decreased to 87.67 at posttest. Because expectancies changed by less than one point, see Table 4.36, the seven point decrease could likely be attributed to nonsmokers' lowered expectations for negative outcomes. However, because of the multiplication factor, small differences should be interpreted with caution. The distribution of scores does indicate a downward shift in scores. Nine more nonsmokers reported scores below the midpoint at posttest. The standard deviation changed by less than a point. The mean pretest score for smokers is 74.79. Lower scores indicate that students do not expect negative outcomes from smoking nor is it of high importance for the student to avoid negative outcomes. Smokers scores increased by 15 points at posttest to 89.92. By looking at the frequency
distribution, scores appear to move toward the midpoint. This posttest mean, particularly, should be interpreted with caution in that the standard deviations is greater than 40 points.

<table>
<thead>
<tr>
<th>Scores</th>
<th>NONSMOKERS (n = 53)</th>
<th></th>
<th></th>
<th></th>
<th></th>
<th>EXPERIMENTAL SMOKERS (n = 28)</th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Pretest</td>
<td>Posttest</td>
<td>Freq</td>
<td>Cum %</td>
<td>Freq</td>
<td>Cum %</td>
<td>Freq</td>
<td>Cum %</td>
<td>Freq</td>
<td>Cum %</td>
</tr>
<tr>
<td>12 - 31</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>3.6</td>
<td></td>
</tr>
<tr>
<td>32 - 51</td>
<td>5</td>
<td>9.4</td>
<td>6</td>
<td>11.3</td>
<td>6</td>
<td>21.4</td>
<td>5</td>
<td>21.4</td>
<td></td>
<td></td>
</tr>
<tr>
<td>52 - 71</td>
<td>6</td>
<td>20.8</td>
<td>14</td>
<td>37.7</td>
<td>9</td>
<td>53.6</td>
<td>4</td>
<td>35.7</td>
<td></td>
<td></td>
</tr>
<tr>
<td>72 - 91</td>
<td>12</td>
<td>43.4</td>
<td>12</td>
<td>60.4</td>
<td>4</td>
<td>67.9</td>
<td>6</td>
<td>57.1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>92 - 111</td>
<td>16</td>
<td>73.6</td>
<td>6</td>
<td>71.7</td>
<td>7</td>
<td>92.9</td>
<td>3</td>
<td>67.9</td>
<td></td>
<td></td>
</tr>
<tr>
<td>112 - 131</td>
<td>7</td>
<td>86.8</td>
<td>9</td>
<td>88.7</td>
<td>1</td>
<td>96.4</td>
<td>5</td>
<td>85.7</td>
<td></td>
<td></td>
</tr>
<tr>
<td>132 - 151</td>
<td>4</td>
<td>94.3</td>
<td>6</td>
<td>100</td>
<td>1</td>
<td>100</td>
<td>2</td>
<td>92.9</td>
<td></td>
<td></td>
</tr>
<tr>
<td>152 - 171</td>
<td>3</td>
<td>100</td>
<td>0</td>
<td>100</td>
<td>0</td>
<td>100</td>
<td>0</td>
<td>100</td>
<td></td>
<td></td>
</tr>
<tr>
<td>171 - 192</td>
<td>0</td>
<td>100</td>
<td>0</td>
<td>100</td>
<td>0</td>
<td>100</td>
<td>0</td>
<td>100</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mean</td>
<td>94.66</td>
<td>87.67</td>
<td>74.79</td>
<td>89.82</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Std Dev</td>
<td>30.23</td>
<td>29.86</td>
<td>25.94</td>
<td>41.20</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Frequency at Maximum Score</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Actual Range</td>
<td>32 - 162</td>
<td>39 - 151</td>
<td>36 - 132</td>
<td>12 - 192</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table 4.40
Pretest and Posttest Frequency Distribution and Mean Scores of Total Negative Refusal Expectations & Importance for Treatment Group, Nonsmokers and Experimental Smokers
Table 4.41 reports the **comparison group** frequency distribution and means for total negative refusal expectations & importance. This variable was calculated by multiplying a negative refusal outcome expectations by its respective refusal outcome expectancy. Values were then summed for total negative expectations & importance. A high score indicates that the student expects negative outcomes, such as being called "wimp", and that the avoidance of this outcome is important. The midpoint of this scale is 90.0. A mean similar to the midpoint score, implies that students, on average, thought either negative outcomes might occur, and avoiding these negative outcomes are unimportant or that these negative outcomes might not occur, yet they did value avoiding these outcomes. As scores lower, students expectations of negative outcomes lower and or the less important it is for a student to avoid this negative outcome. Nonsmokers' mean scores were higher than the midpoint at both pre and post test. The pretest mean is 105.33 and decreased to 101.95 at posttest. On average, the nonsmoker student expected negative outcomes might happen and that it was somewhat important to avoid these negative outcomes. The distribution of nonsmokers' scores at posttest did become more polar. Seven more students reported scores in the two lowest categorizes while three more students reported scores in the two upper categorizes. Smoker scores were lower than the midpoint at both pre and post test. Lower scores indicate that students do not expect negative outcomes from smoking nor is it of importance for the student to avoid negative outcomes. Smokers scores increased by 6.63 points at posttest to 81.78.
<table>
<thead>
<tr>
<th>Scores</th>
<th>NONSMOKER (n = 49)</th>
<th>EXPERIMENTAL SMOKER (n = 31)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Pretest</td>
<td>Posttest</td>
</tr>
<tr>
<td></td>
<td>Freq</td>
<td>Cum %</td>
</tr>
<tr>
<td>12 - 31</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>32 - 51</td>
<td>2</td>
<td>4.1</td>
</tr>
<tr>
<td>52 - 71</td>
<td>8</td>
<td>20.4</td>
</tr>
<tr>
<td>72 - 91</td>
<td>7</td>
<td>34.7</td>
</tr>
<tr>
<td>92 - 111</td>
<td>13</td>
<td>61.2</td>
</tr>
<tr>
<td>112 - 131</td>
<td>9</td>
<td>79.6</td>
</tr>
<tr>
<td>132 - 151</td>
<td>5</td>
<td>84.0</td>
</tr>
<tr>
<td>152 - 171</td>
<td>4</td>
<td>98.0</td>
</tr>
<tr>
<td>171 - 192</td>
<td>1</td>
<td>100</td>
</tr>
<tr>
<td>Mean</td>
<td>105.33</td>
<td></td>
</tr>
<tr>
<td>Std Dev</td>
<td>33.73</td>
<td></td>
</tr>
<tr>
<td>Frequency at Maximum Score</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Actual Range</td>
<td>41 - 192</td>
<td></td>
</tr>
</tbody>
</table>

Table 4.41
Pretest and Posttest Frequency Distribution and Mean Scores of Total Negative Refusal Expectations & Importance for Comparison Group, Nonsmokers and Experimental Smokers
HYPOTHESES TESTING

A three-way analysis of variance, with an alpha level of .05 level of significance, was conducted. The three factors built into this design are treatment, smoking status and time of testing. The two variables of treatment and smoking status each have two levels and are between factors, meaning a subject belongs only to one level. The two levels for treatment are treatment or comparison. For the smoking status factor, subjects are either categorized as a nonsmoker or an experimental smoker. The factor of treatment is built into the design to answer the research questions of does the treatment impact the four theoretical constructs. Smoking status is included in the design to address the secondary purpose of this study, does a student's smoking status interact with treatment for the four theoretical constructs. Time of testing was included in the design to improve the internal validity of the study, not to answer a specific research question. By having time of testing built into the analysis, changes from pre to post test can be reported. This will allow a researcher to report possible testing effects and maturation effects. Group differences at pre to post test can also be reported. For example, should the treatment and comparison group differ at pretest, a treatment by time of testing interaction would be reported. The factor of time of testing is a within factor, meaning that subjects are in both levels; the two levels are pretest and posttest.

The three-way design allows the researcher to report three main effects; for treatment (a comparison between the treatment and comparison group on the dependant variables), for smoking status (a comparison between experimental smokers and nonsmokers on the dependant variables) and for time of testing (a comparison of scores
pretest verses posttest). ANOVA also allows one to examine the interaction amongst the factors. The primary interaction of interest for the purpose of this study is the interaction of treatment and smoking status. Least squares means were used to adjust for unequal sample sizes. Tables 4.42 through 4.45 are summaries of the four ANOVAs. A table is displayed for each of the four theoretical constructs.

For statistically significant main or interaction effects, individual t-tests were conducted, post hoc, to identify which pairs of means differ significantly. If an ANOVA yielded a significant $F$ value for an interaction effect and main effect(s), a post hoc t-test was conducted only on the interaction effect because the interaction influences the interpretation of the main effect. Specific hypotheses to be tested are listed in chapters 1 and 3. Post hoc analysis is reported in the final section this chapter, following the ANOVA tables. Only pre-planned group post hoc comparisons were conducted. The group comparisons to be examined were: (1) treatment and comparison, (2) treatment smoker and treatment nonsmoker, (3) comparison smoker and comparison nonsmoker, (4) treatment smoker and comparison smoker and (5) treatment nonsmoker and comparison nonsmoker.
Table 4.42 summarizes findings from the ANOVA for behavioral capability to resist the positive images of smoking. Statistically significant main effects were found for smoking status \((F_{1,157} = 7.73, p = 0.0068)\) and for time of testing, \((F_{1,157} = 3.82, p = 0.0525)\). There are no significant interactions, thus, main effects are interpreted in post hoc analysis. As a result, the following null hypotheses were rejected:

**HO:** Nonsmoker group mean score on behavioral capability to resist positive images of smoking will be equal to the experimental smoker group mean score.

**HO:** Behavioral capability to resist positive images of smoking mean score measured at pretest (time 1) will be equal to behavioral capability to resist positive images of smoking mean score measured at posttest (time 2).

The following null hypotheses were accepted:

**HO:** Treatment group mean score on behavioral capability to resist positive images of smoking will be equal to the comparison group mean score.

**HO:** Treatment and smoking status will not interact for behavioral capability to resist positive images of smoking.

**HO:** Treatment and time will not interact for behavioral capability to resist positive images of smoking.

**HO:** Smoking status and time will not interact for behavioral capability to resist positive images of smoking.
<table>
<thead>
<tr>
<th>Source</th>
<th>df</th>
<th>Type III SS</th>
<th>MS</th>
<th>F</th>
<th>Pr = F</th>
</tr>
</thead>
<tbody>
<tr>
<td>Model, $R^2 = 0.621$</td>
<td>164</td>
<td>9512.58</td>
<td>58.00</td>
<td>1.57</td>
<td>0.0022</td>
</tr>
<tr>
<td>Treatment</td>
<td>1</td>
<td>14.49</td>
<td>14.49</td>
<td>0.26</td>
<td>0.6133</td>
</tr>
<tr>
<td>Smoking Status</td>
<td>1</td>
<td>425.29</td>
<td>425.29</td>
<td>7.53</td>
<td>0.0068</td>
</tr>
<tr>
<td>Treat*Smoking</td>
<td>1</td>
<td>3.25</td>
<td>3.25</td>
<td>0.06</td>
<td>0.8107</td>
</tr>
<tr>
<td>Subject (treat*smoking)</td>
<td>157</td>
<td>8871.83</td>
<td>56.51</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Error (between)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Time of Testing</td>
<td>1</td>
<td>140.78</td>
<td>140.78</td>
<td>3.82</td>
<td>0.0525</td>
</tr>
<tr>
<td>Treat*Time</td>
<td>1</td>
<td>40.16</td>
<td>40.16</td>
<td>1.09</td>
<td>0.2983</td>
</tr>
<tr>
<td>Time*Smoking</td>
<td>1</td>
<td>1.79</td>
<td>1.79</td>
<td>0.05</td>
<td>0.8256</td>
</tr>
<tr>
<td>Treat<em>Time</em>Smoking</td>
<td>1</td>
<td>0.42</td>
<td>0.42</td>
<td>0.01</td>
<td>0.9144</td>
</tr>
<tr>
<td>Error (within)</td>
<td>157</td>
<td>5790.35</td>
<td>36.88</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>321</td>
<td>15302.93</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table 4.42
Summary of Factorial Analysis of Variance for Behavioral Capability to Resist Positive Images of Smoking
Table 4.43 summarizes findings from the ANOVA for refusal skill-efficacy. There are two statistically significant interactions: treatment by smoking status \( (F_{1,157} = 4.20, \ p = 0.0422) \) and time of testing by smoking status \( (F_{1,157} = 7.08, \ p = 0.0086) \). There are two statistically significant main effects, treatment \( (F_{1,157} = 7.56, \ p = 0.0067) \) and smoking status \( (F_{1,157} = 20.60, \ p = 0.0001) \); however, because of the interaction of treatment by smoking status, the main effects for treatment and smoking status are not interpreted in the post hoc analysis. As a result, the following null hypotheses were rejected:

HO: Treatment group mean score on refusal skill-efficacy will be equal to the comparison group mean score.

HO: Nonsmoker group mean score on refusal skill-efficacy will be equal to experimental smoker group mean score.

HO: Treatment and smoking status will not interact for refusal skill-efficacy.

HO: Smoking status and time will not interact for refusal skill-efficacy.

The following null hypotheses were accepted:

HO: Refusal skill-efficacy mean score measured at pretest (time 1) will be equal to refusal skill-efficacy mean score at posttest (time 2).

HO: Treatment and time will not interact for refusal skill-efficacy.
<table>
<thead>
<tr>
<th>Source</th>
<th>df</th>
<th>Type III SS</th>
<th>MS</th>
<th>F</th>
<th>Pr = F</th>
</tr>
</thead>
<tbody>
<tr>
<td>Model, $R^2 = 0.612$</td>
<td>164</td>
<td>38114.89</td>
<td>232.41</td>
<td>1.51</td>
<td>0.0049</td>
</tr>
<tr>
<td>Treatment</td>
<td>1</td>
<td>1458.56</td>
<td>1458.56</td>
<td>7.56</td>
<td>0.0067</td>
</tr>
<tr>
<td>Smoking Status</td>
<td>1</td>
<td>3976.11</td>
<td>3976.11</td>
<td>20.60</td>
<td>0.0001</td>
</tr>
<tr>
<td>Treat*Smoking</td>
<td>1</td>
<td>810.01</td>
<td>810.01</td>
<td>4.20</td>
<td>0.0422</td>
</tr>
<tr>
<td>Subject (treat*smoking)</td>
<td>157</td>
<td>30299.80</td>
<td>192.99</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Error (between)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Time of Testing</td>
<td>1</td>
<td>96.94</td>
<td>96.94</td>
<td>0.63</td>
<td>0.4288</td>
</tr>
<tr>
<td>Treat*Time</td>
<td>1</td>
<td>174.15</td>
<td>174.15</td>
<td>1.13</td>
<td>0.2893</td>
</tr>
<tr>
<td>Time*Smoking</td>
<td>1</td>
<td>1090.28</td>
<td>1090.28</td>
<td>7.08</td>
<td>0.0086</td>
</tr>
<tr>
<td>Treat<em>Time</em> Smoking</td>
<td>1</td>
<td>87.26</td>
<td>87.26</td>
<td>0.57</td>
<td>0.4528</td>
</tr>
<tr>
<td>Error (within)</td>
<td>157</td>
<td>24187.16</td>
<td>154.06</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Total</td>
<td>321</td>
<td>62302.04</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table 4.43
Summary of Factorial Analysis of Variance for Refusal Skill-Efficacy
Table 4.44 summarizes findings from the ANOVA for total positive refusal expectations & importance. Statistically significant main effects were found for treatment ($F_{1,157} = 3.98, p = 0.0477$). There are no significant interactions, thus, main effects are interpreted in post hoc analysis. The following null hypothesis was rejected:

**HO:** Treatment group mean score on total positive refusal expectations & importance will be equal to comparison group mean score.

The following null hypotheses were accepted:

**HO:** Nonsmoker group mean score on total positive refusal expectations & importance will be equal to experimental group mean score.

**HO:** Total positive refusal expectations & importance mean score at pretest (time 1) will be equal to total positive refusal expectations & importance mean score at posttest (time 2).

**HO:** Treatment and smoking status will not interact for total positive refusal expectations & importance.

**HO:** Treatment and time will not interact for total positive refusal expectations & importance.

**HO:** Smoking status and time will not interact for total positive refusal expectations & importance.
<table>
<thead>
<tr>
<th>Source</th>
<th>df</th>
<th>Type III SS</th>
<th>MS</th>
<th>F</th>
<th>Pr = F</th>
</tr>
</thead>
<tbody>
<tr>
<td>Model, $R^2 = 0.608$</td>
<td>164</td>
<td>120772.64</td>
<td>736.42</td>
<td>1.49</td>
<td>0.0063</td>
</tr>
<tr>
<td>Treatment</td>
<td>1</td>
<td>2935.38</td>
<td>2935.38</td>
<td>3.98</td>
<td>0.0477</td>
</tr>
<tr>
<td>Smoking Status</td>
<td>1</td>
<td>547.57</td>
<td>547.57</td>
<td>0.74</td>
<td>0.3900</td>
</tr>
<tr>
<td>Treat*Smoking</td>
<td>1</td>
<td>163.24</td>
<td>163.24</td>
<td>0.22</td>
<td>0.6385</td>
</tr>
<tr>
<td>Subject (treat*smoking)</td>
<td>157</td>
<td>115676.17</td>
<td>736.79</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Subject (treat*smoking)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Error (between)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Time of Testing</td>
<td>1</td>
<td>22.10</td>
<td>22.10</td>
<td>0.04</td>
<td>0.8330</td>
</tr>
<tr>
<td>Treat*Time</td>
<td>1</td>
<td>161.17</td>
<td>161.17</td>
<td>0.33</td>
<td>0.5692</td>
</tr>
<tr>
<td>Time*Smoking</td>
<td>1</td>
<td>178.12</td>
<td>178.12</td>
<td>0.36</td>
<td>0.5496</td>
</tr>
<tr>
<td>Treat<em>Time</em>Smoking</td>
<td>1</td>
<td>321.52</td>
<td>321.52</td>
<td>0.65</td>
<td>0.4216</td>
</tr>
<tr>
<td>Error (within)</td>
<td>157</td>
<td>77751.84</td>
<td>495.23</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Total</td>
<td>321</td>
<td>198524.48</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

Table 4.44
Summary of Factorial Analysis of Variance for Total Positive Refusal Expectations & Importance
Table 4.45 summarizes findings from the ANOVA for total negative refusal expectations & importance. There are two statistically significant interactions: treatment by smoking status \( (F_{1,157} = 4.37, p = 0.0382) \) and time of testing by smoking status \( (F_{1,157} = 4.28, p = 0.0403) \). There is a statistically significant main effect for smoking status \( (F_{1,157} = 19.91, p = 0.0382) \); however, because of the interaction of treatment by smoking status, the main effect for smoking status is not interpreted in the post hoc analysis. As a result, the following null hypotheses were rejected:

- **HO:** Nonsmoker group mean score on total negative refusal expectations & importance will be equal to experimental smoker group mean score.

- **HO:** Treatment and smoking status will not interact for total negative refusal expectations & importance.

- **HO:** Smoking status and time will not interact for total negative refusal expectations & importance.

The following null hypotheses were accepted:

- **HO:** Treatment group mean score on total negative refusal expectations & importance will be equal to comparison group mean score.

- **HO:** Total negative refusal expectations & importance mean score at pretest (time 1) will be equal to total negative refusal expectations & importance mean score at posttest (time 2).

- **HO:** Treatment and time will not interact for total negative refusal expectations & importance.
<table>
<thead>
<tr>
<th>Source</th>
<th>df</th>
<th>Type III SS</th>
<th>MS</th>
<th>F</th>
<th>Pr = F</th>
</tr>
</thead>
<tbody>
<tr>
<td>Model, $R^2 = 0.535$</td>
<td>164</td>
<td>208453.32</td>
<td>1271.06</td>
<td>1.10</td>
<td>0.2699</td>
</tr>
<tr>
<td>Treatment</td>
<td>1</td>
<td>1502.23</td>
<td>1502.22</td>
<td>1.36</td>
<td>0.2447</td>
</tr>
<tr>
<td>Smoking Status</td>
<td>1</td>
<td>21926.89</td>
<td>21926.89</td>
<td>19.91</td>
<td>0.0001</td>
</tr>
<tr>
<td>Treat*Smoking</td>
<td>1</td>
<td>4815.11</td>
<td>4815.11</td>
<td>4.37</td>
<td>0.0382</td>
</tr>
<tr>
<td>Subject (treat*smoking)</td>
<td>157</td>
<td>172936.22</td>
<td>1101.50</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Error (between)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Time of Testing</td>
<td>1</td>
<td>649.62</td>
<td>649.62</td>
<td>0.56</td>
<td>0.4541</td>
</tr>
<tr>
<td>Treat*Time</td>
<td>1</td>
<td>130.61</td>
<td>130.61</td>
<td>0.11</td>
<td>0.7369</td>
</tr>
<tr>
<td>Time*Smoking</td>
<td>1</td>
<td>4931.37</td>
<td>4931.37</td>
<td>4.28</td>
<td>0.0403</td>
</tr>
<tr>
<td>Treat<em>Time</em>Smoking</td>
<td>1</td>
<td>729.99</td>
<td>729.99</td>
<td>0.63</td>
<td>0.4275</td>
</tr>
<tr>
<td>Error (within)</td>
<td>157</td>
<td>181073.45</td>
<td>1153.33</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Total</td>
<td>321</td>
<td>389526.78</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

Table 4.45
Summary of Factorial Analysis of Variance for Total Negative Refusal Expectations & Importance
POST HOC ANALYSIS

If an ANOVA $F$ test yielded significant main or interaction effects, individual $t$-tests were conducted to identify specific means which differ significantly. Tables 4.46 through 4.52 report these $t$-tests. If an ANOVA yielded a significant $F$ value for an interaction effect and main effect(s), a post hoc $t$-test was conducted only on the interaction effect because the interaction influences the interpretation of the main effect.

Table 4.46 reports the individual $t$-test for the main effect of smoking status, for the construct of behavioral capability to resist positive images of smoking. Because time of testing is built into the design of the study, means below use both the pre and post test scores. Nonsmokers scored significantly higher than experimental smokers on behavioral capability to resist positive images of smoking.

<table>
<thead>
<tr>
<th>Group</th>
<th>n</th>
<th>Mean</th>
<th>Std Err</th>
<th>$p = t$</th>
<th>Effect Size</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nonsmokers</td>
<td>204</td>
<td>28.40</td>
<td>0.53</td>
<td>0.0068</td>
<td>0.32</td>
</tr>
<tr>
<td>Experimental Smokers</td>
<td>118</td>
<td>26.01</td>
<td>0.69</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table 4.46
Post Hoc $t$-test for Behavioral Capability to Resist Positive Images of Smoking, Smoking Status Main Effect
Table 4.47 reports the individual t-test for the main effect of time of testing, for the construct of behavioral capability to resist positive images of smoking. Mean scores increased significantly from pre to post test.

<table>
<thead>
<tr>
<th>Group</th>
<th>n</th>
<th>Mean</th>
<th>Std Err</th>
<th>pr &gt; t</th>
<th>Effect Size</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pretest</td>
<td>161</td>
<td>26.52</td>
<td>0.50</td>
<td>0.0525</td>
<td>0.22</td>
</tr>
<tr>
<td>Posttest</td>
<td>161</td>
<td>27.89</td>
<td>0.50</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table 4.47
Post Hoc t-test for Behavioral Capability to Resist Positive Images of Smoking, Time of Testing Main Effect
Table 4.48 reports the individual t-test for the treatment by smoking status interaction effect, for the construct of refusal skill-efficacy. There were two statistically significant mean differences: between comparison group smokers and comparison group nonsmokers ($p = 0.0001$) and between treatment group smokers and comparison group smokers ($p = 0.003$). The treatment by smoking status interaction is ordinal, with nonsmokers scoring higher than smokers, regardless of treatment or comparison group membership.

<table>
<thead>
<tr>
<th>Group</th>
<th>n</th>
<th>Mean</th>
<th>Std Err</th>
<th>Significant Contrast between Condition(s)</th>
<th>Effect Size</th>
</tr>
</thead>
<tbody>
<tr>
<td>(1) Comparison Group, Nonsmokers</td>
<td>98</td>
<td>49.20</td>
<td>1.40</td>
<td>$1 &gt; 2^a$</td>
<td>0.77</td>
</tr>
<tr>
<td>(2) Comparison Group, Smokers</td>
<td>62</td>
<td>38.60</td>
<td>1.76</td>
<td>$1 &gt; 2^a$ $4 &gt; 2^b$</td>
<td>0.77</td>
</tr>
<tr>
<td>(3) Treatment Group, Nonsmokers</td>
<td>106</td>
<td>50.33</td>
<td>1.35</td>
<td>$3 &gt; 2^c$</td>
<td>n/a</td>
</tr>
<tr>
<td>(4) Treatment Group, Smokers</td>
<td>56</td>
<td>46.33$^b$</td>
<td>1.86</td>
<td>$4 &gt; 2^b$</td>
<td>0.56</td>
</tr>
</tbody>
</table>

Note: $^a p = 0.0001$. $^b p = 0.0030$. $^c$ There is a statistical difference between treatment group nonsmokers and comparison group smokers; however, this two group comparison was not a planned group comparison and thus, not interpreted.

Table 4.48
Post Hoc t-tests for Refusal Skill-Efficacy, Treatment by Smoking Status Interaction Effect
Table 4.49 reports the individual t-test for the time of testing by smoking status interaction effect, for the construct of refusal skill-efficacy. There were two significant mean differences: between pretest nonsmokers and pretest smokers ($p = 0.0001$) and between nonsmokers, pretest to posttest ($p = 0.0001$). Nonsmokers' mean score decreased from pre to post and nonsmoker and smoker mean scores differed at pretest.

The time of testing by smoking status interaction is ordinal; nonsmokers score higher than smokers at both pre and post test.

<table>
<thead>
<tr>
<th>Group</th>
<th>n</th>
<th>Mean</th>
<th>Std Err</th>
<th>Significant Contrast between Condition(s)</th>
<th>Effect Size</th>
</tr>
</thead>
<tbody>
<tr>
<td>(1) Pretest, Nonsmokers</td>
<td>102</td>
<td>52.25</td>
<td>1.23</td>
<td>$1 &gt; 2^*$</td>
<td>0.90</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>$1 &gt; 3^b$</td>
<td>0.40</td>
</tr>
<tr>
<td>(2) Pretest, Smokers</td>
<td>59</td>
<td>41.12</td>
<td>1.62</td>
<td>$1 &gt; 2^*$</td>
<td>0.90</td>
</tr>
<tr>
<td>(3) Posttest, Nonsmokers</td>
<td>102</td>
<td>47.28</td>
<td>1.22</td>
<td>$1 &gt; 3^b$</td>
<td>0.40</td>
</tr>
<tr>
<td>(4) Posttest, Smokers</td>
<td>59</td>
<td>43.81</td>
<td>1.62</td>
<td>$1 &gt; 4^c$</td>
<td>n/a</td>
</tr>
</tbody>
</table>

Note: $^* p = 0.0001$. $^b p = 0.0001$. $^c$ There is a significant difference between posttest smokers and pretest nonsmokers; however, this two group comparison was not a planned group comparison and thus, not interpreted.

Table 4.49
Post Hoc t-statistics for Refusal Skill-Efficacy, Time of Testing by Smoking Status Interaction Effect
Table 4.50 reports the individual t-test for the main effect of treatment, for the
construct of total positive refusal expectations & importance. The treatment group scored
significantly higher than the comparison group \((p = 0.0482)\). Because time of testing is
built into the design of the study, means below use both the pre and post test scores.

<table>
<thead>
<tr>
<th>Group</th>
<th>n</th>
<th>Mean</th>
<th>Std Err</th>
<th>(\text{pr} = t)</th>
<th>Effect Size</th>
</tr>
</thead>
<tbody>
<tr>
<td>Treatment Group</td>
<td>162</td>
<td>76.40</td>
<td>2.20</td>
<td>0.0477</td>
<td>0.22</td>
</tr>
<tr>
<td>Comparison Group</td>
<td>160</td>
<td>70.14</td>
<td>2.24</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table 4.50
Post Hoc t-tests for Total Positive Refusal Expectations & Importance, Treatment Main Effect
Table 4.51 reports the individual t-test for the treatment by smoking status interaction effect, for the construct of total negative refusal expectations & importance. There were two statistical mean differences: between comparison group smokers and comparison group nonsmokers (p = 0.0001) and between treatment group nonsmokers and comparison group nonsmokers (p = 0.0081). Nonsmokers in the comparison group scored statistically higher than smokers in the same group. Nonsmokers in the treatment scored statistically lower than nonsmokers in the comparison group. As a reminder, from a smoking prevention standpoint, lower scores are better for this variable. The treatment by smoking status interaction is ordinal, with nonsmokers scoring higher than smokers, regardless of treatment or comparison group membership.

<table>
<thead>
<tr>
<th>Group</th>
<th>n</th>
<th>Mean</th>
<th>Std Err</th>
<th>Significant Contrast between Condition(s)</th>
<th>Effect Size</th>
</tr>
</thead>
<tbody>
<tr>
<td>(1) Pretest, Nonsmokers</td>
<td>98</td>
<td>103.64</td>
<td>3.35</td>
<td>1 &gt; 2&lt;sup&gt;a&lt;/sup&gt;&lt;br&gt;1 &gt; 3&lt;sup&gt;b&lt;/sup&gt;</td>
<td>0.76&lt;br&gt;0.38</td>
</tr>
<tr>
<td>(2) Pretest, Smokers</td>
<td>62</td>
<td>78.46</td>
<td>4.21</td>
<td>1 &gt; 2&lt;sup&gt;a&lt;/sup&gt;</td>
<td>0.76</td>
</tr>
<tr>
<td>(3) Posttest, Nonsmokers</td>
<td>106</td>
<td>91.16</td>
<td>3.22</td>
<td>1 &gt; 3&lt;sup&gt;b&lt;/sup&gt;</td>
<td>0.38</td>
</tr>
<tr>
<td>(4) Posttest, Smokers</td>
<td>56</td>
<td>82.05</td>
<td>4.44</td>
<td>1 &gt; 4&lt;sup&gt;c&lt;/sup&gt;</td>
<td>n/a</td>
</tr>
</tbody>
</table>

Note. <sup>a</sup>p = 0.0001. <sup>b</sup>p = 0.0081. <sup>c</sup>There is a significant difference between treatment group smokers and comparison group nonsmokers; however, this two group comparison was not a planned group comparison and thus, not interpreted.

Table 4.51
Post Hoc t-tests for Total Negative Refusal Expectations & Importance, Treatment by Smoking Status Interaction Effect
Table 4.52 reports the individual t-test for the time of testing by smoking status interaction effect, for the construct of total negative refusal outcome expectations & importance. There was one statistical mean difference, between nonsmokers at pretest and smokers at pretest (p = 0.0001). Nonsmokers' mean score differed statistically from smokers at posttest, yet the statistical difference did not exist at posttest. The time of testing by smoking status interaction is ordinal, nonsmokers score higher than smokers at both pre and post test.

<table>
<thead>
<tr>
<th>Group</th>
<th>n</th>
<th>Mean</th>
<th>Std Err</th>
<th>pr = t</th>
<th>Effect Size</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pretest, Nonsmokers</td>
<td>102</td>
<td>99.99</td>
<td>3.29</td>
<td>0.0001</td>
<td>0.76</td>
</tr>
<tr>
<td>Pretest, Smokers</td>
<td>59</td>
<td>74.72</td>
<td>4.33</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table 4.52
Post Hoc t-test for Total Negative Refusal Expectations & Importance, Time of Testing by Smoking Status Interaction Effect
CHAPTER 5

CONCLUSIONS & DISCUSSION OF RESULTS

This chapter presents conclusions and a discussion of findings from a process evaluation of a psychosocial smoking prevention program. Psychosocial smoking prevention programs can reduce adolescent smoking initiation by 30 to 50%, up to one year following program implementation (Flay, 1993). Evaluations of program effects longer than one year are understudied and of mixed findings. Two years post treatment, Murray et al. (1987) documented a 20% difference in group smoking initiation rates; two studies documented no difference in the percentage of nonsmokers at two years (Hamm, 1994) and four years (Murray, et al. 1989). Based upon the Social Cognitive Theory, psychosocial smoking prevention programs address the short-term consequences of smoking, refusal skill-development and the identification of social pressures (Flay, 1985; Glynn, 1989). Process evaluations can be used to assess whether successful treatments are influencing the hypothesized theoretical mediating variables and whether these variables are associated with treatment outcomes (McCaul & Glasgow, 1985).

The purpose of this study was to determine the impact of a psychosocial smoking prevention curriculum on the Social Cognitive Theory constructs of behavioral capability to resist positive images of smoking, refusal skill-efficacy, total positive refusal
expectedations & importance and total negative refusal expectations & importance. A second purpose of this study was to determine if there was an interaction of treatment and a student's smoking status for behavioral capability to resist positive images of smoking, refusal skill-efficacy, total positive refusal expectations & importance and total negative refusal expectations & importance. A reliable and valid instrument was developed to measure the theoretical constructs of behavioral capability to resist positive images of smoking, refusal skill-efficacy, total positive refusal expectations & importance and total negative refusal expectations & importance pre and post intervention. The intervention, a six-lesson, previously documented successful smoking prevention program, the Minnesota Smoking Prevention Program, was implemented in five intact classrooms.

For ease of reading, conclusions are presented by Social Cognitive Theory construct. A discussion of the findings follows each section of construct conclusions. The discussion of findings incorporates hypotheses testing with the descriptive data and previous research. Recommendations for future research are presented in this chapter and are followed by implications for the health promotion practitioner.
INTRODUCTION TO CONCLUSIONS

The three-way design allows the researcher to report three main effects; for treatment (a comparison between the treatment and comparison group on the four constructs), for smoking status (a comparison between experimental smokers and nonsmokers on the four constructs) and for time of testing (a comparison of pretest and posttest scores on the four constructs). The main effect of treatment measures whether the smoking prevention program made a difference in scores for the four Social Cognitive Theory constructs. The main effect of smoking status measures whether mean scores of nonsmokers differ from mean scores of experimental smokers. The factor of smoking status is primarily in the design not to measure the main effect of smoking status, but to measure the interaction of smoking status and treatment. The third main effect of time of testing measures whether mean pretest and posttest scores differ. The time of testing main effect will allow a researcher to report statistical pretest (or posttest) differences and to report possible testing or maturation effects.

ANOVA also allows one to examine the interaction amongst the factors. The primary interaction of interest for the purpose of this study is the interaction of treatment and smoking status. A significant interaction of treatment and smoking status indicates that the effect of treatment is influenced by a student’s status as a nonsmoker or experimental smoker.

Two additional interactions, treatment by time of testing and smoking status by time of testing, were also tested. Both interactions were included in data analysis because of the design of the study, but do supply addition study information. An interaction of
smoking status by time of testing would indicate that a particular category of smokers (nonsmoker or experimental smoker) increased or decreased in mean scores from pre to post test or that at pre or post test, experimental smoker and nonsmoker scores differed. An interaction of treatment and time of testing would indicated that the treatment and comparison groups differed significantly at certain times of measurement. A treatment by time of testing interaction could indicate pretest group differences on variables of interest. A treatment by time of testing interaction could also indicate a treatment effect, if groups are equal at pretest, but differ statistically at posttest.

As a measure of the magnitude of a relationship, effect sizes for significant group difference are presented. Effect sizes are standardized measurements which allow the reader to compare results which may have different measurement scales. Standardized effect sizes also allow one to interpret study findings in the context of other research. The effect size was calculated as the difference between the two group means, divided by the standard deviation, \((\mu - \mu_0)/\sigma\). In instances where the standard deviation differed between the two groups, the average of the two group standard deviations was used. The average standard deviation was used in six of the ten post hoc calculations. Five of the six averaged standard deviations varied from the group standard deviations by less 0.05. One of the six standard deviations varied from the group standard deviations by 0.16. An effect size greater than 0.40 is considered large, greater than 0.30 is moderate and 0.10 is small (Cohen, 1977).
INTRODUCTION TO DISCUSSION OF RESULTS

The following section reminds the reader of design, implementation and analysis factors which may have affected the results of the study. A reader should consider the results of this study in the context of these factors. Study design decisions possibly influencing results are the definition of experimental smokers, the time of the school year that the program was implemented and the inclusion of the factor time of testing. Implementation factors to be considered are the scope of the prevention program and the degree of program implementation. Lastly, data analysis factors possibly influencing results are the statistical power of the study, replacing missing data with mean scores, the use of only complete data sets in analysis and an experimentwise error rate influenced by multiple statistical tests.

For the purpose of this study, experimental smokers were defined as a student who reported any cigarette use in the past year (365 days). This definition is more broad than previous research. Flay et al. (1995) and De Vries et al. (1994) both defined a smoker as a student who reported weekly tobacco use. Flay reported that only 4.5% of seventh graders had reported cigarette use in the past week. He further concluded that this low percentage of smokers created a “floor effect” and was a possible reason that his study did not document a treatment effect. Additionally, the purpose of this study warranted a broad definition of experimental smoker. The researcher was interested in examining if students who had prior experience with cigarettes responded to the smoking prevention program differently than students with no prior cigarette experience. The level of experimentation was not to be examined. One should consider, though, that 46%
of the treatment group experimental smokers (13 out of 28) and 29% of the comparison
group experimental smokers (9 out of 31) had reported trying ≤ 1 cigarette in the past
year. Thus, at least one-third of the experimental smokers in this study had very limited
exposure to cigarettes. The high proportion of very low smoking experimentation could
have influenced the treatment effect for smokers. Students with higher levels of regular
smoking, those no longer just experimenting with the behavior, may be less responsive to
the smoking prevention program. Should this study be duplicated and the definition of
experimental smoker be narrowed, documented treatment effects may be increased for
experimenters and possibly lessened for more regular smokers.

Additionally, the timing of the study may have affected how students interpreted
cigarette use in the past year. Data for this study was collected during the last two months
of the school year. Students may have interpreted “cigarette use in the past year (365
days)” as cigarette use in the past school year (cigarettes smoked while in the sixth
grade). Should this study be duplicated and measures of students’ self-reported cigarette
use are taken earlier in the school year (such as October), the percentage of experimental
smokers may be lower than documented in this study. The lower incidence of self-
reported smoking may be due to students’ interpretation of “past year”, not because of
changes in behavior.

To increase the internal validity of the study, time of testing was included in the
design of the study. Green and Lewis (1986) report maturation as “most dramatically a
threat (to internal validity), therefore, to the evaluations of programs for children and
youth, in whom maturational changes are more rapid” (p. 186). Green and Lewis also
report testing as "one nagging problem, especially in health education, even with the all-powerful randomized pretest posttest design. This problem is the threat to internal validity created by testing subjects twice - once before and once after the intervention" (p. 189). Including time of testing in the design does not control for maturation or testing threats, but it does allow the researcher to estimate possible testing or maturation effects. The researcher can report time of testing main effects: did scores increase from pre to post or were scores different at pre or post. The researcher can report time of testing interactions: did scores increase for a particular group only or were scores different at pre or post test for a particular smoking status or treatment/comparison group. In this study, there was one main effect for time of testing: behavioral capability to resist the positive images of smoking scores increased pre to post test. Thus, the lack of additional time of testing main effects should increase the reader's confidence in the internal validity of the study.

The inclusion of time of testing in the design may also affect the interpretation of the main treatment and smoking effects and the interpretation of the interaction of treatment and smoking status. With time of testing in the design, each subject has two scores for each construct, a pretest score and a posttest score. Statistical tests which do not include the factor of time of testing use both scores to calculate an effect. For example, in Table 4.50, for the main effect of treatment for total positive refusal expectations & importance, there are 162 observations for the treatment group and 160 observations for the comparison group. In this study, there were 81 subjects in the treatment group and 80 subjects in the comparison group, but because time of testing was
not a factor included in the above analysis, each of the subject's two scores (a pretest and a posttest score) were included in the calculation. Readers should interpret findings in the context that statistical tests not including time of testing are calculated using means of the pre and post test scores.

Should another researcher duplicate this study and not include time of testing as a factor in the design, comparison scores may differ solely because of the differences of the design. Statistical analysis not including factor of time of testing also have increased power because of the doubling of observations. Thus, the main effects of treatment and smoking status and the interaction of treatment and smoking status have an increased likelihood of detecting group differences because of the increased power.

Conclusions should be considered in the context of the scope of program content and degree of program implementation. The intervention consisted of six, 45-minute lessons which included over 50 activities (see Tables 3.3 through 3.8 for complete listings). The amount of time, in minutes, of scheduled learning activities directed toward a specific Social Cognitive Theory construct variable is as follows: behavioral capability to resist positive images of smoking (62), refusal skill-efficacy (78), total positive refusal expectations & importance and total negative refusal expectations & importance (25). Previously reviewed studies ranged in length from four to twelve sessions. Degree of program implementation can vary vastly. In one previously reviewed study, degree of implementation varied from 27% to 97% (Botvin, et al., 1990). Of the twelve reviewed process evaluations, Botvin et al. was the only study which reported degree of implementation. In evaluating a program's impact, documentation of program
implementation is critical. A high degree of program implementation allows the researcher to rule out lack of program impact due to lack of program implementation. Elder et al. (1994) evaluated quality of the health facilitator and included facilitation quality into the study design. Students were dicotomized as receiving poor facilitation and good facilitation. Students who had good facilitation scored statistically higher in mean refusal skills. Because of the importance of program implementation, in Botvin et al. (1990) only students who received greater than 60% of the program were included in data analysis. In this study, degree of program implementation was greater than 90% in all five classrooms. Quality of instruction was not quantitatively measured. The researcher was in attendance at all educational sessions and did witness a high quality of program facilitation, though.

Power "reflects the degree to which we can detect treatment differences we expect and the chances that others will be able to duplicate our findings when they attempt to repeat our experiments" (Keppel, 1991, p. 68). In designing this study, the researcher estimated a treatment sample size of 116 would achieve a power level of .80. With an overall 22% loss of subject rate, the final treatment sample size was 81, with a comparison group sample size of 80. Thus, power was lessened. With an alpha level of .05, for a two-tailed test, a large effect size of .45 and with a final count of 28 treatment group experimental smokers, post hoc power is reestimated at .60 (Kraemer & Thieman, 1987). In interpreting study findings, readers should consider that small or moderate effect sizes may have gone undetected because of the study's power. Effect size is unaffected by power and can also serve as a tool to the reader in interpreting the impact of
power on a study (Keppel, 1991). "Small" effect sizes found statistical significant may indicate a "trivial" effect that was detected by a particularly powerful test. Additionally, "moderate", but insignificant effect sizes may not be detected because of lack of power. Lastly, a study in which only large effect sizes are detected, may indicate an issue of lack of power (Keppel, 1991). In this study, five of the ten significant post hoc analysis where "large" effect sizes.

The decision to replace missing data with mean scores may affect study findings, but is hypothesized to affect the findings minimally. Mean scores were substituted for the questionnaire item(s) left blank. Substituting the mean for missing items is an acceptable technique, leaves the mean unaffected, maintains power and was within the skills of the researcher. The disadvantages of replacing missing data with the mean can be a reduction in correlations to other items/variables and a reduction in response variability (Gorsuch, 1983). For the treatment group, 14 (of 161) questionnaires had items in which the mean was substituted for blank responses and 22 (of 160) comparison group questionnaires had items in which the mean was substituted. Because only 9% of the treatment group and 14% of the comparison group had items in which the mean was substituted, the effects of substituting the mean on the findings of this study are hypothesized to be minimal. Additional, questionnaires with greater than 10% of missing data were excluded from analysis. The reader should also consider that the scales for all questionnaire items were four point scales. The most that a substituted mean could vary from a "real" response was three points. In that no item mean scores were at the bottom or top of the scales, the maximum variation was less than three points. Additionally, each construct was
measured with a range of 12 to 20 items. Replacing one of twelve (or 20) items with a mean score alters the true score and restricts variability minimally.

The decision to use only complete data sets affects both the construct means and the power of the study. Only subjects in which a pretest could be matched to a posttest were included in data analysis. As stated previously, 31 of 207 pretest cases were lost because of inability to match pretest scores to a posttest score. Should a researcher duplicate this study, but not use only complete data sets, power would increase; however the internal validity of the study could be compromised. Mean scores could change not because of improvement in treatment scores, but because posttest mean scores were calculated without extreme high or low scores.

Lastly, the decision to not adjust the experimentwise error rate of the study impacts the conclusions of the study. Adjusting the experimentwise error rate would have reduced the level of significance for the study and reduced the power of the study (Keppel, 1991). With a reduced level of significance and a reduction in power, small to moderate effect sizes may not be statistically significant. It is for this reason, to reduce the likelihood of type II errors, that the researcher chose to not adjust the experimentwise error rate. Three of the four constructs had not been studied previously. Additionally, the unexpected 22% loss of subject rate lowered the power of the study. Adjusting the experimentwise error rate would have further decreased the power of the study. To inform the reader of significant findings which may have been influenced by the experimentwise error rate, effect sizes were calculated. Effect sizes listed as small or
moderate may not be statistically significant should the reader or future researcher chose to adjusted the experimentwise error rate of this study. Thus, the conclusions of the study would differ.

CONCLUSIONS FROM DESCRIPTIVE DATA

The following section includes conclusions from the descriptive data. At pretest, a higher than expected percentage of the sixth graders had experimented with cigarettes in the past 365 days and in their lifetime. More than one third of students in the study had experimented with cigarettes in the past year: 35% of the treatment group and 39% of the comparison group. Self-reported cigarette experimentation was higher for lifetime usage: 58% of the treatment and 50% of the comparison group. Flay et al. (1995) reported 40% of seventh graders had tried cigarettes in their lifetime.

Changes in the behavior of cigarette smoking was not a variable of interest in this study; however, changes in posttest smoking are notable. The percentage of students categorized as experimental smokers increased from 35% at pretest to 37% at posttest in the treatment group while the comparison group increased from 39% to 50%. Previous research has documented a similar short-term maintenance of current smoking rates by the treatment group and an increase of smoking initiation in the comparison group (Evans, et al., 1978; Flay, 1985). The researcher selected the Minnesota Smoking Prevention program because of its effectiveness, documented in previous studies (Murray, et al., 1987). The similarity of findings from this study to previous research imply that this study’s program implementation was good.
Additionally, because of the similar findings of this study to previous research, findings support the generalizability of psychosocial smoking prevention program impacts. Flay (1985) notes that practical, “real world” constraints often limits random selection in school-based psychosocial smoking prevention programs. Flay adds that the generalizability of studies comes from the duplication of findings by other researchers in different research settings.

Cigarette smoking, in this study, is experimental smoking and not regular smoking. While greater than one-third of the treatment and comparison groups had reported cigarette use in the past year, only 10% and 16% of the treatment group and comparison group, respectively, had smoked cigarettes in the past week. Furthermore, only three students (3.7%) in the treatment and six students (7.5%) in the comparison group had smoked a quarter pack or more in the past week. Thus, sixth grade appears to be a grade of experimental cigarette use and a time prior to regular smoking behavior.

Descriptive data from the refusal skill-efficacy subscales supports the conclusion that efficacy is not a univariate trait, but rather a multidimensional trait which is influenced by the situation. Students’ perceived confidence to refuse cigarette offers varied by person offering the cigarette, by situations and by type of peer pressure. Additionally, the rank order of the mean scores from pre to post test changed in only one group. At pretest, three of the four groups (treatment nonsmokers, treatment experimental smokers, and comparison nonsmokers) reported being most confident in saying “no” to a best friend. At posttest, all four groups report being most confident in saying “no” to a best friend. Furthermore, all four groups reported having the least
confidence in saying “no” to a group of friends, both pre and post test. Thus, despite the fact that there was a treatment effect for refusal skill-efficacy, the maintenance of the same rank orders indicates that all students are more efficacious in certain situations. Students also reported “hassle” as the hardest type of pressure to refuse and most often report that saying “no” at a friend’s house is more difficult than refusing cigarette offers at school.

CONCLUSIONS FOR BEHAVIORAL CAPABILITY TO RESIST POSITIVE IMAGES OF SMOKING

Participation in the treatment did not result in significantly higher scores for the construct behavioral capability to resist the positive images of smoking. Treatment did not interact with student’s smoking status for the variable of behavioral capability to resist positive images of smoking. The effect size for the main effect of treatment is small at 0.056 and was not statistically significant. Lack of treatment impact may be due to measurement issues and will be addressed in the discussion section.

Nonsmokers scored significantly higher on behavioral capability to resist positive images of smoking than experimental smokers. The magnitude of the main effect of smoking status (p = .0068) is moderate at 0.32. Nonsmokers scored, on average, 2.39 points higher than experimental smokers, 28.40 verses 26.01, on a 36-point scale. A two-point difference reflects that nonsmokers’ responses for two questionnaire items were scored a degree higher. Experimental smokers strongly rejected 50% (two out of four) of the positive images, while nonsmokers strongly rejected 75% and experimental smokers
thought 25% (one out of four) of the messages were untruthful (75% were a little untruthful) while nonsmokers rated 50% the messages as untruthful.

Experimental smokers' scores on behavioral capability to resist positive images increased significantly from pre, 26.52, to post test, 27.89. The main effect for the factor time of testing ($p = .0525$) represents a small effect size 0.22. The change in mean score came from small changes (less than a point) in the subscales of ability to evaluate the truthfulness of messages and the ability to reject messages. Changes from pre to post in the subscales of ability to evaluate the truthfulness of messages and the ability to reject messages were inconsistent across treatment and smoker groups: meaning that there was no pattern to the change in scores for the construct behavioral capability to resist positive images of smoking.

Lastly, while behavioral capability to resist positive images of smoking scores did change significantly from pre to post test, there was no significant time of testing by smoking status interaction. The increase in posttest scores occurred in both nonsmokers and experimental smokers. The increase in posttest scores also occurred in both the treatment and comparison group: there was not an interaction of time of testing by treatment.
DISCUSSION FOR BEHAVIORAL CAPABILITY TO RESIST POSITIVE IMAGES OF SMOKING

Behavioral capability to resist the positive images of smoking is defined as a student’s ability to identify, evaluate the truthfulness and reject favorable images of smoking presented through media and adult modeling. Scheduled learning activities include evaluating messages in cigarette advertisements, developing nontobacco use advertisements and an adult interview. The amount of time of scheduled learning activities directed toward behavioral capability to resist positive images of smoking was 62 minutes. Operationally, the construct was defined as a student’s score from 12 items consisting of three subscales: ability to identify media messages, ability to evaluate the truthfulness of messages and the ability to reject favorable images.

Participation in treatment had no statistically significant effect on student’s mean score for behavioral capability to resist positive images of smoking. Scores were high at pretest: treatment group nonsmokers mean score at pretest was 27.51 and increased to 29.54 while treatment group experimental smokers also increased from pretest by two points to 27.44. The comparison group mean scores for nonsmokers went from 28.09 to 28.49 while experimental smokers increased from 25.26 to 26.13.

The frequency distributions of the treatment group and comparison group (Tables 4.21 and 4.23) descriptively show stronger responses to the treatment. In the treatment group (Table 4.21), the frequency distribution of scores below the midpoint changed in frequency and in distribution very little, whereas the distribution of scores above the midpoint changed noticeably. The percentage of experimental smokers scoring in the
highest category (30 to 36) more than doubled, from 25% (n = 7) to 61% (n = 17).

Nonsmokers in the highest category increased from 43% (n = 23) to 64% (n = 34) of the sample. Comparison group frequencies (Table 4.23), by contrast, changed little. The only change of greater than two scores was an increase of experimental smokers in the highest category, from 32% (n = 10) to 42% (n = 13).

Comparison of posttest changes in the frequency distributions without a significant treatment effect indicates a possible measurement issue. There was a 42% increase of scores in the highest category in treatment group verses a 7% increase in the comparison group. While pretest mean scores were eight to ten points below the maximum value, one should consider than one of the subscales, ability to identify media messages, was scored as either correct (3) or incorrect (0). The means for this subscale ranged from 6.11 to 7.02 (out of 12 points). None of the four group means changed at posttest for this subscale. Thus, increases in overall behavioral capability to resist positive images of smoking mean scores came from the other two subscales of ability to evaluate the truthfulness of messages and the ability to reject favorable images. Responses to these two subscales ranged from 8.94 to 11.04 (out of 12). Thus, there was little room for improvement in these two subscales. Also supporting the interpretation of a measurement threat is the confirmatory factor analysis, see Table A.2. The four questionnaire items for the subscale of ability to identify media messages did not have loading factors >.30.

The treatment may have no impact on a student’s ability to resist positive images of smoking. Because of the measurement threats addressed above, though, this study can
not conclude the absence of a treatment effect. From the evidence of this study, though, this researcher concludes that the treatment, as implemented, had no effect on the subscale of ability to identify media messages and the measurement tool had a possible ceiling effect for the two subscales of ability to evaluate the truthfulness of messages and the ability to reject favorable images.

Non-smokers (28.40) scored significantly higher than experimental smokers (26.01) in their ability to resist positive images of smoking. Both experimental smokers and non-smokers have a high skill level of behavioral capability to resist positive images of smoking; the difference in skill is more in the intensity of a rejection. Experimental smokers and non-smokers reject all the presented positive media messages; however, on average, non-smokers rejected media messages more strongly. Experimental smokers strongly rejected 50% (two out of four) of the positive images, while non-smokers strongly rejected 75% of the positive images. Additionally, both non-smokers and experimental smokers, on average, evaluated all the media messages of smoking cigarettes as a little untruthful, but the non-smokers were more likely to report the messages as untruthful as opposed to a little untruthful. Experimental smokers reported that 25% (one out of four) of the messages were untruthful (75% were a little untruthful) while 50% of the non-smokers rated the messages as untruthful. The lower intensity of rejection by experimental smokers indicates that smokers do not entirely reject the positive images of smoking. This finding is consistent with the literature findings that students begin smoking for the utility of smoking (Flay, 1993). The functions often sought by smoking initiation are those of the media messages; to appear “cool”, attractive and more fun.
Behavioral capability to resist the positive images of smoking scores increased significantly from pre, 26.52, to post test, 27.89; a small effect size of 0.22. This small increase likely indicates a testing effect in that there is no interaction with treatment nor with a student's smoking status. The scale included knowledge based items, ability to identify the message, but the values for all groups went unchanged from pre to post test (Tables 4.7, 4.20, 4.22). The change in mean score came from small changes (less than a point) in the subscales of ability to evaluate the truthfulness of messages and the ability to reject messages.

Evaluation of a student's behavioral capability to resist positive images of smoking or a similar construct has not been published in the literature, making comparison to previous findings impossible. The conclusion that experimental smokers have significantly lower scores than nonsmokers for behavioral capability to resist the positive images of smoking appears to be reflecting the theory of the smoking prevention: students with skills for resisting positive images of smoking are less likely to smoke.

CONCLUSIONS FOR REFUSAL SKILL-EFFICACY

Participation in the treatment resulted in significantly higher scores for the construct refusal skill-efficacy (p =.0067); however, the treatment interacted with student's smoking status (p = .0422). The main effect of smoking status was also significant (p = .0001); however, smoking status is interpreted in the context of the interaction with treatment. Post hoc analysis for the treatment by smoking status interaction revealed two significant group differences: between comparison group
nonsmokers (49.20) and comparison group experimental smokers (38.60) and between
treatment group experimental smokers (46.33) and comparison group experimental
smokers (38.60). Treatment group nonsmokers had a mean score of 50.33. The effect
size of comparison group nonsmokers and comparison group smokers is large at 0.77.
The effect size of treatment group experimental smokers and comparison group
experimental smokers is also large, totaling 0.56. This interaction is ordinal; the group of
nonsmokers always scored higher than the group of experimental smokers. In
interpreting these differences, nonsmokers are equal, regardless of level of treatment;
however, experimental smokers in the treatment do not differ significantly from
nonsmokers of either the treatment or comparison group. Thus, the treatment
significantly impacted experimental smokers’ refusal skill-efficacy score, but did not
impact the refusal skill-efficacy of nonsmokers.

Student’s smoking status also interacted with time of testing (p = .0086). Post hoc
analysis for the time of testing by smoking status interaction revealed two significant
group differences: between nonsmokers pre to post test (p = .0001) and between
nonsmokers and experimental smokers at pretest (p = .0001). Nonsmoker scores
decreased from pre (52.25) to post test (47.28) for a large effect size of 0.40.
Experimental smokers (41.12) differed from nonsmokers (52.25) at pretest by 11.13
points: this represents a large effect size of 0.90. The time of testing by smoking status
interaction is ordinal; on average, nonsmokers score higher at pre and post test.

There was no main effect of time of testing: refusal skill-efficacy mean scores did
not increase in all groups from pre to post test. There was not an interaction of time of
testing with treatment, either. There was not an increase (or decrease) of refusal skill-efficacy scores from pre to post in only the treatment or comparison group.

DISCUSSION FOR REFUSAL SKILL-EFFICACY

Refusal skill-efficacy is defined as a student's perceived ability to resist direct, indirect, hassle and put down type cigarette offers made by best friends, groups of friends, and older students. Scheduled learning activities include identification of types of pressure in case studies, role plays of refusal strategies and a discussion of barriers to refusing cigarette offers. The amount of time of scheduled learning activities directed toward refusal skill-efficacy was 78 minutes. Operationally, the construct was defined as a student's score on 20 Likert items.

Participation in the treatment resulted in significantly higher scores for the experimental smokers’ refusal skill-efficacy. The effect size of treatment group experimental smokers and comparison group experimental smokers is also large, totaling 0.56. On average, treatment group experimental smoker scores increased their perceived confidence to refuse cigarette offers by three points. This study's large treatment effect for experimental smokers is of great practical importance: students with the lowest scores, those most in need, increased their skills to refuse cigarette offers. The conclusion of a treatment effect for experimental smokers is consistent with De Vries et al. (1994); the treatment increased the smokers' perceived confidence for refusing tobacco offers. De Vries did not report an effect size, but did report that the treatment effect for smokers was no longer significant at one-year.
In addition to the treatment effect for experimental smokers, smokers, on average, scored lower than nonsmokers for refusal skill-efficacy. Experimental smokers’ confidence to refuse cigarette offers is likely based more on real life experiences whereas sixth grade nonsmokers may not have had the opportunity to refuse actual cigarette offers, and thus are guessing at the degree of difficulty. Bandura (1986) in explaining the construct of self-efficacy notes that individuals without prior experience of a behavior often overestimate their ability. The trend of nonsmokers’ mean scores lowering at posttest also supports the premise of an overestimation of skill ability. Nonsmokers’ overestimated efficacy could have been lowered because of refusal skill practice in the treatment group role plays and or increasing exposure to real cigarette offers. Posttest data was collected during the final week of sixth grade. Sixth to seventh grade is a transition year and a year of increased tobacco use for students. Posttest changes in the frequency distribution also supports this premise of overestimation of skills in the nonsmokers. In both the treatment and comparison group, the number of students reporting scores in the highest category decreased 14% in the treatment group (n = 5) and by 30% (n = 11) in the comparison group (Tables 4.25 and 4.27).

Student’s smoking status also interacted with time of testing. Nonsmokers scores decreased from pre (52.25) to post test (47.28) for a large effect size of 0.40. Experimental smokers (41.12) differed from nonsmokers (52.25) at pretest by 11.13 points: this represents a large effect size of 0.90. The time of testing by smoking status interaction is ordinal in that nonsmokers score higher at pre and post test. As previously discussed for refusal skill-efficacy changes, two interpretations of the decrease in

257
nonsmokers' scores are the overestimation of initial refusal skill to refuse cigarette offers and the decrease in confidence because of the students' transition to middle school.

Differences in refusal skill-efficacy scores also support the Social Cognitive Theory upon which psychosocial smoking prevention programs are based. Students with higher refusal skill-efficacy are theorized to have lower smoking rates. Experimental smokers having significantly lower refusal skill-efficacy than nonsmokers supports this theory. Additionally, the theory assumes that students intend to not use tobacco, but as they age and are exposed to increasing social pressures, their skills, efficacy and expectations alter. The finding of nonsmokers' scores decreasing at posttest supports this theory assumption.

Potential reasons that this study found treatment effects for self-efficacy, unlike the three of the four previously reviewed studies, are twofold: self-efficacy was not measured as a univariate, global trait and the interaction with students' smoking status was considered. First, efficacy was clearly and narrowly defined as refusal skill-efficacy. Previous researchers' measurement tools have encompassed two types of efficacy: refusal skill-efficacy and efficacy to remain smoke-free (De Vries, et al., 1994; Flay, et al., 1995). In addition to being clearly defined by type of skill, refusal skill-efficacy was measured to capture situational differences. Measurement items included situations of in school and at a friend's house, by person making the cigarette offer of best friend, group of friends and an older student and by direct, indirect, hassle and put down types of pressure. Previous researchers measured global efficacy for cigarette refusal with two (Turner, et al., 1993; Flay, et al., 1995), eight (De Vries, et al., 1994) and fourteen (Botvin, et al.,
1990) questionnaire items. Turner et al. (1993) reported variances in self-efficacy by situation; students were more efficacious in refusing smokeless tobacco than cigarettes. By clearly defining the type of efficacy and asking about efficacy in a variety of situations, this study’s measurement tool could capture greater variation in students’ responses. Descriptive Tables 4.28 through 4.33 illustrate that students’ efficacy varies by the three subscales of person making the offer, by situation and by type of pressure. Students in both groups report being most confident in saying “no” to a best friend, report “hassle” as the hardest type of pressure to refuse and most often report that saying “no” at a friend’s house is more difficult than refusing cigarette offers at school.

Additionally, the interaction of a student's smoking status affected the main effects of treatment on refusal skill-efficacy. In both the treatment and comparison group, nonsmokers' scores decreased and experimental smokers’ scores increased (see Tables 4.24 and 4.26). Scores changing in opposite directions could cancel each other’s main effect for treatment. When studying refusal self-efficacy, only De Vries evaluated changes in efficacy by a student’s smoking status. De Vries documented a smoking status by treatment effect similar to this study; smokers in the treatment had higher efficacy than smokers in the comparison group. The three other researchers (Botvin, et al., 1990; Turner, et al., 1993; Flay, et al., 1995) found no treatment effects for refusal self-efficacy.
CONCLUSION FOR TOTAL POSITIVE REFUSAL

EXPECTATIONS & IMPORTANCE

Participation in the treatment resulted in significantly higher scores for the construct total positive refusal expectations & importance \((p = .0477)\). Treatment did not interact with either a student’s smoking status nor with time of testing. Students in the treatment group scored significantly higher than students in the comparison group. Treatment group students scored, on average, 6.26 points higher than comparison group students, 76.40 and 70.14, on a 135-point scale. The effect size is small and equals 0.22.

Scores for total positive refusal expectations & importance were calculated by multiplying an expectation by the corresponding expectancy and then summing all the scores. Table 4.14 illustrates that students’ expectancies are stable, changing less than a point from pre to post test. This stability would be expected in that expectancies are students’ values: values are theorized as stable. Mean expectation post scores increased by one point in the treatment and decreased by half a point in the comparison group. Thus, it appears that the small effect for total expectations & importance was driven by small posttest changes in opposite directions in the treatment and comparison group.

The main effect for treatment was the only statistically significant finding for the construct total positive refusal expectations & importance. A student’s smoking status produced no main effect \((p = .3900)\) on total positive refusal expectations & importance scores; smokers did not differ from nonsmokers in their expectations for positive outcomes from refusing cigarettes and the value that the student places on the anticipated outcomes. There also was not an interaction of student’s smoking status with treatment.
experimental smokers did not respond differently to the treatment than nonsmokers. There was not an interaction of time of testing with smoking status (p = .5496); experimental smokers’ and nonsmokers’ total positive refusal expectations & importance scores did not change differentially from pre to post test. There was no main effect for time of testing (p = .8330); total positive refusal expectations & importance scores did not increase in all groups from pre to post test. There was not an interaction of treatment and time of testing (p = .5692); total positive refusal expectations & importance scores did not change from pre to post test differentially for the treatment or comparison group.

DISCUSSION FOR TOTAL POSITIVE REFUSAL EXPECTATIONS & IMPORTANCE

Total positive refusal expectations & importance is defined as the multiplicative function of positive refusal expectations and expectancies, with expectations being the outcomes a student expects from refusing cigarette offers and expectancies being the value of importance that the student places on the expectation. Scheduled learning activities include role playing of refusal situations and discussion of barriers to refusing cigarette offers. The amount of time of scheduled learning activities directed toward total positive refusal expectations & importance and total negative refusal expectations & importance was 25 minutes. Thus total positive refusal expectations & importance received 10 to 12 minutes of student learning time (25 minutes divided by two). Operationally, the construct was defined as the sum of nine refusal outcome expectations
multiplied by the corresponding refusal outcome expectancy. Example of positive expectations were “my friend would think I’m smart”, “my friend would respect me more” and “my friend would say ok”.

Participation in the treatment resulted in significantly higher scores for the construct total positive refusal expectations & importance. Treatment did not interact with either a student’s smoking status nor time of testing. Students in the treatment group scored, on average, 6.26 points higher than comparison group students, 76.40 and 70.14, on a 135-point scale. The effect size is small, 0.22. The treatment group mean score increased from pretest by three points while the comparison group mean score decreased by one point. These group scores close to the midpoint of the scale (76.50) indicate that students do not have high expectations and expectancies for positive outcomes for refusing cigarette outcomes.

Changes in the frequency distributions for total positive refusal expectations & importance also documents treatment and comparison group scores moving in opposite directions (see Tables 4.38 and 4.39). In the treatment group, scores below the midpoint decreased by six scores at posttest while in the comparison group, scores below the midpoint increased by three scores. Changes in the upper two categories (121 - 136 and 137 - 144) increased by one in the treatment group and decreased by one in the comparison group.

One interpretation of treatment group changes, though, might be a regression to the mean. The percentage of students reporting scores in the midpoint and mean category (73 - 88) nearly doubled, from 10 to 19 scores. There is not a strong case for regression,
though, in that the treatment group scores that moved from below the mean to the mean were not the extreme low scores. Scores moving to or above the mean appeared to come from the two categories directly below the mean, (41 - 56) and (57 - 72) not from the two lowest categories of (9 - 24) and (25 - 40). Also, the same regression did not occur in the comparison group. The comparison group distribution was more clustered around the mean at pretest, meaning there were fewer scores to regress. There was 21 out of 80 comparison group scores in the midpoint and mean category at pretest. Thus, regression to the mean can not be entirely ruled out.

While the treatment effect was small, one should consider the learning time allotted to total positive refusal expectations & importance was estimated as 10 to 12 minutes. Considered in this dose/response context, the trend of change, as opposed to the magnitude, may be of more significance. The small effect size may have also been influenced by the low pretest scores. Students’ expectations and expectancies for positive outcomes from refusing cigarette offers were lower than the midpoint of the scale at pretest. Historically, in skill development programs, low scores are more difficult to improve than higher scores.

The maintenance or small increases in treatment group scores while comparison group scores decreased again supports the psychosocial model (Figure 3.2) that students intend to not smoke cigarettes. As exposure to perceived social pressures increases, efficacy for refusing cigarette offers and expectations decrease. Since expectancies were stable from pre to posttest, the treatment likely reinforced student’s expectations for positive outcomes from refusing cigarette offers.
Evaluation of a student’s total positive refusal expectations & importance or a similar construct has not been published in the literature, making comparison to previous findings impossible. The conclusion that nonsmokers and smokers do not have significantly different scores appears to contrast the Social Cognitive Theory of the smoking prevention and previous findings in this study. The theoretical model (Figure 3.2) hypothesizes that the development of skills to reject cigarette offers, skills to reject positive media messages, confidence to refuse cigarette offers, increased expectations for positive outcomes and decreased expectations for negative outcomes decreases the likelihood of cigarette use. Thus, one would expect experimental smokers to have lower levels of these skills, confidence and expectations. In this study, though, nonsmokers and smokers have equal expectations and expectancies for positive outcomes from refusing cigarette offers. Total positive refusal expectations & importance is the only construct in this study in which smokers’ and nonsmokers’ mean scores did not differ significantly. These preliminary findings may suggest that positive expectations and expectations for refusing cigarettes may not be as influential to cigarette smoking as negative refusal expectations and expectations.
CONCLUSIONS FOR TOTAL NEGATIVE REFUSAL EXPECTATIONS & IMPORTANCE

A student's smoking status did interact with treatment for significantly higher scores for the construct total negative refusal expectations & importance (p = .0382). There was not a main effect for treatment, though (p = .2447). The main effect of smoking status was also significant (p = .0001); however, smoking status is interpreted in the context of the interaction with treatment. Post hoc analysis for the treatment by smoking status interaction revealed two significant group differences on total negative refusal expectations & importance: between comparison group nonsmokers (103.64) and comparison group experimental smokers (78.46) and between treatment group nonsmokers (91.16) and comparison group nonsmokers (103.64). Treatment group experimental smokers scored an average of 82.05. Possible scores could range from 12 to 192. The effect size of comparison group nonsmokers and comparison group smokers is large at 0.76. The effect size of treatment group nonsmokers and comparison group nonsmokers is moderate at 0.38. The interaction is ordinal; on average, nonsmokers always scored higher than experimental smokers. As a reminder, from a smoking prevention perspective, a lower score is better, meaning students expectations for negative outcomes are low and that the avoidance of the negative outcomes is not important. There is not a significant difference between treatment group smokers and treatment group nonsmokers. As with refusal skill-efficacy, the treatment appears to bring nonsmoker and smoker scores to a level of nonsignificance difference.
A student's smoking status also interacted with time of testing. Post hoc analysis for the time of testing by smoking status interaction revealed significant differences between nonsmokers and experimental smokers at pretest \((p = .0001)\). Nonsmoker mean pretest score was 99.99 while experimental smokers' mean pretest score was 74.72. The effect size of the 25.27 pretest point difference is large, totaling 0.76. There was not a significant difference at posttest; nonsmokers' mean score decreased to 94.81 while experimental smokers' mean score increased to 85.80. Thus, nonsmoker scores decreased while experimental smoker scores increased.

Scores were not affected by time of testing only \((p = .4541)\); total refusal negative expectations & importance scores did not increase in all groups from pre to post test. Additionally, there was not an interaction of treatment and time of testing \((p = .7369)\).

**DISCUSSION FOR TOTAL NEGATIVE REFUSAL EXPECTATIONS & IMPORTANCE**

Total negative refusal expectations & importance is defined as the multiplicative function of negative refusal expectations and expectancies, with expectations being the outcomes a student expects from refusing cigarette offers and expectancies being the value of importance that the student places on the expectation. Scheduled learning activities include role playing of refusal situations and a discussion of barriers to refusing cigarette offers. The amount of time of scheduled learning activities directed toward total positive refusal expectations & importance and total negative refusal expectations & importance was 25 minutes. Total negative refusal expectations & importance received
10 to 12 minutes of student learning time (25 minutes divided by two). Operationally, the construct was defined as the sum of 12 refusal outcome expectations multiplied by the corresponding refusal outcome expectancy. Example of negative expectations were “my friend would continue to hassle me until I smoke”, “my friend would call me names like wimp” and “my friend would no longer want to be my friend”.

Participation in the treatment had an impact for nonsmokers’ total negative refusal expectations & importance score. The effect size of treatment group nonsmokers and comparison group nonsmokers is moderate, totaling 0.38. Nonsmoker treatment group mean score decreased seven points. The lowering of the mean appears to come from a general shift downward in scores. As indicated by the frequency distribution (Table 4.40), most of the movement appeared to be nonsmokers just above the midpoint at pretest, moving to a category below the midpoint at posttest: there were nine (16% of nonsmokers) additional posttest scores below the midpoint.

The experimental smoker treatment group mean score increased by 15 points. The mean should be interpreted with caution in that there appears to be two outliers at posttest. There are two scores in the highest category of 171-192, whereas at pretest, the highest score was two categories below, 132 - 151. This increase in variability is also reflected in the posttest standard deviation of 41.20, and increase from 25.94 at pretest. Despite the outliers, experimental smokers’ posttest treatment scores appears to move upward. There is three (11% of sample) fewer scores below the mean.

Experimental smokers’ scores, particularly at pretest, were lower than the researcher anticipated. Post hoc analysis revealed a significant (p = .0001) pretest
difference between nonsmokers and experimental smokers. Experimental smokers’ pretest mean score of 74.72 is 15 points below the midpoint. Nonsmokers’ mean score at pretest were 99.99. This time of testing by smoking status interaction for experimental smokers verses nonsmokers was not significant at posttest: experimental smokers increased to 85.80 while nonsmokers decreased to 94.81. The low pretest score of experimental smokers indicates that smokers do not expect negative outcomes from refusing cigarette offers nor is it of importance for the experimental smoker to avoid these outcomes. This low score is interesting in that one would speculate that the adolescent smoker does not refuse cigarette offers. This lower than expected expectation of negative outcomes is also interesting in that experimental smokers have lower refusal skill-efficacy. One could interpret the low total negative refusal expectations & importance score as an overcompensated way of the smoker saying “I smoke because it is my choice, not because I’m trying to avoid negative outcomes”. The posttest increase in experimental smokers’ mean scores support this interpretation of initial overcompensation.

As discussed above with total positive refusal expectations & importance, one should consider the learning time allotted to total negative refusal expectations & importance when discussing the magnitude of the relationship. At posttest, the difference between treatment group nonsmokers and comparison group nonsmokers was moderate. Considering that learning time addressing total negative refusal expectations & importance equaled 10 to 12 minutes, a moderate effect size is of significance.
Evaluation of total expectations & importance and total negative expectations & importance was mentioned briefly in only one of the previously reviewed studies (Schinke & Gilchrist, 1983). The construct was referred to as “identification of consequences of nonsmoking decisions” and was evaluated after the implementation of an eight-lesson psychosocial smoking prevention program. The authors report statistically significant treatment effects by reporting treatment group students “had superior insight to predicting others’ reactions to nonsmoking decisions” (p. 418). No other discussion of this finding was presented. While comparison to Schinke & Gilchrist’s previous finding is limited, one can say that results from this study are consistent with previous findings.

The finding of differential scores by experimental smokers and nonsmokers for total negative refusal expectations & importance appears to be inconsistent with the Social Cognitive Theory upon which psychosocial smoking prevention programs are based. The theory hypothesizes that students if a student expects negative outcomes from refusing cigarette offers and if the students values the avoidance of the negative outcome, the student is more likely to smoke. In this study, experimental smokers had lower pretest scores than nonsmokers for total refusal negative expectations & importance. Experimental smokers’ low pretest scores appear artificially low and increased at posttest. Interestingly, nonsmokers had high scores at pretest and it was the nonsmokers who appeared to have responded to the treatment.
IMPLICATIONS FOR FUTURE RESEARCH

This study documented differential treatment effects for nonsmokers and experimental smokers. Because of the interaction of treatment with smoking status, all future research should include the variable of smoking status and measure its effect on interactive effects on treatment outcomes. Not only did experimental smokers score statistically lower on three of the four constructs, smoking status interacted with treatment for two of the constructs: refusal skill-efficacy and total negative refusal expectations & importance. For the constructs refusal skill-efficacy, total positive refusal expectations & importance and total negative refusal expectations & importance, nonsmokers and experimental smokers' scores changed in opposite directions at posttest. The only statistically significant finding of this study in which smoking status did not interact or produce a main effect was for total positive refusal expectations & importance. Failure to include smoking status as a variable in the design may inhibit researchers from detecting treatment effects.

This study documented a large treatment effect for experimental smokers for the variable refusal skill-efficacy. Implementing similar programs, three of the four previous researchers did not document any treatment effect for refusal skill-efficacy (Botvin, et al., 1990; Flay, et al., 1995; Turner, et al., 1993). Treatment effects as well as results from the confirmatory factor analysis indicate this study instrument as being a good measurement tool. When examining refusal skill-efficacy, future researchers should use the instrument of this study, or one of similar scope.
Future researchers should reexamine this program's impact on total negative refusal expectations & importance. This study documented a moderate effect size: nonsmokers, after participation in the program, had lower total negative refusal expectations and importance. Experimental smokers appeared to have had artificially low pretest scores for total positive refusal expectations & importance. The low score of experimental smokers should be confirmed by future research, prior to ruling out a lack of treatment effect for experimental smokers.

A small effect size was documented for the construct total positive refusal expectations & importance. Participation in the program resulted in significantly higher scores for total positive refusal expectations & importance for both nonsmokers and experimental smokers. Findings of the treatment's ability to raise students' expectations for positive outcomes from refusing cigarette offers are promising. Given the power limitations of this study and the decision to not adjust the experimentwise error rate, further research should reexamine this construct to clarify the strength of the program's impact on positive refusal expectations & importance.

For both total positive refusal expectations & importance and total negative refusal expectations & importance, future researchers may consider refining the measurement items. Students were only asked about three possible positive refusal outcomes and four possible negative refusal outcomes. Increasing the number of possible responses or changing the responses may alter students' responses. The confirmatory factor analysis also indicated that some of the items should be discarded: for expectations, 7 of the 21 items had loading factors less than .30; for expectancies, 2 of the 21 items had
loading factors less than .30. A possible increase in variability, improvement in the loading factors and an increase in the study's power, may indicate a stronger impact of the treatment. Conversely, future researcher should also reexamine total positive refusal expectations & importance and total negative refusal expectations & importance to rule out possible type I errors made in this study.

Behavioral capability to resist positive images of smoking was not impacted by the program; however, measurement threats may have influenced the lack of significant treatment effects. This study's instrument appeared to have two inadequacies: a potential ceiling effect for two of the subscales and questionnaire items of the third subscale which did not load with the other subscales. On a twelve point scale, treatment pretest mean scores for the two subscales were as follows: ability to evaluate the truthfulness of media messages (9.86) and the ability to reject favorable images (10.16). Thus, there was not much room left for posttest improvement. Additionally, the confirmatory factor analysis revealed that the four items from the subscale ability to identify media messages did not have loading factors >.30. Because one-fifth of the curriculum addresses students' ability to reject positive images of smoking, future researchers should improve the measurement tools and reexamine the impact of the program on the construct behavioral capability to resist to positive images of smoking.

A dose and response relationship for the four variables of interest of this study, behavioral capability to resist positive images of smoking, refusal skill-efficacy, total positive refusal expectations & importance and total negative refusal expectations & importance is also an area for additional research. The educational time allotted for each
of these variables did not exceed 80 minutes. Researchers should investigate if increased contact time for these variables increases program impact.

In addition to improving the understanding of the four variables of interest in this study, results of this study also suggest that the construct of reinforcements should be evaluated. Reinforcements, responses to a person's behavior which increase or decrease the likelihood of behavior's reoccurrence, is a construct of the Social Cognitive Theory and part of the hypothesized model of psychosocial smoking prevention programs, see Table 3.2 (Perry, et al., 1990). It appears that students entered this study with high levels of skills and efficacy and the treatment did not produce large increases in scores. The treatment either raised mean scores minimally, or minimized the decrease of mean scores. With the exception of total negative refusal expectations & importance mean posttest score for smokers (which had a standard deviation of 40 points), no treatment group pre to post increase was greater than six points. The treatment appears to produce small increases in skill and expectations for nonsmokers while maintaining skills, efficacy and expectations for smokers. The maintenance of levels documented in this study could be achieved through reinforcement other than the development of or practice of a skill.

Process evaluations require specifically defined and measured constructs. As supported by this study's documented changes in refusal skill-efficacy, when constructs are measured as the Social Cognitive Theory defines the constructs, greater variation can be captured by the instrument. Measuring constructs with two or three questionnaire items, as previous research has done, does not allow the instrument to detect situational differences. For example, three previous researchers found no program impact for refusal
skill-efficacy. In this study, the treatment did impact refusal skill-efficacy. Descriptive
data from this study indicated that students' efficacy varied by the type of person offering
the cigarette, the physical environment and by the type of pressure. Measuring a
construct with two to three items will not detect these differences. The first step to better
measurement is clearer and more detailed definitions. For example, definitions of the
Social Cognitive Theory constructs should reflect the interaction of the person, the
behavior and of situational influences (Perry, et al., 1990).

Process evaluations should focus on a small number of constructs. Clearly
defining and measuring constructs requires a large number of questionnaire items. In this
study, refusal skill-efficacy was measured with 20 questionnaire items. Since study
subjects are children and children have shorter attention spans, the scope of studies
should be limited to two to four constructs. The 78-item questionnaire used in this study
to measure four constructs took the children 12 to 25 minutes to complete. By watching
children’s reactions and behavior, this questionnaire may have been too long. Previous
researchers have taken an opposite approach, measuring a larger number of constructs
with a reduced number of questionnaire items addressing each construct. Flay et al.
(1995) and Botvin et al. (1990) documented treatment effects, but in both cases the
studies had very large power, driven by large sample sizes. Flay measured seven
constructs with a range of one to eight questionnaire items per construct. With over
7,000 subjects, Flay documented changes in two constructs: knowledge and smoking
prevalence estimates. Similarly, Botvin et al. (1990) measured 23 constructs with a range
of one to fourteen questionnaire items per construct. With greater than 4,000 subjects,
Botvin documented changes in four constructs, all of which are knowledge-based constructs: normative expectations, knowledge of substance abuse, knowledge of interpersonal skills and knowledge of communication skills. With these large sample sizes, "trivial" effects could easily be detected as significant (Keppel, 1991). One would think, also, that with Flay and Botvin's large sample sizes, more construct significant differences could have been detected. A greater number of small or "trivial" treatment group differences may not have been detected because of the measurement of the construct by only a few questionnaire items per construct. Findings from process evaluations reporting changes in two to four constructs may seem small as compared to outcome-based research findings; however, process evaluation findings are crucial for improving program impacts. By identifying a program's working components, resources can be streamlined to these successful components. Additionally, program components not contributing to the desired behavior change be identified and thus, omitted.

Methods should be enacted to retain subjects, particularly smokers, in the study. As noted by Botvin (1990) and Flay (1985), smokers tend to have higher attrition rates. This loss of subjects limits generalizability but not internal validity, because the loss of smokers tends to occur similarly in treatment and comparison groups (Botvin, 1990, Flay, 1995). One limitation of this study was a loss of subject rate of 22%. Less than 4% of the subjects lost were because of absences: subjects were lost because of inability to match pretests to posttests. Of the 46 pretest cases lost, 47% of the treatment cases and
60% of the comparison group cases were categorized as experimental smokers. Matching students’ anonymous questionnaires by identifier questions should not be a method of future researchers.

For the purpose of this study, experimental smokers were defined as a student who reported any cigarette use in the past year (365 days). This definition is more broad than previous research. One should consider that 46% of the treatment group experimental smokers (13 out of 28) and 29% of the comparison group experimental smokers (9 out of 31) had reported trying ≤1 cigarette in the past year. Thus, at least one-third of the smokers in this study had very limited exposure to cigarettes. The high proportion of very low smoking experimentation could have influenced the treatment effect for smokers. Future researchers should distinguish between experimental smokers and regular smokers and seek to duplicated treatment effects.

An additional methodical strength would be to employ a time series design in which repeated measures were collected. This design would allow researchers to further study the initial decreases in refusal skill-efficacy for nonsmokers and the inflated initial scores for total refusal negative expectations & importance of smokers. By having a second testing prior to the intervention, one might get a more accurate measurement of a student’s pre-intervention score, especially for refusal skill-efficacy and total negative refusal expectations. Incorporated into these time series designs should be booster sessions. Booster sessions should include learning activities directed toward the variables of interest. Based upon the preliminary findings of this study, one would hypothesize that comparison group mean scores for the Social Cognitive Theory constructs would
continue to decrease, as more students became smokers and the treatment group scores would either stay the same or increase.

Lastly, once valid and reliable instruments are developed to measure constructs which are impacted by the psychosocial smoking prevention programs, researchers should address the question of sufficiency; how much of a change or at what level should a construct be for a subject to remain a nonsmoker? To answer the question of sufficiency, researchers will need to follow students through time and tie changes in constructs to changes in smoking behavior.

**IMPLICATIONS FOR THE HEALTH PROMOTION PRACTITIONER**

In addition to discussing statistical significance, one must interpret practical significance of these findings. Despite the fact that this study was the first to research three of the four variables, results have implications for the practice of preventing adolescents from initiating smoking.

This study documented that the implemented psychosocial smoking prevention program impacted three Social Cognitive Theory constructs: refusal skill-efficacy, total positive refusal expectations & importance and total negative refusal expectations & importance. A practitioner should have realistic expectations regarding program impact though. While half of the effect sizes were large, the treatment did not produce large gains in scores. Lack of large gains in scores should be considered in two contexts: the treatment appeared to help students with lower scores and the time allocated for activities designed to address these constructs was limited. First, the treatment had a impact for
experimental smokers, those students most in need of smoking prevention efforts. The impact of treatment on experimental smokers' refusal skill-efficacy was a large effect size. Additionally, smokers responded similarly to nonsmokers for total positive refusal expectations. Secondly, the overall curriculum consisted of six, 45-minute lessons which consisted of over 50 activities. Should the time directed at these constructs increase, one could reasonably expect the magnitude of change to increase.

Sixth grade also appears to be an optimal time for implementing in a psychosocial smoking prevention program. Greater than one-third of the students in this study had experimented with cigarettes in the past year. Implementing a program while students are contemplating experimentation or beginning their experimentation increases the relevance of the issues addressed in the curriculum. Additionally, the curriculum is very "hands on", asking students to act out scenarios in role plays, discuss why people start and analyze increasing social pressures to smoke. Students need to bring experiences, not abstract thoughts, to these activities. For practitioners who advocate prevention programs starting before experimentation, this study documented that students with prior experience with cigarettes respond to the program.

Regarding refusal skill-efficacy, health promotion practitioners should include activities designed to maintain efficacy of the nonsmoker and increase the lower preintervention efficacy of the smoker. As that efficacy is situationally influenced, activities, such as role plays, should address refusal skill-efficacy in a variety of situations which vary by person offering the cigarette, by location and by type of pressure. Additionally, practitioners should probe students as to what are the situations in which
they are least confident. Refusal skill-efficacy activities should address these situations of lessor confidence. These activities should be repeated through time, as that there was an initial decrease in efficacy for nonsmokers. Lastly, a health promotion practitioner should be reminded that smokers start the program with lower confidence to refuse cigarette offers. As documented here, the experimental smoker can increase their confidence to refuse cigarette offers and should be included in the program activities.

Total negative expectations & importance should also be addressed by the health promotion practitioner. Experimental smokers reported fewer expectations for negative outcomes, yet with time, smokers’ expectations appear to gravitate toward the mean of nonsmokers. The initial low expectation for negative outcomes is likely artificially low and might be a false expression of the experimental smokers’ rational decision to smoke. Activities designed to maintain these expectations should still be offered over time and tied to the development of refusal skill-efficacy. As noted by Maibach and Murphy (1995), students’ confidence for a skill is influenced what students perceive as the anticipated outcomes.

Total positive expectations & importance was altered by the treatment. In discussing the potential outcomes from refusing cigarettes, teachers should remind students that there are positive outcomes. Role plays, designed to increase refusal skill-efficacy, should include the experience of positive outcomes.
SUMMARY STATEMENT

Psychosocial smoking prevention programs can reduce adolescent smoking initiation by 30 to 50%, up to one year following program implementation (Flay, 1993). How these programs work, however, remains unclear (Flay, 1995; McCaul & Glasgow, 1985). Based upon the Social Cognitive Theory (SCT), psychosocial smoking prevention programs develop skills to help students identify and overcome social pressures to smoke. These programs assume that students intend to not use tobacco. Learning activities are aimed at developing skills for refusing smoking and through practice and role playing, confidence for using these skills is also developed. Actual use of refusal skills is influenced by students' confidence to execute them, by their expectations as to what will happen when they do execute them, the value the person places on these expectations and by the reinforcements they receive for their decision. The theory also anticipates that smokers have lower scores for each of these constructs.

The purpose of this research was to examine how these programs actually work. More specifically, this research examined the impact of a psychosocial smoking prevention program on the Social Cognitive Theory constructs of behavioral capability to resist positive images of smoking, refusal skill-efficacy, total positive refusal expectations & importance and total negative refusal expectations & importance. A secondary purpose of this study was to determine if a student's smoking status interacted with the treatment.

This study documented that a psychosocial smoking prevention program impacted three SCT constructs: refusal skill-efficacy, total positive refusal expectations & importance and total negative refusal expectations & importance. The program impact
with the largest effect size was the improvement of refusal skill-efficacy scores of experimental smokers. After participation in the program, experimental smokers' confidence to refuse cigarette offers increased to a level equivalent to that of nonsmokers. This finding is of great significance in that the effect size was large and that program participants arguably most in need of refusal skills were the ones who improved.

Non-smokers, after participation in the program, had lower total negative refusal expectations and importance. This effect size was moderate in size. Readers should be reminded that experimental smokers appeared to have had artificially low pretest scores for total positive refusal expectations & importance. The low score of experimental smokers should be confirmed by future research, prior to ruling out a lack treatment effect for experimental smokers.

A small effect size was documented for the construct total positive refusal expectations & importance. Participation in the program resulted in significantly higher scores for total positive refusal expectations & importance for both nonsmokers and experimental smokers. Findings of the treatment's ability to raise students' expectations for positive outcomes from refusing cigarette offers are promising. Given the power limitations of this study and the decision to not adjust the experimentwise error rate, further research should reexamine this construct to clarify the strength of the program's impact on positive refusal expectations & importance.

The fourth variable studied, behavioral capability to resist positive images of smoking, was not impacted by the program. Measurement threats may have influenced the lack of significant treatment effects for the variable behavioral capability to resist
positive images of smoking. One subscale, four of the twelve questionnaire items, to measure this construct did not load on the confirmatory factor analysis. This lack of loading indicates that the items may not have been measuring the students' ability to reject positive images of smoking. In that one-fifth of the curriculum addresses students' ability to reject positive images of smoking, measurement should be improved and the impact of the program on this construct should be reexamine.

Other study findings consistent with the SCT are the lower scores by experimental smokers for behavioral capability to resist the positive images of smoking and refusal skill-efficacy. Experimental smokers had scores lower than nonsmokers for behavioral capability to resist the positive images of smoking. Experimental smokers' scores indicate that smokers had the skill to refuse positive media messages, but did not reject the media messages as strongly as nonsmokers. Additionally, experimental smokers' confidence in refusing cigarettes offers (refusal skill-efficacy) was not as a high as that of nonsmokers.

Study findings inconsistent with the SCT were scores by experimental smokers for total positive refusal expectations & importance and total negative refusal expectations & importance. Nonsmokers' and experimental smokers' scores did not differ for total positive refusal expectations & importance. Students had the same low expectations for positive outcomes from refusing cigarette offers, whether the student was a nonsmoker or experimental smoker. At pretest, experimental smokers had lower expectations for negative outcomes from refusing cigarette offers. The pretest score may
have been artificially low; the lower than expected expectations of experimental smokers did not differ from nonsmokers at posttest.

In conclusion, findings from this study provide construct validity for the psychosocial model of smoking prevention programs. Three of the four SCT constructs studied were impacted by the program. Findings from this study warrant continued use of psychosocial smoking prevention programs by practitioners, the inclusion of experimental smokers in the program and call for additional process evaluations of psychosocial smoking prevention by future researchers.
APPENDIX A

INSTRUMENT DEVELOPMENT
SEQUENCE OF EVENTS & RESULTING ACTIONS

284
Instrument Development Sequence of Events and Resulting Actions

January 1997: Development of Constitutive Definitions

- Began developing constitutive definitions of four Social Cognitive Theory (SCT) constructs: refusal self-efficacy, refusal skill-efficacy, refusal outcome expectations, and refusal outcome expectancies. The SCT was referenced for definition development (Perry, et al., 1990).

**Refusal Skill-Efficacy:** one’s perceived communication to successfully say “no” to tobacco offers.

**Refusal Self-Efficacy:** one’s perceived ability to overcome social pressures and offers to remain smoke-free.

**Refusal Outcome Expectations:** expected outcomes of refusing tobacco offers.

Categorically, expectations are positive social consequences, negative social consequences, positive health consequences and negative health consequences.

**Refusal Outcome Expectancies:** the values, favorable or unfavorable, that an individual places on refusal expectations.

- The researcher shared definitions with two members of the panel of experts, Petosa and Hallam. The exchanges with Petosa and Hallam were informal with feedback being communicated via e-mail and telephone conversations. Resulting actions from this feedback are listed below:

**Refusal Skill-Efficacy:** changed “communication” to “ability” and changed “say no” to “reject”.

**Refusal Self-Efficacy:** panel did not understand the difference between the two types of efficacy. Updated definition to: one’s perceived ability to resist positive images of smoking presented through media and adult modeling.

**Refusal Outcome Expectations:** comment was that instrument would have to measure specific consequences and the specific consequences should be reflected in the definition. The researcher generated a list of consequences:

Positive Social Consequences: to be seen as cool, strong, smart, attractive, to make friends, to appear older, others will say “no” and nothing will happen.

Negative Social Consequences: friends will make fun of me, friends will continue to pressure me to smoke, friends will no longer want to be my friend, friends will call me names like wimp and dork, I will not be seen as cool, I will not be invited to parties, I will be excluded from group parties, I will be pressured to say “yes” and I will be ignored.

Positive Health Consequences: I will live longer, I will smell better and I will feel better.

Negative Health Consequences: My friends will beat me up, I will smell bad, I will get in trouble, I will get depressed.

**Refusal Outcome Expectancies:** no comments.
• Sent revised definitions to Petosa and Hallam. The following feedback was received and incorporated:

*Refusal Skill-Efficacy*: no changes to definition of one’s perceived ability to reject offers of tobacco.

*Refusal Self-Efficacy*: no changes to definition of one’s perceived ability to resist positive images of smoking presented through media and adult modeling.

*Refusal Outcome Expectations*: comment was to pick three to four consequences and start developing instrument items to measure the chosen consequences. Decision was also made to remove the positive and negative health consequences from the definition: the health consequences were more of consequences of smoking and not from refusing tobacco offers.

*Refusal Outcome Expectancies*: no comments.

**February 1997: Development of Questionnaire Items with Further Refinement of Constitutive Definitions**

• Began developing pools of questionnaire items which also included different scaling options. As questionnaire items were developed, constitutive definitions were further refined. Summary of actions are listed below.

• General Comment for all construct definitions: definitions were delimited to cigarettes from tobacco.

*Refusal Skill-Efficacy*: definition was refined to reflect the types of peer pressure addressed in the curriculum and to reflect the SCT theory of situational influences. The new definition was one’s perceived ability to resist direct, indirect, hassle and put down type cigarette offers made by best friends, groups of friends, a stranger and a seventh grader. Pools of items were also to reflect two physical environments: in school and after school.

*Refusal Self-Efficacy changed to Self-Efficacy to Resist Positive Images of Smoking*: In updating the definition, the construct was broken down to three categories: identifying messages, evaluating the truthfulness of messages and rejecting messages. The researcher, with feedback from Petosa and Hallam, determined that the construct to be measured was *behavioral capability to resist positive images of smoking*, not self-efficacy. Rationale for changing construct name was that the construct taught in the curriculum was a skill or behavioral capability to resist media images. While self-efficacy is a part of all skill development, the researcher chose to measure the skill.

*Refusal Outcome Expectations*: The consequences to be measured are listed below. The pool of items for expectations was also to reflect the SCT of situationally influenced constructs (comment from panel member). Students would be asked about their expectation of outcomes for refusing offers from best friends, groups of friends, a seventh grader and a stranger. Because the items would measure five different situations, the number of consequences was limited to three positive and four negative.
Positive Refusal Expectations: would be seen as strong, would be respected more, friends would say “ok”.

Negative Refusal Expectations: friends will continue to hassle me to smoke, friends will no longer want to be my friend, friends will call me names like wimp, I would be excluded from group activities.

Refusal Outcome Expectancies: Decision was made to use the scale of “important to unimportant” to measure students’ value of the expectations. The rationale was that “important/unimportant” were words and concepts that a sixth grader comprehended.

Smoking Behavior: Similar to previous researchers, students would be asked about smoking in the past week, month, year and in lifetime. Students would write in an actual number.

• Instrument Item Scales: Initially, a Likert type scale was developed for all four constructs. A sample item is below:

<table>
<thead>
<tr>
<th>My friend would think I am strong.</th>
<th>[-----------------------------]</th>
<th>[-----------------------------]</th>
<th>[-----------------------------]</th>
<th>[-----------------------------]</th>
</tr>
</thead>
<tbody>
<tr>
<td>Would</td>
<td>Likely to</td>
<td>Likely to</td>
<td>Would</td>
<td></td>
</tr>
<tr>
<td>Definitely</td>
<td>Happen</td>
<td>Not Happen</td>
<td>Definitely</td>
<td></td>
</tr>
<tr>
<td>Happen</td>
<td></td>
<td></td>
<td>Not Happen</td>
<td></td>
</tr>
</tbody>
</table>

After generating a pool of 28 items to measure refusal expectations and placing the items in the above scaling format, the researcher decided that this format was too difficult to read. The researcher switched to a vertical format, the format of the final instrument.

March 1997: Instruments to Panel of Experts, Field Testing & Pilot Testing

Instrument was sent to panel of experts on March 2, 1997. See Appendix B for copies of communication to panel and for copy of instrument sent to panel.

• Cycle One of Draft to Panel of Experts: recommended changes are listed below.

Note: No clean copy of the original instrument exists.

Refusal Skill-Efficacy: (1) Deleted the “stranger” from all measurement. Rationale of panel was that a stranger was too much of an abstract thought for sixth graders. (2) Change “seventh grader” to “an older student”. Rationale of panel was that an older student more accurately reflected the item’s intent. (3) There was concern from one panel member about the scaling, particularly for “somewhat sure” and “somewhat unsure”. The researcher brainstormed other options with two panel members and could not develop a different scale. Scaling was kept as is and on second draft, suggestions were asked of other panel members. (4) One panel member asked the researcher to check comprehension of “admire” on the field test.
Behavioral Capability to Resist Positive Images of Smoking: (1) Changed wording of question for tobacco ads from “Based upon images and words in this advertisement: (select one answer)” to “What message do you think the tobacco company is trying to tell you in this advertisement?” (2) Removed “teens are more attractive” as a possible response from the Merit advertisement so that the correct answer was more obvious. (3) Replaced one of the Joe Cool advertisements so that only one out of the four ads was of Joe Cool. (4) Suggestion was made by one panel member to remove “none of the above” as a response option for advertisement questions. Decision was made to test “none of the above” in field test.

Refusal Outcome Expectations: (1) Changed expectation of “strong” to “smart”. Rationale of panel was that strong could imply physically or mentally strong. (2) Changed scoring from 0 to 3 to 1 to 4. This was done so that multiplication of factors could be done.

Refusal Outcome Expectancies: (1) see expectation note (2), above.

Second Cycle of Comments from Panel of Experts:
Refusal Skill-Efficacy: (1) No suggestions were made by panel for improvement of the scaling, particularly “somewhat sure” and “somewhat unsure”. The decision was made to keep the scaling since none of three students in the field test had problems comprehending the scale. Results from pilot would be reviewed prior to the use of this scale in the actual study. (2) “admire” was not changed in that there were no problems of comprehension from the field test.

Behavioral Capability to Resist Positive Images of Smoking: (1) Reduced the number of response options for tobacco advertisements from five to four. (2) Changed the word “states” to “show” for truthfulness items. (3) Kept “none of the above” as a response option. (4) Changed the scale for coding responses: correct answers = 3 (changed from 1); incorrect answers = 0 (unchanged). The rationale for increasing correct answers to “3” was to have to similar range of scores for all constructs. With this change, all construct items were now measured with a scale range of four points between the low and high value.

Refusal Expectations: (1) Option one was selected as the scoring method. This method multiplied the expectation by the respective expectancy. Petosa and Hallam both noted that expectations and expectancies do not, as the SCT describes, exist without the other and should not be measured as separate from one another.

Refusal Expectancies: (1) see expectation note (1), above.

Smoking: (1) Concern was raised by one panel member regarding the stability of answers for students to write in actual number of cigarettes for use in past year and in lifetime. Researcher referenced previous questionnaire items (Hansen, et al., 1988) to develop categories. Categories were added for use in past 365 days and in lifetime. Rationale for changing responses to categories was that for the purpose of my study, the category of use was of interest, not the number of cigarettes. (2) Moved smoking questions to end of the questionnaire. Rationale was that the most sensitive questions should be at the end of a questionnaire.
• Field Testing: The researcher met individually with three sixth graders, not included in the target population, to review the instrument. Field test subjects were a nephew of a colleague and two students from a Safe Sitter class being offered by the researcher's office. All field tests took place while panel members were reviewing the second draft of the instrument. Changes from the field test are listed below:
(1) Italicized key words in questions such as "best friend", "older student" and "at school".
(2) Italicized the word "older" in identifier question of older brothers and older sisters.
(3) One student recommended categories for smoking responses.

• Pilot Test: The instrument was piloted with a class of 25 sixth-graders. Arrangements were made with the school's principal to pilot test the instrument in two classes of sixth graders. The day of testing, only one class had been informed of the testing and the principal was out for the week. The initial date of testing was March 19, 1997. The retest date was March 26, 1997. Validity and reliability results are listed in Appendix D. For the number of cigarettes smoked in the past 30 days, one student reported an increase of 15 cigarettes. The researcher interpreted this as more of a change in behavior other than an unstable answer. Thus, this answer was not included in data analysis. There were no changes in the instrument from pilot to use in the study.

April 1997: Confirmatory Factor Analysis
• Pretest data from the sample was used for the confirmatory factor analysis. There were 166 usable data sets. Results are listed in Table A.2. The SAS job control language was:
PROC FACTOR DATA=SMOKE METHOD=ML NFACTOR=6 ROTATE=VARIMAX SCREE;
TITLE CONFIRMATORY FACTOR ANALYSIS;
VAR BSTSMRT BSTSPT BSTOK GRPSMRT GRPRSPT GRPOK OLDSMRT OLDRSPT OLDOK
BSTHSSL BSTNOFR BSTWIMP BSTOUT GRPHSSL GRPNOFR GRPWIMP GRPOUT OLDHSSL
OLDNOFR OLWDIMP OLDDOUT
IPSTSM IPBSTAP IPBSTAP IPGRPSM IPGRPRP IPGRPAP IPOLDSM IPOLDRP IPOLDAP
IPBSTHS IPBSTFR IPBSTWP IPBSTGR IPGRPHS IPGRPFR IPGRPWP IPGRPGR IPOLDHS
IPOLDFR IPOLDWP IPOLDGR
HSBSTNO HSOLDNO HSGRPN0 HSCWBST HSCWOLD HSCWGRO HSRPBST HSRPOLD
HSRPGRO HANGING SLSBSTNO SLOLDNO SLSGPNO SLCWBST SLCWOLD SLCWGRO
SLRPBST SLRPOLD SLRPGRP AVOID
KNOW1 KNOW2 KNOW3 KNOW4 TRUATTR TRUCOOL TRUFUN TRUBAD IFIATTR
IFICOLL IFIFUN IFIBAD;
APPENDIX B

COMMUNICATION & INSTRUMENT DRAFT
SENT TO PANEL OF EXPERTS
MEMO

To: Jan Henderson, PhD; Jeff Hallam, PhD; Anne Haye; Rick Petosa, PhD
From: Marietta Langlois
Subject: Instrument, Draft #1
Date: March 2, 1997

A - Enclosed is draft #1 of my instrument. There are 6 sections:
   1 - Demographics & Identifier Questions
   2 - Stage of Smoking
   3 - Construct of “Behavioral Capability to Resist Positive Images of Smoking
   4 - Construct of “Refusal Skill Efficacy”
   5 - Construct of “Refusal Outcome Expectations”
   6 - Construct of Refusal Outcome Expectancies”

B - Directions for Panel of Experts: Please read the definition of each construct at the beginning of each section. Then evaluate each item for face validity, based upon the definition given. Also assess clarity or readability of each item. Please also assess construct validity. Write comments directly on your draft of the instrument. A few points/definitions to keep in mind:
   » Sixth grade students will be completing the instrument
   » Face Validity: does the item look like it is measuring the defined term.
   » Construct Validity: recognizing that not every question can be asked, does the sampling of items adequately measured the construct, as defined.

C - Returning the instrument with your comments: Because I am under a short time line, faxing your responses would help me tremendously. If you could fax your responses on Friday, March 7, then I could work on revisions over the weekend. I have included a fax cover sheet. If this is not feasible, questionnaires can be mailed to me at : XXXXXXXXXXX

D - Next Steps: After reviewing & incorporating your comments, I will then send out one more draft for your review. I then hope to begin piloting the instrument March 19. After I have received your comments from the first draft, I will also conduct a field test with a sixth grader.

Thanks Again!!! If you have questions, concerns, etc., please call me at XXXXXXX.
MEMO

To: Jan Henderson, Jeff Hallam, Rick Petosa, Anne Haye
From: Marietta Langlois
Subject: Instrument Second Draft
Date: March 10, 1997

Attached is the second draft of the instrument. Noticeable changes include:

- Removing “the stranger” from the situations included on the instrument.
- Changing the answer options on the advertisement pieces (so that the correct answer is more distinguishable).
- Changing the title of the “seventh grader I admire” to “an older student I admire”.

I have highlighted notes in places where I am undecided and interested in your comments. These include:

- Option of changing the scoring/coding of the construct, refusal outcome expectations.
- Changing the item responses on refusal skill efficacy

If you could get your comments to me by Friday, March 14, I would greatly appreciate it. I will be field testing the instrument this week and have plans to pilot it on Wednesday, the 19th (with a retest on the 26th). As a note, the school that I am piloting the instrument in has two sixth grade classes. I’m thinking I will just pass out the instrument in one class & read the instrument in the other.

Thanks again.
This survey asks questions about smoking. Your answers will be used to plan educational programs in your school. The honesty of your answers is very important. Please be truthful in answering all the questions. Do NOT put your name on this survey. No one will know your answers and this will not affect your grade in school.

Please read all the questions carefully. Some of the questions look the same, but have small, important differences. If you have questions, please raise your hand. Thank you for your time.

How old are you? (write in a number)

What is the month of your birthday? (write in a month)

What sex are you? (please check one answer)
  □ male
  □ female

What is your race? (please check one answer)
  □ African American
  □ White
  □ Asian American
  □ American Indian
  □ Hispanic
  □ other

How many older brothers do you have? (write in a number)

How many older sisters do you have? (write in a number)

PLEASE TURN TO THE NEXT PAGE TO BEGIN THE SURVEY.
How many cigarettes have you smoked in the past 7 days (week)?
____________ (write in a number)

How many cigarettes have you smoked in the past 30 days (month)?
____________ (write in a number)

How many cigarettes have you smoked in the past 365 days (year)?
____________ (write in a number)

How many cigarettes have you smoked in your life?
____________ (write in a number)
Behavioral capability to resist the positive images of smoking: is one's ability to identify, evaluate the truthfulness and reject favorable images of smoking presented through media and adult modeling.

Part A: Ad messages
This is knowledge and will be scored 1 for correct answer, 0 for all others.
4 questions. Possible points = 4
Note: field test and may remove “none if the above” option

Part B: Truthfulness of message
Likert scale, 0 - 3
truthful = 0
a little truthful = 1
a little untruthful = 2
untruthful = 3
4 questions. Possible points = 0 to 12

Part C: Ability to reject image
Likert scale, 0 - 3
strongly agree = 0
agree = 1
disagree = 2
strongly disagree = 3
4 questions. Possible points 0 to 12 possible points

* There will be ONE score, 0 to 28 points
Interpretation: the higher the points, the higher the skill level to resist positive images of smoking.
What message do you think the tobacco company is trying to tell you in this advertisement: (select one answer)

- teens who smoke have more friends
- teens can choose cigarettes which are not bad for their health
- teens who smoke are "cool"
- smoking is bad for teens
- none of the above

*Readable/Clear: □ yes □ no: explain ____________________________
*Face Valid: □ yes □ no: explain ____________________________

296
What message do you think the tobacco company is trying to tell you in this advertisement: (select one answer)

- Teens who smoke are attractive to other people
- Teens who smoke have more friends
- Teens who smoke this brand get free stuff
- Teens who smoke will get in trouble
- none of the above

*Readable/Clear: □yes □no: explain

*Face Valid: □yes □no: explain

297
What message do you think the tobacco company is trying to tell you in this advertisement: (select one answer)

- Teens who smoke will get in trouble
- Teens can choose cigarettes which are not bad for their health
- Teens who smoke are "cool"
- Teens who smoke this brand get free stuff
- none of the above

*Readable/Clear: [ ] yes [ ] no: explain ________________________________
*Face Valid: [ ] yes [ ] no: explain ________________________________
What message do you think the tobacco company is trying to tell you in this advertisement: (select one answer)

- Teens who smoke will get in trouble
- Smoking is bad for your health
- Teens who smoke have lot more fun
- Teens can choose cigarettes which are not bad for their health
- none of the above

*Readable/Clear:  □ yes  □ no: explain _______________________________
*Face Valid:  □ yes  □ no: explain _______________________________

299
How truthful are advertising messages that state that teens who smoke are attractive to others?
- Truthful
- A little truthful
- A little untruthful
- Untruthful
*Readable/Clear: □ yes □ no: explain _________________________________
*Face Valid: □ yes □ no: explain _________________________________

How truthful are advertising messages that state that teens who smoke are "cool"?
- Truthful
- A little truthful
- A little untruthful
- Untruthful
*Readable/Clear: □ yes □ no: explain _________________________________
*Face Valid: □ yes □ no: explain _________________________________

How truthful are advertising messages that state that teens who smoke have lots of fun?
- Truthful
- A little truthful
- A little untruthful
- Untruthful
*Readable/Clear: □ yes □ no: explain _________________________________
*Face Valid: □ yes □ no: explain _________________________________

How truthful are advertising messages that state low tar and low nicotine cigarettes are not bad for your health?
- Truthful
- A little truthful
- A little untruthful
- Untruthful
*Readable/Clear: □ yes □ no: explain _________________________________
*Face Valid: □ yes □ no: explain _________________________________

If I smoked, I would be more attractive to others.
- Strongly agree
- Agree somewhat
- Disagree somewhat
- Strongly disagree
*Readable/Clear: □ yes □ no: explain _________________________________
*Face Valid: □ yes □ no: explain _________________________________
If I smoked, I would be “cool”:
- Strongly agree
- Agree somewhat
- Disagree somewhat
- Strongly disagree
*Readable/Clear: □yes □no: explain ________________________________
*Face Valid: □yes □no: explain ________________________________

If I smoked, I would have lots more fun:
- Strongly agree
- Agree somewhat
- Disagree somewhat
- Strongly disagree
*Readable/Clear: □yes □no: explain ________________________________
*Face Valid: □yes □no: explain ________________________________

If I smoked, I could choose cigarettes which are not bad for my health:
- Strongly agree
- Agree somewhat
- Disagree somewhat
- Strongly disagree
*Readable/Clear: □yes □no: explain ________________________________
*Face Valid: □yes □no: explain ________________________________

*Construct Validity: Does the above sampling of items measure the construct, behavioral capability to resist the positive images of smoking?
- yes
- no, please explain or make suggestions
Refusal Skill Efficacy: one's perceived ability to refuse direct, indirect, hassle and put down type cigarette offers made by best friends, groups of friends and older students.

Refusal Skill Efficacy: likert scales
very sure = 3
somewhat sure = 2
somewhat unsure = 1
very unsure = 0

3 questions X 3 situations, plus one indirect/environment question = 10 x 2 stories = 20 questions.

One score, 0 to 60
Interpretation: The higher the score, the higher the refusal skill efficacy

Questions pertaining to direct pressure: 1 - 3 & 11 - 13
Questions pertaining to indirect pressure: 10 & 20
Questions pertaining to hassle pressure: 7 - 9 & 17 - 19
Questions pertaining to put down pressure: 4 - 6 & 14 - 16
Directions: Read the short story below. Imagine you and your friends in that situation. Answer the questions that follow as if you are in the situation described in the story. There are no right or wrong answers. For each question, choose only one answer. Follow these same directions for story #2.

Note to panel: There is concern about the scaling for these items; particularly "somewhat unsure". I will pilot and see how this goes. One suggestion was to change the two un-sures to "somewhat sure that I could not say ‘no’” & “very sure that I could not say ‘no’”. Your thoughts?

Story #1: Imagine that you are hanging out with friends at a friend’s house. You are having fun. While getting some food, you’re offered a cigarette.

How sure are you that you could say “no” to the cigarette offer and not smoke:
1. If the person who asked you to smoke was your best friend?
   - [ ] I am very sure that I could say “no” to my best friend
   - [ ] I am somewhat sure that I could say “no” to my best friend
   - [ ] I am somewhat unsure that I could say “no” to my best friend
   - [ ] I am very unsure that I could say “no” to my best friend

   *Readable/Clear: [ ] yes [ ] no: explain _________________________________
   *Face Valid: [ ] yes [ ] no: explain _________________________________

2. If the person who asked you to smoke was an older student that you admired?
   - [ ] I am very sure that I could say “no” to an older student that I admired
   - [ ] I am somewhat sure that I could say “no” to an older student that I admired
   - [ ] I am somewhat unsure that I could say “no” to an older student that I admired
   - [ ] I am very unsure that I could say “no” to an older student that I admired

   *Readable/Clear: [ ] yes [ ] no: explain _________________________________
   *Face Valid: [ ] yes [ ] no: explain _________________________________

3. If it was a group of your friends who asked you to smoke?
   - [ ] I am very sure that I could say “no” to a group of my friends
   - [ ] I am somewhat sure that I could say “no” to a group of my friends
   - [ ] I am somewhat unsure that I could say “no” to a group of my friends
   - [ ] I am very unsure that I could say “no” to a group of my friends

   *Readable/Clear: [ ] yes [ ] no: explain _________________________________
   *Face Valid: [ ] yes [ ] no: explain _________________________________

How sure are you that you could say “no” to the cigarette offer and not smoke:
4. If your best friend called you a coward for not smoking?
   - [ ] I am very sure that I could say “no” to my best friend
   - [ ] I am somewhat sure that I could say “no” to my best friend
   - [ ] I am somewhat unsure that I could say “no” to my best friend
   - [ ] I am very unsure that I could say “no” to my best friend

   *Readable/Clear: [ ] yes [ ] no: explain _________________________________
   *Face Valid: [ ] yes [ ] no: explain _________________________________

5. If an older student you admired called you a coward for not smoking?
   □ I am very sure that I could say “no” to an older student that I admired
   □ I am somewhat sure that I could say “no” to an older student that I admired
   □ I am somewhat unsure that I could say “no” to an older student that I admired
   □ I am very unsure that I could say “no” to an older student that I admired

   *Readable/Clear: □yes □ne: explain _______________________________
   *Face Valid: □yes □ne: explain _______________________________

6. If a group of your friends called you a coward for not smoking?
   □ I am very sure that I could say “no” to a group of my friends
   □ I am somewhat sure that I could say “no” to a group of my friends
   □ I am somewhat unsure that I could say “no” to a group of my friends
   □ I am very unsure that I could say “no” to a group of my friends

   *Readable/Clear: □yes □ne: explain _______________________________
   *Face Valid: □yes □ne: explain _______________________________

How sure are you could continue to say “no” and not smoke:

7. If your best friend repeatedly kept asking you to smoke?
   □ I am very sure that I could continue to say “no” to my best friend
   □ I am somewhat sure that I could continue to say “no” to my best friend
   □ I am somewhat unsure that I could continue to say “no” to my best friend
   □ I am very unsure that I could continue to say “no” to my best friend

   *Readable/Clear: □yes □ne: explain _______________________________
   *Face Valid: □yes □ne: explain _______________________________

8. If an older student you admired repeatedly kept asking you to smoke?
   □ I am very sure that I could continue to say “no” to an older student that I admired
   □ I am somewhat sure that I could continue to say “no” to an older student that I admired
   □ I am somewhat unsure that I could continue to say “no” to an older student that I admired
   □ I am very unsure that I could continue to say “no” to an older student that I admired

   *Readable/Clear: □yes □ne: explain _______________________________
   *Face Valid: □yes □ne: explain _______________________________

9. If a group of your friends repeatedly kept asking you to smoke?
   □ I am very sure that I could continue to say “no” to a group of my friends
   □ I am somewhat sure that I could continue to say “no” to a group of my friends
   □ I am somewhat unsure that I could continue to say “no” to a group of my friends
   □ I am very unsure that I could continue to say “no” to a group of my friends

   *Readable/Clear: □yes □ne: explain _______________________________
   *Face Valid: □yes □ne: explain _______________________________
10. How sure are you that you could avoid hanging out after school in places where kids smoked cigarettes?
   - I am very sure
   - I am somewhat sure
   - I am somewhat unsure
   - I am very unsure
   *Readable/Clear: □yes □no: explain
   *Face Valid: □yes □no: explain

(Note...will start a new page on actual instrument)

Story #2: Imagine that you are at school and the bell rings for lunch time. On your way to the cafeteria, you go into the restroom. While in the restroom you are offered a cigarette.

How sure are you that you could refuse the cigarette offer and not smoke:

11. If the person who asked you to smoke was your best friend?
   - I am very sure that I could say "no" to my best friend
   - I am somewhat sure that I could say "no" to my best friend
   - I am somewhat unsure that I could say "no" to my best friend
   - I am very unsure that I could say "no" to my best friend
   *Readable/Clear: □yes □no: explain
   *Face Valid: □yes □no: explain

12. If the person who asked you to smoke was an older student that you admired?
   - I am very sure that I could say "no" to an older student that I admired
   - I am somewhat sure that I could say "no" to an older student that I admired
   - I am somewhat unsure that I could say "no" to an older student that I admired
   - I am very unsure that I could say "no" to an older student that I admired
   *Readable/Clear: □yes □no: explain
   *Face Valid: □yes □no: explain

13. If it was a group of your friends who asked you to smoke?
   - I am very sure that I could say "no" to a group of my friends
   - I am somewhat sure that I could say "no" to a group of my friends
   - I am somewhat unsure that I could say "no" to a group of my friends
   - I am very unsure that I could say "no" to a group of my friends
   *Readable/Clear: □yes □no: explain
   *Face Valid: □yes □no: explain
How sure are you that you could say “no” to the cigarette offer and not smoke:

14. If your best friend called you a coward for not smoking?
   □ I am very sure that I could say “no” to my best friend
   □ I am somewhat sure that I could say “no” to my best friend
   □ I am somewhat unsure that I could say “no” to my best friend
   □ I am very unsure that I could say “no” to my best friend

*Readable/Clear: □yes □no: explain _________________________________
*Face Valid: □yes □no: explain _________________________________

15. If an older student you admired called you a coward for not smoking?
   □ I am very sure that I could say “no” to an older student that I admired
   □ I am somewhat sure that I could say “no” to an older student that I admired
   □ I am somewhat unsure that I could say “no” to an older student that I admired
   □ I am very unsure that I could say “no” to an older student that I admired

*Readable/Clear: □yes □no: explain _________________________________
*Face Valid: □yes □no: explain _________________________________

16. If a group of your friends called you a coward for not smoking?
   □ I am very sure that I could say “no” to a group of my friends
   □ I am somewhat sure that I could say “no” to a group of my friends
   □ I am somewhat unsure that I could say “no” to a group of my friends
   □ I am very unsure that I could say “no” to a group of my friends

*Readable/Clear: □yes □no: explain _________________________________
*Face Valid: □yes □no: explain _________________________________

How sure are you could continue to say “no” and not smoke:

17. If your best friend kept asking you to smoke even after you said “no”?
   □ I am very sure that I could continue to say “no” to my best friend
   □ I am somewhat sure that I could continue to say “no” to my best friend
   □ I am somewhat unsure that I could continue to say “no” to my best friend
   □ I am very unsure that I could continue to say “no” to my best friend

*Readable/Clear: □yes □no: explain _________________________________
*Face Valid: □yes □no: explain _________________________________

18. If an older student you admired kept asking you to smoke even after you said “no”?
   □ I am very sure that I could continue to say “no” to an older student that I admired
   □ I am somewhat sure that I could continue to say “no” to an older student that I admired
   □ I am somewhat unsure that I could continue to say “no” to an older student that I admired
   □ I am very unsure that I could continue to say “no” to an older student that I admired

*Readable/Clear: □yes □no: explain _________________________________
*Face Valid: □yes □no: explain _________________________________
19. If a group of your friends kept asking you to smoke even after you said “no”?
   □ I am very sure that I could continue to say “no” to a group of my friends
   □ I am somewhat sure that I could continue to say “no” to a group of my friends
   □ I am somewhat unsure that I could continue to say “no” to a group of my friends
   □ I am very unsure that I could continue to say “no” to a group of my friends

*Readable/Clear: □ yes □ no: explain _________________________________
*Face Valid: □ yes □ no: explain _________________________________

20. How sure are you that you could avoid places at school where kids smoked cigarettes?
   □ I am very sure
   □ I am somewhat sure
   □ I am somewhat unsure
   □ I am very unsure

*Readable/Clear: □ yes □ no: explain _________________________________
*Face Valid: □ yes □ no: explain _________________________________

*Construct Validity: Does the above sampling of items measure the construct, refusal skill efficacy?
   □ yes
   □ no, please explain or make suggestions

307
Refusal Outcome Expectations: expected positive and negative social consequences from refusing cigarette offers from friends and older students.

Questions pertaining to negative social consequences: 1-3, 8-10 & 15 - 17.

Questions pertaining to positive social consequences: 4-7, 11-14 & 18-21.

**Two Options for Scoring (I'm leaning toward option 2)**

Option 1: Refusal Outcome Expectations Scoring, likert scales
(zero's removed so that these scores can be multiplied by expectancies)
- would definitely happen = 4
- might happen = 3
- might not happen = 2
- would definitely not happen = 1

*Two sub-scales: (note to panel, sub-scales are new)*
- A- positive expectations: 3 questions x 3 situations = 9 items
- B- negative expectations: 4 questions x 3 situations = 12 items

*Then expectations item score multiplied by the respective expectancies.
- very important = 4
- important = 3
- unimportant = 2
- very unimportant = 1

Totaling Possible Scoring
- A- Positive expectancies: 9 (9 items X 1) thru 144 (9 items X 16)
  Interpretation: The higher the score the more the student expects positive outcomes from refusing cigarette offers.

- B- Negative expectancies: 12 (12 items X 1) thru 192 (12 items X 16)
  Interpretation: The higher the score the more the student expects negative outcomes from refusing cigarette offers.

**Option 2:**
Expectations & Expectancies scored as different constructs

*Expectations* coded as above, except the negative items would be reverse coded.
Interpretation: The higher the score, the higher the expectations for positive outcomes from refusing cigarettes

*Expectancies:*
- very important = 4
- important = 3
- unimportant = 2
- very unimportant = 1
Interpretation: The higher the score, the more important peer acceptance is to the student.
**Directions:** Imagine you were hanging out with friends and your best friend offers you a cigarette. Which of the following things do you think would occur if you said “no” to the cigarette offer? Check only one answer per statement.

- **My friend would think I am smart.**
  - □ would definitely happen
  - □ might happen
  - □ might not happen
  - □ would definitely not happen

*Readable/Clear: Yes □: explain
*Face Valid: □: explain

- **He or she would no longer be my friend.**
  - □ would definitely happen
  - □ might happen
  - □ might not happen
  - □ would definitely not happen

*Readable/Clear: Yes □: explain
*Face Valid: □: explain

- **My friend would respect me more.**
  - □ would definitely happen
  - □ might happen
  - □ might not happen
  - □ would definitely not happen

*Readable/Clear: Yes □: explain
*Face Valid: □: explain

- **My friend would call me names like “wimp”.**
  - □ would definitely happen
  - □ might happen
  - □ might not happen
  - □ would definitely not happen

*Readable/Clear: Yes □: explain
*Face Valid: □: explain

- **My friend would say “ok”.**
  - □ would definitely happen
  - □ might happen
  - □ might not happen
  - □ would definitely not happen

*Readable/Clear: Yes □: explain
*Face Valid: □: explain

- **My friend would leave me out of group activities.**
  - □ would definitely happen
  - □ might happen
  - □ might not happen
  - □ would definitely not happen

*Readable/Clear: Yes □: explain
*Face Valid: □: explain

- **My friend would continue to hassle me to smoke.**
  - □ would definitely happen
  - □ might happen
  - □ might not happen
  - □ would definitely not happen

*Readable/Clear: Yes □: explain
*Face Valid: □: explain
Directions: Imagine you were hanging out with a group of friends and one of them offers you a cigarette. Which of the following things do you think would occur if you said “no” to the cigarette offer? Check only one answer per statement.

My friends would think I am smart:
- □ would definitely happen
- □ might happen
- □ might not happen
- □ would definitely not happen
*Readable/Clear: Yes □ No: explain
*Face Valid: Yes □ No: explain

The group would no longer be my friends.
- □ would definitely happen
- □ might happen
- □ might not happen
- □ would definitely not happen
*Readable/Clear: Yes □ No: explain
*Face Valid: Yes □ No: explain

My friends would respect me more.
- □ would definitely happen
- □ might happen
- □ might not happen
- □ would definitely not happen
*Readable/Clear: Yes □ No: explain
*Face Valid: Yes □ No: explain

My friends would call me names like “wimp”.
- □ would definitely happen
- □ might happen
- □ might not happen
- □ would definitely not happen
*Readable/Clear: Yes □ No: explain
*Face Valid: Yes □ No: explain

My friends would leave me out of group activities.
- □ would definitely happen
- □ might happen
- □ might not happen
- □ would definitely not happen
*Readable/Clear: Yes □ No: explain
*Face Valid: Yes □ No: explain

My friends would say “ok”.
- □ would definitely happen
- □ might happen
- □ might not happen
- □ would definitely not happen
*Readable/Clear: Yes □ No: explain
*Face Valid: Yes □ No: explain

My friends would continue to hassle me to smoke.
- □ would definitely happen
- □ might happen
- □ might not happen
- □ would definitely not happen
*Readable/Clear: Yes □ No: explain
*Face Valid: Yes □ No: explain
Directions: Imagine you were hanging out with friends and an older student you admire offers you a cigarette. Which of the following things do you think would occur if you said “no” to the cigarette offer? Check only one answer per statement.

The older student would think I am smart.
- [ ] would definitely happen
- [ ] might happen
- [ ] might not happen
- [ ] would definitely not happen

The older student would respect me more.
- [ ] would definitely happen
- [ ] might happen
- [ ] might not happen
- [ ] would definitely not happen

The older student would call me names like “wimp”.
- [ ] would definitely happen
- [ ] might happen
- [ ] might not happen
- [ ] would definitely not happen

The older student would continue to hassle me to smoke.
- [ ] would definitely happen
- [ ] might happen
- [ ] might not happen
- [ ] would definitely not happen

He or she would not be my friend.
- [ ] would definitely happen
- [ ] might happen
- [ ] might not happen
- [ ] would definitely not happen

The older student would say “ok”.
- [ ] would definitely happen
- [ ] might happen
- [ ] might not happen
- [ ] would definitely not happen

The older student would leave me out of group activities.
- [ ] would definitely happen
- [ ] might happen
- [ ] might not happen
- [ ] would definitely not happen

*Construct Validity: Does the above sampling of items measure the construct, refusal outcome expectations?*

- [ ] yes
- [ ] no, please explain or make suggestions
Refusal Outcome Expectancies: the value, important or unimportant, that an individual places on a refusal outcome expectation.

Directions: The following questions ask how important certain things are to you. Read the statement and then pick the answer that describes how you feel about each statement. There are no right or wrong answers. Pick only one answer per question.

Having my best friend think that I am smart.
- very important
- important
- unimportant
- very unimportant

- very important
- important
- unimportant
- very unimportant

*Readable/Clear: Yes Yes: explain

*Face Valid: Yes Yes: explain

Keeping my best friend as my friend.
- very important
- important
- unimportant
- very unimportant

*Readable/Clear: Yes Yes: explain

*Face Valid: Yes Yes: explain

To not be called names like “wimp” by my best friend.
- very important
- important
- unimportant
- very unimportant

*Readable/Clear: Yes Yes: explain

*Face Valid: Yes Yes: explain

Being included in group activities with my best friend.
- very important
- important
- unimportant
- very unimportant

*Readable/Clear: Yes Yes: explain

*Face Valid: Yes Yes: explain

Having a group of my friends think that I am smart.
- very important
- important
- unimportant
- very unimportant

*Readable/Clear: Yes Yes: explain

*Face Valid: Yes Yes: explain

Having a group of my friends respect me.
- very important
Having the approval of a group of my friends.

- very important
- important
- unimportant
- very unimportant

*Readable/Clear: Yes One: explain

*Face Valid: Yes One: explain

Having a group of my friends not hassle me to smoke.

- very important
- important
- unimportant
- very unimportant

*Readable/Clear: Yes One: explain

*Face Valid: Yes One: explain

Keeping a group of friends as my friends.

- very important
- important
- unimportant
- very unimportant

*Readable/Clear: Yes One: explain

*Face Valid: Yes One: explain

To not be called names like "wimp" by a group of friends.

- very important
- important
- unimportant
- very unimportant

*Readable/Clear: Yes One: explain

*Face Valid: Yes One: explain

Being included in group activities with a group of friends.
Having an older student that I admire think that I am smart.

- very important
- important
- unimportant
- very unimportant

*Readable/Clear: Yes One: explain

*Face Valid: Yes One: explain

Having an older student that I admire respect me.

- very important
- important
- unimportant
- very unimportant

*Readable/Clear: Yes One: explain

*Face Valid: Yes One: explain

Having the approval of an older student that I admire.

- very important
- important
- unimportant
- very unimportant

*Readable/Clear: Yes One: explain

*Face Valid: Yes One: explain

Having a seventh grader that I admire not hassle me to smoke.

- very important
- important
- unimportant
- very unimportant

*Readable/Clear: Yes One: explain

*Face Valid: Yes One: explain

Having an older student that I admire as a friend.

- very important
- important
- unimportant
- very unimportant

*Readable/Clear: Yes One: explain

*Face Valid: Yes One: explain

To not be called names like “wimp” by an older student that I admire.

- very important
- important
- unimportant
- very unimportant

*Readable/Clear: Yes One: explain

*Face Valid: Yes One: explain

Being included in group activities with an older student that I admire.

- very important
- important
- unimportant
- very unimportant

*Readable/Clear: Yes One: explain

*Face Valid: Yes One: explain

*Construct Validity: Does the above sampling of items measure the construct, refusal outcome expectancies?

- yes
- no, please explain or make suggestions
APPENDIX C

DIRECTIONS FOR COMPLETING STUDENT QUESTIONNAIRE
Directions for Completing Student Questionnaire

Research Staff: Read these directions to students each time you administer the questionnaire.

“My name is _______________ and I work for Middletown Regional Hospital. This questionnaire will help us plan educational programs in your school.

Do not put you name on the questionnaire. No one, neither me, nor your teachers nor your parents, will know how you answered these questions. The honesty of your answers is very important. Please be truthful in answering the questions. You will not get in trouble for your answers.

Answer all the questions. Some of the questions look the same but have small, important differences. If you have questions, please raise your hand.

Once you have answered all the questions, please turn your survey over, until everyone is done. We will then ask you to put them in this envelope.”

Research Staff: Directions for Collection

Once all questionnaires are in envelope:
1 - close envelope.
2 - write on the outside: - teacher’s name
   - school name
   - today’s date
   - the number of students in the room (gathered by counting the students).
3 - get the name of absent students from teacher and write names on envelope.
APPENDIX D

RELIABILITY & VALIDITY RESULTS
FROM INSTRUMENT PILOT TEST
<table>
<thead>
<tr>
<th>Variable</th>
<th>Cronbach's ( \alpha )</th>
<th>Test/Retest ( r )</th>
<th>Mean</th>
<th>SD</th>
<th>Actual Range of Scores</th>
<th>Possible Range of Scores</th>
</tr>
</thead>
<tbody>
<tr>
<td>Behavioral Capability to Resist Positive Images of Smoking</td>
<td>0.80(^{**})</td>
<td>0.89(^{**})</td>
<td>22.4</td>
<td>5.4</td>
<td>14 - 28</td>
<td>0 - 28</td>
</tr>
<tr>
<td>Positive Expectations</td>
<td>0.65(^{**})</td>
<td>0.69(^{**})</td>
<td>22.9</td>
<td>4.16</td>
<td>10 - 30</td>
<td>9 - 36</td>
</tr>
<tr>
<td>Negative Expectations</td>
<td>0.88(^{**})</td>
<td>0.64(^{**})</td>
<td>30.7</td>
<td>8.38</td>
<td>12 - 42</td>
<td>12 - 48</td>
</tr>
<tr>
<td>Positive Expectancies</td>
<td>0.86(^{**})</td>
<td>0.85(^{**})</td>
<td>28.4</td>
<td>5.1</td>
<td>17 - 36</td>
<td>9 - 36</td>
</tr>
<tr>
<td>Negative Expectancies</td>
<td>0.87(^{**})</td>
<td>0.71(^{**})</td>
<td>41.8</td>
<td>5.4</td>
<td>31 - 48</td>
<td>12 - 48</td>
</tr>
<tr>
<td>Positive Expectancies X Expectancies</td>
<td>0.74(^{**})</td>
<td>0.74(^{**})</td>
<td>72.6</td>
<td>19.0</td>
<td>37 - 99</td>
<td>9 - 144</td>
</tr>
<tr>
<td>Negative Expectancies X Expectancies</td>
<td>0.89(^{**})</td>
<td>0.74(^{**})</td>
<td>106.1</td>
<td>34.2</td>
<td>41 - 160</td>
<td>12 - 192</td>
</tr>
<tr>
<td>Refusal Skill-Efficacy</td>
<td>0.98(^{**})</td>
<td>0.80(^{**})</td>
<td>46.8</td>
<td>15.8</td>
<td>8 - 60</td>
<td>0 - 60</td>
</tr>
<tr>
<td>Use in Past 7 Days</td>
<td>n/a</td>
<td>not calculable</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0 - ( \infty )</td>
</tr>
<tr>
<td>Use in Past 30 Days</td>
<td>n/a</td>
<td>0.63(^{*})</td>
<td>1.1</td>
<td>3.2</td>
<td>0 - 15</td>
<td>0 - ( \infty )</td>
</tr>
<tr>
<td>Use in Past 365 Days*</td>
<td>n/a</td>
<td>0.76(^{**})</td>
<td>n/a</td>
<td>n/a</td>
<td>0 - 6</td>
<td>0 - 6</td>
</tr>
<tr>
<td>Use in Life*</td>
<td>n/a</td>
<td>0.74(^{**})</td>
<td>n/a</td>
<td>n/a</td>
<td>0 - 6</td>
<td>0 - 6</td>
</tr>
</tbody>
</table>

**Note.** Test Date, March 19, 1997; Retest date, March 26, 1997. \( N = 23 \).

\(^{**} p \leq .001, ^{*} p \leq .002. ^{\wedge} = \text{categorical data, n/a = not applicable.}\)

Table A.1
Reliability & Validity Results from Instrument Pilot Test
This survey asks questions about smoking. Your answers will be used to plan educational programs in your school. The honesty of your answers is very important. Please be truthful in answering all the questions. Do NOT put your name on this survey. No one will know your answers and this will not affect your grade in school.

Please read all the questions carefully. Some of the questions look the same, but have small, important differences. If you have questions, please raise your hand. Thank you for your time.

How old are you? _________ (write in a number)

What is the month of your birthday? _____________ (write in a month)

What sex are you? (please check one answer)
- male
- female

What is your race? (please check one answer)
- African American
- White
- Asian American
- American Indian
- Hispanic
- other

How many older brothers do you have? ____________ (write in a number)

How many older sisters do you have? ______________ (write in a number)

PLEASE TURN TO THE NEXT PAGE TO BEGIN THE SURVEY.
Directions: Imagine you were hanging out with friends and your best friend offers you a cigarette. Which of the following things do you think would occur if you said "no" to the cigarette offer? Check only one answer per statement.

1. My friend would think I am smart.
   - would definitely happen
   - might happen
   - might not happen
   - would definitely not happen

2. My friend would respect me more.
   - would definitely happen
   - might happen
   - might not happen
   - would definitely not happen

3. My friend would say "ok".
   - would definitely happen
   - might happen
   - might not happen
   - would definitely not happen

4. My friend would continue to hassle me to smoke.
   - would definitely happen
   - might happen
   - might not happen
   - would definitely not happen

5. He or she would no longer be my friend.
   - would definitely happen
   - might happen
   - might not happen
   - would definitely not happen

6. My friend would call me names like "wimp".
   - would definitely happen
   - might happen
   - might not happen
   - would definitely not happen

7. My friend would leave me out of group activities.
   - would definitely happen
   - might happen
   - might not happen
   - would definitely not happen
Imagine you were hanging out with a group of friends and one of them offers you a cigarette. Which of the following things do you think would occur if you said “no” to the cigarette offer? Check only one answer per statement.

<table>
<thead>
<tr>
<th>Statement</th>
<th>Would definitely happen</th>
<th>Might happen</th>
<th>Might not happen</th>
<th>Would definitely not happen</th>
</tr>
</thead>
<tbody>
<tr>
<td>8. My friends would think I am smart.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>□</td>
<td>□</td>
<td>□</td>
<td>□</td>
</tr>
<tr>
<td>9. My friends would respect me more.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>□</td>
<td>□</td>
<td>□</td>
<td>□</td>
</tr>
<tr>
<td>10. My friends would say “ok”.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>□</td>
<td>□</td>
<td>□</td>
<td>□</td>
</tr>
<tr>
<td>11. My friends would continue to hassle me to smoke.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>□</td>
<td>□</td>
<td>□</td>
<td>□</td>
</tr>
<tr>
<td>12. The group would no longer be my friends.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>□</td>
<td>□</td>
<td>□</td>
<td>□</td>
</tr>
<tr>
<td>13. My friends would call me names like “wimp”.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>□</td>
<td>□</td>
<td>□</td>
<td>□</td>
</tr>
<tr>
<td>14. My friends would leave me out of group activities.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>□</td>
<td>□</td>
<td>□</td>
<td>□</td>
</tr>
</tbody>
</table>
Imagine you were hanging out with friends and an older student was offering you a cigarette. Which of the following things do you think would occur if you said "no" to the cigarette offer?

Check only one answer per statement.

15. The older student would think I am smart.
   □ would definitely happen
   □ might happen
   □ might not happen
   □ would definitely not happen

16. The older student would respect me more.
   □ would definitely happen
   □ might happen
   □ might not happen
   □ would definitely not happen

17. The older student would say "ok".
   □ would definitely happen
   □ might happen
   □ might not happen
   □ would definitely not happen

18. The older student would continue to hassle me to smoke.
   □ would definitely happen
   □ might happen
   □ might not happen
   □ would definitely not happen

19. He or she would not be my friend.
   □ would definitely happen
   □ might happen
   □ might not happen
   □ would definitely not happen

20. The older student would call me names like "wimp".
   □ would definitely happen
   □ might happen
   □ might not happen
   □ would definitely not happen

21. The older student would leave me out of group activities.
   □ would definitely happen
   □ might happen
   □ might not happen
   □ would definitely not happen


Directions: Read the short story below. Imagine you and your friends in that situation. Answer the questions that follow as if you are in the situation described in the story. There are no right or wrong answers. For each question, choose only one answer. Follow these same directions for story #2.

Story #1: Imagine that you are hanging out with friends at a friend's house. You are having fun. While getting some food, you're offered a cigarette.

How sure are you that you could say “no” to the cigarette offer and not smoke:

22. If the person who asked you to smoke was your best friend?
   □ I am very sure that I could say “no” to my best friend
   □ I am somewhat sure that I could say “no” to my best friend
   □ I am somewhat unsure that I could say “no” to my best friend
   □ I am very unsure that I could say “no” to my best friend

23. If the person who asked you to smoke was an older student that you admired?
   □ I am very sure that I could say “no” to an older student that I admired
   □ I am somewhat sure that I could say “no” to an older student that I admired
   □ I am somewhat unsure that I could say “no” to an older student that I admired
   □ I am very unsure that I could say “no” to an older student that I admired

24. If it was a group of your friends who asked you to smoke?
   □ I am very sure that I could say “no” to a group of my friends
   □ I am somewhat sure that I could say “no” to a group of my friends
   □ I am somewhat unsure that I could say “no” to a group of my friends
   □ I am very unsure that I could say “no” to a group of my friends

How sure are you that you could say “no” to the cigarette offer and not smoke:

25. If your best friend called you a coward for not smoking?
   □ I am very sure that I could say “no” to my best friend
   □ I am somewhat sure that I could say “no” to my best friend
   □ I am somewhat unsure that I could say “no” to my best friend
   □ I am very unsure that I could say “no” to my best friend

26. If an older student you admired called you a coward for not smoking?
   □ I am very sure that I could say “no” to an older student that I admired
   □ I am somewhat sure that I could say “no” to an older student that I admired
   □ I am somewhat unsure that I could say “no” to an older student that I admired
   □ I am very unsure that I could say “no” to an older student that I admired
27. If a group of your friends called you a coward for not smoking?
   □ I am very sure that I could say "no" to a group of my friends
   □ I am somewhat sure that I could say "no" to a group of my friends
   □ I am somewhat unsure that I could say "no" to a group of my friends
   □ I am very unsure that I could say "no" to a group of my friends

   How sure are you that you could continue to say "no" and not smoke:

28. If your best friend repeatedly kept asking you to smoke?
   □ I am very sure that I could continue to say "no" to my best friend
   □ I am somewhat sure that I could continue to say "no" to my best friend
   □ I am somewhat unsure that I could continue to say "no" to my best friend
   □ I am very unsure that I could continue to say "no" to my best friend

29. If an older student you admired repeatedly kept asking you to smoke?
   □ I am very sure that I could continue to say "no" to an older student that I admired
   □ I am somewhat sure that I could continue to say "no" to an older student that I admired
   □ I am somewhat unsure that I could continue to say "no" to an older student that I admired
   □ I am very unsure that I could continue to say "no" to an older student that I admired

30. If a group of your friends repeatedly kept asking you to smoke?
   □ I am very sure that I could continue to say "no" to a group of my friends
   □ I am somewhat sure that I could continue to say "no" to a group of my friends
   □ I am somewhat unsure that I could continue to say "no" to a group of my friends
   □ I am very unsure that I could continue to say "no" to a group of my friends

31. How sure are you that you could avoid hanging out after school in places where kids smoked cigarettes?
   □ I am very sure
   □ I am somewhat sure
   □ I am somewhat unsure
   □ I am very unsure

   "Hanging"

   You are halfway!
Story #2: Imagine that you are at school and the bell rings for lunch time. On your way to the cafeteria, you go into the restroom. While in the restroom you are offered a cigarette.

How sure are you that you could refuse the cigarette offer and not smoke:

32. If the person who asked you to smoke was your best friend?
   - I am very sure that I could say "no" to my best friend
   - I am somewhat sure that I could say "no" to my best friend
   - I am somewhat unsure that I could say "no" to my best friend
   - I am very unsure that I could say "no" to my best friend

33. If the person who asked you to smoke was an older student that you admired?
   - I am very sure that I could say "no" to an older student that I admired
   - I am somewhat sure that I could say "no" to an older student that I admired
   - I am somewhat unsure that I could say "no" to an older student that I admired
   - I am very unsure that I could say "no" to an older student that I admired

34. If it was a group of your friends who asked you to smoke?
   - I am very sure that I could say "no" to a group of my friends
   - I am somewhat sure that I could say "no" to a group of my friends
   - I am somewhat unsure that I could say "no" to a group of my friends
   - I am very unsure that I could say "no" to a group of my friends

How sure are you that you could say "no" to the cigarette offer and not smoke:

35. If your best friend called you a coward for not smoking?
   - I am very sure that I could say "no" to my best friend
   - I am somewhat sure that I could say "no" to my best friend
   - I am somewhat unsure that I could say "no" to my best friend
   - I am very unsure that I could say "no" to my best friend

36. If an older student you admired called you a coward for not smoking?
   - I am very sure that I could say "no" to an older student that I admired
   - I am somewhat sure that I could say "no" to an older student that I admired
   - I am somewhat unsure that I could say "no" to an older student that I admired
   - I am very unsure that I could say "no" to an older student that I admired

37. If a group of your friends called you a coward for not smoking?
   - I am very sure that I could say "no" to a group of my friends
   - I am somewhat sure that I could say "no" to a group of my friends
   - I am somewhat unsure that I could say "no" to a group of my friends
   - I am very unsure that I could say "no" to a group of my friends

"summary"
How sure are you that you could continue to say "no" and not smoke:

38. If your best friend kept asking you to smoke even after you said "no":
   □ I am very sure that I could continue to say "no" to my best friend
   □ I am somewhat sure that I could continue to say "no" to my best friend
   □ I am somewhat unsure that I could continue to say "no" to my best friend
   □ I am very unsure that I could continue to say "no" to my best friend

39. If an older student you admired kept asking you to smoke even after you said "no":
   □ I am very sure that I could continue to say "no" to an older student that I admired
   □ I am somewhat sure that I could continue to say "no" to an older student that I admired
   □ I am somewhat unsure I could continue to say "no" to an older student that I admired
   □ I am very unsure that I could continue to say "no" to an older student that I admired

40. If a group of your friends kept asking you to smoke even after you said "no":
   □ I am very sure that I could continue to say "no" to a group of my friends
   □ I am somewhat sure that I could continue to say "no" to a group of my friends
   □ I am somewhat unsure that I could continue to say "no" to a group of my friends
   □ I am very unsure that I could continue to say "no" to a group of my friends

41. How sure are you that you could avoid places at school where kids smoked cigarettes?
   □ I am very sure
   □ I am somewhat sure
   □ I am somewhat unsure
   □ I am very unsure

*avoid*

327
Directions: The following questions ask how important certain things are to you. Read the statement and then pick the answer that describes how you feel about each statement.
There are no right or wrong answers. Check only one answer per question.

42. Having my best friend think that I am smart.
   ☐ very important
   ☐ important
   ☐ unimportant
   ☐ very unimportant
   "√" very important

43. Having my best friend respect me.
   ☐ very important
   ☐ important
   ☐ unimportant
   ☐ very unimportant
   "√" very important

44. Having the approval of my best friend.
   ☐ very important
   ☐ important
   ☐ unimportant
   ☐ very unimportant
   "√" very important

45. Having my best friend not hassle me to smoke.
   ☐ very important
   ☐ important
   ☐ unimportant
   ☐ very unimportant
   "√" very important

46. Keeping my best friend as my friend.
   ☐ very important
   ☐ important
   ☐ unimportant
   ☐ very unimportant

47. To not be called names like "wimp" by my best friend.
   ☐ very important
   ☐ important
   ☐ unimportant
   ☐ very unimportant

48. Being included in group activities with my best friend.
   ☐ very important
   ☐ important
   ☐ unimportant
   ☐ very unimportant

328
49. Having a group of my friends think that I am smart.
- very important
- important
- unimportant
- very unimportant

50. Having a group of my friends respect me.
- very important
- important
- unimportant
- very unimportant

51. Having the approval of a group of my friends.
- very important
- important
- unimportant
- very unimportant

52. Having a group of my friends not hassle me to smoke.
- very important
- important
- unimportant
- very unimportant

53. Keeping a group of friends as my friends.
- very important
- important
- unimportant
- very unimportant

54. To not be called names like “wimp” by a group of friends.
- very important
- important
- unimportant
- very unimportant

55. Being included in group activities with a group of friends.
- very important
- important
- unimportant
- very unimportant
56. Having an older student that I admire think that I am smart.

- very important
- important
- unimportant
- very unimportant

"ipoldme"

57. Having an older student that I admire respect me.

- very important
- important
- unimportant
- very unimportant

"ipoldrep"

58. Having the approval of an older student that I admire.

- very important
- important
- unimportant
- very unimportant

"ipoldap"

59. Having an older student that I admire not hassle me to smoke.

- very important
- important
- unimportant
- very unimportant

"ipoldmee"

60. Having an older student that I admire as a friend.

- very important
- important
- unimportant
- very unimportant

"ipoldfr"

61. To not be called names like "wimp" by an older student that I admire.

- very important
- important
- unimportant
- very unimportant

"ipoldwp"

62. Being included in group activities with an older student that I admire.

- very important
- important
- unimportant
- very unimportant

"ipoldgr"
63. What message do you think the tobacco company is trying to tell you in this advertisement: (select one answer)

- Teens who smoke have more friends
- Teens can choose cigarettes which are not bad for their health
- Teens who smoke are "cool"
- Smoking is bad for teens
- None of the above

"None!"
64. What message do you think the tobacco company is trying to tell you in this advertisement: (select one answer)

- Teens who smoke are attractive to other people
- Teens who smoke have more friends
- Teens who smoke this brand get free stuff
- Teens who smoke will get in trouble
- None of the above

"Kwid Z"
65. What message do you think the tobacco company is trying to tell you in this advertisement? (select one answer)

- Teens who smoke will get in trouble
- Teens can choose cigarettes which are not bad for their health
- Teens who smoke are "cool"
- Teens who smoke this brand get free stuff
- None of the above

"Hands"
66. What message do you think the tobacco company is trying to tell you in this advertisement? (select one answer)

☐ Teens who smoke will get in trouble
☐ Teens who smoke are “macho”
☐ Teens who smoke have lots more fun
☐ Teens can choose cigarettes which are not bad for their health
☐ None of the above
67. How truthful are advertising messages that show teens who smoke are attractive to others?
   - Truthful
   - A little truthful
   - A little untruthful
   - Untruthful

68. How truthful are advertising messages that show teens who smoke are "cool"?
   - Truthful
   - A little truthful
   - A little untruthful
   - Untruthful

69. How truthful are advertising messages that show teens who smoke have lots of fun?
   - Truthful
   - A little truthful
   - A little untruthful
   - Untruthful

70. How truthful are advertising messages that low tar and low nicotine cigarettes are not bad for your health?
   - Truthful
   - A little truthful
   - A little untruthful
   - Untruthful

71. If I smoked, I would be more attractive to others:
   - Strongly agree
   - Agree somewhat
   - Disagree somewhat
   - Strongly disagree

72. If I smoked, I would be "cool":
   - Strongly agree
   - Agree somewhat
   - Disagree somewhat
   - Strongly disagree
73. If I smoked, I would have lots more fun:
   - Strongly agree
   - Agree somewhat
   - Disagree somewhat
   - Strongly disagree

74. If I smoked, I could choose cigarettes which are not bad for my health:
   - Strongly agree
   - Agree somewhat
   - Disagree somewhat
   - Strongly disagree

75. How many cigarettes have you smoked in the past 7 days (week)?
   _________ (write in a number)

76. How many cigarettes have you smoked in the past 30 days (month)?
   _________ (write in a number)

77. How many cigarettes have you smoked in the past 365 days (year)?
   - None at all
   - I have had only one puff
   - Part or all of one cigarette
   - 2 to 4 cigarettes
   - 5 to 19 cigarettes
   - 1 to 5 packs (20 to 100 cigarettes)
   - more than 5 packs

78. How many cigarettes have you smoked in your life?
   - None at all
   - I have had only one puff
   - Part or all of one cigarette
   - 2 to 4 cigarettes
   - 5 to 19 cigarettes
   - 1 to 5 packs (20 to 100 cigarettes)
   - more than 5 packs

© YOU HAVE COMPLETED THE SURVEY. THANK YOU.
Instrument Coding Sheet

I. Abbreviated Names of Variables

posexp = positive refusal outcome expectations  
negexp = negative refusal outcome expectations  
posval = positive refusal outcome expectancies  
negval = negative refusal outcome expectancies  
refuse = refusal skill efficacy  
images = behavioral capability to resist positive images of smoking  
totpos = sum of positive expectation multiplied by positive expectancy  
totneg = sum of negative expectation multiplied by positive expectancy

II. Subscales of Dependant Variables (with abbreviated name on parentheses)

A. Images:
1. Ability to Identify Message (know) = know1+know2+know3+know4  
2. Ability to Evaluate Truthfulness of Message (truth) = 
   truattr+trucool+trufun+trubad  
3. Ability to Reject Favorable Images (reject) = ifiattr+ificool+iffun+ifibad

B. Refuse:
1. Offer by Best Friend (offbst) = hsbstno+hscwbst+ 
   hsrpbst+slbstno+slcwbst+ slrpbst  
2. Offer by Group (offgrp) = hsgrpno+hscwgrp+hsrgrp+slgrpno+slcwgrp+ 
   slrgrp  
3. Offer by Older (offold) = hsoldno+hscwold+hsrpold+sloldno+slcwold+ 
   slrold  
4. In School (inschl) = slbstno+slgrpno+sloldno+slcwbst+slcwgrp+slcwold+ 
   slrpbst+ slrgrp+hsrpold + avoid  
5. After School (aftschl) = hsbstno+hsgrpno+hsoldno+hscwbst+hscwgrp+ 
   hscwold+hsrpbst+ hsrgrp+hsrpold + hanging  
6. Direct Pressure (direct) = hsbstno+hsoldno+hsggrpno+slbstno+slrgrpno+ 
   sloldno  
7. Indirect Pressure (indir) = hanging + avoid  
8. Hassle (hassle) = slrpbst+ slrgrp+hsrpold + hsrpbst+ hsrgrp+hsrpold  
9. Putdown (putdown) = hscwbst+hscwgrp+hscwold+slcwbst+slcwgrp+ 
   slcwold
III. Instrument Coding

A. Behavioral Capability to Resist Positive Images of Smoking:
One score of 0 to 36 points
Questions: 63 - 74

Know (questions 63 - 66)
3 for correct answer, 0 for all others.
4 questions, possible points 0 to 12

Truth (questions 67-70)
Likert scale, 0 through 3
truthful = 0
a little truthful = 1
a little untruthful = 2
untruthful = 3
4 questions, possible points 0 to 12

Reject (questions 71-74)
Likert scale, 0 through 3
strongly agree = 0
agree = 1
disagree = 2
strongly disagree = 3
4 questions, 0 to 12 possible points

B. Refusal Outcome Expectations:
2 subscales: positive (9 items), scores range from 9 to 36
Questions #1, 2, 3, 8, 9, 10, 15, 16, 17
negative (12 items), scores range from 12 to 48
Questions #4, 5, 6, 11, 12, 13, 14, 18, 19, 20, 21
Likert scale, 1 through 4
would definitely happen = 4
might happen = 3
might not happen = 2
would definitely not happen = 1

C. Refusal Outcome Expectancies:
2 subscales: positive (9 items), scores range from 9 to 36
Questions #42, 43, 44, 49, 50, 51, 56, 57, 58
negative (12 items), scores range from 12 to 48
Questions #45, 46, 47, 48, 52, 53, 54, 55, 59, 60, 61, 62
Likert scale, 1 through 4
very important = 4
important = 3
unimportant = 2
very unimportant = 1

D. Positive Refusal Outcome Expectancies & Importance:
One subscale score of 9 to 144
Score for expectations multiplied by corresponding expectancies, then summed
\[ \text{exval1} = \text{response for first expectation question (# 1) multiplied by corresponding expectancy question response (#42)} \]
\[ \text{exval9} = \text{response for last expectation question (# 17) multiplied by corresponding expectancy question response (#58)} \]

E. Negative Refusal Outcome Expectancies & Importance:
One score of 12 to 192
Score for expectations multiplied by corresponding expectancies, then summed
\[ \text{exval10} = \text{response for first negative expectation question (# 4) multiplied by corresponding expectancy question response (#45)} \]
\[ \text{exval21} = \text{response for last expectation question (# 21) multiplied by corresponding expectancy question response (#62)} \]

F. Refusal Skill-Efficacy:
One score of 0 to 60 points
direct pressure: questions 22 - 24 & 32 - 34
indirect pressure: questions 31 & 41
hassle pressure: questions 28 - 30 & 38 - 40
put down pressure: questions 25 - 27 & 35 - 37

Likert scale, 0 to 3
very sure = 3
somewhat sure = 2
somewhat unsure = 1
very unsure = 0
G. Smoking Behavior:
Use in Past 7 (seven) Days = record number
Use in Past 30 (thirty) Days = record number
Use in Past 365 (year) Days =
(0) □ none
(1) □ I have had only one puff
(2) □ part or all of one cigarette
(3) □ 2 to 4 cigarettes
(4) □ 5 to 19 cigarettes
(5) □ 1 to 5 packs (20 to 100 cigarettes)
(6) □ more than 5 packs (100 cigarettes)

Use in Lifetime (life): coded same as “year”

H. Misc Instrument Coding:

Age (age) = number written in
Month of Birth (month): January = 1 .... December = 12
Sex (sex): male = 1, female = 2

Race (race):
  African American = 1
  White = 2
  Asian American = 3
  American Indian = 4
  Hispanic = 5
  other = 6

Older Brother (oldbro)/Sisters (oldsis) = number written in

Treatment Code (treat):
  Treatment = 1
  Comparison = 0

School Code (school):
  Roosevelt = 1
  Amanda = 2
  Jefferson = 3
Teacher Code (teacher):
  Armbruster = 1
  Davidson = 2
  Heard = 3
  Mack = 4
  Wirtley = 5
  Wood = 6
  Christianson = 7
  Garrett = 8
  both Jefferson teachers = 9

Smoking Status (smoker):
  Nonsmoker = 0
  Experimental Smoker = 1

Test or Time (test)
  Pretest = "1"
  Posttest = "2"
* Note: in raw data print-out, posttest data is indicated by a "p" in front of a code name. Data was not entered with the fields of "test = 1" or "test = 2". For example, a pretest score for refusal skill-efficacy is "REFUSE": a posttest score for refusal skill-efficacy is "PREFUSE". In data entry, there was no "test = 2". A SAS command was used rearranged data so that on the descriptive data, pretest is "1" and posttest is "2". See Appendix for L for job control language.
APPENDIX G

INSTRUMENT CONFIRMATORY FACTOR ANALYSIS RESULTS
<table>
<thead>
<tr>
<th>Questionnaire Item</th>
<th>Factor 1</th>
<th>Factor 2</th>
<th>Factor 3</th>
<th>Factor 4</th>
<th>Factor 5</th>
<th>Factor 6</th>
</tr>
</thead>
<tbody>
<tr>
<td>Items to Measure Positive Refusal Expectations</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>BSTSMRT</td>
<td>0.21235</td>
<td>0.14780</td>
<td>0.12892</td>
<td>0.02319</td>
<td>0.47178</td>
<td>0.07958</td>
</tr>
<tr>
<td>BSTRSPT</td>
<td>0.13361</td>
<td>0.05925</td>
<td>0.09235</td>
<td>0.02163</td>
<td>0.64726</td>
<td>0.15885</td>
</tr>
<tr>
<td>BSTOK</td>
<td>0.00143</td>
<td>0.11908</td>
<td>0.27280</td>
<td>0.04471</td>
<td>0.19384</td>
<td>0.10647</td>
</tr>
<tr>
<td>GRPSMRT</td>
<td>0.21538</td>
<td>0.06450</td>
<td>0.17641</td>
<td>0.01219</td>
<td>0.57589</td>
<td>0.05619</td>
</tr>
<tr>
<td>GRPRSPT</td>
<td>0.15032</td>
<td>0.18911</td>
<td>0.19574</td>
<td>0.05290</td>
<td>0.68391</td>
<td>0.05151</td>
</tr>
<tr>
<td>GRPOK</td>
<td>0.10026</td>
<td>0.03598</td>
<td>0.35015</td>
<td>0.07464</td>
<td>0.34980</td>
<td>0.09130</td>
</tr>
<tr>
<td>OLDHSMRT</td>
<td>0.08430</td>
<td>0.15377</td>
<td>0.28063</td>
<td>0.29620</td>
<td>0.39598</td>
<td>0.19560</td>
</tr>
<tr>
<td>OLDRSPT</td>
<td>0.06039</td>
<td>0.22895</td>
<td>0.25165</td>
<td>0.23993</td>
<td>0.45214</td>
<td>0.08058</td>
</tr>
<tr>
<td>OLDOK</td>
<td>0.07513</td>
<td>0.06040</td>
<td>0.46414</td>
<td>0.16726</td>
<td>0.23834</td>
<td>0.02641</td>
</tr>
<tr>
<td>Items to Measure Negative Refusal Expectations</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>BSTHSSL</td>
<td>0.01123</td>
<td>0.00912</td>
<td>0.3991</td>
<td>0.20563</td>
<td>0.34573</td>
<td>0.12717</td>
</tr>
<tr>
<td>BSTNOFR</td>
<td>0.12920</td>
<td>0.16269</td>
<td>0.67773</td>
<td>0.12121</td>
<td>0.03721</td>
<td>0.04682</td>
</tr>
<tr>
<td>BSWIMP</td>
<td>0.08122</td>
<td>0.06756</td>
<td>0.68921</td>
<td>0.07787</td>
<td>0.14710</td>
<td>0.00852</td>
</tr>
<tr>
<td>BSTOUT</td>
<td>0.12086</td>
<td>0.01775</td>
<td>0.72224</td>
<td>0.04629</td>
<td>0.10265</td>
<td>0.01240</td>
</tr>
<tr>
<td>GRPHSSL</td>
<td>0.00749</td>
<td>0.02411</td>
<td>0.54077</td>
<td>0.11404</td>
<td>0.33363</td>
<td>0.12217</td>
</tr>
<tr>
<td>GRPNPOFR</td>
<td>0.13104</td>
<td>0.08791</td>
<td>0.76308</td>
<td>0.03048</td>
<td>0.05237</td>
<td>0.07492</td>
</tr>
<tr>
<td>GRPWIMP</td>
<td>0.13982</td>
<td>0.10710</td>
<td>0.75421</td>
<td>0.05631</td>
<td>0.08966</td>
<td>0.00858</td>
</tr>
<tr>
<td>GRPOUT</td>
<td>0.15539</td>
<td>0.03797</td>
<td>0.80519</td>
<td>0.04360</td>
<td>0.13837</td>
<td>0.08026</td>
</tr>
<tr>
<td>OLDHSSL</td>
<td>0.03290</td>
<td>0.03750</td>
<td>0.55858</td>
<td>0.10868</td>
<td>0.06423</td>
<td>0.05625</td>
</tr>
<tr>
<td>OLDNOFR</td>
<td>0.09750</td>
<td>0.05719</td>
<td>0.65847</td>
<td>0.23948</td>
<td>0.05666</td>
<td>0.05601</td>
</tr>
<tr>
<td>OLDWIMP</td>
<td>0.13430</td>
<td>0.02470</td>
<td>0.69265</td>
<td>0.18798</td>
<td>0.007484</td>
<td>0.03751</td>
</tr>
<tr>
<td>OLDOOUT</td>
<td>0.16079</td>
<td>0.04004</td>
<td>0.67817</td>
<td>0.29727</td>
<td>0.04536</td>
<td>0.04033</td>
</tr>
<tr>
<td>Items to Measure Positive Refusal Expectancies</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>IPBSTSM</td>
<td>0.09716</td>
<td>0.53461</td>
<td>0.01376</td>
<td>0.09681</td>
<td>0.12543</td>
<td>0.17232</td>
</tr>
<tr>
<td>IPBSTRP</td>
<td>0.02656</td>
<td>0.42941</td>
<td>0.07741</td>
<td>0.07385</td>
<td>0.14865</td>
<td>0.00831</td>
</tr>
<tr>
<td>IPBSTAP</td>
<td>0.00198</td>
<td>0.68634</td>
<td>0.05978</td>
<td>0.00339</td>
<td>0.12071</td>
<td>0.04440</td>
</tr>
</tbody>
</table>

Table A.2
Instrument Confirmatory Factor Analysis Results
<table>
<thead>
<tr>
<th>Questionnaire Item</th>
<th>Factor 1</th>
<th>Factor 2</th>
<th>Factor 3</th>
<th>Factor 4</th>
<th>Factor 5</th>
<th>Factor 6</th>
</tr>
</thead>
<tbody>
<tr>
<td>IPBSTSM</td>
<td>0.06931</td>
<td>0.55768</td>
<td>0.05519</td>
<td>0.07649</td>
<td>0.14602</td>
<td>0.16157</td>
</tr>
<tr>
<td>IPGRPRP</td>
<td>0.02503</td>
<td>0.53904</td>
<td>0.09998</td>
<td>0.05792</td>
<td>0.16339</td>
<td>0.00989</td>
</tr>
<tr>
<td>IPGRPAP</td>
<td>0.07685</td>
<td>0.70701</td>
<td>0.05760</td>
<td>0.02201</td>
<td>0.10848</td>
<td>0.03583</td>
</tr>
<tr>
<td>IPOLDSM</td>
<td>0.16435</td>
<td>0.57247</td>
<td>0.07243</td>
<td>0.05264</td>
<td>0.12082</td>
<td>0.09517</td>
</tr>
<tr>
<td>IPOLDRP</td>
<td>0.01772</td>
<td>0.66801</td>
<td>0.09762</td>
<td>0.17267</td>
<td>0.05092</td>
<td>0.00334</td>
</tr>
<tr>
<td>IPOLDAP</td>
<td>0.06736</td>
<td>0.65794</td>
<td>0.10275</td>
<td>0.00218</td>
<td>0.13874</td>
<td>0.01850</td>
</tr>
</tbody>
</table>

Items to Measure Negative Refusal Expectancies

<table>
<thead>
<tr>
<th>Questionnaire Item</th>
<th>Factor 1</th>
<th>Factor 2</th>
<th>Factor 3</th>
<th>Factor 4</th>
<th>Factor 5</th>
<th>Factor 6</th>
</tr>
</thead>
<tbody>
<tr>
<td>IPBSTHS</td>
<td>0.44066</td>
<td>0.20679</td>
<td>0.07120</td>
<td>0.20248</td>
<td>0.08423</td>
<td>0.18804</td>
</tr>
<tr>
<td>IPBSTFR</td>
<td>0.08398</td>
<td>0.58022</td>
<td>0.02695</td>
<td>0.00388</td>
<td>0.03661</td>
<td>0.04047</td>
</tr>
<tr>
<td>IPBSTWP</td>
<td>0.13930</td>
<td>0.42673</td>
<td>0.02810</td>
<td>0.01188</td>
<td>0.00741</td>
<td>0.74560</td>
</tr>
<tr>
<td>IPBSTGR</td>
<td>0.07555</td>
<td>0.61122</td>
<td>0.12275</td>
<td>0.04025</td>
<td>0.16266</td>
<td>0.03592</td>
</tr>
<tr>
<td>IPGRPHS</td>
<td>0.35826</td>
<td>0.28667</td>
<td>0.03805</td>
<td>0.22375</td>
<td>0.14221</td>
<td>0.22634</td>
</tr>
<tr>
<td>IPGRPFR</td>
<td>0.03056</td>
<td>0.68989</td>
<td>0.01952</td>
<td>0.00308</td>
<td>0.01404</td>
<td>0.05302</td>
</tr>
<tr>
<td>IPGRPWPF</td>
<td>0.10441</td>
<td>0.31254</td>
<td>0.03349</td>
<td>0.11855</td>
<td>0.00961</td>
<td>0.81494</td>
</tr>
<tr>
<td>IPGRPGR</td>
<td>0.16446</td>
<td>0.67441</td>
<td>0.03382</td>
<td>0.10769</td>
<td>0.08881</td>
<td>0.13791</td>
</tr>
<tr>
<td>IPOLDH</td>
<td>0.29551</td>
<td>0.29619</td>
<td>0.01213</td>
<td>0.12166</td>
<td>0.12974</td>
<td>0.28736</td>
</tr>
<tr>
<td>IPOLDFR</td>
<td>0.01971</td>
<td>0.64909</td>
<td>0.03923</td>
<td>0.01761</td>
<td>0.03583</td>
<td>0.00766</td>
</tr>
<tr>
<td>IPOLDWP</td>
<td>0.19281</td>
<td>0.41669</td>
<td>0.05893</td>
<td>0.00002</td>
<td>0.00910</td>
<td>0.69284</td>
</tr>
<tr>
<td>IPOLDGR</td>
<td>0.02439</td>
<td>0.67856</td>
<td>0.11199</td>
<td>0.14711</td>
<td>0.04921</td>
<td>0.12112</td>
</tr>
</tbody>
</table>

Items to Measure Refusal Skill-Efficacy

<table>
<thead>
<tr>
<th>Questionnaire Item</th>
<th>Factor 1</th>
<th>Factor 2</th>
<th>Factor 3</th>
<th>Factor 4</th>
<th>Factor 5</th>
<th>Factor 6</th>
</tr>
</thead>
<tbody>
<tr>
<td>HSBSTNO</td>
<td>0.65568</td>
<td>0.09188</td>
<td>0.15904</td>
<td>0.13812</td>
<td>0.29104</td>
<td>0.00388</td>
</tr>
<tr>
<td>HSOLDNO</td>
<td>0.71462</td>
<td>0.00687</td>
<td>0.03034</td>
<td>0.01004</td>
<td>0.10054</td>
<td>0.02927</td>
</tr>
<tr>
<td>HSGRPNO</td>
<td>0.77793</td>
<td>0.07884</td>
<td>0.05051</td>
<td>0.17999</td>
<td>0.11841</td>
<td>0.00763</td>
</tr>
<tr>
<td>HSCWBST</td>
<td>0.75107</td>
<td>0.13125</td>
<td>0.10102</td>
<td>0.10950</td>
<td>0.17922</td>
<td>0.03621</td>
</tr>
<tr>
<td>HSCWOLD</td>
<td>0.71281</td>
<td>0.12880</td>
<td>0.04825</td>
<td>0.04542</td>
<td>0.18813</td>
<td>0.03370</td>
</tr>
<tr>
<td>HSCWGRP</td>
<td>0.74659</td>
<td>0.16091</td>
<td>0.05485</td>
<td>0.11017</td>
<td>0.14844</td>
<td>0.05588</td>
</tr>
<tr>
<td>HSRPBST</td>
<td>0.73527</td>
<td>0.09925</td>
<td>0.17459</td>
<td>0.11184</td>
<td>0.17371</td>
<td>0.06355</td>
</tr>
<tr>
<td>HSRPOOLD</td>
<td>0.78762</td>
<td>0.00071</td>
<td>0.15972</td>
<td>0.14608</td>
<td>0.13028</td>
<td>0.01165</td>
</tr>
</tbody>
</table>

Table A.2 (Continued)
Instrument Confirmatory Factor Analysis Results
<table>
<thead>
<tr>
<th>Questionnaire Item</th>
<th>Factor 1</th>
<th>Factor 2</th>
<th>Factor 3</th>
<th>Factor 4</th>
<th>Factor 5</th>
<th>Factor 6</th>
</tr>
</thead>
<tbody>
<tr>
<td>HSRPGRP</td>
<td>0.79830</td>
<td>0.08044</td>
<td>0.11921</td>
<td>0.11382</td>
<td>0.11567</td>
<td>0.01051</td>
</tr>
<tr>
<td>HANGING</td>
<td>0.60095</td>
<td>0.03255</td>
<td>0.16493</td>
<td>0.06082</td>
<td>0.20630</td>
<td>0.04191</td>
</tr>
<tr>
<td>SLBSTNO</td>
<td>0.67224</td>
<td>0.02993</td>
<td>0.03745</td>
<td>0.02148</td>
<td>0.07108</td>
<td>0.04967</td>
</tr>
<tr>
<td>SLOLDNO</td>
<td>0.78366</td>
<td>0.05229</td>
<td>0.07035</td>
<td>0.04891</td>
<td>0.11268</td>
<td>0.04022</td>
</tr>
<tr>
<td>SLGRPNO</td>
<td>0.68107</td>
<td>0.00053</td>
<td>0.07629</td>
<td>0.01269</td>
<td>0.02741</td>
<td>0.04875</td>
</tr>
<tr>
<td>SLCWBST</td>
<td>0.82128</td>
<td>0.01872</td>
<td>0.00267</td>
<td>0.03546</td>
<td>0.11405</td>
<td>0.05317</td>
</tr>
<tr>
<td>SLCWOLD</td>
<td>0.83412</td>
<td>0.06059</td>
<td>0.01558</td>
<td>0.05262</td>
<td>0.16973</td>
<td>0.06216</td>
</tr>
<tr>
<td>SLCWGRP</td>
<td>0.81776</td>
<td>0.06864</td>
<td>0.00500</td>
<td>0.00574</td>
<td>0.09722</td>
<td>0.01777</td>
</tr>
<tr>
<td>SLRPBST</td>
<td>0.79829</td>
<td>0.05185</td>
<td>0.07341</td>
<td>0.10832</td>
<td>0.00442</td>
<td>0.03635</td>
</tr>
<tr>
<td>SLRPOLD</td>
<td>0.84576</td>
<td>0.04797</td>
<td>0.00022</td>
<td>0.02940</td>
<td>0.05362</td>
<td>0.08904</td>
</tr>
<tr>
<td>SLRPGRP</td>
<td>0.81282</td>
<td>0.09593</td>
<td>0.11978</td>
<td>0.05916</td>
<td>0.03483</td>
<td>0.05364</td>
</tr>
<tr>
<td>AVOID</td>
<td>0.60486</td>
<td>0.03045</td>
<td>0.04465</td>
<td>0.08020</td>
<td>0.03002</td>
<td>0.02315</td>
</tr>
</tbody>
</table>

Items to Measure Behavioral Capability to Resist Positive Images of Smoking

<table>
<thead>
<tr>
<th>Item</th>
<th>Factor 1</th>
<th>Factor 2</th>
<th>Factor 3</th>
<th>Factor 4</th>
<th>Factor 5</th>
<th>Factor 6</th>
</tr>
</thead>
<tbody>
<tr>
<td>KNOW1</td>
<td>0.09096</td>
<td>0.06393</td>
<td>0.01638</td>
<td>0.04359</td>
<td>0.17444</td>
<td>0.04257</td>
</tr>
<tr>
<td>KNOW2</td>
<td>0.01969</td>
<td>0.04680</td>
<td>0.05844</td>
<td>0.13499</td>
<td>0.13141</td>
<td>0.06222</td>
</tr>
<tr>
<td>KNOW3</td>
<td>0.02293</td>
<td>0.00674</td>
<td>0.04744</td>
<td>0.11675</td>
<td>0.26293</td>
<td>0.16291</td>
</tr>
<tr>
<td>KNOW4</td>
<td>0.02468</td>
<td>0.04793</td>
<td>0.02496</td>
<td>0.13097</td>
<td>0.28815</td>
<td>0.01938</td>
</tr>
<tr>
<td>TRUATTR</td>
<td>0.18583</td>
<td>0.12038</td>
<td>0.02761</td>
<td>0.74398</td>
<td>0.10442</td>
<td>0.04052</td>
</tr>
<tr>
<td>TRUCOOL</td>
<td>0.13162</td>
<td>0.00490</td>
<td>0.02624</td>
<td>0.81799</td>
<td>0.11431</td>
<td>0.02054</td>
</tr>
<tr>
<td>TRUFUN</td>
<td>0.10605</td>
<td>0.03058</td>
<td>0.04672</td>
<td>0.74773</td>
<td>0.05543</td>
<td>0.05604</td>
</tr>
<tr>
<td>TRUBAD</td>
<td>0.05563</td>
<td>0.02128</td>
<td>0.01181</td>
<td>0.61690</td>
<td>0.14369</td>
<td>0.04273</td>
</tr>
<tr>
<td>IFAATTR</td>
<td>0.25745</td>
<td>0.09072</td>
<td>0.00033</td>
<td>0.67576</td>
<td>0.14807</td>
<td>0.06625</td>
</tr>
<tr>
<td>IFICOOL</td>
<td>0.038794</td>
<td>0.02738</td>
<td>0.04349</td>
<td>0.52201</td>
<td>0.03201</td>
<td>0.13632</td>
</tr>
<tr>
<td>IFIFUN</td>
<td>0.27982</td>
<td>0.11508</td>
<td>0.15592</td>
<td>0.46000</td>
<td>0.14633</td>
<td>0.15759</td>
</tr>
<tr>
<td>IFIBAD</td>
<td>0.00809</td>
<td>0.04847</td>
<td>0.18596</td>
<td>0.29994</td>
<td>0.03445</td>
<td>0.01366</td>
</tr>
</tbody>
</table>

Table A.2 (Continued)
Instrument Confirmatory Factor Analysis Results
Table A.2 (Continued)
Instrument Confirmatory Factor Analysis Results

<table>
<thead>
<tr>
<th>Questionnaire Item</th>
<th>Factor 1</th>
<th>Factor 2</th>
<th>Factor 3</th>
<th>Factor 4</th>
<th>Factor 5</th>
<th>Factor 6</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>VARIANCE EXPLAINED BY EACH FACTOR</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>12.538064</td>
<td>6.826791</td>
<td>6.386499</td>
<td>4.075994</td>
<td>3.237581</td>
<td>2.261141</td>
</tr>
</tbody>
</table>

Note. The six factors were refusal skill-efficacy, positive refusal expectancies, negative refusal expectancies, positive refusal expectations, negative refusal expectations, behavioral capability to resist positive images of smoking.
APPENDIX H

NOTE TO ABSENT STUDENTS
May 28, 1997

Dear

Tuesday, in class, your fellow students completed this questionnaire. Since you were not in class, I am asking you to complete it now. Your answers will be used to help plan education programs in your school. Do not put your name on the questionnaire, no one will know your answers. Once you are done answering all the questions, put your questionnaire in the attached envelope, seal it and give it to your teacher. She will then give it to me.

THANKS! ©
Marietta Langlois
APPENDIX I

LETTER TO PARENTS
March 25, 1997

Dear Roosevelt Parent:

Each year, more than 400,000 Americans die because of smoking-related diseases. The most alarming statistic is that 80 - 90% of these smokers begin as school age children.

Roosevelt Elementary School, working with Middletown Regional Hospital and The Ohio State University, would like to work toward decreasing the number of new adolescent smokers. This April, we will be implementing the Minnesota Smoking Prevention Program in the sixth grade classrooms. This program has been shown to reduce the number of new adolescent smokers by as much as 50%.

This classroom-based educational program consists of six, 45-minute lesson plans. Students will discuss the harmful effects of smoking, but also learn and practice strategies to refuse peer pressure, study advertising designed to attract new young smokers and make a commitment to not use tobacco. This program is very "hands on" with the primary means of teaching being small group discussions.

Part of this project will be to evaluate the effectiveness of this smoking prevention program. Each student will be asked to complete an anonymous questionnaire before and after the program. Questionnaire answers will allow us to make decisions about the future use of the program.

Should you wish for your child not to participate in any portion of this program, please contact Marietta Langlois at 746-2445 prior to Monday, April 8. If we do not hear from you, consent for your child's participation will be implied.

Tobacco use by adolescents is a complex and growing concern for everyone. Working together, as institutions and concerned parents, we hope to make a difference.

Sincerely,

Sara Martin
Substance Abuse Coordinator
Middletown City Schools

Rick Petosa, Ph.D.
Associate Professor
The Ohio State University

Marietta Langlois
Director, Health Education
Middletown Regional Hospital
APPENDIX J

HUMAN SUBJECTS APPROVAL
Research Involving Human Subjects

ACTION OF THE INSTITUTIONAL REVIEW BOARD

With regard to the employment of human subjects in the proposed research protocol:

THE EFFECTS OF A PSYCHOSOCIAL SMOKING PREVENTION PROGRAM ON THE HYPOTHESIZED MEDIATING VARIABLES OF REFUSAL SKILL-EFFICACY, BEHAVIORAL CAPABILITY TO RESIST THE POSITIVE IMAGES OF SMOKING, REFUSAL OUTCOME EXPECTANCIES, Rick A. Petosa, Marietta Langlois, Physical Activities and Educational Services

THE BEHAVIORAL AND SOCIAL SCIENCES HUMAN SUBJECTS IRB HAS TAKEN THE FOLLOWING ACTION:

___ APPROVED ___ DISAPPROVED
X ___ APPROVED WITH CONDITIONS* ___ WAIVER OF WRITTEN
     CONSENT GRANTED

* Conditions stated by the IRB have been met by the Investigator and, therefore, the protocol is APPROVED.

It is the responsibility of the principal investigator to retain a copy of each signed consent form for at least three (3) years beyond the termination of the subject's participation in the proposed activity. Should the principal investigator leave the University, signed consent forms are to be transferred to the Human Subjects IRB for the required retention period. This application has been approved for the period of one year. You are reminded that you must promptly report any problems to the IRB, and that no procedural changes may be made without prior review and approval. You are also reminded that the identity of the research participants must be kept confidential.

Date: April 11, 1997

Signed: [Signature]
(Chairperson)
APPENDIX K

TREATMENT LESSON CHECKLISTS
Minnesota Smoking Prevention Program
Lesson Checklist

**Directions:** Please fill out completely after each lesson. Mark which lesson objectives and activities were completed. Also attach the attendance/sign in list to this sheet.

**LESSON #1**

<table>
<thead>
<tr>
<th>Activity</th>
<th>Check (✓) if Completed</th>
<th>If no, what percentage of activity was completed?</th>
</tr>
</thead>
<tbody>
<tr>
<td>Introduction</td>
<td></td>
<td></td>
</tr>
<tr>
<td>- stats of cigarettes</td>
<td></td>
<td></td>
</tr>
<tr>
<td>- overview of 6 lessons</td>
<td></td>
<td></td>
</tr>
<tr>
<td>- intro to small groups</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Negative Consequences</td>
<td></td>
<td></td>
</tr>
<tr>
<td>- define consequences</td>
<td></td>
<td></td>
</tr>
<tr>
<td>- write initial brainstorm of negative</td>
<td></td>
<td></td>
</tr>
<tr>
<td>consequences</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Videotape</td>
<td></td>
<td></td>
</tr>
<tr>
<td>- define addiction</td>
<td></td>
<td></td>
</tr>
<tr>
<td>- write down more negative consequences</td>
<td></td>
<td></td>
</tr>
<tr>
<td>from video</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Small Group Discussion</td>
<td></td>
<td></td>
</tr>
<tr>
<td>- develop group lists</td>
<td></td>
<td></td>
</tr>
<tr>
<td>- group summary &amp; discussion</td>
<td></td>
<td></td>
</tr>
<tr>
<td>- add on smokeless tobacco consequences</td>
<td></td>
<td></td>
</tr>
<tr>
<td>- summary of consequences</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Homework assignment: collect ads</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Were any activities completed in this session which were scheduled for another session?  Yes  No
Which ones:

General Comments
**Minnesota Smoking Prevention Program**  
**Lesson Checklist**

**Directions:** Please fill out completely after each lesson. Mark which lesson objectives and activities were completed. Also attach the attendance/sign in list to this sheet.

**LESSON #2**

<table>
<thead>
<tr>
<th>Activity</th>
<th>Check (✔) if Completed</th>
<th>If no, what percentage of activity was completed?</th>
</tr>
</thead>
</table>
| Review of last class  
- stats of cigarettes  
- negative consequences (smoke & smokeless) | | |
| Brainstorming: Why people start  
- small group discussion  
- group summary | | |
| Brainstorming Alternatives  
- 4 reasons why  
- small group discussion of alternatives  
- group summary | | |
| Estimating # of peer smokers  
- small group estimations  
- group consensus & correction  
- summary | | |
| Homework assignment: adult interview & reminder of ads | | |

Were any activities completed in this session that were scheduled in another session? **Yes**  
**No**  
Which ones:

---

**General Comments**
**Minnesota Smoking Prevention Program**

**Lesson Checklist**

**Directions:** Please fill out completely after each lesson. Mark which lesson objectives and activities were completed. Also attach the attendance/sign in list to this sheet.

**LESSON #3**

School & Classroom: ________________________

Instructor: ________________________

<table>
<thead>
<tr>
<th>Activity</th>
<th>Check (✓) if Completed</th>
<th>If no, what percentage of activity was completed?</th>
</tr>
</thead>
<tbody>
<tr>
<td>Adult Interview Follow-Up</td>
<td></td>
<td></td>
</tr>
<tr>
<td>- discussion of answers</td>
<td></td>
<td></td>
</tr>
<tr>
<td>- addictive nature</td>
<td></td>
<td></td>
</tr>
<tr>
<td>- helping people quit</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Brainstorming: Where people start</td>
<td></td>
<td></td>
</tr>
<tr>
<td>- small group discussion</td>
<td></td>
<td></td>
</tr>
<tr>
<td>- group summary</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Peer Pressure</td>
<td></td>
<td></td>
</tr>
<tr>
<td>- define</td>
<td></td>
<td></td>
</tr>
<tr>
<td>- 4 kinds of peer pressure</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pressure Stories</td>
<td></td>
<td></td>
</tr>
<tr>
<td>- small group discussion</td>
<td></td>
<td></td>
</tr>
<tr>
<td>- readings to large group</td>
<td></td>
<td></td>
</tr>
<tr>
<td>- discussion on non-violent ways to refuse tobacco</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Refusal Strategies Discussion</td>
<td></td>
<td></td>
</tr>
<tr>
<td>- 6 strategies for refusing tobacco</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Homework assignment: reminder of ads</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Were any activities completed in this session which were scheduled in another session?

Yes  No

Which ones:

**General Comments**
Minnesota Smoking Prevention Program
Lesson Checklist

Directions: Please fill out completely after each lesson. Mark which lesson objectives and activities were completed. Also attach the attendance/sign in list to this sheet.

LESSON #4

School & Classroom: ________________________

Instructor: ________________________

<table>
<thead>
<tr>
<th>Activity</th>
<th>Check (✓) if Completed</th>
<th>If no, what percentage of activity was completed?</th>
</tr>
</thead>
<tbody>
<tr>
<td>Refusal Skills &amp; Second-Hand Smoke</td>
<td></td>
<td></td>
</tr>
<tr>
<td>- review transparency of 6 smart strategies</td>
<td></td>
<td></td>
</tr>
<tr>
<td>- define second-hand smoke</td>
<td></td>
<td></td>
</tr>
<tr>
<td>- negative consequences of second-hand smoke</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Role Plays</td>
<td></td>
<td></td>
</tr>
<tr>
<td>- define role playing</td>
<td></td>
<td></td>
</tr>
<tr>
<td>- small group practice</td>
<td></td>
<td></td>
</tr>
<tr>
<td>*list ratio of kids per group who practiced saying “no”</td>
<td></td>
<td></td>
</tr>
<tr>
<td>*list # of scenarios practiced per group</td>
<td></td>
<td></td>
</tr>
<tr>
<td>- small group presentation</td>
<td></td>
<td></td>
</tr>
<tr>
<td>- group discussion of each role play</td>
<td></td>
<td></td>
</tr>
<tr>
<td>- discuss refusal outcome expectations</td>
<td></td>
<td></td>
</tr>
<tr>
<td>- discussion of barriers to refusal</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Homework assignment: reminder of ads</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Were any activities completed in this session, that were scheduled in other session? Yes  No
Which ones:

General Comments
**Minnesota Smoking Prevention Program**  
**Lesson Checklist**

**Directions:** Please fill out completely after each lesson. Mark which lesson objectives and activities were completed. Also attach the attendance/sign in list to this sheet.

**LESSON #5**

School & Classroom: __________________________
Instructor: __________________________
Date: __________________________

<table>
<thead>
<tr>
<th>Activity</th>
<th>Check (√) if Completed</th>
<th>If no, what percentage of activity was completed?</th>
</tr>
</thead>
<tbody>
<tr>
<td>Review Refusal Strategies</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Advertising Pressures</td>
<td></td>
<td></td>
</tr>
<tr>
<td>- stats on spending</td>
<td></td>
<td></td>
</tr>
<tr>
<td>- types of advertising: direct &amp; indirect</td>
<td></td>
<td></td>
</tr>
<tr>
<td>- Surgeon General’s Warnings</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Advertising Analysis</td>
<td></td>
<td></td>
</tr>
<tr>
<td>- discuss “tricks to get you to use”</td>
<td></td>
<td></td>
</tr>
<tr>
<td>- small group analyze their ads</td>
<td></td>
<td></td>
</tr>
<tr>
<td>- small group: “we won’t be tricked”</td>
<td></td>
<td></td>
</tr>
<tr>
<td>sheet</td>
<td></td>
<td></td>
</tr>
<tr>
<td>- group discussion of small group’s ad analysis</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Preparing Own Ads</td>
<td></td>
<td></td>
</tr>
<tr>
<td>- small groups: “An idea worth promoting”</td>
<td></td>
<td></td>
</tr>
<tr>
<td>- assignment to work on Wednesday</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Choose Not To Use Assignment</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Summary:</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Were any activities completed in this session, that were scheduled in other session? Yes  
No
Which ones:

General Comments
Minnesota Smoking Prevention Program
Lesson Checklist

**Directions:** Please fill out completely after each lesson. Mark which lesson objectives and activities were completed. Also attach the attendance/sign in list to this sheet.

**LESSON #6**

School & Classroom: __________________________

Instructor: __________________________

<table>
<thead>
<tr>
<th>Activity</th>
<th>Check (✓)</th>
<th>If no, what percentage of activity was completed?</th>
</tr>
</thead>
<tbody>
<tr>
<td>Presentation of Small Group Ads</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Decision Not to Smoke</td>
<td></td>
<td></td>
</tr>
<tr>
<td>- summarize: negative consequences, types of pressure, learned skills to refuse pressures, and now promoting benefits of being tobacco free.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>- hand-out: choose not to use</td>
<td></td>
<td></td>
</tr>
<tr>
<td>- public declarations</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Summary</td>
<td></td>
<td></td>
</tr>
<tr>
<td>- certificates of completion</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Were any activities completed in this session, that were scheduled in other session?  Yes  No
Which ones:

General Comments

360
APPENDIX L

SAS JOB CONTROL LANGUAGE
PROC STANDARD REPLACE DATA=AMANDA OUT=AMANDAO;
VAR BSTSMRT--IPOLDGR TROATTR--THIRTY PBSTSMRT--IPOLDGR
    PTRUATTR--PTHIRTY;
DATA TWO;
SET AMANDAO;
IF KNOW1= THEN KNOW1=0;
IF KNOW2= THEN KNOW2=0;
IF KNOW3= THEN KNOW3=0;
IF KNOW4= THEN KNOW4=0;
IF PKNOW1= THEN PKNOW1=0;
IF PKNOW2= THEN PKNOW2=0;
IF PKNOW3= THEN PKNOW3=0;
IF PKNOW4= THEN PKNOW4=0;
SUBJECT+1;
POSEXP = BSTSMRT+BSTRSPT+BSTOK+GRPSMRT+GRPRSPT+GRPOK+ OLDSMRT+OLDRSPT+
    OLDOK;
NEGEXP = BSTHSSL+BSTNOFR+BSTWIMP+BSTOUT+GRPHSL+GRPNOSFR+GRPWIMP+
    GRPOUT+OLDHSSL+OLDNOSFR+OLDWIMP+OLDOU;
POSVAL = IPBSTSM+IPBSTRP+IPBSTAP+IPGRPSM+IPGRPRP+IPGRPAP+IPOLDSM+
    IPOLDRP+IPOLDAP;
NEGVAL = IPBSTHS+IPBSTRF+IPBSTWP+IPBSTGR+IPGRPHS+IPGRPRF+IPGRPWP+
    IPGRPRG+IPOLDHS+IPOLDFR+IPOLDPF+IPOLDWP+IPOLDGR;
REFUSE = HSBSTNO+HSOLDNO+HSGRPNO+HSCWBST+HSCWOLD+HSCWGRT+HSRPBST+
    HSRPOLD+HSRPGRP+HANGING+SLBSTNO+SLOLDNO+SLGRPNO+SLCWBST+
    SLCWOLD+SLCGRT+SLRPBST+SLRPGR+SLRPGRP+AVOID;
IMAGES = KNOW1+KNOW2+KNOW3+KNOW4+TRUATTR+TRUCOOL+TRUFUN+TRUBAD+
    IFIATTR+IFICOOL+IFIFUN+IFIBAD;
Replace missing data
with the mean.
Replace missing data,
for "know" items with a
score of "0". "Know" items were scored as
incorrect (0) or correct (3), so the mean was
not substituted.
Equation for positive
expectations - pretest.
Equation for negative
expectations - pretest.
Equation for positive,
expectancies - pretest.
Equation for negative
expectancies - pretest.
Equation for refusal
skill-efficacy - pretest.
Equation for behavioral
capability to resist
positive images of
smoking - pretest.
EXVAL1 = BSTSMRT*IPBSTSM ;
EXVAL2 = BSTRSPT*IPBSTRP ;
EXVAL3 = BSTOK*IPBSTAP ;
EXVAL4 = GRPSMRT*IPGRPSM ;
EXVAL5 = GRPRSPT*IPGRPRP ;
EXVAL6 = GRPOK*IPGRPAP ;
EXVAL7 = OLDSMRT*IPOLDSM ;
EXVAL8 = OLDRSPT*IPOLDRP ;
EXVAL9 = OLDOK*IPOLDAP ;
EXVAL10 = BSTHSSL*IPBSTHS ;
EXVAL11 = BSTDNOFR*IPBSTDFR ;
EXVAL12 = BSTWIMP*IPBSTWP ;
EXVAL13 = BSTOUT*IPBSTGR ;
EXVAL14 = GRPHSSL*IPGRPHS ;
EXVAL15 = GRPNOFRE*IPGRNPFR ;
EXVAL16 = GRPWIMP*IPGRWPW ;
EXVAL17 = GRPOUT*IPGRPOGR ;
EXVAL18 = OLDHSSL*IPOLDHS ;
EXVAL19 = OLDNSOFRE*IPOLDFR ;
EXVAL20 = OLDWIMP*IPOLDWP ;
EXVAL21 = OLDOUT*IPOLDGR ;

TOTPOS = EXVAL1+EXVAL2+EXVAL3+EXVAL4+EXVAL5+EXVAL6+EXVAL7+EXVAL8+
EXVAL9 ;

TOTNEG = EXVAL10+EXVAL11+EXVAL12+EXVAL13+EXVAL14+EXVAL15+EXVAL16+
EXVAL17+EXVAL18+EXVAL19+EXVAL20+EXVAL21 ;

PPOSEXP = PBSTSMRT+PBSTRSPT+PBSTOK+PGRPSMRT+PGRPRSPT+PGRPOK+POLDSMRT+
POLDRSPT+POLDOK ;
PNEGEXP = PBSTHSSL+PBSTNOFR+PBSTWIMP+PBSTOUT+PGRPHSL+PGRPNOFR+
PGRPWIMP+PGRPOUT+POLDHSSL+POLDNOFR+POLDWIMP+POLDOUT ;
PPOSVAL = PIPBSTSM+PIPBSTRP+PIPBSTAP+PIPGRPSM+PIPGRPRP+PIPGRPAP+
PIPOLDSM+PIPOLDRP+PIPOLDAP ;
PNEGVAL = PIPBTHS+PIPBSTFR+PIPBSTWP+PIPBSTGR+PIPGRPHS+PIPGRPF+
PIPGRPW+PIPGRPR+PIPOLDHS+PIPOLDFR+PIPOLDWP+PIPOLDGR ;
PREFUSE = PHSBSTNO+PHSOLDNO+PHSGRPNO+PHSCWBST+PHSCWOLD+PHSCWGRP+
PHSRBPST+PHSRPOLD+PHSRPGRP+PHANGING+PSLBSTNO+PSLOLDNO+
PSLGRPNO+PSLCWBST+PSLCWOLD+PSLCWGRP+PSLRBPST+PSLRPOLD+
PSLRPGRP+PAVOID ;
PIMAGES = PKNOW1+PKNOW2+PKNOW3+PKNOW4+PTRUATTR+PTRUCOOL+PTRUFUN+
PTRUBAD+PIFIATTR+PIFCOOL+PIFIFUN+PIFIBAD ;

Equation for negative expectations - posttest.
Equation for positive expectancies - postest.
Equation for negative expectancies - postest.
Equation for refusal skill-efficacy - postest.
Equation for behavioral capability to resist positive images of smoking- postest.
Equations for total positive (negative) refusal expectations & importance - posttest. A expectation multiplied by the respective expectancy.

Equation for total positive refusal expectations & importance - posttest.

Equation for total negative refusal expectations & importance - posttest.

Treatment group classes coded as "1", comparison group classes coded as "0".
124 IF YEAR>0 THEN SMOKE=1 ;
125 IF YEAR=0 THEN SMOKE=0 ;

126 IF PYEAR>0 THEN PSMOKE=1 ;
127 IF PYEAR=0 THEN PSMOKE=0 ;

128 KNOW=KNOW1+KNOW2+KNOW3+KNOW4 ;
129 PKNOW=PKNOW1+PKNOW2+PKNOW3+PKNOW4 ;
130 TRUTH=TRUATTR+TRUCOOL+TRUFUN+TRUBAD ;
131 PTRUTH=PTRUATTR+PTRUCOOL+PTRUFUN+PTRUBAD ;
132 REJECT=IF1ATTR+IF1COOL+IF1FUN+IF1BAD ;
133 PREJECT=PIF1ATTR+PIF1COOL+PIF1FUN+PIF1BAD ;

Smokers, coded as "1", reported any (>0) cigarette use - pretest.
Smokers, coded as "1", reported any (>0) cigarette use - posttest.
Equations for subscales of behavioral capability to resist positive images of smoking: ability to identify message (know), ability to evaluate truthfulness (truth) and ability to reject the positive message (reject). Pretest and posttest (p).
Equations for subscales of refusal skill-efficacy: offers by best friend (offbst), offers by groups of friends (offgrp), offer by older student (offold), offers in school (inschl), offers after school (aftschi), direct pressure (direct), indirect pressure (indir), hassle pressure (hassle) and putdown pressure (putdown).

Pretest and posttest (p).

Shorten name of four variables of interest, code pretest scores as "time 1".

Shorten name of four variables of interest, code posttest scores as "time 2".

Identifies factors involved in three-way ANOVA data analysis.
Two-way analysis of variance, treatment and time. The factor of smoking status was left out just to look at the data in this simpler format, first. Note: MANOVA also gives the reader an ANOVA.

Post hoc analysis of above ANOVA. Note: least squares means adjust for unequal sample/cell sizes.

Three-way analysis of variance, treatment, smoke and time. Note: MANOVA also gives the reader an ANOVA.
182 MEANS TREAT SMOKE TREAT*SMOKE;
183 MEANS TREAT SMOKE/TUKEY LINES E=SUBJECT(TREAT*SMOKE);
184 MEANS TIME;
185 LSMEANS TIME/STDERR PDIFF;
186 LSMEANS TREAT SMOKE TREAT*SMOKE/STDERR PDIFF E=SUBJECT(TREAT*SMOKE);
187 MEANS TIME TREAT*TIME TREAT*SMOKE TIME*SMOKE TREAT*TIME*SMOKE;
188 MEANS TIME TREAT*TIME TREAT*SMOKE TIME*SMOKE TREAT*TIME*SMOKE
189 /TUKEY LINES;
190 LSMEANS TIME*TREAT TIME*SMOKE/STDERR PDIFF;
191 LSMEANS TIME*TREAT TIME*SMOKE/STDERR PDIFF E=SUBJECT(TREAT*SMOKE);
192 LSMEANS TREAT*SMOKE*TIME/STDERR PDIFF;
193 LSMEANS TREAT*SMOKE*TIME/STDERR PDIFF E=SUBJECT(TREAT*SMOKE);

Post hoc analysis of above ANOVA. Note: least squares means adjust for unequal sample/cell sizes.
APPENDIX M

SAMPLE CORRESPONDENCES TO TEACHERS
Listed below are the scheduled dates for the upcoming implementation of the Minnesota Smoking Prevention Program:

Week of March 26  
Informational letters sent home with sixth grade students

Tues., April 8  
Pretest Questionnaire Given to Students
9 AM - Mack & Wirtley
9:30 - Armbruster & Davidson
10:00 - Heard
(Approximately 20 minutes to complete)

Thurs., April 10  
Peer Leader Training
10:45 AM
(Approximately 45 to 60 minutes to complete)
Peer leaders should be respected & liked by peers and have good attendance.
There should be an “alternate” in case of absences.
* I have attached a sheet to assign students to groups. it would be very helpful if you could assign students to groups and assign a peer leader. I will collect this from you on the day of the pretest.

Tues., April 15
Fri., April 18
9:30 - Armbruster, 10:15 Davidson, 11:00 Wirtley, 1:45 Heard &
Tues., April 22
2:30 Mack
Thurs., April 24
* Each class will meet on all six days at the above time.
Tues., April 29 &
Thurs., May 1

Week of May 26  
Posttest Questionnaire Given to Students
Will schedule at date & time at a later date.

Should you have questions or concerns, please do not hesitate to call me at 746-2445. Thank you again.
MEMO

To: Ms. Armbruster  
    Ms. Davidson  
    Ms. Heard  
    Ms. Mack  
    Ms. Wirtley  

From: Marietta Langlois, HealthWise  

Subject: Smoking Prevention Program Activities  
Date: April 23, 1997  

Four sessions down, two to go!! As Anne and I make preparations for the final sessions of the Minnesota Smoking Prevention Program, we are looking for ways to squeeze in all the remaining activities. Could you arrange a 30-minute block of time on Wednesday, April 30 where students complete the following projects?

- Development of non-smoking advertisements. We will discuss the assignment in lesson #5 on Tuesday, April 29. They are to present them to the class in the final session on Thursday, May 1. They will need time to complete their posters as a team.

- "Choose Not To Use" statement. Students will read these statements during the last class. We will pass out the form in lesson #5, but again they will need time to prepare their statement for the final session.

Because this is a work session, Anne and I will not be at this 30-minute segment. All necessary materials and directions will be distributed on Tuesday in lesson #5.

Additionally, is ok for us to tell the students that the non-smoking ads they develop will be displayed in the school...either in their hallway, library or cafeteria?

Anne or I will check in with you on Tuesday about these changes. Thanks again!
MEMORANDUM

To: Amanda, Jefferson & Roosevelt Elementary Sixth Grade Teachers
From: Marietta Langlois
Subject: Smoking Questionnaires
Date: May 19, 1997

REMINDER, REMINDER, REMINDER

The final distribution of the smoking prevention questionnaires is next Tuesday. Listed below is the schedule:

Tuesday, May 27
Roosevelt:
- 9:00 AM  Mack & Wirtley
- 9:35 AM  Armbruster
- 10:10 AM Heard & Davidson

Amanda:
- 1:15 PM  Christiansen, Wood & Garrett

Jefferson:
- 1:40 PM  Vogel & Heflin

The questionnaire and the procedures are the same as the previous testing in April. If you have questions, please call me at 746-2445.

Thanks again for your help with evaluating the effectiveness of the Minnesota Smoking Prevention Program.
APPENDIX N

PEER LEADER AWARD
Peer Leader Award

presented to

For Outstanding Peer Leadership in the Minnesota Smoking Prevention Program

presented by
Middletown Regional Hospital

May 1, 1997

Anne Haye

Marietta Langlois
APPENDIX O

LETTER OF SUPPORT FROM SCHOOL DISTRICT
March 28, 1997

Behavioral & Social Sciences Review Committee
Office of Research Risks
Room 300, Research Foundation Building
1980 Kenny Road
Columbus, OH 43210

Dear Committee Members:

Adolescent smoking is a complex issue and we eagerly support the implementation of the Minnesota Smoking Prevention Program in our schools. Smoking prevention is already part of the district-wide health curriculum; the evaluation of this comparison instructional technique will allow us to make decisions regarding the future implementation of the program.

The six-lesson program will be implemented in one of our schools' sixth grade classes, while two of our schools will serve as the comparison group. We understand that the tool to evaluate student learning is a pre and post anonymous questionnaire and that only group results will be shared with any individual or organization, other than the investigators. We have absolutely no expectations to see student's individual answers. As a note, our school district already surveys students' substance abuse, including tobacco, through a biannual anonymous questionnaire and students have never been at risk, physically, mentally or legally for their answers.

As with other new programs in the school, an informational letter will be sent home with each sixth grader from the participating classrooms. Because of our preexisting partnership with Middletown Regional Hospital, we have requested that the informational letter be printed on their stationary. Students whose parents wish that their child not participate will be excluded, as requested.

Should you need more information to assure the benefit to as well as guarded privacy of our students, please do not hesitate to call me at (513) 420-4533.

Sincerely,

Cindy Martin
Substance Abuse Education Coordinator

SM-0f

cc: R. Pease
M. Langlois

An Equal Opportunity Employer
LIST OF REFERENCES


