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The relationship between young adult smokers' beliefs about nicotine addiction and smoking-related affect and cognitions

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Abstract

Risk beliefs and self-efficacy play important roles in explaining smoking-related outcomes and are important to target in tobacco control interventions. However, information is lacking about the underlying beliefs that drive these constructs. The present study investigated the interrelationships among young adult smokers' beliefs about the nature of nicotine addiction and smoking-related affect and cognitions (i.e., feelings of risk, worry about experiencing the harms of smoking, self-efficacy of quitting, and intentions to quit). Smokers (N=333) were recruited from two large universities. Results showed that quit intentions were associated with feelings of risk, but not with worry or self-efficacy. Furthermore, higher feelings of risk were associated with lower beliefs that addiction is an inevitable consequence of smoking and with lower beliefs that the harms of smoking are delayed. This suggests that it is important for health messages to counter the possible negative effects of messages that strongly emphasize the addictiveness of nicotine, possibly by emphasizing the importance of quitting earlier rather than later. The findings also add to the

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evidence base that feelings of risk are powerful predictors of behavioral intentions. Furthermore, our results suggest that in some circumstances, feelings of risk predict quit intentions beyond that predicted by worry and self-efficacy. Gaining additional understanding of the tobacco-related beliefs that can increase feelings of risk and incorporating those beliefs into educational campaigns may improve the quality of such campaigns and reduce tobacco use.

Introduction

Tobacco use is one of the most important preventable health risks in the world, accounting for over five hundred thousand deaths in the United States alone each year [1]. Cigarette smoking causes a wide range of diseases, including multiple forms of cancer, coronary heart disease, stroke, and obstructive pulmonary disease. It is therefore not surprising that many public health agencies identify reducing tobacco use as a top priority. Recommended strategies to reduce tobacco use include attempting to motivate smokers to quit by educating them about the long-term health problems caused by tobacco use and providing them with information and resources about how to quit [2].

Empirical research supports targeting health risk beliefs for tobacco control purposes. In one study, smokers who perceived themselves at high risk of experiencing a negative health outcome expressed greater interest in quitting [3]. Another study demonstrated that smokers who were worried about their health were more likely to attempt to quit [4]. There is also extensive literature supporting the premise that smokers who have high confidence in their ability to quit smoking (i.e., self-efficacy) are more likely to succeed [5]. These constructs—perceived risk, worry about negative health outcomes, and self-efficacy of changing one's behavior—are integral components of many health behavior theories, including Protection Motivation Theory [6] and the Extended Parallel Process Model [7].

However, many health behavior theories conceptualize perceived risk as cognitive in nature [6-8]. For example, participants might be asked to indicate *how likely* they *think* they are to experience an outcome. More recent theories suggest that cognitively-based perceptions of risk are missing an important component—affect [9, 10]. The affective aspect is manifested in *feelings* about a risk rather than *thoughts* about a risk. Affective risk perceptions are correlated with, yet distinct from, cognitive risk perceptions [11]. They are distinguished by the assertion that affective feelings are integral and vital components of risk perceptions themselves [9, 10]. Furthermore, although affective risk perceptions are correlated with other affective constructs such as worry about experiencing a negative health outcome, they are not identical constructs [11]. Measures of affective risk perceptions ask people to indicate how vulnerable they *feel*, or the extent to which they *feel* they are going to experience the outcome.

There is extensive empirical support for distinguishing between cognitive and affective risk perceptions. For a variety of health behaviors (including but not limited to cigarette smoking), *feelings of risk* have been found to be more predictive of health behavior and/or behavioral intentions than cognitively-oriented risk perceptions [12-15], worry about experiencing the health problem [14, 15], and self-efficacy of changing behavior [13]. Therefore, it is likely important for smoking cessation interventions to consider people's

feelings about their risk of experiencing negative health outcomes from smoking. This idea is consistent with many current interventions, which attempt to increase cognitive perceptions of risk, self-efficacy of changing behavior, and negative emotions such as fear of developing lung cancer [2]. However, these interventions do not focus on feelings of risk per se.

Unfortunately, several factors act counter to the efforts of public health agencies, which results in millions of continuing smokers. One reason for the resistance of cigarette smoking to tobacco control efforts is that the vast majority of smokers begin smoking when they are teenagers and young adults [1]. However, very little is known about feelings of risk among youth and young adults [16]. Furthermore, youth and young adults are uniquely vulnerable to becoming addicted to nicotine due to a variety of physiological and psychological factors [17], including beliefs that are associated with continued smoking behavior. For example, they underestimate the addictiveness of nicotine and overestimate the ease of quitting [17-19]. Moreover, they display unrealistic optimism about their ability to resist nicotine addiction and their ability to quit smoking easily [20]. That is, they believe that they are less likely to become addicted to nicotine and that will be able to quit more easily than the average smoker their age. In addition, many young adults believe that either the harms of cigarette smoking are delayed [21] or that there are *no* health risks associated with smoking for “only a few years” [22]. However, no amount of smoking is safe [1]. Even smoking a few cigarettes per day—so-called “light” smoking—increases the risk of a variety of *immediate* health problems including lower respiratory tract infections and impaired healing [23], as well as *delayed* health problems such as coronary heart disease [1]. Considered together with evidence about the power of nicotine addiction [1], this research suggests that many (though not all) young smokers may not make plans to quit smoking until they are already addicted to nicotine. The challenge for public health organizations is to identify ways to encourage all smokers, including young adults, to quit smoking immediately instead of “in a few years.”

Objective and Research Questions

Typically, health behavior constructs such as perceived risk, worry, self-efficacy, and intentions are examined in relation to one another and/or to an outcome of interest. However, to improve the effectiveness of behavioral interventions, a better understanding of how these health behavior constructs are related to specific tobacco-related beliefs is needed. Additional knowledge is also needed about feelings of risk and their relationship with cognitions related to tobacco use, particularly among young adult smokers. Understanding these issues might lead to the identification of potential content areas for future smoking prevention or cessation interventions targeted to young adults. The present study addresses these gaps in the literature by examining the following research question and hypotheses:

- RQ1: How are beliefs about the nature of nicotine addiction, the ease of quitting smoking, and perceptions of delayed harm related to cognitive and affective constructs associated with quitting smoking, such as feelings of risk, worry, self-efficacy of quitting, and quit intentions?

- H1: Feelings of risk will have a stronger relationship with quit intentions than worry.
- H2: Feelings of risk will have a stronger relationship with quit intentions than self-efficacy.

Methods

This paper describes the secondary analysis of data collected for the purpose of testing the effect of genetic risk information on smoking-related beliefs [16]. That study reported that informing college-aged smokers that there was a genetic basis for nicotine addiction did not affect beliefs about nicotine addiction, quitting, or the immediacy of harm. Nor did it affect other social-cognitive variables related to quitting smoking (i.e., self-efficacy, feelings of risk, worry about the harms of smoking, intentions to quit).

Participants

Participants were recruited from undergraduate psychology classes at the George Washington University (GWU) and the University of Alabama (UA) during the Fall 2010 and Spring 2011 semesters. A total of 746 students completed the survey, of whom 278 reported not having smoked even a puff of a cigarette in the last 30 days (i.e., never or former smokers). This study focuses only on the smokers in the sample. Of the 392 smokers who began the survey, 333 (85.0%) were eligible for analysis. Six participants were excluded because they had participated in the study previously, 43 because they answered the comprehension verification item inaccurately, and 17 did not check a box indicating they consented to participate. Seven participants were excluded for more than one reason.

Procedure and Measures

Participants completed the study using the Internet-based survey administration platform SurveyMonkey. After consenting, participants provided information about their demographics and past smoking behavior. *Demographics* included age, race, gender, and school attended. *Smoking behavior* was assessed with the following items: “Within the last 30 days did you smoke…? [Not at all, not even a puff/Some days/Every day]”; “Have you smoked at least 100 cigarettes in your entire life? “Yes/No]”; “On average, how many cigarettes do you now smoke per day?”). Participants were then randomly assigned to read one of three news articles described in [16]. Next, they completed survey items assessing comprehension of the information and beliefs about genetic determinism. Beliefs about nicotine addiction and quitting, feelings of risk, worry about experiencing harm from smoking, self-efficacy of quitting, and intentions to quit were assessed. See Table 1 for wording of items. We debriefed participants and provided them with smoking cessation resources. The complete survey can be obtained from the corresponding author.

Analysis Plan

Preliminary Analyses—Participants who reported smoking even a puff on some or every day of the 30 days prior to the experiment were considered smokers. Smokers were further classified into those who smoked less than one cigarette per day *vs.* those who smoked at

least one per day. Pearson and Spearman correlations were used to identify potential confounding variables. Details about the exploratory factor analysis that led to the scales and subscales described in Table 1 can be found in [16].

Main Analyses—The research question and hypotheses were examined using a series of hierarchical linear regressions. Beliefs about addiction and quitting, and beliefs about delayed harm were analyzed separately. The dependent variables were: feelings of risk, worry about becoming ill due to smoking, self-efficacy of quitting, and intentions to quit smoking. Each analysis was identical such that only the dependent variable differed across the regressions. Thus, Step 1 of each analysis contained the covariates, which were uniform across analyses and included: experimental condition (dummy coded), school, gender, race, and number of cigarettes smoked daily (<1 *vs.* 1+). Step 2 added items assessing either addiction and quitting beliefs, or perceptions of delayed harm. Worry was added in Step 3, followed by feelings of risk (Step 4) and self-efficacy of quitting (Step 5).

Results

Sample Characteristics

As noted previously [16], most of the 333 individuals who completed the study were aged 18-22 (97%; n=322; M=19.3, SD=2.0), were women (66.4%; n=221), and were Caucasian (85%; n=283). On average, participants smoked few cigarettes daily (M=2.7, SD=4.3), with more than half smoking less than one cigarette per day (58.6%; n=195). Over half of participants were considered “established” smokers; that is, they had smoked at least one cigarette on at least one of the last thirty days and had smoked at least 100 cigarettes during their lifetimes (53%; n=177). Approximately one-third (34.5%, n=115) of those who had smoked 100 cigarettes in their lifetime had made at least one unsuccessful quit attempt. The main analysis includes only the 306 participants who provided complete data on all the variables of interest.

Main Analysis

Step 1: Demographic and smoking characteristics—Table 2 contains detailed information about the relationships between demographic and smoking characteristics and the outcomes of interest. In brief, being a woman was associated with higher feelings of risk and higher worry. Being non-white was also associated with higher worry. Smoking more than one cigarette per day was associated with higher feelings of risk, higher worry, lower quitting self-efficacy, and lower intentions to quit. These significant demographic and smoking characteristic covariates were controlled for in the remaining steps.

Step 2: Correlates of feelings of risk, worry, self-efficacy, and intentions—There were mixed results for the relationships between addiction beliefs and perceptions of delayed harm and the cognitive and affective variables of interest. None of the addiction or quitting beliefs (Table 2) or perceived delayed harm measures (Table 3) were associated with worry about experiencing the harms of smoking. However, smokers had lower feelings of risk if they endorsed beliefs that addiction was inevitable or of they believed that the harms of cigarette smoking would be delayed. None of the other addiction belief variables were

associated with feelings of risk. Self-efficacy was also associated with few addiction beliefs. Two of the three items assessing agentic beliefs about quitting predicted higher quitting self-efficacy, but none of the remaining addiction beliefs or perceptions of delayed harm items were associated with self-efficacy. In this step, intention to quit was associated only with smoking less than one cigarette per day; neither addiction beliefs nor perceptions of delayed harm were related to quit intentions.

Steps 3-5: Cognitive and affective correlates of intentions to quit—The roles of worry, feelings of risk, and self-efficacy in predicting intentions to quit were examined in Steps 3-5. Adding worry to the model that included addiction beliefs did not account for a statistically significant amount of increased variance in intentions (Table 2, Step 3). Furthermore, worry was not associated with quit intentions. However, feelings of risk did account for a statistically significant amount of increased variance (Table 2, Step 4). Higher feelings of risk were associated with higher intentions to quit. Self-efficacy, on the other hand, was not associated with quit intentions after feelings of risk had been accounted for (Table 2, Step 5), nor did it account for increased variance in intentions. The same pattern of findings can be seen for the analyses examining perceptions of delayed harm. Worry was not related to intentions to quit (Table 3, Step 3), but higher feelings of risk were associated with higher quit intentions (Table 3, Step 4). However, self-efficacy was only marginally related to intentions once feelings of risk were accounted for (Table 3, Step 5).

Discussion

Strong prior correlational evidence for the importance of cognitive and affective risk perceptions and self-efficacy in explaining smoking-related outcomes indicates that that they are important to target in risk communications [3-5, 14]. However, information about the underlying beliefs driving these constructs is scant, despite their possible role in guiding future smoking prevention and cessation interventions. The results of the present study supported our hypotheses that feelings of risk would be more strongly associated with quit intentions than worry about becoming ill due to smoking and self-efficacy of quitting. This suggests that interventions that increase feelings of risk may motivate quit attempts and reduce tobacco use. This finding adds to the growing body of evidence suggesting that feelings of risk are stronger predictors of health behavior and/or behavioral intentions than some social cognitive and affective constructs [12-15]. It is also consistent with several theoretical perspectives emphasizing the important role of feelings in influencing perceptions of risk and health decision making [9, 10]. The reasons why feelings would be more influential or motivating than cognitive risk perceptions should be investigated in future research.

Our results indicate that the belief that addiction is an inevitable consequence of cigarette smoking is associated with lower feelings of risk. It could be that smokers, who may feel personally threatened by addiction, disregard the health threat to reduce the threatening feeling. It is therefore important that public health messages counter the possible negative effects of messages that strongly emphasize the addictiveness of nicotine by providing information about smoking cessation strategies [6, 7]. Moreover, believing that the harms of smoking are delayed was associated with lower feelings of risk. This suggests that smokers

may believe they will quit before they experience harm. Hence, it is important for tobacco control messages to emphasize the urgency of quitting earlier rather than later.

The limited associations found between the remaining addiction and quitting beliefs variables and feelings of risk and intentions to quit indicate that they may not be optimal targets for intervention. It also suggests that risk feelings may originate from some source other than beliefs about addiction, possibly more visceral or experiential in nature (e.g. the extent to which people are able to imagine themselves getting lung cancer) [24, 25]. Future research efforts and public health practice would benefit from investigating these other sources of addiction and quitting beliefs.

Limitations and Future Directions

As with all cross-sectional surveys, the directionality of the relation between feelings of risk and beliefs about the nature of addiction cannot be determined. Longitudinal and experimental research should explore this issue further. Additional research is also needed to determine the conditions under which high feelings of risk lead to actual quit attempts or smoking cessation among smokers. The role of feelings of risk in preventing initiation among young non-smokers should also be examined. Another consideration is that cognitive measures of perceived risk (e.g., “How likely do you think you are to develop lung cancer”) were not included in the survey. Thus, it is not possible to make direct comparisons of the relative power of worry and cognitive and affective perceived risk on intentions to quit. In addition, it is possible that smokers hold beliefs regarding addiction and quitting that were not assessed in this study. Consequently, it is not possible to say that such beliefs overall do not affect quitting intentions. It is also important to note that our sample was comprised primarily of smokers who were white, young, and smoked less than one cigarette per day. This may limit the generalizability of the findings to other populations. Future research should examine these research questions in more established smokers and in more socioeconomically diverse populations. Future work should also systematically test educational strategies for enhancing feelings of risk. One possible approach would be to convey information about the harms of smoking via personal narratives, which are vivid, memorable, and increase feelings of risk [24, 25].

Implications

This study adds to the evidence base that feelings of risk are powerful predictors of behavioral intentions. It also demonstrates that, at least in some circumstances, feelings of risk related to cigarette smoking predict quit intentions above and beyond worry and self-efficacy, two constructs that have been shown to be important predictors of quit intentions and behavior. Gaining additional understanding of what tobacco-related beliefs can increase feelings of risk and incorporating those beliefs into tobacco control campaigns may help increase the effectiveness of such campaigns and reduce tobacco use.

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Table 1
Survey items by construct (in BOLD CAPITALS) and subscale

ADDICTION AND QUITTING[a]	
Amount to addiction (α=.82)	"People can become addicted to cigarettes even if they only smoke one or two cigarettes a day."
	"People can become addicted to cigarettes even if they only smoke one or two cigarettes a week."
	"People can become addicted to cigarettes even if they only smoke occasionally with friends."
Can avoid addiction (α=.62)	"If I have not yet become addicted to nicotine then I never will."
	"If signs of nicotine addiction haven't appeared by the time someone smokes a TOTAL of 5 packs of cigarettes, they will never become addicted."
	"If people who smoke have good genes, they won't get addicted to nicotine."
	"There's not much risk in smoking during college because people have plenty of time to quit."
Judgment (α=.64)	"People who say they are addicted to nicotine just don't have the willpower to quit smoking."
	"People who are addicted to nicotine are emotionally weak."
	"People don't become addicted to nicotine unless they enjoy smoking."
	"People who are addicted to nicotine are not in control of their lives."
Determinism1 (Never addicted-reverse scored[b])	"Some people will never become addicted to nicotine, no matter how much or how long they smoke."
Determinism2 (Unavoidable addiction[b])	"Addiction to nicotine is an unavoidable consequence of smoking cigarettes."
Agentic1 (Complete control[b])	"People who smoke have complete control over their nicotine addiction."
Agentic2 (Really want to stop[b])	"People can stop smoking if they really want to."
Agentic3 (Willpower[b])	"Willpower is the best way to quit smoking."
DELAYED HARM[a] (α=.76)	"There is usually no risk to this person's health at all for the first few years."
	"Although smoking may eventually harm this person's health, there is really no harm from smoking the very next cigarette."
	"There is usually no risk of nicotine addiction for the first few years."
QUITTING SELF-EFFICACY[*acdefg*] (α=.86)	"Whether or not I quit smoking cigarettes completely in the next month would be entirely up to me."
	"How much personal control would you feel you have over quitting smoking completely in the next month?"
	"Quitting cigarettes in the next month would be…"
	"How confident would you be that you could quit smoking completely in the next month if you really wanted to?"
	"How certain would you be that you could quit smoking completely in the next month if you really wanted to?"
	"How difficult would it be for you to quit smoking cigarettes in the next month?"
WORRY[h] (α=.87)	"How much do you worry about…getting lung cancer in the future?
	"How much do you worry about…having a heart attack in the future?"
	"How much do you worry about…becoming addicted to nicotine within in the next year?"
FEELINGS OF RISK[a] (α=.81)	"I feel that I will develop lung cancer in the future if I continue to smoke."
	"I feel that I will have a heart attack in the future if I continue to smoke."

	"I feel that I will get addicted to nicotine in the next year if I continue to smoke."
QUIT INTENTIONS[a]	"I intend to quit smoking within the next year."

Note: Response options all included 5-point Likert-type scales. The anchors changed based on the question.

[a]Strongly disagree – Strongly agree;

[c]No control – Total control;

[d]Not at all possible – Completely possible;

[e]Not at all confident – Completely confident;

[f]Not at all certain – Completely certain;

[g]Not at all difficult – Extremely difficult;

[h]Not at all worried – Extremely worried

[b]These items were intended to be components of two scales titled Deterministic Addiction (Never addicted, Unavoidable addiction) and Agentic Quitting (Complete control, Really want to stop, Willpower), but their internal consistency was limited.

Table 2

Addiction and Quitting Beliefs (n=306)[a]

	Intentions			Feelings of Risk			Worry			Self-Efficacy		
Variables Entered	**β**	***p***	**R^2 (F-Change, Sig. F-Change)**	**β**	***p***	**R^2 (F-Change, Sig. F-Change)**	**β**	***p***	**R^2 (F-Change, Sig. F-Change)**	**β**	***p***	**R^2 (F-Change, Sig. F-Change)**
Step 1 Demographic and Smoking Characteristics[b]			**0.05 (F = 2.47, p=0.024)**			**0.09 (F = 4.65, p=0.000)**			**0.22 (F = 14.31, p=0.000)**			**0.09 (F = 4.78, p=0.000)**
School	-0.06	0.36		-0.02	0.69		0.06	0.26		-0.02	0.78	
Experimental condition												
A vs C	0.04	0.53		-0.10	0.11		0.00	0.96		0.03	0.62	
B vs C	0.06	0.41		0.01	0.90		0.03	0.57		0.00	0.94	
Gender	0.09	0.12		0.22	**0.00**		**0.22**	**0.00**		0.03	0.65	
Race	-0.03	0.62		-0.03	0.60		**-0.18**	**0.001**		0.03	0.61	
Number of cigarettes	**-0.15**	**0.01**		**0.17**	**0.003**		**0.40**	**0.00**		**-0.29**	**0.000**	
Step 2 Addiction Beliefs			0.08 (F = 1.31, p=0.24)			**0.15 (F = 2.91, p=0.004)**			0.24 (F = 0.56, p=0.81)			**0.20 (F=4.89, p=0.000)**
Covariates were included in each step of the analysis but are not shown here for clarity of presentation.												
Amount to addiction	0.06	0.35		0.08	0.15		0.07	0.22		0.06	0.28	
Can avoid addiction	-0.06	0.33		0.01	0.86		0.00	0.98		-0.07	0.28	
Judgment	0.05	0.44		-0.05	0.43		0.01	0.90		0.04	0.44	
Determinism1 (never addicted)	-0.05	0.46		**-0.13**	**0.03**		0.04	0.44		0.11	0.07	
Determinism2 (unavoidable)	-0.05	0.38		**-0.16**	**0.01**		-0.07	0.22		0.06	0.33	
Agentic1 (control addiction)	-0.02	0.76		-0.02	0.77		0.02	0.68		**0.18**	**0.00**	
Agentic2 (quit if really want to)	0.13	0.05		0.05	0.42		-0.04	0.45		**0.16**	**0.01**	
Agentic3 (willpower)	0.02	0.71		0.02	0.77		0.02	0.75		0.04	0.53	
Step 3 Worry			0.09 (F = 3.69, p=0.06)									
Amount to addiction	0.05	0.42										
Can avoid addiction	-0.06	0.32										
Judgment	0.05	0.44										

	Intentions			Feelings of Risk			Worry			Self-Efficacy		
Variables Entered	**β**	***p***	**R^2 (F-Change, Sig. F-Change)**	**β**	***p***	**R^2 (F-Change, Sig. F-Change)**	**β**	***p***	**R^2 (F-Change, Sig. F-Change)**	**β**	***p***	**R^2 (F-Change, Sig. F-Change)**
Determinism1 (never addicted)	-0.05	0.41										
Determinism2 (unavoidable)	-0.05	0.45										
Agentic1 (control addiction)	-0.02	0.72										
Agentic2 (quit if really want to)	**0.13**	**0.04**										
Agentic3 (willpower)	0.02	0.74										
Worry	0.12	0.06										
Step 4 Feelings of Risk			**0.11 (F = 6.15, p=0.014)**									
Amount to addiction	0.04	0.51										
Can avoid addiction	-0.07	0.31										
Judgment	0.06	0.36										
Determinism1 (never addicted)	-0.03	0.68										
Determinism2 (unavoidable)	-0.02	0.69										
Agentic1 (control addiction)	-0.02	0.78										
Agentic2 (quit if really want to)	0.12	0.06										
Agentic3 (willpower)	0.02	0.75										
Worry	0.04	0.56										
Feelings of risk	**0.17**	**0.01**										
Step 5 Self-Efficacy			0.12 (F = 2.81, p=0.10)									
Amount to addiction	0.03	0.61										
Can avoid addiction	-0.06	0.36										
Judgment	0.05	0.40										
Determinism1 (never addicted)	-0.04	0.56										
Determinism2 (unavoidable)	-0.03	0.66										
Agentic1 (control addiction)	-0.04	0.56										
Agentic2 (quit if really want to)	0.10	0.12										
Agentic3 (willpower)	0.02	0.81										

	Intentions			Feelings of Risk			Worry			Self-Efficacy		
Variables Entered	**β**	***p***	**R^2 (F-Change, Sig. F-Change)**	**β**	***p***	**R^2 (F-Change, Sig. F-Change)**	**β**	***p***	**R^2 (F-Change, Sig. F-Change)**	**β**	***p***	**R^2 (F-Change, Sig. F-Change)**
Worry	0.06	0.42										
Feelings of risk	**0.18**	**0.01**										
Self-efficacy	0.11	0.10										

[a]Includes only the 306 participants who provided complete data.

[b]Experimental condition A = There is a genetic link to nicotine addiction; Condition B = There is not a genetic link; Condition C = Attention control. Gender: 1 = Men, 2 = Women. Race: 1 = Non-white, 2 = White. Number of cigarettes: 1 = less than 1 per day; 2 = 1 or more per day.

Table 3

Delayed Harm Beliefs (n=306)[a]

	Intentions			Feelings of Risk			Worry			Self-Efficacy		
Variables Entered	**β**	***p***	**R^2 (F-Change, Sig. F-Change)**	**β**	***p***	**R^2 (F-Change, Sig. F-Change)**	**β**	***p***	**R^2 (F-Change, Sig. F-Change)**	**β**	***p***	**R^2 (F-Change, Sig. F-Change)**
Step 1 Demographic and Smoking Characteristics	The findings for Step 1 in this table are identical to those described in Table 2, Step 1.											
Step 2 Delayed Harm			0.06 (F = 2.40, p=0.12)			**0.10 (F = 4.81, p=0.03)**			0.22 (F = 0.35, p=0.56)			0.1 (F= 3.48, p=.06)
	Covariates were included in each step of the analysis but are not shown here for clarity of presentation.											
Delayed harm	-0.09	0.12		**-0.12**	**0.03**		-0.03	0.56		-0.10	0.06	
Step 3 Worry			0.07 (F = 3.52, p=0.06)									
Delayed harm	-0.08	0.14										
Worry	0.12	0.06										
Step 4 Feelings of Risk			**0.09 (F = 8.05, p=0.005)**									
Delayed harm	-0.06	0.25										
Worry	0.03	0.67										
Feelings of risk	**0.19**	**0.00**										
Step 5 Self-Efficacy			0.1 (F = 3.90, p=.05)									
Delayed harm	-0.05	0.39										
Worry	0.05	0.52										
Feelings of risk	**0.21**	**0.00**										
Self-Efficacy	0.12	0.05										

[a]Includes only the 306 participants who provided complete data.

[b]Experimental condition A = There is a genetic link to nicotine addiction; Condition B = There is not a genetic link; Condition C = Attention control. Gender: 1 = Men, 2 = Women. Race: 1 = Non-white, 2 = White. Number of cigarettes: 1 = less than 1 per day; 2 = 1 or more per day.