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## Readiness to Change Smoking Behavior in Adolescents with Psychiatric Disorders

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### Abstract

There has been recent increased interest in utilizing motivational interviewing (MI) to increase adolescents readiness to quit smoking, but attempts to impact quit rates have thus far been discouraging. A better understanding of factors associated with adolescent readiness to quit smoking prior to receiving any intervention may provide guidance when tailoring future MI interventions in order to increase their effectiveness with this population. Adolescent smokers ( $N = 191$ ) who had been admitted to a psychiatric hospital and enrolled in a clinical trial evaluating MI completed questionnaires that assessed smoking behavior and variables thought to be related to smoking. Confidence to quit smoking and negative beliefs about smoking were significant predictors of adolescents' baseline readiness to quit smoking. The failure to demonstrate relationships between health consequences and readiness suggest that caution may be warranted in the use of feedback, a common component of MI-based interventions. Such feedback tends to focus on health consequences, which was unrelated to adolescent baseline readiness to change smoking behavior in the current study. Parallels between current results and the Theory of Planned Behavior are discussed in consideration of developing more effective MI-based interventions for adolescent smokers.

### Keywords

Smoking; Tobacco use; Adolescents; Motivation

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Over the last decade, motivational interviewing (MI) has been a well-investigated therapeutic approach for the treatment of substance use problems among adults. The promising outcomes of these studies with adult populations (see Burke, Arkowitz, & Menchola, 2003 for a review) have resulted in increased interest in developing MI interventions for adolescents. MI's focus on a clinical style that is respectful, acknowledges ambivalence, emphasizes the autonomy of the client, and does not confront resistance is well-suited for adolescent populations (Baer &

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Peterson, 2002). Several studies of MI for alcohol and drug abuse among adolescents have demonstrated positive findings, such as reduced drinking and driving (Monti et al., 1999), reductions in marijuana use (Dennis et al., 2002), and increased treatment entry (Aubry, 1998).

Clinical trials of MI for adolescent smoking have shown less promising findings. Colby and colleagues (1998) conducted a brief smoking intervention in a hospital setting where adolescents were randomized to either receive a 30-minute motivational interviewing intervention or a 5-minute brief advice (BA). At the 3-month follow-up, smoking status did not statistically differ between MI and BA groups. Kentala and colleagues (1999) conducted a brief intervention (using MI) for smoking cessation among adolescents in community dental clinics in Finland. At the 2-year follow-up interview, there were no significant differences between the intervention and control groups on the prevalence of smoking. In our own recent investigation (Brown et al., 2003) of smoking adolescents in an inpatient psychiatric facility, MI was no more efficacious than brief advice at increasing quit rates. A better understanding of factors that are related to adolescent readiness to quit smoking *prior* to interventions may provide information to better tailor MI interventions in order to increase their effectiveness with this population. The current report reflects our attempt to examine correlates of adolescent readiness to change smoking in hopes of learning more about naturally occurring motivation in order to harness those factors in future refinements of MI-based interventions. Hence, data reported here represent a secondary analysis of our prior study (Brown et al., 2003). Previous research suggests several factors that may predict readiness to change smoking behavior among adolescents.

### Peer and family attitudes

Peer and parental influences are among the strongest predictors of smoking *initiation* among adolescents (Avenevoli & Merikangas, 2003; Kobus, 2003), and evidence suggests that these social networks may also influence *readiness to quit*. For example, Pallonen and colleagues (1998) examined characteristics of high school smokers and found lower rates of peer smoking among youth considering quitting (i.e., contemplation and preparation stages) than those not considering quitting (precontemplation stage). Similarly, Riedel and colleagues (2002) also found that the number of nonsmoking peers was predictive of adolescents' motivations to quit smoking. A number of other studies have found that receiving requests or advice from parents and peers to quit smoking is associated with greater readiness to quit (Sussman et al., 1998; Hurt et al., 2000; Dozois, Farrow, & Miser, 1995).

### Pros and cons of smoking

Other attempts at understanding smoking cessation among adolescents have incorporated concepts from the transtheoretical model of change (TMC; Prochaska, DiClemente, & Norcross, 1992). Based on TMC, individuals make behavior changes, such as quitting smoking, when the positive aspects – the pros – of continuing the behavior are outweighed by the negative aspects – the cons (Plummer et al., 2001). Young adult smokers who endorse more cons of smoking are more likely to make a quit attempt (Rose, Chassin, Presson, & Sherman, 1996). At the same time, adolescent smokers who report more pros of smoking demonstrate lower levels of readiness to quit (Tyc et al., 2004).

### Confidence

The concept of self-efficacy refers to a person's subjective belief (i.e., confidence) in his or her ability to perform a specific behavior in order to produce a certain outcome (Bandura, 1977), and has figured prominently in the literature of substance abuse and why people change addictive behaviors (Prochaska et al., 1992). A number of studies of adult smokers have demonstrated that perceived self-efficacy to succeed at quitting smoking affects quitting

behavior (DeVries & Backbier, 1994; Rose, Chassin, Presson, & Sherman, 1996; Dijkstra, DeVries, & Bakker, 1996). For adolescents, higher levels of self-efficacy are associated with a greater number of future quit attempts (McMillan, 2000).

### Health concerns

Health concerns have been considered to be among the most motivating factors in making a quit attempt. In a study of adolescents referred by school personnel for being caught with a cigarette at school, 73% reported concerns about their future health (e.g. cancer), while 65% reported current health concerns (e.g., impaired athletic performance) as reasons to make a quit attempt (Riedel, Robinson, Klesges, & McLain-Allen, 2002). Similarly, concerns about health were cited by adolescents as the primary reason for enrolling in another study examining the efficacy of nicotine patch (Hurt et al., 2000). Health concerns have also been identified as the primary reason for wanting to quit smoking among adolescents in clinical settings such as a youth detention center (Dozois, Farrow, & Miser, 1995).

### Goals

Finally, it has been suggested that a crucial aspect of developing discrepancy in the context of motivational interviewing involves contrasting the current behavior (e.g., smoking) with broader life goals and values (Miller & Rollnick, 2002). As such, it was decided to investigate the relationship of adolescent life goals with baseline levels of readiness to change smoking behavior.

While previous research has begun to address the predictors of motivation and readiness to quit among adolescent smokers, much of this work has focused on community samples. However, clinical samples of adolescent smokers (i.e., those with co-occurring psychiatric and substance use disorders) are in particular need of well-designed, effective interventions for youth (Brown et al., 2003). In the absence of intervention, adolescent smokers with psychiatric disorders are likely to develop into highly dependent adults who will experience great difficulty quitting (Brown et al., 1996). The purpose of this study was to identify factors that are related to readiness to quit smoking among adolescent smokers in an inpatient psychiatric setting. Based on previous studies and areas of hypothesized importance in the theory of motivational interviewing, the following characteristics were hypothesized to be important in predicting youth readiness to quit: peer/family attitudes toward adolescents' smoking, self-efficacy for quitting, pros and cons of smoking, current and future health consequences, and the importance of life goals. Because increased readiness to change has been linked to overt quit behavior among adolescents (Pallonen et al., 1998), we sought to identify characteristics associated with readiness to quit smoking in order to guide future efforts to tailor motivational interviewing for use with this population.

## Method

### Study Design

Study staff approached adolescents who were admitted to a private psychiatric hospital located in the northeastern United States. Patients were screened for smoking status, and study staff provided a detailed explanation of study procedures to patients who appeared to meet eligibility criteria. To be eligible for the study, participants must have been 13-17 years of age, reported smoking at least one cigarette per week for the four weeks prior to hospitalization, and had access to a telephone. Patients who met DSM-IV criteria for a current psychotic disorder were excluded from the study.

All participants provided written assent for study participation, and written consent was obtained from a parent or legal guardian. A baseline assessment battery was then completed.

Participants received \$25 in gift certificates to a local mall for completion of the post-treatment assessment battery. Participants for the current study were part of a randomized, controlled clinical trial of the effectiveness of motivational interviewing to reduce smoking among adolescents hospitalized for a psychiatric disorder. Outcomes for the larger study have been reported elsewhere (Brown, et al., 2003).

## Participants

Participants were 191 adolescents (62% female) with a mean age of 15.4 years. The sample was primarily Caucasian (94.8%; reflecting the community from which the sample was drawn); with 1.6% Hispanic/Latino, 0% African-American, and 3.6% Other. The mean length of participants' hospital stay was 9.11 days ( $SD = 7.11$ ). The average current grade was 9<sup>th</sup> grade ( $SD = 1.35$ ).

## Measures

**Contemplation Ladder**—The dependent variable for the current study was readiness to change smoking behavior, which was assessed using the Contemplation Ladder (Biener & Abrams, 1991), a continuous measure of motivation to change behavior. Validity studies have demonstrated that the Ladder is associated with cognitive and behavioral indices of readiness to consider smoking cessation, such as intention to quit and number of prior quit attempts (Biener & Abrams, 1991). Ladder response options range from 1 (lowest level of readiness) to 10 (highest level of readiness). Responses 1-3 are indicative of no plans to quit smoking, 4-6 range from thinking about quitting to planning to quit in the next six months, and 7-10 range from planning to quit in the next 30 days to having already quit smoking. (Table 1)

**Attitudes of significant others**—A series of questions assessed how attitudes of significant others in the adolescent's life affected his or her smoking behavior. Attitudes of father, mother, best friend, boyfriend/girlfriend, and siblings were measured using the following format: "How has your \_\_\_\_\_ reacted to your cigarette smoking?" Answer choices were: Fully accepts my cigarette smoking, Somewhat accepts my cigarette smoking, Neutral, Discourages my cigarette smoking, Strongly discourages my cigarette smoking. These questions were adapted from the Monitoring the Future study (Johnston, O'Malley, & Bachman, 1995) and a social influences questionnaire used in the alcohol field (Clifford & Longabaugh, 1991). For analyses, responses to the questions of father, mother, and sibling attitudes were summed to form an aggregate measure of attitudes of family (Cronbach's alpha = .48), and responses to the questions of best friend and boyfriend/girlfriend were summed to form an aggregate measure of attitudes of peers (alpha = .48).

**Goals**—A series of five questions were asked regarding the goals of the adolescent, using the following format: "How important is each of the following to you in your life: Being successful in my line of work, Graduating from high school, Being a leader in my community, Graduating from college, Getting good grades." Answer choices were on a three-point scale: Not important, Somewhat important, or Very important. Questions were adapted from the Monitoring the Future study (Bachman, Johnston, & O'Malley, 1985). Responses to the five questions were summed to form a single measure of the importance of life goals (alpha = .77).

**Pros and cons of smoking**—The Adolescent Decisional Balance Scale (Velicer, DiClemente, Prochaska, & Brandenburg, 1985) was administered to assess perceived pros and cons about smoking. Participants were asked to rate their level of agreement or disagreement with statements about smoking, using a 5-point Likert scale ranging from "strongly disagree" to "strongly agree." Nine statements reflected the perceived cons of smoking (smoking stinks; smoking can affect the health of others; smoking cigarettes is hazardous to people's health; smoking makes clothes smell bad; cigarette smoke bothers other people; smoking is a messy

habit; smoking causes bad breath; smoking causes people to get wrinkles at an earlier age; smoking makes teeth yellow), while six statements reflected the perceived pros of smoking (smoking makes kids get more respect from others; kids who smoke have more friends; smoking helps people deal better with frustrations; smoking cigarettes is pleasurable; smoking cigarettes relieves tension; kids who smoke go out on more dates). The cons of smoking were summed to form a single aggregate scale ( $\alpha = .83$ ), as were the pros of smoking ( $\alpha = .67$ ).

**Current health consequences**—An abbreviated and adapted version of the American Thoracic Society questionnaire on respiratory health (Comstock, Tockman, Helsing, & Hennessy, 1979) was used to assess current physical symptoms (wheezing, coughing, shortness of breath, phlegm or mucous, pain or tightness in chest, sore throats, sinus or ear infections, colds) that could be caused by or exacerbated by cigarette smoking. Each participant was asked to rate how frequently each symptom was experienced on a five-point scale ranging from “Every day” to “Never.” These 13 items were summed to form a single aggregate measure of current negative physical consequences of smoking ( $\alpha = .58$ ).

**Anticipated future health consequences**—Participants were asked to rate the likelihood of experiencing negative physical consequences to smoking in the future using a measure of perceived vulnerability (Urberg & Robbins, 1984) by responding to the following question: “If I smoked regularly or continued to smoke regularly, I would probably...” There were eight potential physical consequences (get a sore throat, get a daily cough, get cancer, get short of breath, get a serious disease, have heart trouble, get headaches, get a sickness in my lungs), with a 5-point Likert scale ranging from “Definitely not” to “Very sure.” Responses to the eight items were again summed to form an aggregate measure of anticipated future negative consequences ( $\alpha = .89$ ).

**Confidence**—A single question was asked in order to assess each participant's level of confidence in his or her ability to change smoking behavior. The question read, “If you try to quit smoking in the next month, how confident are you that you will succeed in quitting smoking?” Responses were recorded on an 11-point Likert scale, from “Not at all confident” to “Very confident.”

### Statistical Analyses

Bivariate correlations were computed to examine the relationship of each of the eight independent variables (attitudes of family, attitudes of peers, goals, pros of smoking, cons of smoking, current negative physical consequences, anticipated future negative consequences, and confidence) with the dependent variable of readiness to change. Variables with significant relationships were entered into a multiple regression model to examine the unique effects of predictors.

### Results

Of the 191 participants, 122 (63.9%) were daily smokers and 131 (68.6%) met criteria for Nicotine Dependence. Participants on average reported that they first smoked a cigarette prior to age 11 ( $\bar{X}=10.85$ ,  $SD=2.20$ ). During the three months prior to hospitalization, participants smoked on 91.2% ( $SD=18.63$ ) of the days and smoked an average of 14.48 ( $SD=9.37$ ) cigarettes on smoking days. The vast majority (94.8%) of participants reported that their parents were aware of their smoking. Participants reported a range of current readiness to change smoking behavior. The Contemplation Ladder and percentage of participants endorsing each item reflecting their readiness to change are presented as Table 1.

Five of the eight potential predictor variables were not significantly related to readiness to change: attitude of family ( $r = 0.09$ ,  $p = 0.209$ ), attitude of peers ( $r = 0.11$ ,  $p = 0.149$ ), importance of life goals ( $r = 0.12$ ,  $p = 0.108$ ), pros of smoking, ( $r = -0.14$ ,  $p = 0.054$ ), and current negative physical consequences ( $r = -0.01$ ,  $p = 0.942$ ). Three independent variables were significantly correlated with readiness to change (as measured by the Contemplation Ladder): cons of smoking ( $r = 0.35$ ,  $p < 0.001$ ), anticipated future negative physical consequences ( $r = 0.18$ ,  $p = 0.014$ ), and confidence ( $r = 0.53$ ,  $p < 0.001$ ).

A linear regression was then computed. The dependent variable was readiness to change smoking behavior as measured by the Contemplation Ladder. After entering the demographic variables of age and gender, the three independent variables with significant bivariate correlations were entered into the model: cons of smoking, anticipated future negative physical consequences, and confidence. The model was significant,  $F(5,187) = 18.38$ ,  $p < 0.001$ . Confidence ( $p < 0.001$ ) and cons of smoking ( $p < 0.05$ ) contributed to the model (see Table 2), while age, gender, and anticipated future negative physical consequences did not.

Because the “cons of smoking” construct was an aggregate scale, a post-hoc regression analysis was conducted to examine the items that may be more salient than others. To predict readiness to change smoking behavior as measured by the Contemplation Ladder, the confidence scale was again entered, followed by the nine individual items from the cons of smoking scale (smoking stinks; smoking can affect the health of others; smoking cigarettes is hazardous to people's health; smoking makes clothes smell bad; cigarette smoke bothers other people; smoking is a messy habit; smoking causes bad breath; smoking causes people to get wrinkles at an earlier age; smoking makes teeth yellow). The model was significant,  $F(3,187) = 32.97$ ,  $p < 0.001$ . Confidence ( $p < 0.001$ ), “smoking causes bad breath” ( $p < 0.001$ ), and “smoking is a messy habit” ( $p < 0.05$ ) contributed to the model, while the other items did not. The proportion of variance ( $R^2$ ) in readiness to change accounted for by each variable was: confidence (.279), “smoking causes bad breath” (.056), and “smoking is a messy habit” (.014).

## Discussion

The main finding of the current study is that confidence to quit smoking and perceived cons of smoking predicted baseline readiness to change smoking among adolescents with a psychiatric disorder, while peer and family attitudes, pros of smoking, current and future health concerns, and life goals were not related to readiness to change. Given the lack of efficacious findings for the use of MI with adolescent smokers in previous studies, the current study's results could potentially inform the development of more effective MI interventions for smoking youth, especially those with comorbid psychiatric disorders.

### Findings in relation to the Theory of Planned Behavior

The Theory of Planned Behavior (TPB; Ajzen, 1991) can provide a theoretical framework by which the results of this study can be interpreted. The TPB is a parsimonious model that explains behavior in terms of an individual's intention to engage in that behavior. This behavioral intention is predicted by attitudes toward the behavior, subjective norm, and perceived behavioral control (i.e., attitudes toward behavior, subjective norm, perceived behavioral control  $\rightarrow$  behavioral intention  $\rightarrow$  behavior change). While this study was not designed to test the applicability of the TPB for this psychiatric sample of adolescent smokers, the variables that were examined are congruous to the constructs that comprise the TPB. For example, readiness to change smoking behavior can be considered a measure of behavioral intent. Further, pros and cons of smoking and health consequences can be considered attitudes toward the behavior, significant others' attitudes toward smoking can be considered subjective norms, and self-efficacy a measure of perceived behavioral control. Thus, current results can be seen as provided mixed support for the TPB, because although others' attitudes toward



participants' smoking and perceived health consequences (both measures of attitudes in the TPB) did not predict readiness to change, cons of smoking (a measure of attitudes in the TPB) and self-efficacy (a measure of perceived control in the TPB) did predict readiness to change.

Several previous studies have also applied the TPB to the prediction of smoking behaviors (e.g., Norman, Conner, Bell, 1999; Hanson, 1997; Godin, Valois, Lepage, & Desharnais, 1992; Hu & Lanese, 1998). The current study's results converge with the findings of these previous studies in that perceived behavioral control emerges as one of the most important predictors of smoking intention (Boissonneault & Godin, 1990; Godin et al., 1992; Norman, Conner, Bell, 1999). Further, the TPB has also demonstrated applicability for the subpopulation of adolescent smokers (Maher & Rickwood, 1997; Higgins & Conner, 2003). For example, Hanson (1997) applied the TPB to African-American, Puerto Rican, and White female adolescent smokers and found empirical support of the TPB for African-Americans while only attitudes and perceived behavioral control were predictive of smoking intention among Puerto Rican and White youth. Similarly, Hill and colleagues (1997) found that only attitudes and perceived behavioral control, but not subjective norms, were predictive of smoking acquisition among adolescents. In addition, perceived susceptibility has been included to the TPB and found to be predictive of intention to quit smoking (Norman, Conner, & Bell, 1999). Therefore, the results of these studies that have examined the TPB in relation to smoking behaviors can serve to guide the development of effective prevention and intervention efforts, including MI. Ways of linking these variables of the TPB (self-efficacy as a measure of perceived behavioral control, and cons of smoking as a measure of attitudes) will be considered in the following section.

### **Exercise caution with feedback**

Previous MI-based interventions for adolescent smokers have focused heavily on the use of feedback, which is a common component of brief motivational interventions. For example, Colby and colleagues (1998) incorporated feedback on health effects, social consequences, financial cost of smoking, level of nicotine dependence, and current health consequences. The study by our research group (from which current data are derived) provided feedback on nicotine dependence, financial cost of smoking, impact of smoking on physical appearance, and indices of lung functioning (Brown et al., 2003). Both of these studies reported that MI was no more effective than control conditions at reducing smoking.

Results of the current report suggest that future MI interventions with adolescent smokers may benefit from a more flexible and tailored approach to delivering feedback. Current results showed that attitudes of others, current health risks, and future health risks were all unrelated to baseline readiness to change, and yet these components figure prominently in many MI interventions for smoking adolescents. In other words, these may be more important to clinicians and researchers than to the adolescents. We had originally thought that feedback focused on health risks would be important at developing discrepancy among adolescents receiving our MI intervention. When our study yielded nonsignificant results of MI versus brief advice, we decided to investigate baseline readiness in order to guide revisions of future treatment efforts.

The use of feedback is often considered an essential component of motivational interviewing, perhaps due to the prominent emphasis given to feedback in the Motivational Enhancement Therapy (MET) treatment manual from Project MATCH (Miller, Zweben, DiClemente, & Rychtarik, 1995). Indeed, the manual states, "the first MET session should always include feedback to the client from the pretreatment assessment (Miller et al., 1995, p. 19)." However, recent evidence suggests that feedback may not be warranted for all clients. In a psycholinguistic investigation of the process of MI, Amrhein and colleagues (2003) found that

client speech representing intention to change *decreased* during the provision of such feedback, particularly among those most ambivalent about changing. This change in speech patterns predicted actual drug use outcomes a year later, suggesting caution in the use of standardized feedback.

### Focus on self-efficacy and pros and cons

Clinician time and energy in MI-based adolescent smoking interventions could perhaps focus more on boosting self-efficacy and exploring the pros and cons of quitting smoking. Miller and Rollnick (2002) describe a number of techniques for boosting self-efficacy in the context of MI. These techniques include the use of a “confidence ruler,” exploring previous successes in a variety of life areas, and asking about general personal strengths and resources that may be helpful in making the desired change. In addition, future MI interventions with adolescent populations may also benefit from more time and effort on exploring pros and cons *as the adolescent perceives them*. Rather than introducing negative aspects of smoking that a *clinician* decides to provide as feedback to all clients (e.g., “Your lung capacity is 38% below average”), the individual cons of smoking self-identified by an adolescent (e.g., “You mentioned that you don’t like how smoking causes bad breath. What other downsides of smoking have you noticed?”) in the context of an MI session could have more salience. Interestingly, when we examined post-hoc which specific “cons” items predicted readiness, only items that related to the teen personally added predictive value to the model (e.g., smoking is a messy habit), while items related to the effect of the teen’s smoking on others did not (e.g., smoking can affect the health of others; cigarette smoke bothers other people).

Future studies could use pre-treatment assessment data provided by an adolescent to tailor a more flexible MI intervention that targets specific areas of concern for each adolescent, rather than make assumptions that certain types of feedback will be effective for most teens. Indeed, one of the progenitors of motivational interviewing recently warned against the hazards of manualized MI interventions, suggesting instead that a competent motivational interviewer should attend to shifts in client language and not persist with strategies that increase resistance (Miller, Amrhein, Yahne, & Tonigan, 2003). Recent evidence suggests that clinician interpersonal skills and adherence to an overall MI style (e.g., empathy, warmth, acceptance) may be more important than specific techniques (e.g., feedback) at bringing about client engagement in MI sessions (Moyers, Miller, & Hendrickson, 2005).

In sum, adolescent confidence in ability to quit smoking, and identified cons of smoking are predictive of baseline readiness to change. Interpretations from current findings are limited by measurement concerns, such as low alpha levels among some constructs. Also, the current sample was composed of adolescents with psychiatric comorbidity and may not apply to smoking adolescents more generally. Despite these limitations, results suggest that future MI-based interventions for this population may benefit from a more individualized approach.

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**Table 1**  
Level of readiness to change smoking (Contemplation Ladder)

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“How do you feel about your smoking now?”

Response (% of participants endorsing)	
10	I have already quit smoking (4%)
9	I have made changes in my smoking but I need to keep working at it (7%)
8	I have begun to make changes in my smoking (6%)
7	I plan to quit smoking in the next 30 days (11%)
6	I plan to quit smoking in the next 6 months (7%)
5	I often think about quitting, but I have no plans yet (14%)
4	I sometimes think about quitting, but I have no plans yet (15%)
3	I rarely think about quitting, and I have no plans to quit (9%)
2	I do not think about quitting smoking (9%)
1	I have decided to continue smoking (18%)

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**Table 2**  
Regression Model Predicting Readiness to Change Smoking

Variable	Beta	SE	t Score	p Value
Age	.168	.129	1.309	.192
Gender	.106	.353	.300	.764
Confidence	.364	.049	7.410	.000
Anticipated future health consequences	.032	.025	1.318	.189
Cons of Smoking	.064	.027	2.374	.019