SMOKING BEHAVIOR AMONG IMMIGRANTS FROM THE FORMER SOVIET UNION

DISSERTATION

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

By

Cathy Jo Baker, M.S.

*****

The Ohio State University
2008

Dissertation Committee:
Professor Karen Ahijevych, Adviser
Professor Mary Ellen Wewers
Professor Phyllis Pirie

Approved by

Adviser
Graduate Program in Nursing
ABSTRACT

Description of cigarette smoking behavior and beliefs in high risk ethnic groups is a critical step to bringing cultural and ethnic considerations into tobacco cessation interventions. This study focused on variables related to smoking behavior among immigrants from former Soviet Union (FSU) countries with high smoking prevalence (53-63% men) now living in Ohio. Three papers are presented that explore elements of this overarching theme. A qualitative perspective was gained from interviews which is discussed in Chapter 1. The larger study of quantitative results is presented in Chapter 2. The importance of cultural influences on smoking behavior, which was revealed in both qualitative and quantitative analyses of data, is further explored in Chapter 3.

Variable selection was guided by The Biobehavioral Model of Tobacco Use, which depicts biological and behavioral factors both influencing and being influenced by tobacco use. Study variables selected using this framework include depressive symptoms, stressful life antecedents, acculturation, acculturative stress, level of tobacco use, salivary cotinine (the major nicotine metabolite), nicotine dependence, and the cultural context of smoking (decisional balance and reasons for smoking). This study employed a descriptive correlational design with 80 participants, including men and women, smokers and non-smokers. Cross-sectional data was collected in community settings with those who had immigrated from the FSU within the last 20 years. Data analysis examined relationships
between these variables and smoking. In addition, qualitative data collected in interviews with a subset of the total sample of smokers and former smokers (n=14) from the FSU helped to illuminate attitudes toward smoking and cessation in this culture.

The first paper reports the results of qualitative interviews that were utilized to assess beliefs and attitudes toward smoking. The purposes of the interviews were to identify participants’ reasons for cigarette smoking, interest in quitting smoking, perceived barriers and benefits of quitting, strategies used in the past, preferences for intervention strategies, and unique cultural stressors.

Semi-structured interviews were conducted in focus group or individual settings with a total of 14 participants in two focus groups and six individual interviews. Participants included smokers and former smokers from FSU countries who were recruited from community settings. The content of interview data transcribed verbatim from audiotapes was analyzed with the help of NVivo software.

The data especially emphasized the importance of social factors and stress management as motivators for smoking behaviors in this culture. Personal will-power was the most helpful cessation strategy identified, with a firm lack of openness to pharmacologic approaches expressed in the interviews. Participants also described the difference between the acceptability of smoking in their native country versus that of the United States and an ambivalent attitude toward smoking and cessation. The importance of social connectedness in the lives of participants was a strong theme.

Based on these qualitative findings, interventions with this type of population should include stress management and address the need to maintain social connectedness in a cultural context where smoking may be the norm. The qualitative data will inform
future interventions in terms of these aspects of the cultural context of smoking and to compare the equivalency of the concepts of interest experienced by this group with dominant U.S. society.

Quantitative results with 80 participants are presented in Chapter 2. This part of the study examined the relationships between the biobehavioral aspects of cigarette smoking in immigrants from the FSU living in Ohio including their level of depressive symptoms, acculturation, acculturative stress, nicotine dependence, and tobacco use. Smokers and non-smokers were compared on selected variables. All participants completed the Center for Epidemiologic Studies depression scale (CES-D), Stephenson Multigroup Acculturation Scale (SMAS), and Social, Attitudinal, Familial, and Environmental (SAFE) Acculturative Stress scale, as well as assessment of salivary cotinine level. Number of cigarettes smoked per day (CPD), Fagerström Test for Nicotine Dependence (FTND), Reasons for Smoking scale, and the Decisional Balance of Smoking scale were collected from the current smokers (n = 26). All participants received both Russian and English versions of the CES-D for comparison of these parallel forms.

Acculturation measurement results revealed high identification with both the dominant and ethnic cultures among participants, though ethnic identification was found to be significantly higher. Acculturative stress mean score was significantly higher in those under 60 years of age. Average CES-D score was 16.7 on the English version and 18.7 on the Russian version, and 52% of the sample scored greater than the cut-off score set for further depressive symptom evaluation on the English CES-D. There was a significant negative correlation between English CES-D score and dominant society
immersion score \( (r = -.439, p < .05) \) and a positive correlation with ethnic society immersion \( (r = .384, p = .06) \). Score on the English CES-D was significantly positively correlated with acculturative stress score \( (r = .344, p < .01) \) and both versions were negatively associated with number of cigarettes smoked per day (Russian: \( r = -.468, p < .05 \); English: \( r = -.382, p = .06 \)). CES-D score was not significantly correlated with nicotine dependence score. The best fitting regression model to predict number of cigarettes smoked per day (CPD) included three variables (FTND score, CES-D score, and number of years smoked), which were each significant contributors to the variation in CPD and combined they explained 59% of this variation. Those who reported higher nicotine dependence, lower depressive symptoms and more years having smoked reported a higher number of cigarettes per day. Cotinine level was predicted by a single item indicator of nicotine dependence from the FTND, time to first cigarette of the day \( (R^2 = .783, p < .01) \).

This study provides foundational information on biobehavioral aspects of cigarette smoking in FSU immigrants with the goal of guiding culturally sensitive smoking cessation interventions. This sample reported relatively high depressive symptoms and high ethnic and dominant culture identification, with significant associations revealed among acculturation, acculturative stress, depressive symptoms and smoking. In this culture where smoking may be an important part of stress management and social connectedness, smoking may have protective effects against depressive symptoms, for which FSU immigrants appear to be particularly at risk. Smoking cessation interventions, therefore, must address replacing the social and coping functions of smoking with healthier alternatives.
The third paper explores the cultural context of smoking behavior. The concept of traditional racial groupings having more cultural significance than biological significance is discussed. Differences between ethnic groups in smoking behavior reported in the literature are reviewed. Variables thought to be most directly related to cultural context from the current FSU sample are presented as an exemplar of how cultural context may influence smoking behavior. Stress relief was identified in the qualitative interviews as the primary reason for smoking. Participants’ comments reflected that acculturative stress was a major contributor to stress levels. Further, the average score on the acculturative stress instrument used in the survey reflected moderate levels of acculturative stress, despite an average of 12 years since emigration. Neither acculturation nor acculturative stress was found to be significantly correlated with numbers of years since immigration. Current smokers reported the highest levels of acculturative stress, followed by former smokers, with never smokers reporting the lowest levels of stress. Participants scored high on both of the acculturation measure’s subscales (ethnic society immersion and dominant society immersion).

These findings highlight the need for smoking cessation interventions with this group to address acculturative stress within a unique cultural context that identifies strongly with both ethnic and American culture. Research that explicates mechanisms by which potentially health damaging social influences present within a culture or subculture can be ameliorated without damaging the beneficial effects of social support is needed. Anticipated benefits of this research include more culturally sensitive smoking cessation services aimed at increasing the efficacy of interventions, as well as greater understanding of the cultural influences on health behavior.
To my parents, Roger and Jean Baker
ACKNOWLEDGMENTS

I would like to express heartfelt gratitude to Dr. Karen Ahijevych for her support and mentorship with this project and in my professional development throughout my doctoral education. Her knowledge and expertise in tobacco control research has been a great help and inspiration to me. The feedback of Dr. Mary Ellen Wewers and Dr. Phyllis Pirie during the writing of this document, along with the sharing from their wealth of experience in tobacco control research, have been greatly appreciated.

I would like to thank my family for their encouragement and my doctoral program classmates for their support and companionship on this journey.

This research was supported by the OSU Alumni Grant for Graduate Research and Scholarship and by Sigma Theta Tau International, Epsilon Chapter.
VITA

July 18, 1968

Born – Mount Gilead, Ohio

1993

B.S.N., The Ohio State University

1993-1995

Staff Nurse, James Cancer Hospital, The Ohio State University

1995-1996

Home Health Nurse, Al Nursing, Columbus, Ohio

1996-1997

Psychiatric Nurse, Netcare Access, Columbus, Ohio

1997-2001

Academic Adviser, OSU College of Nursing

2001

M.S., Nursing, The Ohio State University

2001-2002

Psychiatric Crisis Nurse, Netcare Access, Columbus, OH

FIELD OF STUDY

Major Field: Nursing
TABLE OF CONTENTS

Abstract ........................................................................................................................................... ii
Dedication .......................................................................................................................................... vii
Acknowledgments ......................................................................................................................... viii
Vita .................................................................................................................................................... ix
List of Tables ................................................................................................................................... xii
List of Figures .................................................................................................................................. xiii

Chapters

1. Former Soviet Union immigrants and smoking: Qualitative interviews ........... 1
   Introduction ................................................................................................................................. 1
   Background ................................................................................................................................. 2
   Purpose .................................................................................................................................... 3
   Methods ................................................................................................................................... 4
   Sample ..................................................................................................................................... 4
   Analysis of data .......................................................................................................................... 5
   Results ..................................................................................................................................... 6
   Discussion ................................................................................................................................. 12
   References ................................................................................................................................. 19

2. Relationships among variables in smokers and non-smokers.............................. 25
   Introduction ................................................................................................................................. 25
   Background ................................................................................................................................. 27
   Methods ................................................................................................................................... 35
   Results ..................................................................................................................................... 45
   Discussion ................................................................................................................................. 50
   References ................................................................................................................................. 55
3. Cultural context of health behavior: Smoking among former Soviet Union immigrants

Introduction ........................................................................................................................................73
Ethnic identity and cultural context of health behavior .................................................................74
Importance of ethnicity to smoking behavior ...............................................................................75
Smoking behavior in cultural context .............................................................................................78
Exemplar: Former Soviet Union immigrants and smoking ............................................................83
Conclusion .......................................................................................................................................88
References .........................................................................................................................................90

Conclusion ........................................................................................................................................97

Bibliography .....................................................................................................................................100
LIST OF TABLES

<table>
<thead>
<tr>
<th>Figure</th>
<th>Description</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.1</td>
<td>Interview Questions</td>
<td>23</td>
</tr>
<tr>
<td>1.2</td>
<td>Demographic Characteristics of Participants n=14</td>
<td>24</td>
</tr>
<tr>
<td>2.1</td>
<td>Study Variables and Their Measurement</td>
<td>63</td>
</tr>
<tr>
<td>2.2</td>
<td>Demographic Characteristics of Participants n=80</td>
<td>64</td>
</tr>
<tr>
<td>2.3</td>
<td>Descriptive Statistics of Study Variables</td>
<td>65</td>
</tr>
<tr>
<td>2.4</td>
<td>Descriptive Statistics of Variables Only For Smokers</td>
<td>66</td>
</tr>
<tr>
<td>2.5</td>
<td>Descriptive Statistics of Reasons for Smoking</td>
<td>67</td>
</tr>
<tr>
<td>2.6</td>
<td>Correlational Coefficients Among Variables, Total Sample</td>
<td>68</td>
</tr>
<tr>
<td>2.7</td>
<td>Correlational Coefficients Among Variables in Smokers</td>
<td>69</td>
</tr>
<tr>
<td>2.8</td>
<td>Correlational Coefficients Among Variables Related to Smoking</td>
<td>70</td>
</tr>
<tr>
<td>2.9</td>
<td>Analysis of CPD Regressed on Craving, CES-D, and Habit</td>
<td>71</td>
</tr>
<tr>
<td>2.10</td>
<td>Analysis of Cotinine Regressed on Time to First Cigarette</td>
<td>72</td>
</tr>
<tr>
<td>3.1</td>
<td>Demographic Characteristics of Participants n=80</td>
<td>96</td>
</tr>
</tbody>
</table>
# LIST OF FIGURES

<table>
<thead>
<tr>
<th>Figure</th>
<th>Description</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>2.1</td>
<td>Biobehavioral Model of Smoking and Tobacco Use</td>
<td>61</td>
</tr>
<tr>
<td>2.2</td>
<td>Application of Theoretical Framework</td>
<td>62</td>
</tr>
<tr>
<td>3.1</td>
<td>Biobehavioral Model of Smoking and Tobacco Use</td>
<td>95</td>
</tr>
</tbody>
</table>
CHAPTER 1

FORMER SOVIET UNION IMMIGRANTS AND SMOKING: QUALITATIVE INTERVIEWS

Introduction

There seem to be ever widening disparities in smoking prevalence, the leading cause of preventable death in the U.S. (CDC, 2007). Cigarette smoking has adverse effects that start before birth and continue throughout the lifespan, causing 440,000 premature deaths annually in the U.S. (USDHHS, 2004). The smoking rates in a number of groups remain higher than the overall prevalence, possibly burdening already vulnerable populations with accompanying morbidity and mortality.

The majority of current tobacco cessation interventions have been designed for and with middle-class White Americans (Benowitz, 2002). Therefore, the tobacco cessation needs of other groups may be neither adequately known nor effectively addressed. The Treating Tobacco Use and Dependence Clinical Practice Guideline (Fiore & et al, 2008) encourages culturally appropriate models of cessation counseling and materials, and sensitivity to individual differences and health beliefs. Description of smoking behavior and beliefs in ethnic groups is a critical first step to bringing cultural considerations to tobacco cessation interventions. This need is urgent when considering that the U.S. Census Bureau estimates that by the year 2050, nearly half the U.S. population will be made up of ethnic minorities.
Background

Immigrants from the 15 countries that together formerly comprised the Soviet Union (U.S.S.R.) have the unifying factor in their adopted country that they all speak Russian. The Former Soviet Union (FSU) is a significant source of immigrants to the U.S; in the 1990s it was the source of the most immigrants and refugees, with significant numbers immigrating in this period (U.S. Census Bureau, 2003), with 709,000 people stating that they speak Russian at home in the 2000 Census. This large ethnic group is not distinguished racially from the American White population and is not geographically defined (e.g. Appalachia), therefore; they are invisible in smoking prevalence data.

However, smoking prevalence in their native countries of 53-63% in men is more than double the general U.S. rate. In the U.S., 23.9% of men and 18.0% of women smoke cigarettes (CDC, 2007) while across FSU countries, 53-63% of men and 9-15% of women smoke (Shafey, Dolwick, & Guindon, 2003). The World Health Organization (WHO, 1999) has reported a widening gap between Western and Eastern Europeans in smoking prevalence. Further, the similarly high rates and patterns of smoking in FSU countries differentiates them even from prevalence in other Eastern European countries, such as Poland (42% prevalence in men, 23% in women) (Shafey et al., 2003). Thus, individuals from the FSU are differentiated from other European immigrants, suggesting a unique smoking pattern occurring in this culture.

Studies regarding smoking in ethnic minority groups from native cultures with high smoking prevalence such as Southeast Asia (Jenkins et al., 1997)(Wewers et al., 2000) and Hispanic immigrants (Shanker, Gutierrez-Mohamed, & Alberg, 2000) have found that smoking rates in the U.S. among these first generation immigrants were similar to
those of the native country. These rates continue to be observed even a number of years post-immigration. For example, a study of Southeast Asian immigrants found that smoking rates remained similar to the native countries among men who were in the U.S. an average of 7 years (Wewers et al., 1995).

Belief systems have been found to be important in helping to explain the variance in smoking behavior in studies with other types of special populations (Stacy & Loyd, 1990); (Tipton, 1988); (Kaufert, 1986). To date, no data have been published on the smoking behaviors or beliefs following immigration by FSU immigrants. A better understanding of the factors that influence smoking behavior may improve smoking cessation efforts in this and other immigrant groups. Culturally sensitive information relating to smoking in the cultural context of this unique group is needed in order to appropriately design interventions.

Purpose

The purpose of this study was to identify participants’ reasons for cigarette smoking, interest in quitting smoking, perceived barriers and benefits of quitting, strategies used in the past, preferences for intervention strategies, and cultural stressors. Qualitative data collected in the interviews will inform future research and interventions in terms of these aspects of the cultural context of smoking and will compare the equivalency of the concepts of interest experienced by FSU immigrants with dominant U.S. society. This study provides foundational information on cigarette smoking among FSU immigrants with the long-term goal of guiding culturally sensitive smoking cessation interventions.
Methods

Semi-structured interviews were conducted in focus group or individual settings with a total of 14 participants in two focus groups and six individual interviews between March 2006 and February 2007. Participants were given the choice of completing an individual interview in lieu of a focus group, if so desired, because a number of the participants were very uncomfortable talking in a group setting and refused to do so. The individual interviews included the same questions as those posed to focus group participants. Sample interview questions include: “What are some reasons people smoke cigarettes?”; “What role do others play in your smoking?”; and “What would it take for you to quit smoking?” Questions about stressors before and after immigration were also asked (See Table 1.1). Interviews were conducted in English.

The moderator and on-site observer conducted focus groups according to techniques described by Krueger (Krueger, 2003). All interviews were conducted by the same moderator. Techniques used by the moderator included probing and clarifying questions. The on-site observer unobtrusively recorded field notes, not participating in the discussion. The observer recorded key points, significant quotes, behavioral observations, and clarified which participant was the speaker. All sessions were audio taped and transcribed verbatim.

Sample

A total of fourteen participants were recruited through immigrant social service programs, flyers in Russian grocery stores, and workplaces that employed Russian-speaking personnel. Participant demographics are displayed in Table 1.2. The average age of participants was 51 years ranging from 32 to 74 years old, including 6 men and 8
women. Seventy-eight percent of the sample was married, with a mean of 10.4 years in the U.S., ranging from 2 to 15 years. Participants were from the FSU countries of Russia, Ukraine, Belarus, and Georgia, 78% were Jewish, and all participants had at least some college level education. Participants were included who were 18 years of age or older in order to include as wide an age range as possible of participants that had an established smoking pattern and in order to include late adolescents. Individuals who had emigrated from a former Soviet country in the last 20 years were included in order to capture increased Russian-speaking immigration that occurred in the 1990s. Participants must have been at least 15 years old on immigration, could speak and understand English and were self-reported current or former cigarette smokers. A $20 incentive to participate was provided to each participant to acknowledge the participants' time commitment.

Analysis of Data

Upon completing a comprehensive review of transcripts and field notes, content analyses using NVivo software (N6, 2002) was conducted involving the coding of responses to the interview questions, followed by the extraction and synthesis of overall themes and patterns. Two research personnel conducted coding analyses independently to assess consistency of assigning participants’ responses to particular codes (Sandelowski, 1986). There was greater than 95% agreement between the two coding researchers. For the smoking content, a coding framework was used that had been identified in a focus group study with women in Ohio Appalachia (Abbott et al., 2005). For the stress and immigration issues content, codes were developed based on the data. The software aided
in identifying the major themes by counting the number of sources and references that had been coded for each factor. In this way, themes that were discussed by a majority of participants were noted.

Results

Reasons for Smoking

Understanding what the benefits of smoking are for the individual is important to consider in cessation efforts. Thus, participants were first asked about what smoking did for them, the reasons they thought themselves or others smoke. A reason for smoking that was alluded to by all participants was stress relief. Participants related pervasive, long term societal-level stressors in their lives. Stressors before emigration included: anti-Semitism, lack of opportunities, and economic hardships in a context of governmental instability, including food insecurity. As one participant described,

…also I think people smoke out of stress, just out of stress. It’s more effective usually mentally when people they smoke, to relieve their stress and you know, let them. It’s very stressful, life in former Soviet Union, is very stressful. I mean the country just fell apart, crumbled down, no infrastructure, no jobs.

Current life stressors included the different pace of life in the U.S., language/accent barriers and economic or job issues. The most bothersome current stressors were the lack of social connectedness here and separation from family or friends in their native country.

The second major reason for smoking that was given by all participants was socializing rituals or connections, illustrated by this comment:

It’s social, a social thing. It’s not as much physical, I think, as going outside and chatting, you know, have a cigarette and coffee. It’s almost like if you quit doing that,
you’re invisible because you don’t have that connection. You don’t have that break for 5 minutes to go and chat, to listen to gossips of others that come outside and smoke and chat, things like that. A lot of people don’t smoke when they’re alone, can stay without smoking like hours and hours, and then when they meet somebody, they will take a cigarette.

One man described smoking as a way to connect through a sense of common purpose: “I mean if you just sit on a bench not doing anything, you are not doing anything. But if you smoke cigarette you are smoking together. I mean, you are doing something.”

The majority of participants discussed the high importance of social connectedness in their lives. This quote represents the many comments about trying to adjust to a different sense of social connection in contemporary U.S. society:

…still things am not accustomed. Say today, is nice day outside, when I go outside, no people, only cars. In Russia, many people out, many, many people. People walking, enjoying beautiful day, the children having good time – another life, another type of life. Here, empty streets, nobody out, shut inside.

One participant related that when he tried to quit smoking, he “felt invisible” in his social group. A key part of socializing was lost for him, which lead to him beginning to smoke again.

Other themes that were mentioned by a majority of the participants regarding reasons for smoking included nicotine dependence and the ritual or habit of smoking. Nicotine dependence was usually inferred from comments in the interviews, rather than mentioned by name, such as the following.
When you start to smoke, you don’t have the dependency yet. And, a lot of people tell me, oh I’ll quit whenever I can, I can smoke for a day or 2 and then just quit for few days. With this in mind, people don’t notice how they get sucked into it.

Another participant related her experience with smoking: “So, I decide to try [to quit] and honestly it was harder mentally than physically. It’s a ritual, you have a good meal you gotta light a cigarette, especially when you’re in good company, relaxed, it’s a ritual. It really is.”

Most participants also pointed to social forces, such as peer pressure and the glamour of smoking, as reasons for initiating smoking. “When I was in the university, because I was ashamed to look other [different] than others. Everyone was smoking, they were cool and I wanted to be cool, too!”

Experiences With Quitting

The reason that all participants gave for quitting smoking or considering quitting was health concerns: “And we do know more about adverse effects of smoking and I guess nobody wants to get lung cancer or some other problems related to smoking”.

The current smokers in the sample all reported having quit for periods of months or years in the past. Reasons given for resuming smoking included stress, enjoying smoking and smoking being a habit. One participant described trying to give up smoking: “you decided you were going to quit. Once you make that decision, it’s a constant fight. Fight may be too strong a word, but it’s a constant process until you die. Until you die!”

All participants reported increased knowledge regarding the risks of smoking since moving to the U.S. The salience of health concerns also seemed to have increased since emigration. To illustrate: “They simply didn’t care [in FSU]. Maybe now when
circumstances, social circumstances change, maybe now they have to think about their individual health and how they will do. They do want to live longer.” The participants who were former smokers reported quitting because of potential health concerns, with one participant also citing finances.

Several strategies that had been tried in order to quit were identified. All participants reported that their personal strength or resolve (sela volye in Russian) had been their only or most important aid in smoking cessation. However, the social milieu around smoking seemed to have a large influence: “And when I’m not seeing other people smoking it’s easier for me not to smoke.” Participants also described a reduction in stress levels or increased resources for coping as being helpful in the quitting process.

Like here [in the U.S.], I was mugged by my house, but that’s an occasion, it happens. But, there [FSU] it was every day, for a long, long period of time. So, I don’t think I would be able to quit there as easy as I did here.

Only one of the participants was open to trying nicotine replacement therapy (NRT) or other pharmacological cessation aids. Comments regarding NRT were negative and suspicious. One participant compared NRT to illicit drugs. Those who had successfully quit (n=5), had done so without cessation aids.

Cultural Context of Smoking

All participants spoke of the difference between acceptability of smoking in their native country versus that of the U.S.. “Yeah, the majority of people, you know, were smoking, you didn’t have to hide it from your folks, your parents, teachers”. In contrast to the U.S., where “People look at you like you’re an outcast. They start (sniff, sniff), you know…. As one woman put it: “I actually almost feel like I’m using drugs or drinking
outside on the street when I smoke sometimes, because people look at you like you are a prostitute, whatever! I don’t know!”

Ambivalence about the dangers of smoking was evident in the interviews as a whole, illustrated by this comment: “Why shouldn’t I [smoke]? I mean yeah, all kinds of health things. I cut down because of it actually. I said maybe I shouldn’t smoke, whatever, I [still] smoke.” All of the smokers expressed a desire to quit and had past quit attempts. All but one of the former smokers spoke of occasional smoking, which they did not see as a concern, but were quick to assert that they were non-smokers. Most of the participants displayed an ambivalent attitude toward smoking that seemed to reflect their cultural milieu.

During the study, a state-wide indoor smoking ban in public settings was approved by voters. Participants, both current and former smokers, had negative comments regarding these ordinances, as well as the high taxes on cigarettes. Comments seemed to express a feeling of persecution, as one participant stated, “[the] government doesn’t punish people for smoking there [native country]”.

Another theme that arose in the data was a fatalistic outlook that seemed to affect the decision to continue smoking. As one current smoker put it “let’s face it, none of us, smokers and non-smokers, will get out of this thing [life] alive”. This outlook was combined with a history of relatively low expectations of longevity or fulfillment.

So basically the needs, you know this Maslow’s Hierarchy? The needs are cut off.

You basically don’t think about any of those higher needs. You basically are on your
physiological needs and you know, and love and basic social things. You don’t actually care about self fulfillment and actualization itself. Kind of people just lower their expectations in life.

Reasons for Emigrating

Reasons for emigrating to the U.S. were assessed in the interviews in order to gain some understanding of the participants’ social milieu during their smoking history. The top reason for emigrating to the U.S. for the non-Jewish participants was to have greater economic and work opportunities in the U.S.

I mean there’s no jobs [in FSU]. It’s why I came here actually, I mean this is the only reason I came here. I had no other reason. I finished school and nothing for me to do there, so I decided to do something. What I had was just being wasted.

Another participant talked of better opportunities for his children compared to his upbringing, “Always fights [in FSU]. I want my boys to have different life than that. Here my boys playing soccer, going to school, learning. There I was smoking and fighting in the street.”

The reason all of the Jewish participants had emigrated was to escape persecution and oppression of Jews in the FSU, which also affected the range of options available to them. “Lots of anti-Semitism in Russia. That’s why we came, really. No opportunities for Jews. We felt our lives, talents, minds would be wasted there.” The Jews in the sample also related feeling threatened and unwelcome in the FSU.

I got letters saying “We will kill you Jews”. At first I thought it was a joke, but I kept getting and got scared. So, I went to the police. Policeman says “Well, why don’t you
leaving? Why don’t you go back to Israel?” Israel? I don’t know Israel. This was my home, I was born there, my mother and grandmother were born there, in Russia.

Discussion

Results of this study especially emphasize the importance of social factors and stress management as motivators for smoking behaviors in this culture. Smoking in order to mitigate stress was a strong theme in the data. Other studies with minority and disadvantaged populations have similarly reported that smoking as a stress coping technique was one of the major factors related by participants (Romano, Bloom, & Syme, 1991); (Pletsch & Johnson, 1996); (Stewart et al., 1996); (Pletsch, Morgan, & Pieper, 2003) (Manfredi, Young, Crittenden, & Dolecek, 2007). Exposure to traumatic events has also been linked to increased tobacco use; for example, the sustained increased tobacco use found in Manhattan after the 9/11/01 attacks (Vlahov et al., 2004) and in Israeli youth exposed to terrorism (Schiff, Zweig, Benbenishty, & Hasin, 2007).

Although stressors have changed since emigration, this group of FSU immigrants reported a continued relatively high level of stress after a number of years post-emigration. Acculturative stressors, such as language or accent barriers and navigation of a foreign workforce seem to make up the majority of this group’s current stress. Immigrants will probably experience life-long acculturative stress at some level that is over and above the life stressors that are typically expected. Because of this, immigrants may experience a higher level of stress, with different types of stressors and fewer resources for coping than the native born population. Stress management, including stressors particular to immigrants must be considered in cessation interventions.
The vital importance of social connections in their lives was emphasized by participants, underlining the social reasons for smoking. In a culture where the social environment is a key component of living, smoking to avoid social isolation may be a much more motivating factor than it would be in mainstream American culture. Keeping social connections seems to be a significant factor for this group.

Studies with other cultural groups in the U.S. have also shown the importance of social factors in health behaviors. Focus groups conducted with male Korean smokers revealed social factors as a strong motivator of smoking behavior, reporting a fear of social isolation within a collectivistic cultural heritage (Kim, Son, & Nam, 2005). These Korean participants also discussed the relative ease of quitting in the U.S. versus their native country and the social stigma toward smoking experienced by smokers in the U.S. Focus groups conducted with American Indians who reported a high acceptability of smoking in their culture also pointed to the presence of smokers in their community as a barrier to smoking cessation, along with stress and physical dependence (Burgess et al., 2007). Qualitative studies with Appalachian smokers also reported that the social environment was a large influence in smoking behavior (Ahijevych et al., 2003);(Abbott et al., 2005).

Nicotine dependence was described by a majority of the participants in the current study when talking about their experiences with smoking and attempting to quit. This factor in smoking behavior has been cited in the literature with studies of many populations, including the qualitative studies with special populations discussed in this report (Pletsch & Johnson, 1996);(Stewart et al., 1996);(Ahijevych et al., 2003);(Reynolds, Neidig, & Wewers, 2004);(Burgess et al., 2007).
Weight control has been cited in other studies as a major concern in smoking choices among women (Pirie, Murray, & Luepker, 1991), including minority groups such as Latinas (Pletsch & Johnson, 1996), and African Americans (Pomerleau, Zucker, Namenek Brouwer, Pomerleau, & Stewart, 2001). Concerns about weight control as a reason for smoking was not mentioned by any of these FSU participants.

This group of smokers and former smokers is not alone in their negative feelings toward smoking bans and taxes on cigarettes as an increasingly common way to pay for government programs. Qualitative studies of other cultural groups have reported similar findings in Korean (Kim & Nam, 2005) and Appalachian (Abbott et al., 2005) populations. Some groups of smokers may feel persecuted by what they perceive as anti-smoker initiatives. Interventions with these populations may increase effectiveness by emphasizing autonomy and personal control over their health behaviors.

The perception of a social stigma toward smoking in the U.S. was a strong theme in the current interviews. Other groups have reported this as well, such as a qualitative study with disadvantaged women in Atlantic Canada (Stewart et al., 1996) and HIV-positive men (Reynolds et al., 2004). As the stigma toward smoking grows, clinicians can continue to offer smoking cessation help and advice in a non-judgmental environment.

Participants displayed especially closed attitudes toward the use of nicotine replacement or other medications to aid smoking cessation. Focus groups conducted with American Indians in the Upper Midwest also found skeptical and mistrustful attitudes toward pharmacological cessation treatment, but unlike this sample, the participants reported a willingness to try these in the future (Burgess et al., 2007). A quantitative study with 300 American Indians in the same area including smokers and non-smokers
reported that the majority of the smokers would prefer the strategy to “quit on my own” and that only one of the former smokers reported use of any pharmacological therapy (Forster et al., 2007). In contrast, openness to trying NRT despite a distrust of medications was reported among women in Appalachia (Abbott et al., 2005).

This sample of FSU immigrants reports a life-long pattern of high stress levels, including early deprivation of basic needs, such as a reliable supply of food. This history of stress and insecurity at the lower levels of the hierarchy of needs may influence the relatively low importance placed on prevention and health promotion activities, even when stress regarding basic needs is lessened or removed. The interview participants gave a low priority overall to preventing potential health problems caused by smoking, despite knowledge of the health risks. This may result from multiple competing demands on time and energy, pushing preventive efforts to a low priority, in combination with a fatalistic outlook on life and health.

The Soviet medical system is reported to have been quite paternalistic which may have ingrained feelings of individual lack of control over health status (Remennick, 2003); (Cockerham, 1997). Other qualitative studies regarding health issues with FSU immigrants to the U.S. (Benisovich & King, 2003); (Lipson, Weinstein, Gladstone, & Sarnoff, 2003) and Israel (Remennick, 2003) have found similar attitudes. Interviews conducted with older FSU immigrants to the U.S about the meaning of health revealed the theme of a definition of health based on the absence of disease and a high level of stress related to acculturative issues (Benisovich & King, 2003). That study also found a distrust of health information and media thought to stem from governmental control over media and information in the FSU, suggesting that increased knowledge of health risks
may have little effect on changing health behaviors in this culture. This may be an explanation for the ambivalence toward risks of smoking displayed by the current sample, who said they had learned of the risks primarily through the U.S. media. Other immigrant groups may also experience feelings of lack of control over individual health as well as barriers to preventive health measures fueled by acculturative stress, as discussed in qualitative studies among Latinas (Garces, Scarinci, & Harrison, 2006); (Pletsch & Johnson, 1996).

Limitations of the current study include the relatively small sample size. Also, participants were required to speak English reasonably well, tended to be well educated, and the majority were Jewish. These characteristics are fairly reflective of the population of FSU immigrants in the U.S.. However, research including those who are not fluent in English, less educated, and more individuals who identify with other religious faiths is needed. Interviews conducted in the native Russian language may also allow a fuller range of expression of thoughts than those conducted in English.

Conclusion

Based on the findings of these interviews, smoking cessation interventions with this type of population should include stress management and address the need to maintain social connectedness in a cultural context where smoking is the norm. Currently, the situation that these individuals find themselves in is that smoking helps to cope with the level of stress that they experience, with another major coping strategy being connection to other FSU immigrants. Thus, when they try to quit smoking, two of their main coping strategies are affected because quitting smoking diminishes their social connections with other FSU immigrants, a major source of support. Simich, Beiser & Mawani (2003)
found in a qualitative study of 47 refugees in Canada that having support from others that have a shared experience was of great importance. Perhaps cessation interventions that occur in a group setting would be beneficial for this population. Group members could be supported by the micro-environment of a smoking cessation group thereby decreasing the isolation experienced by this population when attempting to quit. In addition, respect for the individual’s autonomy seems to be an important factor. A qualitative study with 42 smokers focusing on experiences with advice to quit smoking from health care professionals suggested that interventions be respectful, sensitive to the individual’s situation, and supportive in order to decrease defensiveness and increase receptivity (Butler, Pill, & Stott, 1998).

Nicotine dependence is an integral component of the continuation of smoking for many smokers. Therefore, addressing nicotine dependence is important because most smokers know that they need to smoke to avoid withdrawal symptoms and have experienced this cycle. So, strategies to deal with this dependence on nicotine may increase the confidence that smokers can quit, thereby increasing self-efficacy. According to this sample, FSU immigrants are not open to pharmacological cessation interventions. So, education regarding the safety and efficacy of these treatment options would also be a key component.

Smoking in the cultural context of immigrants from the FSU may differ in nature from White Americans in the same racial/ethnic category by affecting beliefs, self-efficacy, coping skills, and social norms. Addressing specific barriers such as acculturative stress, the cultural context of smoking, and nicotine dependence may increase the self-efficacy of members of this unique group. Preventive and health promoting interventions tend to
be developed for mainstream Americans who have never experienced insecurities related
to societal instability or acculturative issues. When compared to their U.S.-born
counterparts, these immigrants have a markedly different history and life experience,
which has influences on health behaviors that must be considered in interventions.


N6. (2002). LaTrobe University, Melbourne: Qualitative Solutions & Research Pty. Ltd.


Shafey, O., Dolwick, S., & Guindon, G. e. (2003). *Tobacco control country profiles 2003*. Atlanta, GA:


Table 1.1

Interview Questions

1. What are some reasons people smoke cigarettes?
2. What role does tobacco play for you? How is it helpful?
3. In what ways is tobacco not helpful?
4. What role do others play in your smoking?
5. What would it take for you to quit smoking?
6. What are reasons you may have considered quitting?
7. Have you tried to quit smoking in the past?
8. Have you or someone you know ever used nicotine replacement products? How did those work?
9. What concerns do you have about quitting?
10. Where would you seek help or information about quitting?
11. Are there differences in the acceptability of smoking between your native country and the U.S.?
12. What were your top 3 stressors before emigrating to the U.S.?
13. What are your top 3 stressors now? How do you manage these?
N=14

<table>
<thead>
<tr>
<th>Demographic Characteristics of Participants</th>
</tr>
</thead>
<tbody>
<tr>
<td>Average age at interview                  51.0</td>
</tr>
<tr>
<td>Average years in U.S.                     10.4</td>
</tr>
<tr>
<td>Gender</td>
</tr>
<tr>
<td>Men</td>
</tr>
<tr>
<td>Women</td>
</tr>
<tr>
<td>Percent Married</td>
</tr>
<tr>
<td>Education</td>
</tr>
<tr>
<td>Bac. Degree or higher</td>
</tr>
<tr>
<td>Religion</td>
</tr>
<tr>
<td>Jewish</td>
</tr>
<tr>
<td>Orthodox</td>
</tr>
<tr>
<td>Smoking Status</td>
</tr>
<tr>
<td>Smoker</td>
</tr>
<tr>
<td>Former</td>
</tr>
</tbody>
</table>

Table 1.2
CHAPTER 2

RELATIONSHIPS AMONG VARIABLES IN SMOKERS AND NON-SMOKERS FROM THE FORMER SOVIET UNION

Introduction

Tobacco-related illnesses are among the greatest preventable threats to health in the world today. Cigarette smoking is the cause of significant morbidity and mortality. Smokers have increased risk of coronary artery disease, stroke, and chronic obstructive pulmonary disease and smoking is believed to cause 87% of lung cancers (CDC, 2003). Tobacco is responsible for approximately 440,000 deaths per year and $167 billion is spent annually in the U.S. on tobacco-related illnesses across the life span (CDC, 2007). Smoking cessation at any age has been shown to have a meaningful positive effect on longevity (Taylor Jr., Hasselblad, Henley, Thun, & Sloan, 2002).

The Treating Tobacco Use and Dependence Clinical Practice Guideline (Fiore et al, 2008) encourages culturally appropriate models of cessation counseling and sensitivity to individual differences and beliefs. Description of smoking behavior and beliefs in ethnic groups is a critical step to bringing cultural considerations to tobacco cessation interventions. There is a need to examine factors related to smoking behavior in special populations with high smoking prevalence in order to reduce the possible burden of disease.

The Former Soviet Union (FSU) was the source of the most immigrants and refugees to the U.S. in the 1990's, with significant numbers immigrating in this period (U.S.D.I,
2002). In the U.S., 23.9% of men and 18.0% of women smoke cigarettes (CDC, 2007), while across FSU countries, 53-63% of men and 9-15% of women smoke (Shafey, Dolwick, & Guindon, 2003). The World Health Organization (WHO, 1999) has reported a widening gap between western and eastern Europeans in smoking prevalence. High rates and patterns of smoking in FSU countries differentiate them even from prevalence in other Eastern European countries, such as Poland (42% men, 23% women) (Shafey et al., 2003), suggesting a unique smoking pattern occurring in this culture.

This ethnic group is not distinguished racially or geographically from the American White population, and therefore invisible in smoking prevalence data. However, the smoking prevalence of their native countries of 53-63% in men is approximately double that of the general U.S. rate. Studies regarding smoking in first generation immigrants from areas with high smoking prevalence such as Southeast Asian (Wewers et al., 2000)(Jenkins et al., 1997) and Hispanic immigrants (Shanker, Gutierrez-Mohamed, & Alberg, 2000) have identified that their smoking rates in the U.S. continue to be similar to those of the native country. These rates have continued to be observed after a number of years post-immigration in some groups, such as a study of first generation Southeast Asian immigrants where smoking rates were similar to the native country among men who were in the U.S. an average of 7 years (Wewers et al., 1995). No data have been published to date on the smoking behaviors of immigrants from the FSU to the U.S..

The level of smoking in FSU countries, particularly among males (53-63%), puts immigrants from these countries to the U.S. at extreme risk for health problems.
Culturally sensitive information relating to smoking in the context of this unique group is needed in order to eventually decrease smoking related morbidity through appropriately designed interventions.

The focus of this study was to identify biobehavioral aspects related to cigarette smoking in immigrants from the Former Soviet Union (FSU) in the U.S. Factors associated with tobacco use were examined in a sample of immigrants from the FSU including current smokers, former smokers and never smokers. Using the Biobehavioral Model of Tobacco Use as a guiding framework, variables incorporated include depressive symptoms, stressful life antecedents, cultural context, acculturation, acculturative stress, smoking status and level of smoking and nicotine dependence in current smokers, to reflect both biological and behavioral/psychosocial aspects.

Background

Theoretical Framework

The variables selected for study in this unique population were drawn from the Biobehavioral Model of Cigarette Smoking and Tobacco Use (Kozlowski, Henningfield, & Brigham, 2001) because cigarette smoking is influenced simultaneously by both physiologic and psychosocial/ lifestyle components (Figure 2.1). Despite the known health risks and personal expense of smoking, smokers who are motivated to quit often experience great difficulty. Relapse is common and multiple attempts to quit are usually necessary, with an estimated 44.2% of current smokers having made a quit attempt within the last 12 months (CDC, 2007). The physically and psychologically addictive nature of nicotine, combined with social and coping factors, affect the ability to quit smoking. Immigrants have additional obstacles and, without culturally sensitive support in tobacco
cessation, are essentially isolated in their attempts to quit smoking. Clinical trials of smoking cessation medications have primarily been performed with American White, middle class subjects and behavioral interventions developed are culturally appropriate for this group (Benowitz, 2002). In addition, as smoking has declined in the American white population, cigarette advertising has increasingly targeted minority groups and developing countries (ALA, 2004).

Application of the Biobehavioral Model of Smoking and Tobacco Use among FSU immigrants focused on the psychological (or behavioral) influences of cultural context, the biophysical (or biological) aspect of nicotine dependence, and the biobehavioral influences of depressive symptoms and stressful life antecedents (See Figure 2.2). The Kozlowski, Henningfield, and Brigham Model depicts psychosocial influences such as culture, economics, and beliefs affecting behavior, while biological factors of physiology and pharmacology also affect behavior (Kozlowski et al., 2001). In the model, the word behavioral refers to a broad class of nonbiological influences. There are bi-directional relationships between the behavior of smoking and biobehavioral factors, as the behavior can, in turn, affect the behavioral and biological domains. The behavior of smoking affects the brain and body neurochemically through nicotine, which reinforces addiction (Benowitz, 1999). Smoking behavior also influences, through the mind, the person’s thoughts and beliefs about themselves and smoking (Kozlowski et al., 2001). The variables drawn from the Biobehavioral Model of Smoking and Tobacco Use that were assessed in this study include Thoughts and Beliefs/Neurosciences (depressive symptoms.
and stressful life antecedents); Pharmacology (nicotine dependence); Culture (cultural context, acculturation, and acculturative stress); and Tobacco Use (cigarettes per day and salivary cotinine concentration).

Thoughts and Beliefs/Neurosciences

*Depressive Symptoms and Smoking*

Depressive symptoms are depicted in the model within both psychological and biophysical influences, as Thoughts and Beliefs affect and are affected by Neurosciences, the biochemical processes in the brain. Major depressive symptoms suggest both biochemical and psychological mediation. These include symptoms such as sleep and appetite disturbances, fatigue, inappropriate guilt, decreased ability to concentrate, psychomotor agitation or retardation, and suicidal ideation (APA, 2000). The stress of immigration has been found to increase depressive symptoms (Shiraev & Levy, 2004) and acculturative stress in African Americans has been linked to increased suicidality (Walker, Wingate, Obasi, & Joiner, 2008). A number of studies among Russian-speaking populations have shown mean scores significantly higher than their American counterparts on depression instruments, with 70-84% scoring above the established score indicative of further evaluation for depressive illness (Aroian & Norris, 2002; Aroian & Norris, 2003; Miller & Chandler, 2002). Further, high levels of depression were sustained in former Soviet immigrants for at least two years post immigration (Aroian & Norris, 2002), and depression scale scores were not found to be significantly correlated with number of years since immigration (Miller & Chandler, 2002), suggesting that this is not only a transient issue tied to the initial post-immigration adjustment. There has been no
research on depressive symptoms among longer residing FSU immigrants, nor regarding depressive symptoms and smoking in this population at increased risk for depressive symptoms.

A strong association between depressive symptoms and smoking has been found (Anda et al., 1990; Covey, Glassman, & Stetner, 1998; Glassman et al., 1990). These investigations also identified that presence of major depressive disorder negatively affected success in quitting smoking. Studies have reported increased depressive symptoms following smoking cessation (Covey, Glassman, & Stetner, 1997; Covey et al., 1998), suggesting that smoking may be a form of self-medication for depressive symptoms.

*Stressful Life Antecedents*

People who have lived in a stressful or unstable social environment may continue to experience the effects of chronic stress after emigration. Chronic stressful experiences are associated with the development of nicotine dependence (Little, 2000). Smoking has also been found to be strongly associated with adverse childhood events, such as excessive parental conflict and separation (La Rosa, Consoli, Le Clesiau, Soufi, & Lagrue, 2004), as well as, abuse or witnessing abuse (Anda et al., 1999). Therefore, stressful life antecedents may be an important influence on smoking in immigrants from the FSU in which there was an unstable or oppressive social and economic environment that may have also affected family stability.
Pharmacology

**Nicotine Dependence**

Biophysical influences in the model include *Pharmacology*, the study of the effects of drugs, such as nicotine, on the body. Although nicotine dependence also has a psychological component, it is usually conceptualized as mainly having a biological influence on smoking behavior.

The Surgeon General has reported that the nicotine in tobacco is addictive, determined by similar pharmacological and behavioral processes as addiction to heroin and cocaine (USDHHS, 1988; USDHHS, 2004). Nicotine administered by smoking is rapidly absorbed into the blood, resulting in intensive psychological effects, peaking at the completion of the cigarette (Benowitz, 1999). Therefore, behavioral reinforcement is strong because the time from dosing to maximal effect is short. Tolerance develops quickly and sets in motion a cycle of use in order to avoid withdrawal discomfort (Benowitz, 1999). Nicotine dependence can be defined as a state produced by chronic use of nicotine, resulting in physiologic symptoms of withdrawal that are reversed by administration of the drug (Fagerstrom, 1978). Level of nicotine dependence is helpful in determining the type of intervention appropriate for the individual.

Culture

**Cultural Context**

The Biobehavioral Model depicts the psychological influences of behavior as factors that are processed in the mind. These include behavioral factors such as culture, fashion, economics, thoughts, laws, symbols, and beliefs. All of these factors could be influenced by culture, which is commonly thought of as a set of attitudes, behaviors, and symbols
shared by a group (Shiraev & Levy, 2004). Culture is a constellation of values, customs, and traditions transmitted through generations that is constantly in flux, but also highly resistant to change (Berry, Poortinga, Segall, & Dasen, 2002). Culture may shift, but it remains a stable force particular to a group over time. Smoking prevalence between genders varies widely in some ethnicities, but not in others, suggesting that gender ideologies across cultures have an influence on smoking behavior (Unger et al., 2003). In addition, the context of smoking may differ between genders. A study of French smokers found that the reasons for smoking were different for males versus females (Berlin et al., 2003).

The environmental smoking and attitudes of family, friends, and co-workers toward smoking in a cultural group may impact individual smoking choices. Culture impacts the reasons for smoking, in part, by dictating the way that people interact socially, as well as, the acceptability of behaviors. The decision to smoke or to attempt cessation is affected by the individual's perception of the costs and benefits of smoking (Prochaska, DiClemente, Velicer, Ginpil, & Norcross, 1985). Reasons for smoking including stimulation, pleasure, craving, and coping with negative feelings (Ikard, Green, & Horn, 1969; Ikard & Tomkins, 1973), may be affected by culture because smoking influences acceptable ways of meeting these needs. Differences in reasons for smoking have been found to influence severity of nicotine withdrawal symptoms during tobacco cessation (Niaura, Goldstein, Ward, & Abrams, 1989).

Acculturation is a process that an individual undergoes (Berry et al., 2002) as a result of people of different cultures coming into continuous contact, and is usually measured on a continuum, rather than a dichotomous outcome. Acculturation in this study was
conceptualized and measured as a multi-dimensional process and included measurement of identification with the culture of origin as well as the current dominant culture (Stephenson, 2000) including domains of language, food, media, and interaction. Level of acculturation has been associated with smoking behavior in a number of studies with immigrants of various ethnicities. Many investigations have found that as level of acculturation to the dominant culture increases, smoking behavior becomes more like the adopted culture (Lee, Sobal, & Frongillo, 2000; Perez-Stable et al., 2001; Jeltova, 2003; Fu, Ma, Tu, Siu, & Metlay, 2003).

Acculturative stress is a distressful psychological reaction to an unfamiliar cultural environment (Shiraev & Levy, 2004). This is a unique type of stress, with both physiological and psychological components, having its source in the acculturative process and involving a reduction in health status (Berry, Kim, Minde, & Mok, 1987). Emotional disorders in immigrants, such as anxiety and depression, have been directly linked to acculturative stress (Shiraev & Levy, 2004)(Mirsky, Barasch, & Goldberg, 1992). Smoking has been found to be related to increased acculturative stress in Chinese American adolescents (Booker, 2006) and African American women (Fernander, Schumacher, & Nasim, 2008).

Tobacco Use

Tobacco use was defined in this study as smoking at least 1 cigarette per day (CPD), along with biochemical measure of level of smoking by salivary cotinine, the major metabolite of nicotine, of at least 15 ng/ml. Plasma levels of nicotine correlate best with tobacco exposure; however, to measure nicotine level directly is not very useful because nicotine's half-life is about two hours, only assessing tobacco use in the last eight hours
Cotinine concentration is often used to measure level of tobacco use because it has a relatively long half-life (17 hours), allowing detection of tobacco several days after use (Benowitz et al).

**Summary**

Application of the Biobehavioral Model of Smoking in this study (see Figure 2.2) includes measuring the behavioral factor of culture via acculturation and acculturative stress, as well as other measures to capture the cultural context of smoking. In the biological domain, nicotine dependence was assessed. The variables of depressive symptoms and stressful life antecedents encompass both biological and behavioral aspects.

The purpose of this study was to identify biobehavioral aspects of cigarette smoking in immigrants from the Former Soviet Union (FSU) in the U.S. currently living in Ohio.

**Research Questions**

1. What are the sociodemographic, depressive (CES-D), acculturative (SMAS and SAFE), and stressful (DDS) characteristics of immigrants from the former Soviet Union?

2. What are the relationships between sociodemographic characteristics (such as age and years in the U.S.), depressive symptoms (CES-D), stressful life antecedents (DDS), acculturation (SMAS), and acculturative stress (SAFE) among immigrants from the former Soviet Union?

2a. What are the relationships between sociodemographic characteristics, depressive symptoms (CES-D), stressful life antecedents (DDS), acculturation
(SMAS), acculturative stress (SAFE), cigarettes per day, salivary cotinine level and nicotine dependence (FTND) among immigrants from the former Soviet Union who currently smoke?

2b. What are the relationships among the variables related to smoking behavior including decisional balance, reasons for smoking, cigarettes per day, salivary cotinine level, and nicotine dependence (FTND) among immigrants from the former Soviet Union who currently smoke?

3. Are there differences in depressive symptoms, acculturative stress, cigarettes per day, and smoking history (age of initiation, number of years having smoked, number of years in the U.S.) between women and men immigrants from the former Soviet Union who currently smoke?

4. What variables best predict cigarettes per day and cotinine level in immigrants from the former Soviet Union who currently smoke?

- A secondary aim was to compare linguistic parallel forms of the CES-D depression measure (English and Russian) including comparison of smokers, former smokers, and never smokers.

Methods

Procedure

This study employed a descriptive correlational design. Cross-sectional data were collected in community settings with immigrants from the FSU living in Ohio. Participants were recruited through immigrant social service programs, flyers in Russian grocery stores, workplaces which employed Russian-speaking personnel, Russian-
language newspapers, and Russian-speaking physician offices. Recruitment took place both through face-to-face contact, as well as through printed material. Participants were included who were 18 years of age or older who had emigrated from a former Soviet country in the last 20 years in order to capture increased Russian-speaking immigration that occurred in the 1990s. Participants must have been able to speak and understand English as determined through screening conversation. Current smokers, former smokers, and never smokers of both genders were included. A $20 incentive to participate was provided to each participant to acknowledge the participants' time commitment. The study was approved by the Institutional Review Board of a major Midwestern university.

After determining eligibility and obtaining informed consent, the participant completed a series of paper-pencil questionnaires in a private, quiet setting at a community location or in the participant's home, whichever was more convenient for the participant. At this time, saliva samples were collected from all participants in order to quantify salivary cotinine. All participants completed the Center for Epidemiologic Studies depression scale (CES-D) in English and Russian, the Stephenson Multigroup Acculturation Scale (SMAS), the Social, Attitudinal, Familial, and Environmental (SAFE) Acculturative Stress scale and the Daily Discrimination Scale (DDS). Number of cigarettes smoked per day (CPD), Fagerström Test for Nicotine Dependence (FTND), Reasons for Smoking scale, and the Decisional Balance of Smoking scale were collected from the current smokers (n=26).

Measures

The variables drawn from the Biobehavioral Model for Smoking and Tobacco Use that were assessed include Neurosciences/Thoughts and Beliefs (stressful life antecedents
and depressive symptoms); *Pharmacology* (nicotine dependence); *Culture* (cultural context, acculturation, and acculturative stress); and *Tobacco Use* (cigarettes per day and salivary cotinine concentration). Table 2.1 provides a summary of the measures used and their relationship to the theoretical framework.

The demographic characteristics of age, gender, marital status, religion, income, education, years in U.S., and country of origin (ethnicity) were collected, in addition to smoking history. The fact that smoking prevalence rates vary widely between genders in some ethnicities, but not in others, suggests that gender ideologies across cultures have an influence on smoking behavior (Unger et al., 2003). In addition, the context of smoking may differ between genders. A recent study of French smokers found that the reasons for smoking (RFS) (Ikard et al., 1969) were different for males versus females (Berlin et al., 2003). In general, the older a person is on immigration, the less acculturated they become, (Berry et al., 2002) thus age is of interest. Number of years in U.S. was collected because of the possible effect on cultural variables.

The Center for Epidemiologic Studies Depression (CES-D) Scale (Radloff, 1977) a 20-item screening self-report measure, was used to assess the intensity of depressive symptoms. Subjects rank their responses of how often they experienced the symptom in the last week on a 4-point Likert-type scale, ranging from "rarely or none" to "most or all" of the time. The response on each item is scored from 0-3 and summed to obtain total scores ranging from 0-60, with lower scores indicating less depressive symptoms. A score of 16 is suggested as the cut-off between mild mood disturbance and clinical depression when screening adults (Radloff, 1977). The CES-D emphasizes psychological depressive symptoms and moods, rather than focusing on behaviors. This instrument has
been found to have excellent internal consistency ($\alpha= .85-.90$) (Radloff, 1977; Wilcox, Field, Prodromidis, & Scafidi, 1998). Validity is supported by the finding that scores indicative of clinical depression on the CES-D correlate with DSM-IV-TR diagnosis of depression, as well as other measures of depressive symptoms, such as the Beck Depression Inventory (Wilcox et al., 1998).

The American Psychological Association has suggested that the measurement of psychological variables is most valid when the instrument is administered in the respondent's native language (Flores & Obasi, 2003). The CES-D has been translated into a number of different languages including Spanish, French, Chinese, Dutch, Korean, German, and Russian. Studies using the CES-D in Russian-speaking populations have found a higher percentage of subjects scoring in the clinical depression range when compared to U.S. subjects and norms, with very similar coefficient alphas and nearly identical factor loadings observed in both groups (Dershem, Patsiorkovski, & O'Brien, 1996). The Russian version used in this study was translated and back-translated using the committee method, has the same number of items as the original and internal consistency of .90 (Miller & Chandler, 2002). Participants completed both versions in order to make comparisons within subject, and were randomized to which form was received first, either the English or Russian version.

To measure Stressful Life Antecedents occurring in the social context, the Daily Discrimination Scale (DDS) was utilized. The scale contains 9 items ($\alpha = .80$) measuring frequency of perceived hostile or derogatory treatment in public (Taylor, Kamarck, & Shiffman, 2004). Sample items include: rate frequency of day-to-day events such as 1) People acted as if they thought you were not smart, 2) You were called names or insulted,
and 3) You were threatened or harassed. Scores on the DDS have been found to be associated with scores on perceived stress and depression scales (Taylor et al., 2004). Retrospective and current data were obtained as participants were asked to respond to items based on their life before emigration, as well as responding to the same set of questions reflecting their current life, for comparison.

The Fagerström Test of Nicotine Dependence (FTND) measures the degree of dependence on nicotine (Heatherton, Kozlowski, Frecker, & Fagerstrom, 1991). Scores on the FTND have been associated with cotinine levels and withdrawal symptoms (Pomerleau, Carton, Lutzke, Flessland, & Pomerleau, 1994), but, it most strongly predicts ability to stop smoking (Fagerstrom, Heatherton, & Kozlowski, 1990). This self-report instrument is a revised version of Fagerström's original questionnaire (Fagerstrom, 1978), which demonstrated a significant inverse relationship between nicotine dependence score and a sign of tolerance, smaller than normal increase in heart rate with smoking ($r = -0.69$, $p < .01$). One item, 'time to the first cigarette the day' (TTF) in minutes, has been strongly related to nicotine dependence (Heatherton, Kozlowski, Frecker, Rickert, & Robinson, 1989; Kozlowski, Porter, Orleans, Pope, & Heatherton, 1994).

The FTND, used world-wide in tobacco-related studies, consists of 6 questions with ordinal and dichotomous responses. The range of total nicotine dependence scores are divided into 5 categories: 0-2 very low, 3-4 low, 5 medium, 6-7 high, 8-10 very high dependence (Fagerstrom et al., 1990). Test-retest reliability of $r = .783$ in an American sample of smokers ($n = 237$) and $r = .845$ in a French sample ($n = 36$) was found with three weeks between tests (Pomerleau et al., 1994). Cronbach's alpha was $\alpha = .47$ (American sample) and $\alpha = .61$ (French). Pomerleau et al (Pomerleau, Pomerleau, Majchrzak, Kloska,
Malakuti, 1990) reported a moderate correlation of FTND scores and cotinine (r= .35, p< .001) and FTND with number of years smoking (r= .38, p< .001). According to Lowe and Ryan-Wenger, (1992) the convergent validity of an instrument with the same construct measured via a different method should be r= .40 to be adequate, which these findings approximate. The fact that the instrument was tested in two cultural groups with different smoking prevalence (U.S. =21%, France = 40%) lends validity. Nicotine dependence has not been studied in FSU immigrants.

The Decisional Balance Scale (DBS) and the Reasons for Smoking questionnaire (RFS) were administered to capture beliefs about and reasons for smoking in this cultural group. The Decisional Balance Scale (DBS) measures beliefs about the positive and negative aspects of smoking (Prochaska et al., 1985). The 20-item instrument has two subscales named Pros of Smoking and Cons of Smoking. The importance of each item is rated from 1 (not important) to 5 (extremely important). The Pros scale contains items that reflect pleasure, tension reduction, and self-image factors, for example, "Smoking helps me concentrate and do better at work" and "I like myself better when I smoke". The Cons scale focuses on items that reflect health and being a role model, such as "My smoking affects the health of others" and "I'm embarrassed to have to smoke". Internal consistency was 0.87 for the Pro scale and 0.90 for the Con scale (Prochaska et al., 1985). Validity of the DBS is supported by the strong relationships found between the DBS and Stages of Change (Plummer et al., 2001). This instrument has been used extensively in smoking research, including a recent study in Russia (Schnoll, Engstrom, Subramanian, Demidov, & Weilt, 2004).
The Reasons for Smoking Scale (RFS) (Ikard, Green, & Horn, 1969) has six subscales assessing importance of smoking for reasons of stimulation, handling, pleasurable relaxation, habit, craving (or addiction), and tension reduction. Responses to 18 items representing motives for smoking are on a five-point Likert scale (1=always, 5=never). Scores for each subscale range from 3-15. A score of 11 or above in a category is considered high, probably influencing smoking. Conversely, scores 7 or below indicate a subscale does not significantly affect smoking choice. Sample items: "I smoke cigarettes to give me a ‘lift’" and "Handling a cigarette is part of my enjoyment in smoking it". The six-factor structure was stable across samples differing in age, gender, smoking status, and geography (Tate, Schmitz, & Stanton, 1991). The RFS has demonstrated adequate internal consistency (.67-.82) (Tate et al). Validity of the tension reduction subscale is supported by a significant increase in smoking observed as a function of increased negative affect (Ikard & Tomkins, 1973). Validity of the craving or addiction subscale is supported by finding that score increased in a dose-dependent manner with number of cigarettes smoked per day (CPD) (Berlin et al, 2003; Tate, 1991). In addition, the habit subscale score was significantly higher with higher levels of CPD and, along with the craving subscale, was significantly associated with decreased time to first cigarette after awakening, a common measure of nicotine addiction (Berlin et al., 2003).

The Stephenson Multigroup Acculturation Scale (SMAS) was used to measure level of acculturation because it includes multiple domains, assessing degree of immersion in both dominant and ethnic societies with two subscales (Stephenson, 2000). This instrument was tested in a sample of 436 participants from five racial/ethnic groups including Africans, African Americans, Asian Americans, European Americans, and
Hispanic Americans, 47% were first generation immigrants. The SMAS consists of two subscales labeled *dominant society immersion* (DSI) and *ethnic society immersion* (ESI), each measuring the domains of language, media, food, and interaction. Sample questions include “I enjoy speaking my native language” and “I socialize with many friends of my ethnicity” assessing ethnic society immersion while questions such as “I am familiar with important people in American history” and “I have many American friends” assess dominant society immersion. Validity is supported in the finding that the DSI score increased with each of the first three successive generations after immigration, while the ESI score decreased. The DSI has 15 items, while the ESI has 17 items in a Likert-type response format scored from 1 (false) to 4 (true). Items were then summed for each scale, with a higher score indicating more identification with the dominant (DSI) or ethnic (ESI) culture depending on subscale. Coefficient alphas were .97 for the ESI subscale and .90 for the DSI subscale. Due to the unequal number of items in the subscales, results were reported as average responses on each subscale items from 1 to 4, with higher average responses indicating more identification with the subscale.

Acculturative stress was measured using the Social, Attitudinal, Familial, and Environmental (SAFE) acculturative stress scale, with 26 items that address social, attitudinal, familial, and environmental contexts, as well as perceived discrimination (Mena, Padilla, & Maldonado, 1987). Participants rated each item on a 5-point Likert scale (“not stressful” to “extremely stressful”). A score of 0 is assigned if an item does not apply. Possible total scores range from 0 to 130, with higher scores indicating higher levels of acculturative stress. Adequate internal consistency of .89 to .90 has been found in previous studies (Hovey & Magana, 2000; Mena et al., 1987). The SAFE scale has
been used and validated in Hispanic and Korean populations, (Mena et al., 1987)(Nho, 1999)(Hovey & Magana, 2000) but not with Russian-speaking groups. Examples of items include: “It bothers me that I have an accent” and “Because I am different I do not get credit for the work I do.”

Ever smokers were defined as those who reported having smoked at least 100 cigarettes in their lifetime, current smokers were classified as those who reported that they currently smoked, while former smokers reported that they currently did not smoke. Never smokers were classified as those who reported that they had not smoked at least 100 cigarettes in their lifetime. Tobacco use was measured in two ways with number of cigarettes per day and salivary cotinine. Participants were asked to report the number of cigarettes per day that they currently smoked. Studies have shown that increased CPD is associated with increased difficulty quitting (USDHHS, 2004). Validity has been demonstrated through positive correlation with salivary cotinine (Benowitz, Jacob, Ahijevych, & Jarvis, 2002). Tobacco use was quantified by measuring salivary cotinine, the major metabolite of nicotine, using a chemiluminescent assay. Studies have found strong positive correlations between cotinine level in saliva with nicotine intake from tobacco (Benowitz, et al). Saliva cotinine measurement is relatively non-invasive with moderate cost. A salivary cotinine level of at least 15 ng/ml indicates tobacco use (Benowitz, et al); cotinine below this level could be due to nicotine intake from second-hand smoke or light, irregular smoking. Cotinine has an excellent specificity for tobacco use (99-100%), except in the presence of nicotine-containing medications, because dietary sources of nicotine are insignificant (Benowitz, et al). Sensitivity is also high at 96-97%. In addition to smoking status, the potential range of cotinine concentrations
provides a means of quantifying level of use. Although cotinine level may be affected by racial/ethnic differences in nicotine and cotinine metabolism, most researchers agree that higher levels of nicotine and cotinine indicate higher levels of dependence and that it is the gold standard for validating smoking status in research (Benowitz et al). In comparison to studies that use a serum matrix, the linear relationship of serum and saliva cotinine concentrations is used to estimate serum concentration given salivary cotinine result within ± 10% (Bernert, McGuffey, Morrison, & Pirkle, 2000).

Statistical Analysis

Power analysis revealed that a sample of 85 was required for correlations among the variables measured (research questions 2, 2a and 2b) when effect size is medium, $\alpha=0.05$, and power=0.80 and 30 when effect size is large (Cohen, 1992). To compare male and female smokers (research question 3), 26 participants in each group were needed for power = .80, $\alpha= 0.05$, and a large effect size. To predict cigarettes per day and salivary cotinine in smokers (research question 4), a sample of 84 was recommended for stepwise multiple regression with up to 4 predictor variables when effect size is medium, $\alpha=0.05$, and power=0.80, while 38 would be required with a large effect size (Cohen, 1992).

Data were examined for completeness and violations of the assumptions of parametric tests used, including normality and homoscedasticity. Instruments were analyzed for internal consistency. Descriptive statistics and frequencies were used to characterize the study variables in this sample to address research question #1. Descriptive statistics such as frequencies and percentages were calculated for socio-demographic variables (i.e. marital status, gender). For continuous variables such as age, time in U.S, tobacco use, and scores on described instruments, means, standard deviations, and ranges were
calculated. Relationships between continuous variables in the total sample (research question 2) and among current smokers (research question 2a) were assessed using correlational statistics such as Pearson’s r for data meeting parametric assumptions and Spearman’s rho for data not meeting parametric assumptions. For research question #3, comparisons between the genders in current smokers were made using t-tests. For the fourth research question identifying predictors of level of tabacco use in current smokers (CPD and cotinine concentration), regression models were constructed using variables found to be significant in bivariate analysis to predict cigarettes per day and cotinine level among smokers. Significance level was set at .05 unless otherwise noted. The CES-D versions were compared using paired t-test.

Results

Sample Characteristics

Selected demographic characteristics of the sample are presented in Table 2.2 (n=80). The average age of participants was 57 years ranging from 18 to 92 years old, including 68% women. Fifty-five percent of the sample was married, with a mean of 12.1 years (SD 4.7) in the U.S., ranging from 1 to 20 years. The majority of participants were from the FSU countries of Russia (47%), Ukraine (31%), and Belarus (14%). These Republics had the highest concentration of Jews, reflected in the fact that 71% of the sample were Jewish and 21% were Christian. Eighty percent of participants had the equivalent of a bachelor’s degree or more college level education, while 52% reported a household income of less than $25,000. Thirty three percent of the sample were current smokers, 16% were former smokers, and 51% were never smokers.
Characterization of Variables Measured

Descriptive statistics to address research question 1 for variables incorporated in the study are presented in Table 2.3. The average score for the sample on the English version of the CES-D was 16.7 (range= 0-40; SD= 8.8). While ethnic society identification (ESI) was higher in this sample, participants scored relatively high on both subscales of the acculturation measure; the average rating on a scale of 1-4 was 2.93 (SD 0.51) on dominant society identification (DSI) and 3.55 (SD 0.39) on the ESI. Retrospective Daily Discrimination Scale (DDS) mean score was 11.32 (SD= 9.47), while the current DDS mean score was 4.64 (SD= 6.74).

Table 2.4 displays descriptive statistics of the variables related to smoking behavior in the current smoker group (n=26). The average age of initiation for the current smoker group was 23.6 years old (range: 13-51; SD= 10.8). Five of the smokers started smoking since emigration, while living in the U.S; two of these are men and three are women. Reported average of cigarettes smoked per day was 5.6 (range: 1-15, SD= 5.02). Salivary cotinine levels ranged from 20 to 500 ng/ml, with a mean level of 177 ng/ml. The FTND mean score was 1.15 (range= 0-6; SD= 1.5) and may have reflected the low average number of cigarettes smoked per day. Mean scores on the Pros and Cons subscales were similar. The subscale on the Reasons for Smoking Scale that showed the highest mean score was Pleasurable- Relaxation and the second highest mean score was Tension Reduction (See table 2.5). There was one participant who misreported that she was a non-smoker based on her level of cotinine; she was known to be pregnant. This participant was classified as a smoker for the analysis.
Relationships Among Variables

Relationships among the variables calculated to address research question 2 (see Table 2.6) included significant correlations between depressive symptoms and cultural context variables. There was a significant negative correlation between English CES-D scores and Dominant Society Immersion (DSI) acculturation subscale scores (r= -.439, p< .05), and a near-significant positive correlation with the Ethnic Society Immersion (ESI) subscale score (r= .384, p=.06). The CES-D score was also significantly positively correlated with acculturative stress score (r= .388, p< .01). The CES-D score was not correlated with age or with the number of years living in the U.S.

The acculturation subscales of ESI and DSI were significantly inversely correlated (r= -.352, p<.01), and significantly different within a given subject (paired t=12.65, p< .001). Age was significantly positively correlated with ESI score (r= .436, p< .001) and significantly negatively correlated with DSI score (r= -.376, p=.001). Neither the ESI nor the DSI were correlated with the number of years living in the U.S. or smoking status. Retrospective Daily Discrimination Scale (DDS) scores were positively correlated with number of years in the U.S.. Current DDS scores were positively correlated with CES-D, SAFE, and retrospective DDS scores.

Table 2.7 displays correlations among study variables adding CPD, cotinine, and FTND calculated in the current smoker sample (n=26). The CES-D was negatively associated with number of cigarettes smoked per day (r= -.382, p=.06). The smokers had a significant positive correlation between the CES-D and the ethnic identification subscale (r= .447, p< .05); this relationship was not significant in non-smokers. CES-D scores were not significantly correlated with nicotine dependence scores. Correlations
among variables directly related to smoking behavior are displayed in table 2.8. Nicotine dependence score was positively correlated with number of cigarettes smoked per day (r= .660, p< .01). Salivary cotinine level was positively correlated with cigarettes per day (r= .725, p< .05). The Pros and Cons subscales were positively correlated. The Craving and Habit subscales from Reasons for Smoking were positively correlated with cigarettes per day.

Gender Differences in Smoker Group

Of the 26 current smokers, 11 were men and 15 were women. The average age of smoking initiation was 18.6 years for men and 27.8 years for women, the difference between mean age was statistically significant (t= 2.41, p<.05). There were no gender differences in number of cigarettes smoked per day, number of years smoked, or number of years living in the U.S. A difference was found in the mean score on the English CES-D between men (8.9) and women (19.3) who were current smokers (t= 3.23, p< .01). Men and women differed significantly on 4 items: 1) I was bothered by things, 11) My sleep was restless, 12) I was happy, and 17) I had crying spells. By gender, the acculturative stress mean score was higher for women (40.2, SD= 19.8) than for men (33.3, SD=19.7); however, this difference was not statistically significant.

Predictors of Level of Tobacco Use

Variables found to be significant in bivariate correlations with the dependent variable were entered in stepwise regression analysis. To account for redundancy in the inclusion of the categorical cigarettes per day item in the FTND, the FTND score minus the cigarettes per day item was used. The model that best predicted number of cigarettes smoked per day (CPD) by current smokers (n=26) included three variables (CES-D score,
Craving subscale, and Habit subscale), which were each significant contributors to the variation in CPD. Thus, a model including the Craving and Habit Reasons for Smoking subscales and English CES-D score explained 68% of the variance in number of cigarettes smoked per day (See Table 2.9). Those who reported higher craving and habit reasons for smoking and lower depressive symptoms reported higher CPD. In selecting variables for multiple regression to predict cotinine level, the only variables significantly correlated were FTND score and the single item of ‘Time to First Cigarette’ on the FTND. Cotinine level was predicted more strongly by ‘Time to First Cigarette’ alone, accounting for 78% of the variance as shown in Table 2.10. A significant Kendall’s Tau correlation between cotinine and the ‘Time to First Cigarette’ item supported this relationship (.655, p<.05).

Comparison of CES-D Versions

The Russian and English versions of the CES-D were compared as a secondary aim of the study. The average score for the sample on the English version of the CES-D was 16.7 (range= 0-40; SD= 8.8) and 18.7 (range 3-40; SD= 7.8) on the Russian version. A paired samples t-test showed a significant within subject difference between scores on the English and Russian versions (t=2.95, p< .01).

Comparison by Smoking Category

There were significant differences in the mean scores on the Russian CES-D between smokers and never smokers, and smokers and former smokers. Smokers had the lowest mean score, while former smokers had the highest mean score of the three smoking
categories. There was not a significant difference in English CES-D scores by smoking status, although the average score was 15.0 (SD= 9.8) for the smokers and 20.7 (SD= 10.3) for the former smokers.

Discussion

Depressive symptom levels as measured by the CES-D showed an average score for this sample that was above the cut-off score of 16 for screening (Radloff, 1977). The norm developed for this instrument was 9.25 (SD= 8.56) in community based samples. Immigrants have scored higher than native born populations in a number of investigations (Mechakra-Tahiri, 2007). For example, a study with older Korean immigrants found the CES-D mean score to be 12.9, compared to 7.6 in a native born older adult white sample (Min, Moon, & Lubben, 2005). FSU immigrants have had depression measure mean scores far above those reported for their American counterparts in previous studies (Dershem et al., 1996); (Aroian & Norris, 2002); Miller et al, 2004), with a mean score as high as 28.3 (Miller & Chandler, 2002). Elevated depressive symptoms in FSU immigrants may be partially related to a probable change in social class after immigration. The current sample was well educated, yet more than half reported household income below $25,000 per year. It may be inferred that many in this group held a higher social standing in their native country than they have currently.

A relatively low level of tobacco use and nicotine dependence was reported in the current sample. Fifty percent of the sample reported a household income of less than $25,000, so financial necessity may have driven the number of cigarettes per day lower in this group. It is also possible that the FTND may not accurately assess nicotine
dependence in this population or that a response bias was operating in which more light
smokers volunteered to participate.

Higher level of cigarettes smoked per day was found to be related to lower depressive
symptoms in this sample. In many investigations, smoking level has been found to be
related to higher depressive symptomatology (Anda et al., 1990; Breslau, 1991);
although, some studies have suggested that smoking abstinence increased depressive
instrument scores (Moreno-Coutino, 2007). Perez-Stable (1995) found no relationship
between mean CES-D scores and serum cotinine in an adult Mexican-American sample.
In adolescent samples, both Rojos et al (1998) and Kandel et al (2006) observed negative
associations between depressive symptoms and cotinine. Like the current sample,
adolescent smokers tend to be lighter smokers, which may account for a negative
relationship being noted in these samples. While non-smokers had a higher mean age,
English CES-D mean score was not correlated with age in this sample. In other respects,
the relationships between variables in this sample were expected, such as the positive
correlation between acculturative stress and depressive symptoms. Smoking has been
related to higher stress in multiple studies (Cohen & Lichtenstein, 1990; Pomerleau &

In the current study, former smokers had a significantly higher mean score on the
CES-D than current smokers. In qualitative interviews associated with this study, former
smokers stated that they quit because of health concerns and the growing social stigma
toward smoking. These interviews also revealed the importance of maintaining social
connectedness in this community and the use of smoking for stress management;
participants spoke of feeling “invisible” when they quit smoking. Smoking becomes part
of the person’s social interaction patterns and coping mechanisms. With high smoking prevalence among men from the FSU, smoking is an integral part of social interactions and a symbol of Russian-speaking culture in the U.S. Former smokers in this community may now have fewer coping mechanisms without smoking and may feel more socially isolated. Without the possibly self-medicating effect of nicotine, former smokers may be experiencing more depressive symptoms. The former smokers did have a slightly higher average age, but depression scores were not significantly correlated with age in ever smokers. Therefore, treating depressive symptoms in smokers and former smokers should be given priority in order to support smoking cessation and continued abstinence. An important perspective regarding social influences on smoking behavior is provided by Sorensen, Emmons, Stoddard, Linnan, & Avrunin (2002). Sorensen depicts a separation between social support, which has been found in many investigations to have a positive effect on health, from social influence, which can at times negatively affect health behavior.

In general, the older a person is on immigration, the less acculturated they become (Berry et al., 2002), which has been upheld in the results of this study. However, acculturation level was not related to smoking status or smoking level, which contrasted with the results of many studies which have linked acculturation and smoking behavior in immigrants. However, acculturation among Mexican Americans in California (n= 767) did not show a linear increase with smoking prevalence, rather, those with moderate American orientation were the most at risk for smoking (Wolff & Portis, 1996).

The current study found gender differences among smokers, for instance, that men started smoking significantly earlier than women. This finding concurred with other
investigations, including a recent study conducted in Ukraine which found men to start smoking at a significantly earlier age than women (Andreeva, Krasovsky, & Semenova, 2007). Underreporting of smoking has also been found to be significantly more among women than in men in former Soviet countries, and significantly more than in other European countries (Laatikainen, Vartiainen, & Puska, 1999). So, although the prevalence of smoking is much higher for men, awareness of the need for cessation interventions to also address women smokers is also necessary.

In addition to CES-D score, the Craving and Habit subscales on the Reasons for Smoking Scale were the variables that best predicted number of cigarettes per day. The relationship of these subscales to the number of cigarettes smoked per day has been found in other studies (Berlin et al, 2003; Tate et al, 1991). The Craving subscale has also been called the Addiction subscale (Ikard, Green, & Horn, 1969). So, although nicotine dependence scores were low in this sample overall, addiction still appears to be an important factor to smoking behavior. These results point to the need to particularly address these reasons for smoking in smoking cessation interventions.

Comparison of the English and Russian versions of the CES-D showed that these versions may not be interchangeable since the paired t-test in this sample found the scores to be significantly different within a given participant. This issue requires further investigation to determine the meaning and sources of the difference in scores. The Russian version appeared to be more strongly related to smoking in this sample.

Limitations of the current study include a non-probability sample and the relatively small sample size, particularly current smokers. To be eligible, participants needed to speak English reasonably well; this may have biased the sample toward those who were
well educated. Also, the majority were Jewish. These characteristics are reflective of the population of FSU immigrants in the U.S. Research including those who are not fluent in English, less educated, and more individuals who identify with other religious faiths is needed. Due to the sample recruitment methods (i.e. flyers, newspaper advertisements), it is impossible to determine if there were differences in those that declined to participate versus those who responded, so there may be a response bias in the sample. For instance, those who were heavier smokers may not have made an initial contact.

**Conclusion**

This study provides foundational information on the biobehavioral aspects of cigarette smoking in FSU immigrants with the long-term goal of guiding culturally sensitive smoking cessation interventions to help reduce the considerable potential burden of tobacco-related morbidity and mortality in this group. Areas for further study highlighted by these results include interventions to enhance stress and depressive symptom management for immigrants in order to increase their ability to maintain a health behavior change.

This preliminary study adds to the knowledge of cultural influences and stress on smoking behavior. Research that explicates mechanisms by which potentially health damaging social influences present within a culture or subculture can be ameliorated without damaging the beneficial effects of social support is needed. Variables of acculturative stress and stressful life antecedents require further exploration in regard to smoking behavior and could also be applied to other high risk groups and health behaviors.


Figure 2.1 Biobehavioral Model of Smoking and Tobacco Use
(Kozlowski, Henningfield & Brigham, 2001)
Figure 2.2
Application of Model
### Study Variables and Their Measurement

<table>
<thead>
<tr>
<th>INSTRUMENT</th>
<th>VARIABLE</th>
<th>MODEL</th>
<th>RELIABILITY</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fagerstrom Test of Nicotine Dependence (FTND)</td>
<td>Nicotine Dependence</td>
<td>Symbols</td>
<td>Test-retest $r = .78-.86$ Coefficient $\alpha = .47-.61$</td>
</tr>
<tr>
<td>Decisional Balance Scale (DBS)</td>
<td>Cultural Context</td>
<td>Culture/Beliefs</td>
<td>Coefficient $\alpha = .87-.90$ Coefficient $\alpha = .67-.82$</td>
</tr>
<tr>
<td>Reasons for Smoking (RFS)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Stephenson Accul. Scale (SMAS)</td>
<td>Acculturation</td>
<td>Culture</td>
<td>Coefficient $\alpha = .86-.97$</td>
</tr>
<tr>
<td>Social, Att, Fam, Environ (SAFE)</td>
<td>Acculturative Stress</td>
<td>Culture</td>
<td>Coefficient $\alpha = .89-.90$</td>
</tr>
<tr>
<td>Daily Discrimination Scale</td>
<td>Stressful Life Antecedents</td>
<td>Thoughts/Neurosciences</td>
<td>Coefficient $\alpha = .80$</td>
</tr>
<tr>
<td>Center for Epidemiologic Studies Depression (CES-D)</td>
<td>Depressive Symptoms</td>
<td>Thoughts/Neurosciences</td>
<td>Coefficient $\alpha = .85-.90$</td>
</tr>
<tr>
<td>Scale</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Chemiluminescent assay</td>
<td>Tobacco Use: Cotinine</td>
<td>Pharmacology</td>
<td>Interassay COV 4.9%</td>
</tr>
</tbody>
</table>

Table 2.1

Study Variables and Their Measurement
<table>
<thead>
<tr>
<th>Demographic Characteristics of Participants</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>N=80</strong></td>
</tr>
<tr>
<td>Age at interview</td>
</tr>
<tr>
<td>&lt;60</td>
</tr>
<tr>
<td>60+</td>
</tr>
<tr>
<td>Average years in U.S.</td>
</tr>
<tr>
<td>Marital status</td>
</tr>
<tr>
<td>Married</td>
</tr>
<tr>
<td>Not married</td>
</tr>
<tr>
<td>Education</td>
</tr>
<tr>
<td>Less than Bac. Degree</td>
</tr>
<tr>
<td>Bac. Degree or higher</td>
</tr>
<tr>
<td>Ethnicity</td>
</tr>
<tr>
<td>Russia</td>
</tr>
<tr>
<td>Ukraine</td>
</tr>
<tr>
<td>Belarus</td>
</tr>
<tr>
<td>Other</td>
</tr>
<tr>
<td>Religion</td>
</tr>
<tr>
<td>Jewish</td>
</tr>
<tr>
<td>Orthodox</td>
</tr>
<tr>
<td>Other</td>
</tr>
<tr>
<td>Smoking Status</td>
</tr>
<tr>
<td>Smoker</td>
</tr>
<tr>
<td>Former</td>
</tr>
<tr>
<td>Never</td>
</tr>
</tbody>
</table>

Table 2.2
<table>
<thead>
<tr>
<th>Variable</th>
<th>Mean</th>
<th>SD</th>
<th>Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>Depression (CES-D) English</td>
<td>16.7</td>
<td>8.84</td>
<td>0-40</td>
</tr>
<tr>
<td>CES-D Russian</td>
<td>18.7</td>
<td>7.63</td>
<td>3-40</td>
</tr>
<tr>
<td>Acculturative Stress (SAFE)</td>
<td>38.0</td>
<td>7.87</td>
<td>7-95</td>
</tr>
<tr>
<td>Stressful Life Antecedents:</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Daily Discrimination (DDS)</td>
<td>11.3</td>
<td>9.47</td>
<td>0-35</td>
</tr>
<tr>
<td>DDS Post Immigration</td>
<td>4.6</td>
<td>6.74</td>
<td>0-25</td>
</tr>
<tr>
<td>Acculturation:</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ethnic Society Immersion</td>
<td>3.55</td>
<td>.385</td>
<td>2.5-4</td>
</tr>
<tr>
<td>Dominant Society Immersion</td>
<td>2.93</td>
<td>.506</td>
<td>1.4-3.7</td>
</tr>
</tbody>
</table>

Table 2.3

Descriptive Statistics of Study Variables n=80
<table>
<thead>
<tr>
<th>Variable</th>
<th>Mean</th>
<th>SD</th>
<th>Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cigarettes per Day (CPD)</td>
<td>5.6</td>
<td>5.02</td>
<td>1-15</td>
</tr>
<tr>
<td>Salivary Cotinine (ng/ml)</td>
<td>177</td>
<td>154.9</td>
<td>20-500</td>
</tr>
<tr>
<td>Age of Initiation</td>
<td>23.6</td>
<td>10.8</td>
<td>13-51</td>
</tr>
<tr>
<td>Decisional Balance:</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pro subscale</td>
<td>26.9</td>
<td>6.48</td>
<td>14-39</td>
</tr>
<tr>
<td>Con subscale</td>
<td>28.1</td>
<td>7.83</td>
<td>16-47</td>
</tr>
<tr>
<td>Nicotine Dependence:</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>FTND</td>
<td>1.15</td>
<td>1.5</td>
<td>0-6</td>
</tr>
</tbody>
</table>

Table 2.4
Descriptive Statistics of Variables for Smokers n=26
<table>
<thead>
<tr>
<th>Reason</th>
<th>Mean</th>
<th>SD</th>
<th>Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>Relaxation</td>
<td>11.0</td>
<td>2.28</td>
<td>6-14</td>
</tr>
<tr>
<td>Tension Reduction</td>
<td>10.7</td>
<td>2.85</td>
<td>4-15</td>
</tr>
<tr>
<td>Handling</td>
<td>9.2</td>
<td>2.70</td>
<td>3-15</td>
</tr>
<tr>
<td>Craving</td>
<td>7.8</td>
<td>3.17</td>
<td>3-13</td>
</tr>
<tr>
<td>Stimulation</td>
<td>7.0</td>
<td>3.10</td>
<td>3-14</td>
</tr>
<tr>
<td>Habit</td>
<td>4.9</td>
<td>2.54</td>
<td>3-12</td>
</tr>
</tbody>
</table>

Table 2.5
Descriptive Statistics of Reasons for Smoking n=26
<table>
<thead>
<tr>
<th></th>
<th>Age</th>
<th>Years in U.S.</th>
<th>DSI</th>
<th>ESI</th>
<th>SAFE</th>
<th>CES-D</th>
<th>DDS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Years in U.S.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dominant Society Imm. DSI</td>
<td>**.332</td>
<td></td>
<td>**-.376</td>
<td>.003</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ethnic Society Imm. ESI</td>
<td>**.436</td>
<td>-.032</td>
<td>**-.352</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Acculturative Stress SAFE</td>
<td>*-.241</td>
<td>-.177</td>
<td>-.101</td>
<td>.191</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Depression CES-D English</td>
<td>.040</td>
<td>.026</td>
<td>*-.439</td>
<td>.119</td>
<td>**.388</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Daily Discrimination DDS</td>
<td>.086</td>
<td>*-.233</td>
<td>.214</td>
<td>-.082</td>
<td>-.061</td>
<td>.116</td>
<td></td>
</tr>
<tr>
<td>DDS Post Immigration n=62</td>
<td>-.009</td>
<td>-.117</td>
<td>-.070</td>
<td>.122</td>
<td>**.423</td>
<td>*-.337</td>
<td>*.257</td>
</tr>
</tbody>
</table>

Table 2.6

Correlational Coefficients Among Variables in Total Sample (n=80)

*p < .05

**p < .01
<table>
<thead>
<tr>
<th>Variables</th>
<th>Correlation Coefficients</th>
</tr>
</thead>
<tbody>
<tr>
<td>Years in U.S.</td>
<td>**.332</td>
</tr>
<tr>
<td>Dominant Society Imm. DSI</td>
<td>-.086 -.202</td>
</tr>
<tr>
<td>Ethnic Society Imm. ESI</td>
<td>*.436 -.019 -.132</td>
</tr>
<tr>
<td>Acculturative Stress SAFE</td>
<td>.266 -.268 -.215 *.432</td>
</tr>
<tr>
<td>Depression CES-D English</td>
<td>*.454 .131 *-.439 *.447 ***.646</td>
</tr>
<tr>
<td>Daily Discrimination DDS</td>
<td>.086 *.233 .214 -.082 -.061 .116</td>
</tr>
<tr>
<td>DDS Post Immigration n=62</td>
<td>-.009 -.117 -.070 .122 ***.423 **.337 *.257</td>
</tr>
<tr>
<td>Cigarettes per Day (CPD)</td>
<td>-.028 -.299 .240 .014 .002 *-.382 .155 -.205</td>
</tr>
<tr>
<td>Salivary Cotinine</td>
<td>.007 -.422 -.313 -.422 -.279 -.463 .112 .143 **.725</td>
</tr>
<tr>
<td>Nicotine Dependence FTND</td>
<td>-.085 .225 .120 -.041 .130 -.253 .175 .123 ***.660 .669</td>
</tr>
</tbody>
</table>

Table 2.7

Correlational Coefficients Among Variables incl. CPD, Cotinine, and FTND in smokers (n=26)

*p < .05
**p < .01
<table>
<thead>
<tr>
<th></th>
<th>Years smoked</th>
<th>Pros</th>
<th>Cons</th>
<th>Stim</th>
<th>Hand.</th>
<th>Relax.</th>
<th>Tension</th>
<th>Craving</th>
<th>Habit</th>
<th>CPD</th>
<th>Cotinine</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pros of smoking</td>
<td>-.073</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cons of smoking</td>
<td>-.123</td>
<td>.430</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Stimulation</td>
<td>.110</td>
<td>**.488</td>
<td>.184</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Handling</td>
<td>-.218</td>
<td>.430</td>
<td>.008</td>
<td>.133</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Relaxation</td>
<td>-.095</td>
<td>.452</td>
<td>-.064</td>
<td>.089</td>
<td>.390</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tension Reduction</td>
<td>.249</td>
<td>**.765</td>
<td>**.488</td>
<td>.359</td>
<td>.046</td>
<td>.433</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Craving</td>
<td>**.520</td>
<td>.468</td>
<td>.354</td>
<td>**.590</td>
<td>.034</td>
<td>.032</td>
<td>.476</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Habit</td>
<td>.177</td>
<td>.335</td>
<td>.055</td>
<td>**.757</td>
<td>.062</td>
<td>-.070</td>
<td>.160</td>
<td>**.541</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cigarettes per Day (CPD)</td>
<td>.273</td>
<td>**.477</td>
<td>.381</td>
<td>.382</td>
<td>-.150</td>
<td>-.047</td>
<td>.361</td>
<td>**.612</td>
<td>.521</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Salivary Cotinine</td>
<td>.139</td>
<td>.038</td>
<td>-.059</td>
<td>-.212</td>
<td>.388</td>
<td>.225</td>
<td>-.078</td>
<td>.489</td>
<td>.336</td>
<td>.725</td>
<td></td>
</tr>
<tr>
<td>Nicotine Dependence FTND</td>
<td>-.007</td>
<td>**.410</td>
<td>.257</td>
<td>**.582</td>
<td>.094</td>
<td>.047</td>
<td>.282</td>
<td>**.553</td>
<td>**.579</td>
<td>**.660</td>
<td>.669</td>
</tr>
<tr>
<td>Time to First Cigarette of Day</td>
<td>-.005</td>
<td>.260</td>
<td>.152</td>
<td>**.524</td>
<td>.084</td>
<td>.071</td>
<td>.076</td>
<td>**.525</td>
<td>.490</td>
<td>**.613</td>
<td>**.886</td>
</tr>
</tbody>
</table>

Table 2.8
Correlational Coefficients Among Variables Related to Smoking in Smokers (n=26)

*p < .05
**p < .01
<table>
<thead>
<tr>
<th>Variable</th>
<th>Regression Coefficients</th>
<th>$R^2$ change</th>
<th>$R^2$ cum</th>
<th>t</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Constant</td>
<td>2.35</td>
<td>0.063</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Craving</td>
<td>0.494</td>
<td>.396</td>
<td>.396</td>
<td>2.99</td>
<td>0.009</td>
</tr>
<tr>
<td>CES-D</td>
<td>-0.447</td>
<td>.186</td>
<td>.582</td>
<td>2.72</td>
<td>0.008</td>
</tr>
<tr>
<td>Habit</td>
<td>0.355</td>
<td>.098</td>
<td>.680</td>
<td>2.15</td>
<td>0.048</td>
</tr>
</tbody>
</table>

Table 2.9

Analysis of CPD regressed on Craving, CES-D and Habit n=26
<table>
<thead>
<tr>
<th>Variable</th>
<th>Regression Coefficients</th>
<th>$R^2$</th>
<th>t</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Constant</td>
<td></td>
<td>2.30</td>
<td>0.036</td>
<td></td>
</tr>
<tr>
<td>TTF</td>
<td>0.669</td>
<td>.783</td>
<td>4.60</td>
<td>0.003</td>
</tr>
</tbody>
</table>

Table 2.10

Analysis of Cotinine regressed on Time to First Cigarette n=26
CHAPTER 3

CULTURAL CONTEXT OF HEALTH BEHAVIOR: SMOKING AMONG FORMER SOVIET UNION IMMIGRANTS

Cigarette smoking has been shown to result in damage to most of the body organs, limiting the health and longevity of smokers (USDHHS, 2004). Quitting smoking has both short and long-term benefits to health, in addition to reduction in the risk of diseases caused by smoking (Taylor, Hasselblad, Henley, Thun, & Sloan, 2002). Smoking prevalence has been stable in the U.S. in recent years, not changing significantly from 2004 to 2006 (CDC, 2007). Prevalence varies widely among ethnic and socioeconomic status subgroups. These data point to the existence of groups of smokers that for various reasons may be more resistant to current smoking cessation interventions.

There is need to examine the factors related to smoking behavior in special populations in order to reduce the potential burden of disease associated with smoking in already vulnerable groups. This paper will review the literature involving the cultural context of health behaviors including ethnic identity, acculturation and acculturative stress and their potential effects on health behavior. Data collected in a sample of immigrants from the former Soviet Union (FSU) will be presented as an example of how these cultural variables may affect smoking behavior.
Ethnic Identity and Cultural Context of Health Behavior

The concept of ethnicity has particular salience in the history of the U.S. because this country is, in effect, a nation of immigrants. The ethnic mix has been ever changing, with each new group bringing a different set of cultural values. So, while the ethnic issues in the U.S. are not unique in the world, the environment in which these issues occur is. The demographics of the U.S. are evolving, with immigrants and minorities becoming increasingly predominant groups. The U.S. Census Bureau estimates that by the year 2050, nearly half the U.S. population will be made up of ethnic minorities.

The term ethnicity has begun to replace “race” in the health sciences literature. The word *race*, coined from the Latin root “ratio” by the German anthropologist Blumenbach in 1775, historically had a meaning similar to “species” or “kind”; it has been used over the past two centuries to designate divisions in human species most often according to the three landmasses of Europe, Africa, and Asia based on phenotypic characteristics (Scupin, 2003). The 1996 statement on race by The American Association of Physical Anthropologists (AAPA) states that all humans now living belong to a single species and share a common descent (1996). The AAPA asserts that pure races, that is, homogenous populations, do not exist and probably never existed. The biological variation among humans is modest (Barbujani, Magagni, Minch, & Cavalli-Sforza, 1997). People are classified into racial groups on the basis of characteristics, usually physical, that are socially significant. So, traditional racial groupings may actually reflect cultural differentiations more than biological ones.

A unique cultural environment is usually tied to a sense of ethnic identity. The origin of the word *ethnicity* is the Greek *ethnos*, which was used to mean “other than Greek”;
the word now usually implies the notion of shared heritage (Scupin, 2003). Ethnicity has evolved to not only describe others, but to also describe ourselves. Senior & Bhopal (Senior & Bhopal, 1994) state that ethnicity implies one or more of the following: shared origins or social background, shared culture or traditions that are maintained between generations and lead to a sense of identity and group, and a common language or religious tradition. Ethnicity is also how people are categorized, by themselves and by others, as related to other groups. Zelinsky (2001) points out that all ethnic groups in the U.S. are made up of diverse groups within them that are grouped together on the basis of some shared characteristics. So, one must decide at what level ethnicity will be measured, for instance, tribal affiliation within American Indians.

Culture is central to the understanding of ethnicity because it shapes the norms, customs, and worldview of a group (Berry, Poortinga, Segall, & Dasen, 2002). Cultural identification may be important in influencing health beliefs, habits, and values. Ethnic identity, both in individuals viewing themselves as belonging to a certain group and society categorizing them into that group, may also help to create a unique cultural milieu around health behaviors.

Importance of Ethnicity to Smoking Behavior

Research has shown differences in smoking behavior between ethnic groups. For example, the CDC (2003) reports ethnic differences in young female smokers, with twice as many white girls smoking compared to black girls. One reason for this finding may be ethnic differences in the use of smoking by women to control weight. In a survey of 81,247 adolescent females, Fulkerson & French (2003) found that black girls were less likely than all other ethnic groups to smoke for weight control. A study comparing black
and white women smokers revealed that the black women were more likely to be satisfied with their body shape and their preferred weight was significantly higher (Pomerleau, Zucker, Namenek Brouwer, Pomerleau, & Stewart, 2001). However, black women were more likely to be unwilling to gain weight upon quitting smoking. So, weight may motivate smoking behavior in black women in a different way than with white women. In addition, a review of literature by Mermelstein (1999) observed consistent findings across studies of relative resiliency of black youth to negative peer and societal influences surrounding smoking. However, the stress of minority status may have a negative effect on smoking behavior. Guthrie, Young, Williams, Boyd, & Kintner (2002) interviewed 178 black girls and noted that their perceptions of racial discrimination were strongly positively associated with smoking.

Gender seems to have had a protective effect for women across ethnicities according to national smoking prevalence data (CDC, 2007). Wide gender differences in smoking prevalence have also been reported in studies among Hispanic populations, such as Salvadorean immigrants (Shankar, Gutierrez-Mohamed, & Alberg, 2000), Eastern European immigrants (Shafey, Dolwick, & Guindon, 2003), and Asian Americans (Yu, Chen, Kim, & Abdulrahim, 2002).

Smoking cessation interventions may differ in effectiveness across racial, ethnic, and economic groups. Clinical trials of smoking cessation medications have primarily been performed on American white, middle class subjects and behavioral interventions developed are culturally appropriate for this group (Benowitz, 2002). A review of literature by Mermelstein (1999) pointed out that most research involving ethnicity and smoking is done through a “white filter” rather than in cultural context. Smoking
cessation treatments that are culturally specific and that address possible differences in nicotine addiction are more likely to be effective in minority groups (Benowitz).

Lack of adjustment for socioeconomic status (SES) or social class is an important potential source of bias in studies of racial and ethnic differences (Kaplan & Bennett, 2003). Some of the ethnic differences may be related to differential educational opportunities. Smoking prevalence by education shows a clear gradient, with 46% prevalence among persons with a GED to 6.5% of persons with graduate degrees (CDC, 2007). Cessation rates have the opposite trend, with persons above the poverty line quitting at much higher rates than those below. A survey analysis by McGrady and Pederson (2002) found that success in quitting was independent of ethnicity and concluded that differences in age of initiation among ethnic groups were producing a statistical association between ethnicity and cessation rates.

So, it is important to also consider socioeconomic factors. Using the traditional ethnic (or “racial”) groupings, American Indians have the highest smoking prevalence in the U.S. at 32.4% (CDC, 2007). The accuracy of national estimates of minority group smoking prevalence is affected by relatively small sample sizes. In addition, a study in Washington State found that higher American Indian smoking prevalence rates were attenuated when sociodemographic and individual level risk/protective factors were considered (Akins, Mosher, Rotolo, & Griffin, 2003). Also, rates in an ethnic group may vary widely according to their location, as Yu, Chen, Kim & Abdulrahim (2002) found when comparing Chinese Americans in Chicago and California, with significantly less smoking among those in California.
It is difficult to assess the separate effects of SES and ethnicity on health because of the intertwining of the two. In addition, there seem to be many factors involved with the effect of ethnicity on health and health behaviors. For example, a study of black/white health disparities by Otten, Teutsch, Williamson, & Marks (1990) analyzed the effect of six health risk factors including smoking, hypertension, and diabetes and found that these six together accounted for 31 percent of the difference in mortality, while income accounted for an additional 38% of the difference.

There have been studies that have identified some biological differences among racial/ethnic groups that affect smoking behavior. Those of African and Asian descent have been found to metabolize nicotine more slowly than those of European descent, accompanied by reporting fewer cigarettes smoked per day (Benowitz, et al, 1999; Kandel et al, 2007). Recent studies suggest genetic differences involving CYP2A6, the gene responsible for nicotine metabolism, specific to African Americans (Fikami et al, 2007). In addition, smoking mentholated cigarettes has been shown to inhibit nicotine metabolism (Benowitz, Herrera, and Jacob, 2004). The biobehavioral nature of smoking behavior influences involves the simultaneous effects of biological factors and behavioral factors such as culture and economics.

Smoking Behavior in Cultural Context

Variations between groups in prevalence and gender patterns of tobacco use underline the influence of culture on tobacco use. While a number of twin studies have shown a genetic basis for smoking behavior, much of the variance in smoking can be attributable to environmental factors, many of which are influenced by cultural context (Unger et al., 2003). Culture shapes tobacco use. Physical and psychological addiction to nicotine are
tied to social and coping factors that affect the ability to quit smoking. These factors could be influenced by culture, which is commonly thought of as a set of attitudes, behaviors, and symbols shared by a group (Shiraev & Levy, 2004). Culture has been described as a constellation of values, customs, and traditions transmitted through generations that is constantly in flux, but also highly resistant to change (Berry et al., 2002). Culture may shift, but it remains a stable force particular to a group over time.

The Kozlowski, Henningfield, and Brigham Biobehavioral Model of Tobacco Use (figure 3.1) depicts psychosocial influences such as culture, economics, and beliefs affecting behavior, while biological factors such as physiology, pharmacology, and neuroscience simultaneously affect smoking behavior (Kozlowski, Henningfield, & Brigham, 2001). In the model, the word behavioral refers to a broad class of nonbiological influences. There are bi-directional relationships between the behavior of smoking and biobehavioral factors, as smoking can, in turn, affect the behavioral and biological domains. The behavior of smoking affects the brain and body neurochemically through nicotine, which reinforces addiction. Smoking behavior also influences, through the mind, the person’s thoughts and beliefs about themselves and smoking. Guided by the model, variables selected to reflect concepts particularly related to cultural context include acculturation, acculturative stress, stressful life antecedents, and environmental influences on smoking.

Acculturation

One of the earliest definitions of this concept is that it is the result of people of different cultures coming into continuous contact, which causes changes in the culture of one or both groups (Redfield, Linton, & Herskovits, 1936). Acculturation has come to be
thought of as a *process* that an individual undergoes (Berry et al., 2002) and is usually measured on a continuum, rather than as a dichotomous outcome. It is usually defined as multidimensional, (Stephenson, 2000)(Berry et al., 2002) (Unger et al., 2003) but is typically measured with a single item, usually language use. Acculturation is not confined to immigrants, but also applies to native-born ethnic minorities (Stephenson, 2000).

Level of acculturation has been associated with smoking behavior in a number of studies with immigrants of various ethnicities. Usually, when acculturation level is higher toward the dominant culture, smoking behavior becomes more like the adopted culture. Higher linguistic acculturation was found to be associated with decreased smoking in Chinese American men, (Fu, Ma, Tu, Siu, & Metlay, 2003) there being a higher smoking prevalence in China than in the U.S. A survey of 103 recent immigrant adolescent girls from former Soviet countries in New York showed that acculturation was positively correlated to risky health behaviors, such as smoking (Jeltova, 2003). Girls who scored higher on identification with American culture reported more risky health behaviors, including smoking, than those who were less acculturated. A study of the smoking behavior of 8,882 Latino men and women in the U.S. found that high acculturation was associated with more smoking in females and less smoking in males compared to the native country (Perez-Stable et al., 2001). Likewise, a survey of 356 Korean Americans showed that higher acculturation to dominant U.S. culture was associated with more smoking in women and less smoking in men compared with those with less acculturation (Lee, Sobal, & Frongillo, 2000).
Acculturative Stress

The “psychological” influences on tobacco use according to the Biobehavioral Model of Tobacco Use include culture, thoughts, and beliefs. These factors together encompass acculturative stress, a distressful psychological reaction to an unfamiliar cultural environment (Shiraev & Levy, 2004). This is a unique type of stress, with both physiological and psychological effects, having its source in the acculturative process and involving a reduction in health status (Berry, Kim, Minde, & Mok, 1987). Emotional disorders in immigrants, such as anxiety and depression, have been directly linked to acculturative stress (Mirsky, Barasch, & Goldberg, 1992)(Hovey, 1998; Hovey & Magana, 2000)(Shiraev & Levy, 2004). A study of Asian American youths reported that family conflicts and lack of acculturation were among the most significant risk factors for stress, emotional problems, and suicide (Lau, Jernewall, Zane, & Myers, 2002).

Acculturative stress may be an important variable to consider in minority populations regarding health behaviors.

A study of 68 FSU immigrants in Israel identified that high levels of psychological distress, when compared to the native Israeli population, persisted at least two years post-immigration and that social support mainly consisted of fellow FSU immigrants (Mirsky, Dreiman, & Kedem, 2002). In addition, a study of 170 Soviet immigrants in Israel during the Gulf War found that immigration issues were of much greater concern than the war (Mirsky & Barasch, 1993). Further, qualitative studies of refugees in Canada (Simich, Beiser, & Mawani, 2003) and immigrants in the U.S. (Aroian, Spitzer, & Bell, 1996) found that, while fellow immigrants were an important source of support, immigrant families were at times too overwhelmed to provide support to each other.
Stressful Life Antecedents and Smoking

People who have lived in a stressful or unstable social environment may continue to experience the effects of chronic stress after emigration. Chronic stressful experiences are associated with the development of nicotine dependence (Little, 2000). Smoking has also been found to be strongly associated with adverse childhood events, such as excessive parental conflict and separation (La Rosa, Consoli, Le Clesiau, Soufi, & Lagrue, 2004), as well as, abuse or witnessing abuse (Anda et al., 1999). Therefore, smoking may be influenced by stressful life antecedents such as an unstable or oppressive social and economic environment, especially if family stability was affected.

Environmental/Social Influences

Environmental smoking and attitudes of family, friends, and co-workers toward smoking in a cultural group may impact individual smoking choices. Partner support and availability of general support has been associated with success in smoking cessation, while a social network containing smokers deterred the maintenance of cessation (Mermelstein, Cohen, Lichtenstein, Baer, & Kamarck, 1986). Culture may impact the reasons for smoking, in part, by dictating the way that people interact socially, as well as the acceptability of behaviors. Reasons for smoking including stimulation, pleasure, and coping with negative feelings (Ikard, Green, & Horn, 1969) may be affected by culture because smoking influences acceptable ways of meeting these needs. Differences in reasons for smoking have been found to influence severity of nicotine withdrawal symptoms during tobacco cessation (Niaura, Goldstein, Ward, & Abrams, 1989). In
addition, the decision to smoke or to attempt cessation is affected by the individual's perception of the costs and benefits of smoking (Prochaska, DiClemente, Velicer, Ginpil, & Norcross, 1985), which may be influenced by values and beliefs.

**Exemplar: Former Soviet Union Immigrants and Smoking**

As depicted by the Kozlowski Biobehavioral Model of Tobacco Use previously discussed, the entwined biological and behavioral components in variables such as nicotine dependence, combined with social and coping factors, affect smoking behavior and the ability to quit smoking. Immigrants may have additional obstacles and, without culturally sensitive support in tobacco cessation, are essentially isolated in their attempts to quit smoking. In addition, as smoking has declined in the American white population, cigarette advertising has increasingly targeted other ethnic groups and developing countries (ALA, 2004).

Immigrants from the Former Soviet Union (FSU) have come to the U.S. from countries which have different group norms toward smoking. The level of smoking in FSU countries, particularly among males (53-63%), puts immigrants from these countries to the U.S. at extreme risk for health problems. Smoking prevalence of 80% among men in the more industrial areas of FSU countries was reported in the mid-1990s (Hurt, 1995). There was a sharp increase in the numbers of immigrants to the U.S from FSU countries in the mid-1990s, a time when the life expectancy for males in Russia dropped to 57.5 years. The cause for this low longevity has been attributed to the health lifestyles, including smoking behaviors, in Russia and other FSU countries (Cockerham, Snead, & Dewaal, 2002).
Exemplars from a 2-phase study will be used to illustrate acculturation, acculturative stress, and health behavior. The focus of this study was to identify biobehavioral aspects of cigarette smoking in immigrants from FSU countries now living in Ohio. In Phase 1, focus group and individual interviews were utilized to assess beliefs and attitudes toward smoking in this group. Qualitative data collected in the focus groups and individual interviews of smokers and former smokers (n=14) from the FSU helped to illuminate attitudes toward smoking and cessation in this culture. Biobehavioral variables in phase 2 included level of tobacco use, nicotine dependence, cultural context (including beliefs and attitudes toward smoking, acculturation, acculturative stress, and environmental smoking), stressful life antecedents, depressive symptoms, and demographic characteristics, including years in U.S. This biobehavioral descriptive survey assessed the relationships between these constructs and smoking. Cross-sectional data was collected in community settings with immigrants from former Soviet countries (n=80) and is reported elsewhere (Chapter 2). Data related to the cultural context will be included here.

Sample Characteristics

A total of 80 participants were recruited through immigrant social service programs, flyers in Russian grocery stores, workplaces which employed Russian-speaking personnel, and Russian-language newspapers. Selected demographic characteristics of the sample are presented in Table 3.1. The average age of participants was 57 years ranging from 18 to 92 years old, including 68% women. Fifty-five percent of the sample was married, with a mean of 12.1 years (SD 4.7) in the U.S., ranging from 1 to 20 years. The majority of participants were from the FSU countries of Russia (47%), Ukraine (31%), and Belarus (14%). These Republics had the highest concentration of Jews, reflected in
the fact that 71% of the sample were Jewish and 21% were Christian. Eighty percent of participants had the equivalent of a bachelor’s degree or more college level education, while 52% reported a household income of less than $25,000. Thirty three percent of the sample were current smokers, 16% were former smokers, and 51% were never smokers.

Acculturation

Acculturation in this study was conceptualized and measured as a multi-dimensional process and included measurement of identification with the ethnic culture of origin as well as with the current dominant culture including language, food, media, social, and work domains with the Stephenson Multigroup Acculturation Scale (SMAS) (Stephenson, 2000). A higher score indicates more identification with the dominant or ethnic culture, assessed with two subscales. While ethnic society immersion (ESI) was higher in this sample, participants scored relatively high on both of the acculturation measure’s subscales; the average rating on a scale of 1-4 was 2.93 (SD .51) on dominant society immersion (DSI) and 3.55 (SD .39) on the ESI. The subscales were significantly inversely correlated (r= -.352, p<.01). A paired t-test found the ESI and DSI average ratings significantly different (t=12.65, p< .001). Age was significantly positively correlated with ESI score (r= .436, p< .001) and significantly negatively correlated with DSI score (r= -.376, p= .001). Neither the ESI nor the DSI were correlated with the number of years living in the U.S. or smoking status.

Acculturative Stress

In the qualitative interviews, stress relief was identified as the one of the major reasons for smoking. Participants’ comments in the focus groups and interviews reflected that acculturative stress was a major contributor to stress levels.
…one time I go to hospital. And I point to English-Russian dictionary book to say “I need to see doctor”. And I looked at book for what I need to say to doctor. Now, I know what I want to say, but cannot explain something. If I go somewhere, to get tickets, sometimes can’t explain what I need. To know English, would make easier for life, communication.

Interview participants also talked of adjusting to the different pace of life in the U.S.:

I do not think life in the United States is simple. I think it’s very stressful and complicated. It is a very complicated life. Very complicated. It was much more simple in Russia because for so little wages, you had no choices, but you have the simple life.

Acculturative stress in the survey was measured using the Social, Attitudinal, Familial, and Environmental (SAFE) acculturative stress scale, with 26 items that cover social, attitudinal, familial, and environmental contexts, as well as perceived discrimination (Hovey & Magana, 2000). Possible scores range from 0 to 130, with higher scores indicating higher levels of acculturative stress. The average score on the acculturative stress instrument in this sample was 38.0 (SD 19.9) with a range of 9-95. When compared with other studies using this instrument, this average reflects a moderate level of acculturative stress, despite an average of 12 years since emigration. Using this same instrument, Hovey (Hovey, 1998) found a mean of 52.2 (SD 19.3) in Mexican American immigrant adolescents and 57.8 (SD 21.4) among Mexican immigrant farmworkers (Hovey & Magana, 2000). In the current study, current smokers reported the highest levels of acculturative stress (41.2), followed by former smokers (38.7), with
never smokers reporting the lowest levels of stress (35.8). These differences were not statistically significant. When the smokers were compared using the cut point of 3 cigarettes per day, which was the value at the 50 percentile, the group who reported smoking greater than 3 cigarettes a day were higher; the difference in mean scores on acculturative stress trended toward significance.

There was a significant inverse correlation between acculturative stress score and age ($r = -0.241, p < 0.05$). The average score of those who were under the age of 60 was 43.2 (SD 21.7), while those who were age 60 and older had an average of 32.8 (SD 16.7). A significant difference in the mean scores was found ($t = 2.39, p < 0.05$). Acculturative stress score was not significantly correlated with the number of years since immigration. This was also found by Hovey (1998) among Mexican immigrants.

Examples of stressful life antecedents were described by the qualitative interview participants when asked about their stressors before immigration:

In Russia, there were many times of very little food. I can remember when I was a little girl, my mother getting me up very early in the morning so we could go and wait in line for bread. Because each person got a certain amount, I had to go with her to get my portion. A lot of time waiting in line for food.

In a different interview, another participant compared this stress with her current life in the U.S.:

And lines. I mean that’s like every day, you know, every day living. Which here [in the U.S.] is very, you know, you don’t, it’s all available, accessible. So, much less stress with daily kinds of things. Back there, the most stress was on those things because they were not easily available, accessible. I would go nuts standing in a line.
Hours sometimes to get…a chicken. I mean, 2 hours in a line for bread, I mean that was crazy! I won’t say we had it all our lives, but it was a lot of the time. Extremely stressful…

Participants also pointed to the general political climate as a major stressor before immigration: “Instability in the country, because you never knew what was going to happen tomorrow, and how it would be with your children, with your future, with your job.”

To reflect the social environmental influences around smoking, attitudes toward smoking of the participant’s spouse, family, friends, and co-workers were assessed in smokers and non-smokers in the sample, for comparison. Ninety percent of the never smokers reported that their spouse or partner did not smoke, compared with 50% of the smokers. Forty two percent of never smokers said they had friends who smoked, versus 96% of the smokers.

Conclusion

These findings highlight the need for smoking cessation interventions with this group to address acculturative stress within a cultural context that identifies strongly with both ethnic and American culture. While this sample of first generation FSU immigrants has a relatively strong identification with dominant U.S. culture, their ethnic identification is higher. Therefore, although this group may seem to be “acculturated”, their ethnic culture is probably having more of an effect on their health beliefs and behaviors. Despite an average of 12 years living in the U.S., this sample showed that a moderate amount of acculturative stress was sustained a number of years post-immigration. As might be expected, acculturative stress had a positive relationship with ethnic identification. That
is, those who showed more identification with the ethnic culture also had more acculturative stress. So, assessment of ethnic identification may be a helpful step in planning health behavior change interventions.

Although the older people in this study showed more identification with the ethnic culture, they had lower acculturative stress scores. Older adults are typically retired; they usually are not in school or working and thus do not have as much interaction with those in the dominant culture. They may be more able to stay within their ethnic community. While it may be assumed that younger immigrants will have fewer issues with acculturative stress, the higher scores were found among the younger participants, who may need more support in this area when making behavior changes.


Shafey, O., Dolwick, S., & Guindon, G. e. (2003). *Tobacco control country profiles 2003*. Atlanta, GA:


Figure 3.1 Biobehavioral Model of Smoking and Tobacco Use
(Kozlowski, Henningfield & Brigham, 2001)
<table>
<thead>
<tr>
<th></th>
<th>N</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>N=80</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Age at interview</td>
<td></td>
<td></td>
</tr>
<tr>
<td>&lt;60</td>
<td>40</td>
<td>50</td>
</tr>
<tr>
<td>60+</td>
<td>40</td>
<td>50</td>
</tr>
<tr>
<td>Average years in U.S.</td>
<td>12</td>
<td></td>
</tr>
<tr>
<td>Marital status</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Married</td>
<td>44</td>
<td>55</td>
</tr>
<tr>
<td>Not married</td>
<td>36</td>
<td>45</td>
</tr>
<tr>
<td>Education</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Less than Bac. Degree</td>
<td>16</td>
<td>20</td>
</tr>
<tr>
<td>Bac. Degree or higher</td>
<td>64</td>
<td>80</td>
</tr>
<tr>
<td>Ethnicity</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Russia</td>
<td>48</td>
<td>47</td>
</tr>
<tr>
<td>Ukraine</td>
<td>23</td>
<td>31</td>
</tr>
<tr>
<td>Belarus</td>
<td>15</td>
<td>14</td>
</tr>
<tr>
<td>Other</td>
<td>6</td>
<td>8</td>
</tr>
<tr>
<td>Religion</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Jewish</td>
<td>57</td>
<td>71</td>
</tr>
<tr>
<td>Orthodox</td>
<td>17</td>
<td>21</td>
</tr>
<tr>
<td>Other</td>
<td>6</td>
<td>8</td>
</tr>
<tr>
<td>Smoking Status</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Smoker</td>
<td>26</td>
<td>33</td>
</tr>
<tr>
<td>Former</td>
<td>13</td>
<td>16</td>
</tr>
<tr>
<td>Never</td>
<td>41</td>
<td>51</td>
</tr>
</tbody>
</table>

Table 3.1

Demographic Characteristics of Participants
CONCLUSION

Since smoking has been shown to have significant health consequences, smoking cessation efforts have the potential to dramatically affect individual and societal health (Taylor, & Hasselblad, 2002; CDC, 2003; CDC, 2007). Smoking prevalence varies significantly in the U.S. among ethnic and socioeconomic groups (CDC, 2007). Immigrants from the Former Soviet Union (FSU), who are unified after immigration by the fact that they speak Russian, represented the greatest proportional increase of foreign language speakers from the 1990 to the 2000 Census. This group is a high risk group in regard to smoking behavior who may have unique needs for smoking cessation interventions.

The major findings resulting from this study highlight the need to consider cultural identification in health behavior change interventions such as smoking cessation. Time in the U.S. since immigration may not indicate the strength of cultural identification or a decrease in immigration-related mental health issues, as evidenced by the continued levels of acculturative stress and depressive symptoms in this sample. These issues must be addressed in health behavior interventions, as well as helping to identify alternative, effective coping mechanisms in order to increase the success and maintenance of health behavior changes.
There are many strengths in the social context of Former Soviet Union immigrants; the social support present in Russian-speaking communities and a perspective borne of past struggles are resources for positive health changes. Many of the people in the FSU immigrant population have surmounted formidable challenges in order to increase their life chances and opportunities in a new country. The multiple competing demands experienced by this and other population subgroups may influence the priority of health behavior changes.

Research within the Russian-speaking population could explore further the increased depressive symptoms that seem to be experienced in this and other FSU samples and examine beliefs and attitudes toward mental health symptoms and openness to the use of professional help, including smoking cessation assistance. Ways to use the social connectedness in this culture to support smoking cessation without damaging the positive effects of social support will more easily be revealed with the insight of those from within these communities.

Next steps in research with this population will need to also address issues with participation in research. Wariness toward researchers and differing social and health priorities may require planning special considerations when approaching this group for research participation. Data regarding research participation among other special populations may provide insights to the approach of FSU immigrants. For example, a study involving African Americans and Latinos regarding clinical research found that financial, safety, and transportation concerns superseded health concerns and that distrust of researchers may hinder research participation (Napoles-Springer et al, 2000). The results suggested that potential participants would be more willing if fully informed of
the research and if tangible benefits were perceived. There are similarities in the FSU immigrant population in that multiple competing demands may decrease the priority of health concerns and that distrust of researchers may be a factor related to their immigrant status and possible mistrust of authorities based on past experiences.
BIBLIOGRAPHY


N6. (2002). LaTrobe University, Melbourne: Qualitative Solutions & Research Pty. Ltd.


