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THE RELATIONSHIP BETWEEN PERCEIVED STRESS AND SMOKING:
FOCUSING ON SCHIZOPHRENIA AND COMPARATIVE SUB-GROUPS
DIAGNOSED WITH MENTAL ILLNESS

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Submitted in partial fulfillment of requirements for the degree

MASTER OF SCIENCE IN HEALTH SCIENCES

At the

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ABSTRACT

The context for this research project is a population of individuals diagnosed with a mental illness; schizophrenia, bipolar disorder, depressive disorders, or other diagnosis as specified by participant. Research has shown that 87% of individuals diagnosed with schizophrenia are smokers and 65-75% of those diagnosed with bipolar or depressive disorders smoke compared to 20% from the general population. The purpose of this study is to determine if perceived stress is positively associated with cigarette dependence among a study sample of non-psychiatric participants and those diagnosed with a mental illness. A correlational survey based design was used to test five hypotheses of perceived stress and smoking. Survey data was obtained from smokers and non-smokers hospitalized at Windsor-Laurelwood Center for Behavioral Medicine. Included in this study sample were smokers and non-smokers from Cleveland State University representative of the general population. The survey instruments used in this data collection included the psychometric assessments; Perceived Stress Scale, Cigarette Dependence Scale, and the Reasons for Quitting Scale.

Consistent with prior research and published government data on smoking rates for those diagnosed with a mental illness, this sampling of participants reported similar smoking rates at 88% for those with schizophrenia, and 75% and 74% for those diagnosed with bipolar and depressive disorders respectively. The first hypothesis was

supported in this research; the levels of perceived stress are significantly greater in those with mental illness compared to the group drawn from the general population. A second hypothesis was supported; perceived stress is positively related to cigarette dependence. Though, this relationship between perceived stress and cigarette dependence was not shown to be greater in those with schizophrenia, nor was it stronger than those with bipolar or depressive disorders.

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CHAPTER I

INTRODUCTION

Over the past four decades the United States has experienced an impressive reduction in smoking rates among all age groups. According to the Center for Disease Control and Prevention, the current smoking rate has dropped to less than 20% (19.8%) in the general U.S. population (Center for Disease and Prevention [CDC], 2008), and the World Health Organization supports smoking cessation as the only intervention to reduce tobacco related morbidity and mortality (World Health Organization [WHO], 2003). Yet, those diagnosed with a severe mental illness (SMI); schizophrenia, bipolar, or depressive disorders are far less fortunate. They tend not only to have higher nicotine dependence and addiction to smoking, but lower smoking cessation rates than the general population. The culmination of higher co-morbid incidence and the medical consequences from tobacco-related diseases raises the risk profile and decreases the quality of life for anyone diagnosed with a severe mental illness. Hence, those inflicted with a mental illness merit special attention, and the CDC has campaigned to identify and disseminate an evidence based need to reduce tobacco-related disparities.

The CDC reports 60-70% of those diagnosed with bipolar or depressive disorders continue to smoke, and an alarming 90% of those diagnosed with schizophrenia are current smokers (“Schizophrenia and Cigarette Smoking”, 2006; WHO, n.d.). The

National Institute of Mental Health reports approximately 6% of the U.S. population meet the criteria for SMI (National Institute of Mental Health,[NIMH], 2008) with varying degrees of all diagnosable mental illnesses range upwards of 12%-26% of the U.S. population (Leonard et al., 2001; NIMH, 2008). Though, those with mental illness account for nearly half of all cigarette consumption in the United States (Lasser et al., 2000; NIMH, 2009), with one study reporting this rate of cigarette consumption is closer to 70% (Grant, Hasin, Chou, Stinson & Dawson, 2004).

According to the National Institute of Mental Health, mental illness is the leading cause of disability for Americans between the age of 15-44 (NIMH, 2008), resulting in lost earning potential during their most productive adult years. Based on these studies and government reports, those diagnosed with a mental illness contribute exponentially to the \$167 billion annual cost for smoking-related medical expenses and loss of productivity (CDC, 2006). Furthermore, those with mental illnesses are more likely to have more co-morbid medical conditions than the general public. Also, they are dying much younger, with their mortality rate 13-30 years earlier than the general population (Colton & Manderscheid, 2006). Not unlike the general population, heart disease is the leading cause of death for this population (Gelenberg, deLeon, Evins, Parks, & Rigotti, 2008). However, findings supported by research applying different study design and methods have shown that those with schizophrenia are twice as likely to develop cardiovascular disease compared to the general population of smokers (Curkendall, Mo, Jones, & Glasser, 2001; Leucht, Burkard, Henderson, Maj, & Sartorius, 2007; Goff et al., 2005).

The detrimental effects and financial burden of health related problems associated with smoking are not solely restricted to the United States. Smoking is a global health

epidemic, with its hazardous results shared by many countries, societies, and communities (Dalack, Healy, & Meadows-Woodruff, 1998; deLeon, 1996; deLeon, Beacons, Gurpegui, Gonzalez-Pinto, & Diaz, 2002). An Australian mental health charity reported similar per capita smoking rates as the United States; with nearly 40% of all Australian smokers having a diagnosed mental illness and costing \$33 billion a year in health related illnesses and lost productivity (SANE, 2007).

Cigarette smoking is the leading cause of preventable death in the United States, resulting in more than 400,000 deaths per year or about one in every five deaths (National Institute on Drug Abuse [NIDA], 2008). The relationships between psychiatric disorders and smoking have important implications for public health as well as the financial burden to both the individuals and our fragile health care system. The well-known risk of smoking may synergistically exacerbate health risks among this group, making additional clinical and research programs essential in addressing this critical public health crisis.

Previous research efforts focused on correlational relationships between stress and mental illnesses, and cigarette dependence and mental illnesses; however, there is a paucity of research testing correlational and causality relationships between stress as the independent variable and smoking as the dependent variable in individuals diagnosed with schizophrenia, bipolar, and depressive disorders. Extant research has not explored the direct effect of perceived stress on smoking. The literature review section shows that a hypothesis linking perceived stress to smoking would be consistent with the larger or general finding on smoking among those with mental illnesses. **The intent of this research is to examine relationships identifying hypotheses linking one factor, perceived stress and the relationship to higher cigarette dependence and decreased**

motivation to quit for those diagnosed with schizophrenia and comparative sub-groups of mental illness; bipolar and depressive disorders.

1. The first hypothesis of this study is that the levels of perceived stress are significantly greater in the group diagnosed with mental illnesses compared with the group drawn from the general population.
2. The second hypothesis of this study is that perceived stress is positively related to cigarette dependence, and this relationship is stronger in those diagnosed with schizophrenia.
3. The third hypothesis is that the relationship between perceived stress and cigarette dependence is stronger among those diagnosed with schizophrenia than in those diagnosed with bipolar disorder.
4. The fourth hypothesis is that the relationship between perceived stress and cigarette dependence is stronger among those diagnosed with schizophrenia than those diagnosed with a depressive disorder.
5. The fifth hypothesis is that perceived stress is negatively related to motivation to quit smoking. This relationship is stronger in those diagnosed with a mental illness.

CHAPTER II

LITERATURE REVIEW

SMOKING and MENTAL ILLNESS

Over the past 30 years, Americans have experienced a public outcry calling for smoking reform following the nonsmoker's rights movement and the publicized health hazards and risks associated with smoking. In the 1960s, the U.S. Surgeon General began requiring warning labels on cigarette packs, and even though Gallup Poll results indicated an increase in public perceptions of smoking risks, there was no immediate decline in the U.S. smoking rate. During the 1970s the smoking rate dropped below 40%, though it was not until the government initiated proactive regulations in 1989 that the smoking rate fell below 30% (Morales, 2008). This reform encouraged higher state and federal tobacco taxes, outlawed smoking in public places and the workplace, banned advertising targeted toward children, encouraged avoidance, and ultimately aided smokers trying to quit the habit.

Regrettably, those with mental illnesses have not reaped the benefits from the antismoking campaigns, and over the years have become somewhat resistant to any change in smoking behaviors in light of current reforms and social attitudes. As part of

the remaining population of smokers, their co-morbid illness contributes to the ever increasing healthcare cost, and it appears this addictive habit is more difficult for them to quit compared to the population at large. They continue to be highly addicted to cigarettes (deLeon & Diaz, 2005; George & Vessicchio, 2002), heavier smokers (Dalack, Healy, & Meadows-Woodruff, 1998; DeLeon & Diaz, 2005, Hughes, Hatsukami, Mitchell, & Dahlgren, 1986; Kelly, & McCreadie, 1999; Lasser et al., 2000), and less successful in attempting or maintaining smoking cessation (Addington, el-Guebaly, Campbell, Hodgins, & Addington, 1998; Dalack et al., 1998; deLeon, Diaz, Rogers, Browne, & Dinsmore, 2002; George, Vessicchio et al., 2000; George & Vessicchio, 2002; Hughes et al., 1986).

Over the past 25 years, researchers have continued to focus on co-morbidity between physical illness and various mental disorders and on the relationship between cigarette smoking and generalized psychiatric disorders while disseminating research showing this population continues to smoke at much higher rates than the general population (Dalack, & Glassman, 1992; Dickey, Normand, Weiss, Drake, & Azeni, 2002; Hughes et al., 1986). Additionally, the higher the severity of schizophrenic symptoms has an impact. The higher the severity of symptoms, the more likely an individual will smoke more frequently and more heavily than lesser degrees of severity (Lohr and Flynn, 1992).

Research interests are not only focused on the exploration of the multidimensional aspects between medical illnesses and mental illnesses, but also on the behaviors associated with smoking. While many studies have identified areas of interest in smoking rates among all mental disorders, recent findings have focused on the triangulation between psychological, social, and biological factors, all playing an

important role in the high rate of smoking; especially for those diagnosed with schizophrenia.

Research investigation has recently focused on the genetic components associated with schizophrenia and nicotine addiction, providing a plausible connection between a form of biochemical changes and its affinity with this mental disorder. Active areas of research examining the etiology of schizophrenia and genetic defects link to smoking, reporting a gene defect commonality with bipolar disorder (Leonard et al., 2001).

Even though this defective gene theory does not overtly appear to implicate a gene defect relationship with major depression (deLeon, 1996), contradictory research suggests genetic factors are likely to predispose and influence the liability to both smoking and major depression (Kendler et al., 1993). Previous researchers have argued that studies focusing on one distinct psychiatric disorder provide very little information pertaining to these common risk factors for smoking across the entire spectrum of mental disorders (Venable, Carey, Carey, & Maisto; 2003). More recently researchers have noted forms of shared vulnerability or common risk genes linking the full spectrum of major psychotic disorders with smoking (Diaz et al., 2009).

Several recent studies have explored the biological abnormalities of mental disorders; including dysregulation and desensitization of the pathophysiological functions between nicotinic acetylcholine (Dalack et al., 1998; Leonard, et al., 2000) and the mesolimbic dopamine system (George, Verrico, Picciotto, & Roth, 2000). Prior research focused on the nicotine modulation effect on dopamine in the prefrontal region of the brain, with dopamine deficiency in this area leading to the negative symptoms of schizophrenia, i.e., social apathy and social withdrawal, and excessive dopamine in the

mesolimbic area increasing the positive symptoms, i.e., hallucinations and delusions (McCloughen, 2003).

While some researchers have focused on a singular importance of dopamine and dopamine receptors, other neurotransmitters and their role in the complex neurocircuitry in schizophrenia have been identified, including serotonergic, cholinergic, and glutamatergic neurotransmitters (George, Zeidonis et al., 2000). For instance, the National Institute of Health (NIH) reports one key neurotransmitter, glutamate, to be linked to the genetic deficits spectrum of schizophrenia, suggesting that it contributes to the dysfunction of the frontal area of the brain where decision-making and higher order thinking occurs. (NIH, 2004). Stress increases the release of glutamate in the prefrontal cortex area and dopamine in the mesolimbic system (Duncan, Sheitman, & Lieberman, 1999).

Recent research likely coincides with previous research suggesting those with schizophrenia have fewer hippocampal nicotinic receptors, and a failure to activate cholinergic inhibitory interneurons, resulting in a decreased gating response to sensory stimulation and a sensory overload regulating auditory and cognitive sensory perceptions (Freedman, Hall, Adler, & Leonard, 1995). Other areas of interest include auditory sensory gating deficits and the neurochemical changes associated with the alpha 7 nicotinic cholinergic receptor linked to schizophrenia, with this dysfunctional abnormality more specific to the hippocampal alpha 7 nicotine receptor (deLeon, Diaz et al., 2002). With this sensory deficit and the alpha 7 nicotine receptor, nicotine exposure during smoking offers temporary improvement and normalization (Leonard et al., 2000; Leonard, Mexal, & Freedman, 2007; Olincy et al., 2006). Nicotine has the ability to transiently normalize auditory gating and thus decrease difficulty with processing sensory

information (Adler, Hoffer, Wiser, & Freedman, 1993). Other studies suggest those with schizophrenia have an overall reduction in nicotine receptors in the hippocampus, cortex, and caudate areas of the brain (Breese et al., 2000). Prior researchers looked at the association between the sensory gate deficit and the defective gene theory, concluding this is a matter of a faulty nicotine receptor gene (Brain Disorders, Smoking, & Nicotine Addiction, 2006). Based on data provided by the NIMH Schizophrenia Genetics Initiative project, Farone et al. (2004) discovered several nicotinic receptor genes linked to smoking traits in schizophrenia. Saccone et al. (2007) also conducted genotyping research showing genetic variants associated with nicotine dependence. These research efforts have shed some light on smoking as a form of self-medication, implicating the need for protection from neurotoxicity and enhancement of cognitive processes (Leonard et al., 2007).

Research attention has also been directed to the positive aspect of nicotine on cognitive function, including emotion, motivation, attention, behavioral liveliness, and alertness due to nicotine interaction with neurotransmitter systems (Adler et al., 1993; Dalack et al., 1998; George et al., 2000; Kumari & Postma, 2005). Nicotine helps with the cognitive impairments and overall cognitive processes along with difficulties in abstract thinking common in schizophrenia. For those diagnosed with schizophrenia, aspects of smoking and the actions of nicotine may help compensate for some of the cognitive impairments associated with the illness and may also counteract the psychotic symptoms or alleviate unpleasant side effects common with antipsychotic medications.

Glynn and Sussman (1990) reported that those with schizophrenia smoke for the same reasons as the general population—to settle nerves (52%), out of habit (67%), and for relaxation (80%). For smokers with mental illness, smoking is a central part of life, and

considered an affordable luxury. Research has provided an understanding that smoking is a major part of their daily routine, and those with mental illnesses experience less satisfaction from other activities in comparison to the pleasure derived from smoking (Snyder, McDevitt, & Painter, 2008). Spring, Pingitore, and McChargue (2003) found that persons with schizophrenia are just as aware of the drawbacks and disadvantages of smoking as those in the general population, but they perceive more personal benefits from smoking versus not smoking.

Persistent depressive symptoms experienced by some individuals with schizophrenia may also influence the prevalence of smoking, suggesting an important relationship between depression and nicotine dependence (Breslau, Kilbey, & Andreski, 1993; Glassman, 1993; Hughes, 1993). The absence of nicotine increases the risk for depression in those predisposed to depressive symptoms (Kotov, Guey, Bromet, & Schwartz, 2008; Ziedonis, Kosten, Glazer, & Frances, 1994), making it more difficult to contemplate, initiate, or adhere to smoking cessation.

Furthermore, studies have shown that those with schizophrenia do not self-medicate with nicotine to reduce the positive symptoms of schizophrenia; hallucinations, delusions, suspiciousness, paranoia or persecution (Lohr & Flynn, 1992; Patkar et al., 2002), which reflect an excess or distortion of normal functions. Rather, research attention has focused on the aspects of chronic negative symptoms of schizophrenia—emotional and social withdrawal, apathy, and lack of energy or motivation, which are those that appear to reflect a diminution or loss of normal functions. These negative symptoms are ameliorated with exposure to nicotine while smoking (Dalack et al., 1998; Lyon, 1999), with an overall improvement in neuropsychological performance (Lavin, Siris, & Mason, 1996). Individuals diagnosed with schizophrenia are more prone to be

smokers and the actual smoking behavior may reduce negative symptoms of the disorder (deLeon et al., 1995). Additionally, nicotine has anxiolytic effects (Diaz et al., 2009), with varying degrees of stress reduction, often depending on the degrees of anxiety evoked and the response to the event (Morissette, Tull, Gulliver, Kamholz, & Zimering, 2007). It is an ongoing dilemma as to why this generalized grouping of mental illnesses continue to be so highly addicted to nicotine and less motivated to quit smoking in light of social concerns and media attention placed on the health risks associated with smoking.

STRESS and MENTAL ILLNESS

There is a clear link between stressors and psychotic episodes (Butzlaff & Hooley, 1998; Nuechterlein & Dawson, 1986). Schizophrenia is a debilitating mental disorder, with complexity of the underlying pathophysiology. Schizophrenia may exist alone or in combination with other psychiatric or medical conditions, and is known as a biological disease of the brain that ebbs and flows, with acute periods of hallucinations, thought confusion, and delusional thinking possibly triggered by a variety of stressors. It usually abates in response to decreased stimuli, calm interactions, and antipsychotic medicine (“Understanding and Responding”, n.d.). Those with schizophrenia have altered sensitivity to stress and their environment, in addition to maladaptive coping skills during stressful situations (Gispen de Weid, 2000).

Both social stigmatism (Dixon et al., 2007; Lee, Lee, Chiu, & Kleinman, 2005; Rüscher et al., 2009), and negative self perceptions of their mental illness exacerbates their stress (Dinos, Stevens, Serfaty, Weich, & King, 2004). A more recent study by Cooke et al. (2007) reported individuals with schizophrenia who have greater awareness and insight of their mental illness experience greater distress, as measured by poor self-

esteem, anxiety, and depression. Whereas those with poorer insight have developed maladaptive coping styles, denial, or have cognitive functioning impairments or deficits. However, only slight differences in levels of stress have been reported between the diagnostic sub-groups of schizophrenia, bipolar, or depressive disorders (Rüsch et al., 2009). When factoring in the added social stigma and self-stigmatization associated with their diseases, it is possible that both the nicotine addiction and the smoking behavior associated with smoking may help them deal with their stress and anxiety. Nicotine dependence develops when tobacco is used as a coping strategy in response to life stressors, and this repeated use as a coping mechanism delays adaptive coping strategies and increasing psychological dependence on tobacco (Morissette et al., 2007).

In exploring psychological aspects of smoking among those with schizophrenia, researchers have identified smoking as a mechanism to cope with stress. Smoking offers not only a calming effect (anxiety-reducing) and decreased stress, but also a reduction in boredom and increased concentration (Esterberg & Compton, 2005). Finally, those with severe mental illness increase the number of cigarettes smoked when experiencing increased perceived stress (Dixon et al., 2007; Lasser et al., 2000; Snyder et al., 2008).

MOTIVATION TO QUIT and MENTAL ILLNESS

Those with schizophrenia have impairments in coping and stress management skills, with decreased motivation to quit smoking (Esterberg & Compton, 2005). Some study results conclude that individuals with schizophrenia are not motivated to quit smoking, nor are they successful in smoking abstinence or cessation (Etter, Mohr, Garvin, & Etter, 2004), while some simply lack confidence in their ability to quit smoking when compared to the general population (DeLeon, Diaz et al, 2002). Further,

persons with common mental disorders are 30% more likely to increase their cigarette smoking from the previous year (Ismail, Sloggett, & DeStavola, 2000).

Researchers have also shown that there is a worsening of psychotic symptoms with the cessation of smoking (Dalack et al., 1998; Hartman, Leong, Glynn, Wilkins, & Jarvik, 1991), and according to Forchuk et al. (2002) most individuals with schizophrenia would like to cut down on the number of daily cigarettes smoked or quit altogether. While, a study by Glynn and Sussaman (1990) showed that approximately half of those with schizophrenia want to stop smoking for health reasons. However, their study findings do not support an associated decline in smoking rates for schizophrenics since 1990, nor do their findings show the same increased smoking cessation trend as the general population.

When comparing reinforcement values of cigarette smoking among those with schizophrenia, depression, and non-psychiatric smokers, both individuals diagnosed with schizophrenia and depressed participants chose smoking not only as their preferred activity, but also found smoking to be more appealing than alternative rewards (Spring et al., 2003). Recent research purports that smokers in total are becoming significantly more nicotine dependent, since smokers who could easily quit have already done so, leaving those who are more severely nicotine dependent (Zoler, 2009).

CHAPTER III

HYPOTHESIS DEVELOPMENT

Generally, those with schizophrenia display high degrees of nervousness, stress, and an inability to deal with challenges posed by life. The inability to rationally deal with difficulties and stressful situations in any coherent and rational fashion, juxtaposed with their stressful lives and absence of any social connection in a manner that would allow them to utilize available resources for managing stressful situations, contributes to further stress and feelings of helplessness, psychosis, or depression. In such situations, frequent and intense smoking may help calm nerves. Hence, it can be concluded that these three aspects of nervousness, stress, and the inability to deal with life's challenges will lead to increased perceived stress. As smoking is viewed as a stress reliever, those with schizophrenia, bipolar or depressive disorders will smoke more to reduce stress.

Given that stress is associated with smoking among those with schizophrenia, it is important to explore finer grained arguments that relate various dimensions of perceived stress to cigarette dependence. The perceived stress construct focuses upon the level of control these individuals feel over the direction of their life events, the measurement of their nervousness, stress, and the inability to cope with a variety of life changes and how they respond to stressful situations (Esterberg & Compton, 2005). Contradictory studies

have shown there is not much difference in the smoking rates and nicotine dependence between those diagnosed with schizophrenia and those diagnosed with other severe mental illnesses (deLeon & Diaz, 2005; Kotov et al., 2008).

Hypothesis 1: Levels of perceived stress will be significantly greater in the group diagnosed with mental illnesses compared with the group drawn from the general population

PERCEIVED STRESS and CIGARETTE DEPENDENCE

Schizophrenia is a complex interaction between the biological and genetic factors and maladaptive psychosocial deficits, increasing their stress vulnerability and diminished ability to cope with daily stressors (Jansen, Gispen-de Wied, & Kahn, 2000). This perceived or subjective interpretation of the environment stressors can increase an individual's liability for the onset of psychotic symptoms and variation in intensity of symptoms (Nuechterlein & Dawson, 1986; Nuechterlein et al, 1992). Researchers have suggested that nicotine appears to relieve the symptoms of anxiety and decrease the apathy and poor concentration that are symptomatic of schizophrenia, with additional nicotine properties demonstrating antidepressant effects (Diaz et al., 2009).

In studies attempting to explain the stress vulnerability factors, multiple researchers have reported an association between psychosocial stress and symptom exacerbation in schizophrenia (Duncan et al., 1999; Gispen-de Weid, 2000; Rudnick, 2001). However, these findings do not seem to clearly explore what other factors may be contributing to an incidence of higher smoking among those diagnosed with schizophrenia.

Hypothesis 2a: Perceived stress will be positively related to cigarette dependence.

Hypothesis 2b: This relationship will be stronger in those diagnosed with schizophrenia.

PERCEIVED STRESS, CIGARETTE DEPENDENCE and SCHIZOPHRENIA

A valid argument would be that those with schizophrenia generally attribute most life events to be outside their control. Prior research has suggested that these individuals are smoking to self-medicate and regulate their own behavior, with the positive symptoms; auditory and visual hallucinations and paranoia directly related to distress (Rudnick, 2001). Given this perception of lack of control over important things in life, those with schizophrenia would respond by perceiving greater stress and consequently resorting to frequent and intense smoking in attempts to alleviate perceived stress, and with a higher dependence on cigarettes than smokers with a bipolar disorder. Although the rates of anxiety in bipolar and depression tend to exceed the general population (Boylan, Bieling, & Marriott, 2004; Keller, 2006; Kessler, 1999), these individuals usually do not experience the extent and severity, or the intensity and duration of hallucinations and/or paranoia common to those diagnosed with schizophrenia.

Hypothesis 3: The relationship between perceived stress and cigarette dependence will be stronger among those diagnosed with schizophrenia than in those diagnosed with bipolar disorder.

Similar to bipolar, those with depressive disorders are unlikely to experience the extent or types of symptoms and forms of hallucinations and delusional thinking associated with schizophrenia, symptoms which are likely to exacerbate any feeling of perceived stress. The presence of anxiety acts as a mediator between smoking and depression, otherwise there is little evidence of an association linking depressive symptoms and smoking (Mykletun, Overland, Aarø, Liabø, & Stewart, 2008). Though, one study reports that not only do major life events contribute to perceived stress, but day to day stressors have an impact on depression levels (Farabaugh et al., 2004).

Hypothesis 4: The relationship between perceived stress and cigarette dependence will be stronger among those diagnosed with schizophrenia than in those diagnosed with a depressive disorder.

MOTIVATION TO QUIT SMOKING

Existing research exploring the high incidence of smoking among those with schizophrenia has pointed towards the notion that psychiatric patients undergo considerable stress and therefore should not be encouraged to give up smoking as a pleasurable habit, even though it is a destructive behavior (Dalack & Glassman, 1992). Several studies have concluded that smoking cessation programs often fail and prevention strategies are seldom achieved due to poor motivation in those with schizophrenia (Forchuk, Norman, Malla, Vos, & Martin, 1997; Forchuk et al, 2002). This is in contrast to smokers in the general population who are more likely to be successful with smoking cessation efforts, but they have an added advantage because they are less likely to experience adverse withdrawal symptoms affecting their mental status (Mykletun et al., 2008). A recent study by Diaz et al. (2009), reports the diagnosis

of schizophrenia is associated with a decreased ability to sustain smoking abstinence, though it is unknown if this difference is also similar in those with other diagnosable mental disorders.

Hypothesis 5a: Perceived Stress will be negatively related to motivation to quit smoking.

Hypothesis 5b: This relationship will be stronger in those diagnosed with a mental illness.

CHAPTER IV

METHODS

RESEARCH SETTINGS and DESIGN

This sample size selection was based on the accessibility of participants from two institutions located in the Cleveland, Ohio area, with the number of participants proportionate to the general population size of each facility. I selected the sample based upon an attempt to collect maximum variance in the dependent variable, cigarette dependence. This strategy is recommended when randomization of the sample is not possible. This cross-sectional study compared current smokers and non-smokers from an inpatient mental health facility in Willoughby, Ohio and students and faculty who reported themselves as current smokers and non-smokers from Cleveland State University, Cleveland, Ohio. Questionnaires for this survey-based research were used to ensure that responses would be anonymous for this non-randomized sample consisting of participants voluntarily hospitalized with a mental illness, and Cleveland State University students and faculty between the ages of 18-81. The data analysis consisted of t-tests and partial correlations.

DATA COLLECTION

Prior to initiating this research, the informed consent for both the hospitalized individuals and the Cleveland State University participants was approved by Cleveland State University's Institutional Review Board, and approval to include hospitalized patients was obtained from the Medical Executive Committee at Windsor-Laurelwood Center for Behavioral Medicine. Initiation began in November 2008 and continued until March 2009. All participants signed the informed consent form prior to participation and completing the survey questionnaires. All questionnaires collected contain only numerical identification; names identifying participants were not obtained on the survey questionnaires in order to protect the anonymity of participants. All participants were allowed to withdraw at any time; although, to date no participant has withdrawn consent after completing the study questionnaires.

SAMPLE

The study sample consisted of a total of 343 participants; of which 168 were diagnosed with a mental illness and 175 were not diagnosed with a mental illness. In terms of age groups, 48.5% of the sample were individuals between the ages of 18-27 years of age, 17.2% of the sample were between the ages of 28-37, 17.1% were at ages between 38-47 years, 12.4% were between the ages of 48-57, 3.3% were 58-69 years of age, those at ages 70-81 were 1.5% of the total sample.

Of the total sample 51% were not diagnosed with any mental illness. 49% were diagnosed with a mental illness. The mentally ill included 9.9% diagnosed with schizophrenia, 15.2% diagnosed with bipolar disorder, 19.2% diagnosed with depressive disorder, and 4.7% with a non-specified mental illness. Forty-two % of the sample were

hospitalized patients (data collected at Windsor Laurelwood Center for Behavioral Medicine), while 58% of the total sample were non-hospitalized individuals (data collected at Cleveland State University).

Of the smokers in the sample for this study, 21.6% started smoking during their pre-adolescent years between 6-13 years of age. Most of the smokers in our sample, 58.8% started smoking during their adolescent years between the ages of 14-18 years. For those who started smoking as adults, 17.5% were between the ages of 19-30 years, and the remaining 2.1% started between the ages of 33-40 years.

Consistent with prior research and published government data on smoking rates for those with a diagnosed mental illness, this sampling of participants reported similar smoking rates. 88% of those with schizophrenia currently smoke, 75% of those diagnosed with bipolar disorder smoke, 74% of those with depressive disorders smoke, and 43% diagnosed with “other” mental illnesses, i.e., attention deficit hyperactivity disorder, generalized anxiety disorder, and post traumatic shock disorder, are smokers. This evidence shows that the sample for this study is fairly representative of those with mental illnesses.

CONFOUNDING VARIABLES

Demographic information was collected reflecting the smoker’s age, gender, number of years smoked, and age first started smoking. In conducting analyses, I controlled for variance associated with these variables, since each demographic variable could potentially influence the relationship between the independent variable and the dependent variable.

SCALES

In order to collect data for the independent variable, stress, the Perceived Stress Scale was completed by all participants, both smokers and non-smokers alike. The information needed to determine reported smokers cigarette dependence, the dependent variable, was provided by utilizing the Cigarette Dependence Scale. All smokers completed the Reasons for Quitting Scale to determine motivational factors for smoking cessation.

Perceived Stress Scale

To capture levels of perceived stress, this research project collected data utilizing the 10 item self-report questionnaire, the Perceived Stress Scale (Cohen et al, 1983; Appendix A), which was completed by all participants. This self-rating scale was developed primarily as a research instrument to demonstrate the consequences of stress on disease processes. This scale emphasizes the importance of the subjective interpretation of life events and the degree to which respondents perceive their life situations to be stressful, unpredictable, uncontrollable and overloading. The test-retest reliability indices for this scale range from 0.84 to 0.86. (American Psychiatric, 2000b, p. 232-235).

Cigarette Dependence Scale

In order to measure the dependent variable, an adaptation of the Cigarette Dependence Scale was administered to all individuals reporting themselves as smokers (Appendix B). Due to a low correlation one item was dropped from the composition of the scale. The original Cigarette Dependence Scale was designed to provide an ordinal measure of nicotine dependence related to cigarette smoking, consisting of a 5 item self-

reporting questionnaire evaluating the quantity of cigarette consumption, the compulsion to use, and dependence. This scale is useful as a screen for nicotine dependence and as a severity rating that can be used for treatment planning and prognostic judgments. Test-retest reliability ($r > 0.83$) & internal consistency (Cronbach's $\alpha > 0.84$). (Etter, Houezec, & Perneger, 2003).

Reasons for Quitting Scale

The Reasons for Quitting Scale (Appendix C) was completed by all smokers. This scale was developed for smokers who were interested in receiving minimal self-help interventions for smoking cessation. This scale applies an intrinsic-extrinsic model of motivation for smoking cessation. It contains 10 intrinsic items related to health concerns and self-control and 10 extrinsic items that related to social pressure and immediate reinforcement. Earlier reported alpha reliability coefficients for the overall intrinsic and extrinsic scales were 0.83 and 0.75, respectively (Curry, Grothaus, & McBride, 1997).

VALIDITY OF SCALES

Since these scales have been used in previous published studies, the validity is commonly accepted (Hewitt, Flett, & Mosher, 1992; Marshall et al., 2009; Stavem, Røgeberg, Olsen, & Boe, 2008). However, as part of this research a factor analysis was done with each scale to determine convergent validity of the constructs in this study. Divergent validity was not a concern since the scales have been utilized in many published studies (Addington, el-Guebaly, Campbell, Hodgins, Addington, 1998, Etter, 2008; Naquin & Gilbert, 1996).

CHAPTER V

RESULTS

The first hypothesis of this study was tested using an independent samples t-test (Table 1a & 1b). The mean level of perceived stress for those diagnosed with a mental illness was 2.44 while the mean level of perceived stress in the general population part of the sample was 1.84. The difference of 0.60 was statistically significant ($t=7.74$ at $p=0.000$). This test provides support for hypothesis 1.

Table 1a **Group Statistics**

Diagnosis		N	Mean	Std. Deviation	Std. Error Mean
Perceived Stress	Mentally Ill	167	2.4365	.74149	.05738
	General Population	174	1.8351	.69280	.05252

Table 1b

Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means						
		F	Sig.	t	df	Sig. 2-tailed	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
									Lower	Upper
Perceived Stress	Equal variances assumed	.535	.465	7.743	339	.000	.60147	.07768	.44868	.75426
	Equal variances not assumed			7.732	335.028	.000	.60147	.07779	.44846	.75448

The second hypothesis consisted of two parts (Table 2a & 2b). First, I tested the strength of the relationship between perceived stress and levels of cigarette dependence. I used a partial correlation between these two variables, controlling for age, gender, years of smoking, and age at which the research participants first started smoking. The partial correlation was statistically significant (partial $r=0.245$, $p=0.001$). This provides support for hypothesis 2a. In testing hypothesis 2b, I examined the same relationship between perceived stress and cigarette dependence for the group of schizophrenics in this sample. This partial correlation was weaker than the overall sample and statistically insignificant (partial $r=0.037$, $p=0.857$), hence hypothesis 2b was not supported.

Table 2a **Correlations**

Control Variables			Perceived Stress	Cigarette Dependence
Age Gender Number years smoked Age first started smoking	Perceived Stress	Correlation	1.000	.245
		Significance (2-tailed)	.	aa.001
		df	0	179
	Cigarette Dependence	Correlation	.245	1.000
		Significance (2-tailed)	.001	.
		df	179	0

Table 2b

Correlations

Control Variables			Perceived Stress	Cigarette Dependence
Age	Perceived Stress	Correlation	1.000	.037
Gender		Significance (2-tailed)	.	.857
Number of years smoked				
Age first started smoking		df	0	24
	Cigarette Dependence	Correlation	.037	1.000
		Significance (2-tailed)	.857	.
		df	24	0

The third hypothesis (Table 3) posited a stronger relationship between perceived stress and cigarette dependence among schizophrenics than among those diagnosed with bipolar disorder. The partial correlation for this relationship among schizophrenics, as reported in results for hypothesis 2b was 0.037. Controlling for the same variables, this relationship among those diagnosed with bipolar disorder was a partial correlation of 0.015 ($p=0.930$). Although this relationship is somewhat stronger among schizophrenics (difference=0.022), both partial correlations are statistically insignificant and therefore hypothesis 3 was not supported.

Table 3 **Correlations**

Control Variables		Perceived Stress	Cigarette Dependence
Perceived Stress	Correlation	1.000	.015
	Significance (2-tailed)	.	.930
	df	0	33
Cigarette Dependence	Correlation	.015	1.000
	Significance (2-tailed)	.930	.
	df	33	0

The fourth hypothesis (Table 4) examined the partial correlation difference between perceived stress and cigarette dependence between those diagnosed with schizophrenia (partial $r=0.037$) and those diagnosed with depressive disorder (partial $r=0.120$, $p=0.436$). Both these partial correlations were statistically insignificant and hence hypothesis 4 in this study was not supported.

Table 4 **Correlations**

Control Variables			Perceived Stress	Cigarette Dependence
Age	Perceived Stress	Correlation	1.000	.120
Gender		Significance (2-tailed)	.	.436
Number years smoked		df	0	42
Age first started smoking	Cigarette Dependence	Correlation	.120	1.000
		Significance (2-tailed)	.436	.
		df	42	0

The fifth and final hypothesis of this study argued that perceived stress is first, negatively related to motivation to quit (Table 5a & 5b). Controlling for age, gender, years of smoking, and age at which the research participant first started smoking, this partial correlation was low and statistically insignificant (partial $r=0.091$, $p=0.225$). Hence, hypothesis 5a was not supported. To test hypothesis 5b, I computed the partial correlation between perceived stress and motivation to quit among those diagnosed with a mental illness (partial $r=0.076$, $p=0.413$). Given that this partial correlation was not greater than the overall sample and that both partial correlations were statistically insignificant, I concluded that hypothesis 5b was also not supported.

Table 5a **Correlations**

Control Variables			Perceived Stress	Motivation to Quit
Age Gender Number years smoked Age first started smoking	Perceived Stress	Correlation	1.000	.091
		Significance (2-tailed)	.	.225
		df	0	178
	Motivation to Quit	Correlation	.091	1.000
		Significance (2-tailed)	.225	.
		df	178	0

Table 5b

Correlations

Control Variables			Perceived Stress	Motivation to Quit
Age Gender Number of years smoked Age first started smoking	Perceived Stress	Correlation	1.000	.076
		Significance (2-tailed)	.	.413
		df	0	117
	Motivation to Quit	Correlation	.076	1.000
		Significance (2-tailed)	.413	.
		df	117	0

LIMITATIONS

There are several limitations inherent in this study. Firstly, this sample is non-randomizing sampling of those with mental illnesses and a somewhat unlikely representation of the general population of severe mental illnesses. One of the main limitations of this study using these self-reporting questionnaires as survey instruments is that the self-report cannot be verified by other sources. Neither screening procedures nor chart reviews were performed to accurately verify the psychiatric disorder as specified by the participants. Psychiatric diagnoses are categorized according to the Diagnostic and Statistical Manual of Mental Disorders, 4th. Edition (DSM-IV), published by the American Psychiatric Association for the purpose of classifying psychiatric diagnoses in the United States (American Psychiatric Association [AMA], 2000a), though, there is no reason to suspect the patients or the students purposefully misreported information. Secondly, I failed to collect data on any current psychotropic medications; antipsychotics or antidepressants which could influence the perceived stress levels as reported by the participants. Thirdly, the hospital environment is another factor which has a probability of influencing both the responses for perceived stress and cigarette dependence. The strict smoking restrictions established on each hospital units are likely to cause some distress or anxiety, with smoke breaks offered every 2 hours versus the liberal smoking opportunities for individuals when not hospitalized. Lastly, I did not capture socio-demographic information pertinent to race, ethnicity, educational level, socio-economic status, marital status, and any additional co-morbid illnesses or possible confounding factors such as alcohol or drug use and abuse.

CHAPTER VI

CONCLUSION

The main objective of this study was to examine if perceived stress levels are greater in those diagnosed with the mental illnesses of schizophrenia, bipolar, and depressive disorders. The second aim was to determine if perceived stress influences cigarette dependence in individuals diagnosed with these distinctly different mental illnesses. Another aim was to determine if perceived stress influences motivation to quit smoking for those with schizophrenia, bipolar, or depressive disorders. In a comprehensive model showing a relationship between perceived stress and smoking for those diagnosed with schizophrenia, many independent variables should be included. According to the American Psychiatric Association classification of schizophrenia, several types are categorized and recognized by the predominant symptomatology; with the dominant types characterized as paranoid, disorganized, catatonic, schizophreniform, and schizoaffective, and additional sub-types of the dominant characteristic (APA, 2000a). This disorder spectrum makes it more inherently difficult to make a generalization for all types and sub-types when looking at how specific factors influence both their perceived stress and smoking habits. Therefore, symptomatology may be a key variable impacting the stress and smoking relationship.

Though, as a group with similar characteristics, those with schizophrenia lack the social support systems more prevalent and available to those with bipolar and depressive disorders, thus the presence or relative absence of these support systems can be an independent variable. Based on the schizophrenics presenting symptoms of social apathy and withdrawal, it can be theorized that it is more difficult to engage those with these symptoms, and a general stigmatism of schizophrenia makes it more difficult to include and involve families and communities, increasing their perceived stress. Those with schizophrenia are more likely to be unemployed due to the severity of their illness; therefore the lack of this type of socialization and lack of financial support contributes to their perceived stress. Compared to schizophrenia, those with bipolar and depressive disorders are more easily integrated into the social framework of work, families, and communities, and they face less stigmatism of “being crazy”. Thus, social acceptance may be a key variable impacting the stress and smoking relationship. Also, those with bipolar and depressive disorders are more cognizant of medication adherence and recovery than those with schizophrenia, hence, making them more socially acceptable since they are less likely to display bizarre behaviors. Adherence to medication is also a possible independent variable.

Without any significant difference of perceived stress and cigarette dependence among all three mental illness groups, it is possible that the lack of a significant relationship hinges on the impaired awareness of the schizophrenics. This concept aligns with research by Cooke et al. (2007) in that those with greater awareness of their illness experience more stress. In my study, the individuals with schizophrenia have been hospitalized due to worsening or escalation of their psychotic symptoms, and decompensation usually presented with disturbances in thought or cognition and a loss of

reality of self and relationship to the external world. Thus, they experience lesser degrees of awareness of their illness and the severity of their symptoms, being instead focused on internal stimuli. Hence, it can be concluded that they are less likely to report equivalent or similar stress levels when not hospitalized. Thus hospitalization may be a key variable impacting these relationships.

Schizophrenia is an illness with cognitive deficits, flight of ideas, thought disorganization, hallucinations, paranoia, and bizarre “delusions that express a loss of control over mind or body” (APA, 2000a). A recent study noted not only do those with schizophrenia feel a loss of identity, viewing their mental illness as a personal punishment, but also do not see themselves working towards recovery when asked to describe their illness beliefs (Kinderman, Setzu, Lobban, & Salmon, 2006). This coalesce of losses can easily influence their perceived stress and smoking habits.

The results of this research study support previous research findings that levels of perceived stress are greater in those with schizophrenia, bipolar, and depressive disorders in comparison to the general public. However, I did not find support for a stronger relationship between perceived stress and cigarette dependence among those diagnosed with schizophrenia compared with other mental illnesses. There could be many reasons that the relationship in schizophrenics in this study was not as robust as expected. First, there is a possibility that the convenience sample collected as part of this research did not include these differences. Secondly, there has not been much work examining differential stress and smoking relationships between different mental disorders. Most stress and smoking research, as shown in the literature review, has focused on the commonly observed dominant relationship between stress and smoking among schizophrenics. Third, the instruments used to measure potential differences of perceived

stress and cigarette dependence among the classes of mental illness may not have been sensitive enough to discern any subtle variations that were present.

One unexpected result of this research study shows that perceived stress does not have a negative correlation with motivation to quit smoking. Instead, this data shows that there is no relationship between stress and motivation to quit, which is in conflict with research by Dalack and Glassman (1992) who recommended that those with mental illness should not be encouraged to quit smoking when factoring in their stress levels. Conversely, this study lends more than tentative support for the notion that smoking cessation initiatives can be considered and implemented for those with mental illnesses.

This research study has shown that those with mental illnesses experience greater perceived stress than the general population, with findings that the smoking rates for those with mental illnesses are comparable to published reports by the CDC. This has become a health care crisis which cannot be ignored, and it is irresponsible of the health care community not to intervene and offer smoking cessation information and programs to psychiatric patients. The same promising treatments for nicotine addiction available to the general public can be modified to accommodate those with mental illnesses. However, few smoking cessation programs have been targeted or tailored to the needs of psychiatric patients, particularly those with schizophrenia (George, Vessicchio, Termine, Bregartner et al., 2002; Rohsenow, n.d.). A collaborative approach is needed to assess needs, available resources, establish guidelines and interventions in order to provide the greatest opportunity for those with mental illnesses who smoke.

Future research investigating whether treatment tailored specifically to the psychiatric smoker represents a more effective approach to long-term abstinence is

necessary. This research can be designed as comparative assessments of the relative efficacy of interventions that provide information, build confidence, and teach practical strategies. Further, it is essential that smoking cessation programs for those with mental illnesses include support staff and resources for motivation building, teaching coping skills and techniques; while allowing for long-term quit plans (Meadows et al, 2001), and the effectiveness of these approaches can be evaluated through survey based research. Success should be achievable if modeled and built on smoking cessation interventions and outcomes designed for the general public, with some modification to include motivation and coping strategies specifically designed for psychiatric smokers. Future research must also investigate availability of resources and staff at psychiatric facilities, who are in a strong position to implement motivational and coping programs during periods of hospitalization. The window of opportunity provided by hospitalization should be used to initiate smoking cessation interventions and treatments focused on this particular group of smokers who have the greatest propensity for smoking.

The research initiated in this study can be extended in several ways. Obviously, cigarette dependence has many antecedents. It would be very useful to identify, classify, conceptualize and test these antecedents and their relationships with cigarette dependence. For instance, individual level attributes such as socio-economic background and lifestyle choices could be important antecedents to levels of smoking that might shed more light on the relationship between perceived stress and smoking. Another avenue of research could be to identify individual-level moderators and mediators that influence the nature and magnitude of the relationship between stress and smoking. For example, symptomatology and hospitalization can be conceptualized as moderators in the relationship between perceived stress and cigarette dependence. Furthermore, collecting

samples from many locations, especially with randomization may allow for greater generalization of results.

This research has initiated a broader look at the somewhat assumed and tacit knowledge underpinning differences in stress levels and smoking rates among individuals diagnosed with different mental disorders. Future research is needed to help clarify the interactive effects of stress, smoking, and psychiatric disorders in order to understand what effective treatment approaches to smoking cessation will most benefit this population. There are tremendous quality-of-life and cost benefits for developing a deeper understanding of these relationships, therefore further research along these streams is merited and long overdue.

This research has offered some insight into significant interactive effects between stress, smoking, and psychiatric disorders, which pose particular challenges to smoking cessation that must be addressed. This research study should also heighten interest in outcomes of smoking cessation strategies for persons with mental illnesses. I hope to pursue this avenue of research with intervention and outcome studies, possibly looking at the effectiveness of smoking cessation programs with concurrent nicotine replacement and behavioral techniques, or consider specially targeted educational efforts to reduce their smoking rates. Because effective smoking cessation treatments are available, every patient with a psychiatric illness who uses tobacco should be offered at least some form of cessation treatment.

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APPENDIX

Appendix A

Perceived Stress Scale

Instructions: The questions in this scale ask you about your feelings and thoughts during the **last month**. In each case, please indicate with a check how often you felt or thought a certain way.

1. In the last month, how often have you been upset because of something that happened unexpectedly?

___0=never ___1=almost never ___2=sometimes ___3=fairly often ___4=very often

2. In the last month, how often have you felt that you were unable to control the important things in your life?

___0=never ___1=almost never ___2=sometimes ___3=fairly often ___4=very often

3. In the last month, how often have you felt nervous and “stressed”?

___0=never ___1=almost never ___2=sometimes ___3=fairly often ___4=very often

4. In the last month, how often have you felt confident about your ability to handle your personal problems?

___0=never ___1=almost never ___2=sometimes ___3=fairly often ___4= very often

5. In the last month, how often have you felt that things were going your way?

___0=never ___1=almost never ___2=sometimes ___3=fairly often ___4= very often

6. In the last month, how often have you found that you could not cope with all the things that you had to do?

___0=never ___1=almost never ___2=sometimes ___3=fairly often ___4=very often

7. In the last month, how often have you been able to control irritations in your life?

___0=never ___1=almost never ___2=sometimes ___3=fairly often ___4=very often

8. In the last month, how often have you felt that you were on top of things?

___0=never ___1=almost never ___2=sometimes ___3=fairly often ___4=very often

9. In the last month, how often have you been angered because of things that were outside of your control?

___0=never ___1=almost never ___2=sometimes ___3=fairly often ___4=very often

10. In the last month, how often have you felt difficulties were piling up so high that you could not overcome them?

___0=never ___1=almost never ___2=sometimes ___3=fairly often ___4=very often

Appendix B

Cigarette Dependence Scale

1. Please circle the average number of cigarettes you smoke per day?
 - A. 0-5
 - B. 6-10
 - C. 11-20
 - D. 21-29
 - E. 30+

2. Usually, how soon after waking up do you smoke your first cigarette (in minutes)?
 - A. 0-5
 - B. 6-15
 - C. 16-30
 - D. 31-60
 - E. 61+

3. For you, quitting smoking for good would be:
 - A. Impossible
 - B. Very Difficult
 - C. Fairly Difficult
 - D. Fairly Easy
 - E. Very Easy

4. After a few hours without smoking, I feel an irresistible urge to smoke
 - A. Totally disagree
 - B. Somewhat disagree
 - C. Neither agree nor disagree
 - D. Somewhat agree
 - E. Fully agree

Appendix C

Reasons for Quitting Scale

	Not at all true	A little true	Moder- ately true	Quite true	Extremely true
I WANT TO QUIT SMOKING:					
1. Because I am concerned that I will suffer from a serious illness if I don't quit smoking.....	0	1	2	3	4
2. To show myself that I can quit smoking if I really want to.....	0	1	2	3	4
3. So that my hair and clothes won't smell.....	0	1	2	3	4
4. Because my spouse, children, or other person I am close to will stop nagging me if I quit smoking.....	0	1	2	3	4
5. Because I have noticed physical symptoms that smoking is hurting my health.....	0	1	2	3	4
6. Because I will like myself better if I quit smoking	0	1	2	3	4
7. So that I will save money on smoking related costs such as dry cleaning	0	1	2	3	4
8. Because someone has given me an ultimatum (made a threat) to quit	0	1	2	3	4
9. Because I can graphically picture the effects that smoking has on my body.....	0	1	2	3	4
10. So that I can feel in control of my life.....	0	1	2	3	4
11. Because I won't burn holes in clothing or furniture.....	0	1	2	3	4
12. Because I will receive a special gift if I quit	0	1	2	3	4

- | | Not
at all
true | A
little
true | Moder-
ately
true | Quite
true | Extremely
true |
|--|-----------------------|---------------------|-------------------------|---------------|-------------------|
| 13. Because I have known other people who have died from serious illnesses that were caused by smoking..... | 0 | 1 | 2 | 3 | 4 |
| 14. Because quitting smoking will prove that I can accomplish other things that are important to me | 0 | 1 | 2 | 3 | 4 |
| 15. Because I want to save money that I spend on cigarettes | 0 | 1 | 2 | 3 | 4 |
| 16. Because people I am close to will be upset with me if I don't quit | 0 | 1 | 2 | 3 | 4 |
| 17. Because I am concerned that smoking will shorten my life | 0 | 1 | 2 | 3 | 4 |
| 18. To prove to myself that I am not addicted to cigarettes | 0 | 1 | 2 | 3 | 4 |
| 19. So that I won't have to clean my house or car as often..... | 0 | 1 | 2 | 3 | 4 |
| 20. Because I will receive a financial reward for quitting (money from a friend or family member, bonus from work, etc.) | 0 | 1 | 2 | 3 | 4 |