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# Intentions to Quit Smoking: Causal Attribution, Perceived Illness Severity, and Event-Related Fear During an Acute Health Event

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## Abstract

**Background—**Experiencing a serious consequence related to one's health behavior may motivate behavior change.

**Purpose—**This study sought to examine how causal attribution, perceived illness severity, and fear secondary to an acute health event relate to intentions to quit smoking.

**Methods—**Using a cross-sectional survey design, adult emergency department patients who smoked provided demographic data and ratings of nicotine dependence, causal attribution, perceived illness severity, event-related fear, and intentions to quit smoking.

**Results—**A linear regression analysis was used to examine the relations between the independent variables and quit intentions. We enrolled 186 participants. After adjusting for nicotine dependence, smoking-related causal attribution and event-related fear were associated with intentions to quit ($\beta$=0.26, $p$<0.01 and $\beta$=0.21, $p$<0.01, respectively). Perceived illness severity was correlated with event-related fear ($r$=0.46, $p$<0.001) but was not associated with intentions to quit ($\beta$=−0.08, $p$=0.32).



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**Conclusion—**While causal attribution and event-related fear were modestly associated with quit intentions, perceived illness severity was not. Longitudinal studies are needed to better explicate the relation between these variables and behavior change milestones.

### Keywords

Smoking cessation; Causal attribution; Perceived illness severity; Fear; Acute health event; Smoking; Readiness to quit; Stage of change; Affect; Illness severity; Emergency medicine

## Introduction

The notion that people change their smoking in response to specific cues or triggering events, such as an acute medical illness, has played a prominent role in some health behavior theories [1, 2]. This observation has been central to the popular concept of the "teachable moment" [2-4]. However, the circumstances under which a "moment" is most likely to be teachable and when a triggering event is most likely to inspire behavior change remain elusive and poorly defined [2]. Better delineating the mechanisms of action that mediate between specific triggering events, intentions to change, and behavior change milestones can help to guide decisions about counseling content, message framing, motivational toolkit development, and optimal timing of interventions for use in opportunistic settings.

Recently, researchers have postulated that an acute health problem leading to an emergency department (ED) visit can provide a trigger to stop smoking [5, 6]. There are more than 119 million emergency department visits annually in the USA [7], and up to 48% of these are by individuals who smoke [8]. Consequently, the emergency department affords a unique opportunity to capture smokers during or immediately after an acute health event. While a host of potentially relevant constructs exist, the present study focuses on three with strong theoretical support, practical relevance for intervention development, and evidence to support their association with motivation and behavior change milestones: (1) smoking-related causal attributions, (2) perceived illness severity, and (3) event-related fear. In the context of an emergency department visit, smoking-related causal attribution is defined as the patient's perception that the medical problem prompting the emergency department visit is one that is caused or made worse by smoking. We hypothesize that smoking-related causal attributions will be associated with stronger intentions to quit smoking [5, 6, 9-11].Perceived illness severity is defined as the patient's perception of the seriousness of his or her current health problem [12, 13]. Studies have typically examined perceptions of susceptibility for an illness the individual does *not* yet have; however, the current study examines perceptions of an acute illness the person *already* has. We expect that perceived illness severity will be positively associated with intentions to quit smoking.

The role of emotions in health behavior change has received far less attention than cognitive constructs [14]. Recently, however, researchers have highlighted the importance of affect in health decision making [12, 15]. We expect that the degree of fear or anxiety surrounding the event is likely to be positively associated with quit intentions.

## Methods

### Study Design and Participant Selection

We enrolled smokers who were being treated in an urban, academic emergency department. Using a paper-and-pencil questionnaire, trained research assistants enrolled patients 18 years and older who smoked. Hours of coverage were 8:00 A.M. to midnight from January through May 2006. Exclusion criteria included acute medical conditions which would interfere with successful completion of the survey (e.g., intubation, persistent vomiting,

severe pain), cognitive insufficiency (e.g., delirium, dementia, intoxication), insurmountable language barrier, previous enrollment, and refusal. Although specific times were not recorded, most participants were enrolled toward the end of their visit, after diagnostic testing had been completed but prior to discharge from the emergency department or transfer to an inpatient floor. The research assistant, upon conclusion of the interview, gave all participants a card with the toll-free, national smoker's hotline (1-800-QUIT-NOW). The hospital's institutional review board approved the study, and all participants signed a written informed consent.

## Setting and Population

The emergency department at our institution is an academic, level I trauma center serving a catchment area of approximately two million persons. The annual census is approximately 51,000 visits per year. The emergency department population is 35% White, 44% Black, 20% Hispanic, and 1% other race/ethnicity. Approximately 30% are commercially insured, 40% are government insured, and 30% are un-insured. Approximately 20% of all patients are admitted to the hospital. Patients were enrolled regardless of whether they were admitted or discharged.

## Measures

Because of the need for brevity due to the nature of the ED, we measured the variables we believed to be most critical to testing our hypotheses. When available, we used previously validated instruments. It took approximately 10 min to complete the survey.

**Demographics—**Demographic characteristics included age and sex.

**Smoking History and Nicotine Dependence—**Current smokers were defined as anyone who reported smoking any cigarettes or cigars in the past 30 days. This broad definition has been used by our research team to help account for a tendency of medically ill smokers to temporarily stop smoking because they are ill, not because they are actively trying to quit [6]. Nicotine dependence was assessed with the Heavy Smoking Index [16], a well-established self-report measure of dependence for use when rapid assessment is needed. The Heavy Smoking Index correlates highly with the Fagerstrom Test for Nicotine Dependence, the most widely use measure of nicotine dependence, and has been shown to be positively associated with carbon monoxide levels [16].

**Intentions to Quit—**Intentions to quit smoking were assessed by asking subjects to rate three items constructed using principles from the *Theory of Planned Behavior* [17], as well as our previous research [6]. The three items were: "I intend to quit smoking some time within the next 30 days", "I have decided to quit smoking today", and "I will continue to smoke until I die (reverse scored)." They were each rated using a seven-point anchored scale: 1 = strongly disagree, 4 = neither agree nor disagree, and 7 = strongly agree. The coefficient alpha of the three items was 0.66.

**Smoking-Related Causal Attributions—**Participants rated their smoking-related causal attributions using the question, "my current medical visit is due to a problem that is caused or made worse by smoking" (seven-point scale, per above). This question has been used by previous emergency department research [6, 17, 18]. It demonstrated construct validity through strong associations with intentions to quit smoking and has been shown to predict quit attempts after an emergency department visit.

**Perceived Illness Severity—**Participants rated their illness severity using three items (seven-point scale, per above). The first two items, "My current health problem is a serious

medical condition" and "My current health problem will have a major impact on my life", were adapted from the Illness Perception Questionnaire—Revised [19]. The third item, "my current medical condition is life-threatening", was included because we were concerned about a ceiling effect, since most people present to the emergency department with the belief that their illness is serious. The third item was expected to help better differentiate the upper spectrum of illness severity. The coefficient alpha of the three items was 0.72.

**Event-Related Fear—**Participants rated their event-related fear and anxiety using three items (seven-point scale, per above). The first two items, "My current health problem makes me feel afraid" and "my current health problem makes me feel anxious", were adapted from the Illness Perception Questionnaire—Revised [19]. The third item, "when I think of my current health problem, I get very scared about what might happen to me", was included to help avoid the ceiling effect, as described above (see "Perceived Illness Severity" section). The coefficient alpha of the three items was 0.72.

### Data Analyses

All analyses were performed using SPSS 15.0 (Chicago, IL, USA). Descriptive statistics are presented as means with standard deviations or counts with percentages. All scale scores were calculated by computing the arithmetic mean of the items comprising the scale. Pearson correlation coefficients were calculated between the independent variables and intentions to quit. We conducted a multiple linear regression using a hierarchical approach [20]. Block 1 consisted of demographic variables that demonstrated a significant correlation with intentions to quit (the criterion variable) and nicotine dependence. Block 2 consisted of the three primary predictors of smoking-related causal attribution, perceived illness severity, and event-related fear. Block 3 consisted of two interaction terms: causal attribution×perceived illness severity and causal attribution×event-related fear. All predictor variables were centered prior to inclusion in the regression analyses [20].

## Results

### Descriptive Statistics

Of the 661 patients who consented to be surveyed, 210 (32%) were current smokers and 186 (89% of smokers) provided complete data on all measures. Table 1 summarizes the sample's descriptive statistics. The mean age, sex distribution, and smoking prevalence (32%) are similar to other studies published on smokers treated in urban EDs [6, 8].

All measures were examined for normality. Only causal attribution was non-normally distributed. The distribution showed a high "zero" saturation, with about 45% of all participants ($n$=83) endorsing the lowest rating of "1", or "strongly disagree", and the rest ($n$=103) endorsing a rating of "2" or higher. This distribution, often referred to as "data with excess zeros" [21], could not be fixed using any transformation. Consequently, we followed recommendations for analyzing such data proposed by Lachenbruch [21], which are described in the "Multivariable Analyses" section.

### Correlations

Quit intentions were correlated with the following variables in the theoretically expected directions: nicotine dependence ($r$=−0.19, $p$<0.05), smoking-related causal attributions ($r$=0.24, $p$<0.01), and event-related fear ($r$=0.21, $p$<0.01). Quit intentions were not correlated with age ($r$=0.06), sex ($r$=−0.01), or perceived illness severity ($r$=0.05), all $p$>0.05. Perceived illness severity and event-related fear were correlated ($r$=0.46, $p$<0.001).

### Multivariable Analyses

Table 2 summarizes the results from the multiple linear regression using the entire sample of 186 participants. In the final model, causal attribution and event-related fear both remained related to quit intention ($\beta$=0.27, $p$<0.01 and $\beta$=0.21, $p$<0.01, respectively), even after adjusting for nicotine dependence and the two interaction terms (model $R$=0.37, $p$<0.001). Perceived illness severity was not related to intentions to quit ($\beta$=−0.08, $p$=0.32). Because age can be associated with perceived illness severity, quit intention was regressed on age and perceived severity. The model was not statistically significant (model $R$=0.129, $p$=0.198). When the model included the interaction effect of age and perceived severity, the model was still not statistically significant (model $R$=0.135, $p$=0.316).

Because of the non-parametric (zero-inflated) distribution for smoking-related causal attribution, we decided to conduct two subgroup analyses patterned after Lachenbruch's [21] suggestions for analyzing data with excess zeros. The first subgroup analysis was restricted to the 83 participants who scored the lowest rating on the smoking-related causal attribution (i.e., those who selected "1", or "strongly disagree"). The second subgroup analysis was restricted to the 103 participants who reported any level of causal attribution (i.e., those who selected a "2" or higher, or who had some non-zero level of causal attribution). For the first subgroup analysis, restricted to those with no causal attribution ($n$=83), the full model (nicotine dependence, perceived illness severity, event-related fear) accounted for 9% of the variance in quit intentions but was not statistically significant (model $R$=0.30, $p$=0.05). Nicotine dependence exhibited a statistically significant association with quit intentions ($\beta$=−0.26, $p$<0.05), while perceived illness severity and event-related fear did not ($\beta$=−0.01, $p$=0.93 and $\beta$=0.11, $p$=0.34, respectively).

For the second subgroup analysis, restricted to those with non-zero level of causal attribution ($n$=103), the model (nicotine dependence, causal attribution, perceived illness severity, event-related fear) accounted for 18% of the variance (model $R$=0.43, $p$<0.001). Nicotine dependence remained associated with quit intentions ($\beta$=−0.22, $p$<0.05), as did smoking-related causal attribution ($\beta$=0.36, $p$<0.001) and event-related fear ($\beta$=0.31, $p$<0.01). Perceived illness severity was not associated with quit intentions ($\beta$=−0.18, $p$=0.10). Because the two subgroup analyses included different predictors, the $B$ coefficients for event-related fear from the two subgroup analyses were directly compared to test for interaction effects using an independent groups $t$ test. The $B$ coefficient of event-related fear in those with no smoking-related causal attribution ($B$=0.11, 95% confidence interval (CI) −0.09 to 0.32) was not significantly different from the $B$ coefficient of event-related fear in those with non-zero causal attribution ($B$=0.28, 95% CI 0.08 to 0.48). This finding confirms the results pertaining to the interaction terms entered in the primary analysis (see Table 2) and suggests that there was no interaction effect present based on level of smoking-related causal attribution.

## Discussion

ED patients who perceived their visit to be related to smoking reported stronger intentions to quit. While the strength of the association between causal attributions and quit intentions was modest, it was on par with the association between quit intentions and nicotine dependence, a powerful and consistent predictor of successful smoking cessation [22]. Many smokers with a diagnosable smoking-related medical condition may not recognize this fact [6]. Confirmation of the independent link between causal attribution and quit intentions provides evidence supporting the development of interventions to strengthen an individual's understanding of the pathogenesis between smoking and their *current* illness or health effects.

Our study is innovative in its inclusion of a measure of affective response in addition to cognitive constructs. In our sample, the more fear an individual experienced as a result of his health event, the more likely he was to endorse stronger intentions to quit smoking, even after adjusting for nicotine dependence and causal attribution. The strength of this independent association was similar to the strength to causal attribution and nicotine dependence, reinforcing affective responses as an important domain for further investigation. This specific form of negative affect may *enhance* motivation to change, which contradicts a voluminous literature that implicates negative affect as a retardant to change and a promoter of relapse in those who have attempted to quit [23]. Emotion researchers have emphasized the multi-dimensionality of affect, suggesting that different kinds of affect may have different effects on behavior [15]. Researchers have distinguished between integral and incidental affect. Integral affect is emotion about the target event. For example, worry about breast cancer is associated with increased breast cancer screening behavior [24] and worry about the flu with getting vaccinated [25]. Incidental affect is emotion that arises for reasons unrelated to the target of the decision, but nevertheless can influence the decision. For example, Lerner and Keltner [26, 27] found that emotions induced via a laboratory task influenced a later, unrelated decision task. It is possible that event-related fear (integral affect) can promote behavior change, while general negative affect (incidental affect) can retard behavior change or promote relapse. The highly volatile nature of affect may hold important insights into the tenacity of the lapse–relapse cycle of tobacco cessation, with transient affective states being responsible for both initiation of behavior change and relapse back to smoking.

Finally, our results did not support our hypothesis that perceived illness severity would be positively associated with quit intentions. This is difficult to reconcile, since the correlation between event-related fear and perceived illness severity was fairly strong ($r$=0.46) and event-related fear was, itself, positively associated with quit intentions. One might expect that given these associations, event-related fear might be a mediator between illness severity and intentions to quit. However, our exploratory mediation analysis did not support this. Weinstein [13] has suggested that between-subjects analyses may not be ideally suited for understanding perceived severity and motivation and recommended using within-subjects studies. Finally, distinct subgroups of patients might exist. For some, greater severity might lead to decreased motivation, perhaps because they become stressed or hopeless in the face of life-threatening diagnoses. For others, greater severity might lead to greater motivation, perhaps because they believe changing their behavior can improve their illness or help them to avoid a recurrence. If distinct subgroups co-existed within our sample, it could have "washed out" the effect.

## Limitations

We did not collect data during low census hours (12:00 midnight to 8:00 A.M.). This could mean our sample is not representative of the overall emergency department patient population. The concern over generalizability is ameliorated somewhat since our sample's demographics and smoking rates were very similar to our emergency department as a whole, as well as other published studies in urban EDs [6, 8].

Because of practical demands associated with performing research in a time-sensitive setting like the ED, we were unable to include other important non-event-related predictors, like self-efficacy. The study would have been stronger had we been able to include such constructs. Additionally, the study would have benefited from studying actual quitting behaviors after the emergency department visit, rather than studying behavioral intentions exclusively.

## Conclusion

The effect of an acute health event, like an emergency department visit, on the behavior change process is likely to be very complex and to involve a combination of cognitive, contextual, and affective factors. Our results suggest that two constructs likely to be important and which deserve further investigation are causal attribution and event-related fear. The role of perceived illness severity is less clear. Additional longitudinal studies should examine how perceived illness severity, perceived susceptibility to future health events, event-related affect, and general negative affect are related to one another, as well as how they are related, independently and in combination, to quit intentions and behavior change milestones.

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## References

1. Rosenstock I. Historical origins of the health belief model. Health Educ Monogr. 1974; 2:328–335. http://www.ncbi.nlm.nih.gov/pmc/articles/PMC1373444/.
2. McBride CM, Emmons KM, Lipkus IM. Understanding the potential of teachable moments: The case of smoking cessation. Health Educ Res. 2003; 18:156–170. doi:10.1093/her/18.2.156. [PubMed: 12729175]
3. Gritz ER, Fingeret MC, Vidrine DJ, Lazev AB, Mehta NV, Reece GP. Successes and failures of the teachable moment smoking cessation in cancer patients. Cancer. 2006; 106:17–27. http://www3.interscience.wiley.com/journal/28741/home?CRETRY=1&SRETRY=0. [PubMed: 16311986]
4. Demark-Wahnefried WN, Aziz M, Rowland JH, Pinto BM. Riding the crest of the teachable moment: Promoting long-term health after the diagnosis of cancer. J Clin Oncol. 2005; 23:5814–5830. doi:10.1200/JCO.2005.01.230. [PubMed: 16043830]
5. Bernstein SL, Cannata M. Nicotine dependence, motivation to quit, and diagnosis in emergency department patients who smoke. Addict Behav. 2006; 31:288–297. doi:10.1080/14622200802239272. [PubMed: 15993546]
6. Boudreaux ED, Baumann BM, Camargo CA Jr, O'Hea E, Ziedonis DM. Changes in smoking associated with an acute health event: Theoretical and practical implications. Ann Behav Med. 2007; 33:189–199. doi:10.1007/BF02879900. [PubMed: 17447871]
7. Pitts SR, Niska RW, Xu J, Burt CW. National hospital ambulatory medical care survey: 2006 emergency department summary. Natl Health Stat Report. 2008; 7:1–38. http://www.cdc.gov/nchs/data/nhsr/nhsr007.pdf. [PubMed: 18958996]
8. Lowenstein SR, Koziol-McLain J, Thompson M, et al. Behavioral risk factors in emergency department patients: A multisite survey. Acad Emerg Medicine. 1998; 5:781–787. http://www.wiley.com/bw/journal.asp?ref=1069-6563.
9. Duncan CL, Cummings SR, Hudes ES, Zahnd E, Coates TJ. Quitting smoking: Reasons for quitting and predictors of cessation among medical patients. J Gen Intern Med. 1992; 7:398–404. http://www.wiley.com/bw/journal.asp?ref=0884-8734. [PubMed: 1506945]
10. Hall S, Weinman J, Marteau TM. The motivating impact of informing women smokers of a link between smoking and cervical cancer: The role of coherence. Health Psychol. 2004; 23:419–424. doi:10.1037/0278-6133.23.4.419. [PubMed: 15264979]
11. Scott RR, Lamparski D. Variables related to long-term smoking status following cardiac events. Addict Behav. 1985; 10:257–264. doi:10.1016/0306-4603(85)90006-1. [PubMed: 3878665]

12. Leventhal, H.; Nerenz, D.; Steele, D. Illness representations and coping with health threats. In: Baum, A.; Revernson, T.; Singer, J., editors. Handbook of psychology and health. Vol. IV. Erlbaum; Hillsdale: 1984. p. 219-252.
13. Weinstein ND. Perceived probability, perceived severity, and health-protective behavior. Health Psychol. 2000; 19:65–74. doi:10.1037/0278-6133.19.1.65. [PubMed: 10711589]
14. Rothman AJ. Toward a theory-based analysis of behavioral maintenance. Health Psychol. 2000; 19:64–69. doi:10.1037/0278-6133.19.Suppl1.64. [PubMed: 10709949]
15. Mellers B, McGraw AP. Anticipated emotions as guides to choice. Curr Dir Psychol Sci. 2001; 10:210–214. doi:10.1111/1467-8721.00151.
16. Kozlowski LT, Porter CQ, Orleans CT, Pope MA, Heatherton T. Predicting smoking cessation with self-reported measures of nicotine dependence: FTQ, FTND, and HSI. Drug Alcohol Depend. 1994; 34:211–216. doi:10.1016/0376-8716(94)90158-9. [PubMed: 8033758]
17. Ajzen, I. From intentions to actions: A theory of planned behavior. In: Kuhl, J.; J, Beckman, editors. Action-control: From cognition to behavior. Springer; Heidelberg: 1985. p. 11-31.
18. Bock BC, Becker B, Monteiro R, Partridge R, Fisher S, Spencer J. Physician intervention and patient risk perception among smokers with acute respiratory illness in the emergency department. Prev Med. 2001; 32:175–181. doi:10.1006/pmed.2000.0799. [PubMed: 11162344]
19. Moss-Morris R, Weinman J, Petrie KJ, Horne R, Cameron LD, Buick D. The Revised Illness Perception Questionnaire (IPQ-R). Psychol Health. 2002; 17:1–16. doi: 10.1080/08870440290001494.
20. Cohen, J.; Cohen, P.; West, SG.; Aiken, LS. Applied multiple regression/correlation analysis for the behavioral sciences. 3rd ed.. Lawrence Erlbaum; Mahwah: 2003.
21. Lachenbruch PA. Analysis of data with excess zeros. Stat Methods Med Res. 2002; 11:297–302. doi:10.1191/0962280202sm289ra. [PubMed: 12197297]
22. Carlson LE, Taenzer P, Koopmans J, Casebeer A. Predictive value of aspects of the Transtheoretical Model on smoking cessation in a community-based, large-group cognitive behavioral program. Addict Behav. 2003; 28:725–740. doi:10.1016/S0306-4603(01)00268-4. [PubMed: 12726786]
23. Carmody TP. Affect regulation, nicotine addiction, and smoking cessation. J Psychoactive Drugs. 1992; 24:111–122. http://www.journalofpsychoactivedrugs.com/. [PubMed: 1506996]
24. McCaul KD, Schroeder DM, Reid PA. Breast cancer worry and screening: Some prospective data. Health Psychol. 1996; 15:430–433. [PubMed: 8973922]
25. Chapman G, Coups E. Emotions and preventative health behavior: Worry, regret, and preventive health behavior. Health Psychol. 2006; 25:82–90. doi:10.1037/0278-6133.25.1.82. [PubMed: 16448301]
26. Lerner J, Keltner D. Beyond valence: Toward a model of emotion-specific influences on judgment and choice. Cognit Emot. 2000; 14:473–493. http://www.tandf.co.uk/journals/pp/02699931.html.
27. Lerner JS, Keltner D. Fear, anger, and risk. J Pers Soc Psychol. 2001; 81:146–159. doi: 10.1037/0022-3514.81.1.146. [PubMed: 11474720]

## Table 1

Descriptive statistics ($n$=186)

| Variable | Statistic |
|---|---|
| Sex, count (%) | |
| Male | 103 (56) |
| Age, mean (SD) | 41 years (15 years) |
| Cigarettes per day | |
| 1–10 | 142 (74) |
| 11–20 | 52 (22) |
| 21–30 | 5(3) |
| 31 + | 4 (2) |
| Heavy smoking index (nicotine dependence), mean (SD) | 1.77 (1.43) |
| Nicotine dependence low to moderate (<4) | 163 (88) |
| Nicotine dependence high (> =4) | 23 (12) |
| Smoking-related causal attribution[a], mean (SD) | 2.85 (2.08) |
| Perceived illness severity[b], mean (SD) | 4.64 (1.67) |
| Event-related fear[b], mean (SD) | 4.42 (1.78) |
| Intentions to quit smoking[b], mean (SD) | 3.82 (1.68) |

*SD* standard deviation

[a]Measured with one item, using a seven-point scale (1 = strongly disagree, 4 = neither agree nor disagree, and 7 = strongly agree)

[b]Measured by three items, using a seven-point scale (see above). Score represents the mean of the scale's items

**Table 2**

Summary of hierarchical multiple regression analyses for intention to quit

| Predictors | *β* | *t* | *df* | $R^2$ | $\Delta R^2$ |
|---|---|---|---|---|---|
| Step 1 | | | | | |
| Nicotine dependence | −0.20 | −2.92* | | | |
| Causal attribution | 0.25 | 3.52* | | | |
| Perceived illness severity | −0.08 | −1.02 | | | |
| Event-related fear | 0.21 | 2.66* | 181 | 0.138** | |
| Step 2 | | | | | |
| Nicotine dependence | −0.21 | −2.92* | | | |
| Causal attribution | 0.27 | 3.53* | | | |
| Perceived illness severity | −0.08 | −0.99 | | | |
| Event-related fear | 0.21 | 2.65* | | | |
| Causal attribution × perceived illness severity | −0.04 | −0.46 | | | |
| Causal attribution × event-related fear | 0.05 | 0.64 | 179 | 0.140** | 0.002 |

Degrees of freedom of residuals are reported

* p<0.01;

** p<0.001