Published in final edited form as:

Addict Behav. 2011 July ; 36(7): 789–791. doi:10.1016/j.addbeh.2011.03.003.

Risk perception and motivation to quit smoking: A partial test of the Health Action Process Approach

Rebecca J. Williams^a, Thaddeus A. Herzog^{b,*}, and Vani N. Simmons^c

^aDepartment of Public Health Sciences, John A. Burns School of Medicine, University of Hawaii at Manoa, 1960 East-West Road, Honolulu, HI 96822

^bCancer Research Center of Hawaii, 677 Ala Moana Boulevard, Suite 200, Honolulu, Hawaii 96813

^cUniversity of South Florida and H. Lee Moffitt Cancer Center & Research Institute, 4115 E. Fowler Avenue, Tampa, FL 33617

Abstract

Introduction—The Health Action Process Approach (HAPA) posits a distinction between pre-intentional motivation processes and a post-intentional volition process that leads to the actual behavior change. For smoking cessation, the HAPA predicts that increased risk perceptions would foster a decision to quit smoking. From a cross-sectional perspective, the HAPA predicts that those who do not intend to quit (non-intenders) should have lower risk perceptions than those who do intend to quit (intenders).

Method—Adult smokers participated in a cross-sectional survey. Multiple measures of motivation to quit smoking and risk perceptions for smoking were assessed. ANOVA and contrast analysis were employed for data analysis.

Results—The results were generally supportive of the HAPA. Non-intenders had systematically lower risk perceptions compared to intenders. Most of these findings were statistically significant.

Conclusion—The results demonstrated that risk perceptions distinguish non-intenders from intenders. These results suggest that smokers low in motivation to quit could benefit from information and reminders about the serious health problems caused by smoking.

Keywords

Smoking; Motivation; Risk Perception; Health Action Process Approach

1. Introduction

Two important psychological variables associated with smoking cessation are motivation to quit and health risk perceptions of smoking. Although both of these variables have been studied extensively, few theories explicitly define their relationship. The Health Action Process Approach (HAPA) was used as the theoretical model in the current study because it

© 2011 Elsevier Ltd. All rights reserved

*Corresponding author. Cancer Research Center of Hawaii, 677 Ala Moana Boulevard, Suite 200, Honolulu, Hawaii 96813. therzog@crch.hawaii.edu.

Publisher's Disclaimer: This is a PDF file of an unedited manuscript that has been accepted for publication. As a service to our customers we are providing this early version of the manuscript. The manuscript will undergo copyediting, typesetting, and review of the resulting proof before it is published in its final citable form. Please note that during the production process errors may be discovered which could affect the content, and all legal disclaimers that apply to the journal pertain.

specifies a relationship between level of motivation to quit and degree of risk perceptions (Schwarzer, 2008). The HAPA proposes that there is a distinction between the pre-intentional motivation process (including risk perceptions) that leads to intention to make a behavior change and the post-intentional volition process that leads to the actual behavior change (Schwarzer, 2008). The volition process can be further sub-divided into a planning phase, action phase, and maintenance phase. In the example of smoking cessation, the HAPA predicts that those who do not intend to quit (non-intenders) should have lower risk perceptions than those who do intend to quit (intenders).

1.1 Operationalizing motivation to quit using the HAPA

Given that the HAPA does not recommend any specific measure of motivation to quit, the current study employed two disparate measures of motivation to quit: the stages of change (SOC; Prochaska, DiClemente, & Norcross, 1992) and the contemplation ladder (CL; Beiner & Abrams, 1991). By employing these two measures of motivation to quit, the HAPA can be tested using different underlying assumptions regarding the measurement of motivation to quit.

1.2 Hypotheses

Our hypotheses are derived from the HAPA. We predict that smokers low in motivation to quit (i.e., non-intenders) will evince lower risk perceptions than those who are medium or high in motivation to quit (i.e., intenders). Further, we hypothesize no significant differences in risk perceptions between those medium and those high in motivation to quit, as these two groups both are classified as “intenders” within the context of the HAPA. Hypotheses can be summarized as a pattern of relatively “low-high-high” risk perceptions for low (non-intender), medium, and high motivation to quit smokers, respectively. Hypotheses will be tested for multiple measures of both motivation to quit and risk perceptions.

2. Methods

2.1 Participants and Procedures

Participants for this cross-sectional study were recruited using newspaper advertisements and flyers distributed at community events in Tampa, Florida. Eligible participants (a) were 18 years old or over, (b) could read English, (c) had a mailing address, (d) and were self-identified as smokers. Potential participants were screened for eligibility requirements on the telephone. Participants were mailed questionnaires along with a stamped and addressed return envelope. Upon receipt of completed questionnaire, participants were mailed a \$25 check.

2.2 Measures

Stages of Change (SOC) Algorithm—The SOC construct partitions smokers into three categories (e.g., DiClemente et al., 1991). Smokers in the pre-contemplation stage indicated that they do not intend to quit smoking in the next 6 months. Contemplators are smokers who intend to quit in the next 6 months and (a) are not seriously intending to quit within the next 30 days or (b) have not made at least one 24-hour quit attempt in the past year, or both (a) and (b). Smokers in the preparation stage are seriously intending to quit within the next 30 days and had at least one 24-hour quit attempt during the past year. In the current study, precontemplation stage smokers are considered low in motivation to quit and are classified as non-intenders within the context of the HAPA. Contemplation and preparation smokers are considered medium and high in motivation to quit, respectively, and smokers in both of these stages are considered intenders for purposes of the HAPA.

The Contemplation Ladder (CL)—This instrument employs an 11-point Likert scale depicted as a ladder (Biener & Abrams, 1991). For the current study, low motivation to quit (i.e., non-intenders) was defined by response 0 (“No thought of quitting”) to response 2 (“Think I need to consider quitting someday”). Intermediate motivation to quit was defined as responses 3 to 7, centering on response 5 (“Think I should quit, but not quite ready”). High motivation to quit ranged from response 8 (“Starting to think about how to change my smoking patterns”) to response 10 (“Taking action to quit, such as cutting down on smoking, enrolling in a program”). This method of partitioning the CL has been used in past research and has been validated for measuring the readiness of smokers to make a behavior change (Biener & Abrams, 1991; Herzog, Abrams, Emmons, & Linnan, 2000). The rationale for partitioning the CL in this manner is to create a variable that contains three levels of motivation to quit. The transformed three-level CL facilitates comparisons with the three-level SOC.

Risk Perception Items—Two categories of risk perception were assessed. The first category measured “absolute risk” of smoking (i.e., “How likely do you think you are to develop the following health conditions as a result of smoking?”). The second category of risk perception was “relative risk” perception (i.e., “compared to other smokers your same age and sex, how would you rate your risk of getting one of the following conditions?”). Responses ranged from “Very Unlikely” to “Very Likely” on a five point scale for both absolute and relative risk questions. For both categories of risk perception, risk associated with the following smoking-related diseases was assessed: lung cancer, heart disease, emphysema, circulatory problems, stroke, and “other types of cancers.”

3. Results

3.1 Participant Characteristics

A total of 273 individuals qualified for the study and were sent surveys. Of these, 242 (89%) surveys were completed and returned. The mean age of participants was 47.00 years old ($SD=13.19$), with more than two thirds (68%) female. The sample was primarily Caucasian (71%), followed by African Americans (23%) and Hispanics (10%). Thirty-three percent of participants had a high school level of education or less. Forty-seven percent of participants were employed, with the remaining participants being either unemployed (20%), retired (13%), or disabled (20%). The median income was between \$20,000 and \$30,000. Participants smoked at a mean rate of 19.10 cigarettes per day ($SD=10.90$) and had smoked for a mean of 26.08 years ($SD=13.18$).

3.2 Data Reduction

The factor structure of the risk perception scales was assessed using principal components analysis (PCA). Separate PCA's were conducted for absolute and relative risk questions, respectively. Each PCA revealed a one-factor structure, leading us to compute composite risk scores. The initial eigen values yielded a one factor solution explaining 77% of the variance for absolute risk variables (eigen value=4.64). A one-factor solution was also found for the relative risk variables (eigen value=4.36) and accounted for 72% of the variance. Other factors had eigen values below 1.00. The alpha level for all risk variables was set at $p=0.05$. Scree plots further indicated in graphical representation one factor solutions. Cronbach's alphas for the six relative risk categories and six absolute risk categories were 0.94 and 0.92, respectively.

3.3 Cross-tabulations of the SOC and CL

A Wilcoxon Signed Ranks Test revealed that the SOC classified smokers as significantly less motivated to quit compared to the CL ($Z = 7.04, p < .001$; see Table 1). This pattern of results is consistent with previous research (e.g., Herzog & Blagg, 2007).

3.4. Main Results

We employed ANOVA to test our hypotheses. Contrast analyses within the context of ANOVA (Rosenthal & Rosnow, 1985) were employed to test the specific hypothesis that the means for risk perception would reveal a “low-high-high” pattern for low, medium, and high motivation to quit, respectively. Contrast weights associated with the “low-high-high” predictions were $-2, 1$, and 1 , for low, medium, and high motivation to quit, respectively. These weights were used for both the SOC and CL.

Stage of Change (SOC)—Two separate one-way ANOVAs were calculated for SOC: one for absolute risk, and one for relative risk. For absolute risk, there was a significant main effect for SOC, $F(2, 234) = 4.32, p = 0.014, \eta^2 = 0.19$. In other words, risk perceptions differed by stage. Contrast analyses revealed that the predicted “low-high-high” pattern of means also was supported for absolute risk, $t(234) = 2.83, p = .005, r = 0.18$. For relative risk, neither the main effect of SOC nor the “low-high-high” contrast were statistically significant (each $p > .05$; see Table 2).

Contemplation Ladder (CL)—Separate one-way ANOVAs (one for absolute risk and one for relative risk) also were calculated for the CL. Main effects for the CL group were obtained for both absolute risk, $F(2, 226) = 3.17, p = 0.044, \eta^2 = 0.16$, and relative risk, $F(2, 224) = 5.34, p = 0.005, \eta^2 = 0.21$. Further, the predicted “low-high-high” contrast was supported for both absolute risk, $t(226) = 2.41, p = .017, r = 0.16$, and relative risk, $t(224) = 3.24, p = .001, r = 0.21$; please see Table 2.

4. Discussion

This study assessed risk perceptions of smokers at different levels of motivation to quit. Using two measures of risk perception and two measures of motivation to quit, the predictions derived from the HAPA were mostly supported. Specifically, low-motivation to quit (i.e., non-intenders) demonstrated low risk perceptions relative to smokers who were medium or high in motivation to quit (intenders). The general pattern of results were similar for the SOC and CL, however one difference did emerge. For the SOC, the low-high-high contrast (and main effect of SOC) was confirmed for absolute risk, but not for relative risk. For the CL, main effects and the contrasts were significant for both absolute and relative risk.

Means presented in Table 2 reveal that non-intenders as classified by the CL had lower mean risk perceptions than non-intenders as measured by the SOC. This pattern of results reveals that the distinctions postulated by the HAPA are more clearly evident when the CL is employed, as compared to the SOC. However, the overall direction and trends in the results were similar for the SOC and CL.

The current study is subject to limitations. The sample used in the analysis was not a random sample from the population of smokers. Instead, participants received monetary incentives to participate in the study, leading to a possible selection bias. However, a fully representative sample was not needed to meet the study objectives.

The overall results demonstrate that risk perception does distinguish non-intenders from intenders. However, these cross-sectional results do not demonstrate the causal direction of this relationship. Further, although the results reveal differences in risk perception across levels of motivation to quit, risk perceptions still were substantial even among the non-intenders. Nonetheless, the results do provide support for the notion that smokers low in motivation to quit can benefit from information and reminders about the serious health problems caused by smoking. Future research should focus on how messages regarding health risks can be incorporated into interventions targeted at smokers who do not intend to quit.

References

- Biener L, Abrams DB. The Contemplation Ladder: validation of a measure of readiness to consider smoking cessation. *Health Psychology*. 1991; 10:360–365. [PubMed: 1935872]
- DiClemente CC, Prochaska JO, Fairhurst S, Velicer WF, Velasquez MM, Rossi JS. The process of smoking cessation: An analysis of precontemplation, contemplation, and preparation stages of change. *Journal of Consulting and Clinical Psychology*. 1991; 59:295–304. [PubMed: 2030191]
- Herzog TA, Abrams DB, Emmons KA, Linnan L. Predicting increases in readiness to quit smoking; a prospective analysis using the contemplation ladder. *Psychology and Health*. 2000; 15:369–381.
- Herzog TA, Blagg CO. Are most precontemplators contemplating smoking cessation? Assessing the validity of the stages of change. *Health Psychology*. 2007; 26:222–231. [PubMed: 17385974]
- Prochaska JO, DiClemente CC, Norcross JC. In *Search of How People Change. Applications to Addictive Behaviors*. *American Psychologist*. 1992; 47:1102–1114. [PubMed: 1329589]
- Rosenthal, R.; Rosnow, RL. *Contrast Analysis: Focused Comparisons in the Analysis of Variance*. Cambridge University Press; New York: 1985.
- Schwarzer R. Modeling Health Behavior Change: How to Predict and Modify the Adoption and Maintenance of Health Behaviors. *Applied Psychology*. 2008; 57:1–29.

Table 1

Cross-tabulation of Stages of Change (SOC) and Contemplation Ladder (CL)

		Contemplation Ladder			
		Low MTQ (%)	Medium MTQ (%)	High MTQ (%)	Sum (%)
Stages of Change	Low MTQ (%)	24	39	6	69 (31%)
	Medium MTQ (%)	5	54	47	106 (47%)
	High MTQ (%)	2	8	38	48 (22%)
	Sum (%)	31 (14%)	101 (45%)	91 (41%)	223 (100%)

Note. MTQ=motivation to quit

Table 2

Mean Risk Perception by Level of Motivation for the Stages of Change and Contemplation Ladder

Level of Motivation to Quit	Absolute Risk Perception Mean (SD)	Relative Risk Perception Mean (SD)
Stage of Change		
Low MTQ	3.6 (1.00)	3.3 (0.94)
Mid MTQ	3.9 (0.80)	3.5 (0.85)
High MTQ	3.9 (0.91)	3.5 (0.98)
Contemplation Ladder		
Low MTQ	3.4 (0.95)	3.0 (0.86)
Mid MTQ	3.8 (0.90)	3.4 (0.88)
High MTQ	3.9 (0.87)	3.5 (0.87)

Note. MTQ=motivation to quit