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Measuring Cognitive and Affective Constructs in the Context of an Acute Health Event

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Abstract

The latest recommendations for building dynamic health behavior theories emphasize that cognitions, emotions, and behaviors – and the nature of their inter-relationships -- can change over time. This paper describes the development and psychometric validation of four scales created to measure smoking-related causal attributions, perceived illness severity, event-related emotions, and intention to quit smoking among patients experiencing acute cardiac symptoms. After completing qualitative work with a sample of 50 cardiac patients, we administered the scales to 300 patients presenting to the emergency department for cardiac-related symptoms. Factor analyses, alpha coefficients, ANOVAS, and Pearson correlation coefficients were used to establish the scales' reliability and validity. Factor analyses revealed a stable factor structures for each of the four constructs. The scales were internally consistent, with the majority having an alpha of >0.80 (range: 0.57 to 0.89). Mean differences in ratings of the perceived illness severity and event-related emotions were noted across the three time anchors. Significant increases in intention to quit at the time of enrollment, compared to retrospective ratings of intention to quit before the event, provide preliminary support for the sensitivity of this measure to the motivating impact of the event. Finally, smoking-related causal attributions, perceived illness severity, and event-related emotions correlated in the expected directions with intention to quit smoking, providing preliminary support for construct validity.

Introduction

An acute health-related experience, like a myocardial infarction or a diagnosis of cancer, may act as a sentinel event that propels an individual toward behavior change (Boudreaux, Bock, & O'Hea, 2011). McBride, Emmons, and Lipkus (2003) published a broad review of the medical literature and found compelling evidence that patients who experience an important health event, such as pregnancy, hospitalization, or serious disease diagnosis, have

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significantly higher rates of smoking cessation than the general population or patients simply attending an outpatient clinic appointment. Researchers have begun to explore in greater depth how sentinel events relate to both short and long term change. Boudreaux and colleagues (2011) recently described a new method for developing dynamic health behavior models to explain health behavior change after an event called the Sentinel Events Method (see Figure 1). An important step in the Sentinel Events Method is to develop measures of constructs thought to be related to how the event or illness influences subsequent health behavior change. The current paper describes the development and validation of the core event-related constructs we hypothesize are important to understanding the motivating influence of an acute illness. The model, which is a simplified version of the one depicted in Boudreaux et al. (2011), is summarized in Figure One.

Core Constructs

The four core constructs of the SEM are smoking-related causal attribution, perceived illness severity, event-related emotions, and intentions to quit smoking. They are common to several different health behavior theories, but they are most notably linked to Leventhal's Self Regulation Theory (Leventhal, Nerenz, & Steele, 1984; Leventhal, Leventhal, & Cameron, 2001). Self Regulation Theory, also referred to as the Common Sense Model, argues that both cognitive *and* emotional processes determine an individual's appraisal of an illness and subsequent health behaviors related to the disease.

One important cognitive variable that is virtually transtheoretical is causal attribution. It refers to an individual's understanding of the factors that cause or exacerbate his illness (Leventhal et al., 1984; Leventhal, Leventhal, & Contrada, 2007). In the context of an acute health event, smoking-related causal attribution can be defined as the patient's perception of the degree to which his medical problem is caused or made worse by smoking. While evidence strongly suggests that smokers who believe their health problems are smoking-related are more likely to quit (e.g., Boudreaux et al., 2007; 2010; Clark, Hogan, Kviz, & Prohaska, 1999; Duncan, Cummings, Hudes, Zahnd, & Coates, 1992; McCaul et al., 2006; Rohren et al, 1994; Scott and Lamparski, 1985), the literature does not provide readily available tools to assess smoking-related causal attributions for an acute health event, like an emergency department visit.

Perceived illness severity refers to the perception of negative consequences linked to a specific diagnosis or event, such as heart disease or cancer. The role of illness severity in influencing health behavior change has been inconsistently demonstrated, and the literature suggests that the relationship between the severity of an illness and health behavior change is complex and may be multi-dimensional or non-linear (Weinstein, 2000). Some of the inconsistencies in the literature may be related to examining diseases that most individuals would agree hold a high rating of seriousness, like cancer (Weinstein, 2000). This results in a restricted range of severity ratings. Studying illness events that have a broader spectrum of actual and perceived severity might help to further elucidate the relation between severity and health behavior change (Boudreaux et al., 2011). For example, chest pain that brings a person into an emergency room can be viewed as highly serious or not, depending on the situation, the nature of the symptoms being experienced, previous experiences with similar symptoms, and, ultimately, the final outcome of the event, such as whether the individual is discharged or admitted to the hospital. Further, researchers should consider the anchor, or time-point, for which severity measures are taken. An individual's perception of the seriousness of a current health event will likely change over time, and this variability may have important implications for how it ultimately relates to behavior change. Garnering richer descriptions of how patients perceive the seriousness of their symptoms over time is critical to guiding operationalization, measurement, and model construction.

The role of event-related emotions is acknowledged by Leventhal's Self Regulation Theory in that it posits that a negative health experience will likely cause a person to attempt to cope with both the threat and the event-related emotions. Emotion, most notably in the form of fear, can prompt behavior change. Although interventions that appeal to fear in order to prompt behavior change have been well examined (Ruiter, Abraham, & Kok, 2001; Witte & Allen, 2000), very little work has been done studying how different types of emotions experienced as a result of an illness influence health behavior change (Leventhal, Nerenz, & Steele, 1984; Leventhal; Leventhal, Benyamini, Brownlee, 1997; Rothman, 2000). The model described by Boudreaux and colleagues (2011) includes emotional reactions during the event as potential contributors to change.

A final construct we examined is intention to quit smoking. Intention to quit smoking has been well studied within the health behavior change literature. Ajzen's Theory of Planned Behavior (TPB; 1991) places central emphasis on behavioral intentions as an important mediator between other constructs and behavior change. Research has been inconsistent regarding the strength of relationship between intentions and behaviors. A recent study by Smit, Fidler, & West, (2011) explored intention in predicting smoking cessation attempts using a longitudinal design. Intention to quit smoking at baseline was related to quit attempts at both 3 and 6 month follow up assessments. However, because there have also been many non-significant findings in this area of inquiry, many researchers agree that more detailed analysis is warranted to determine what role *intentions have in predicting behavioral choices* (Rise, Kovac, Kraft, & Moan, 2008; Sheeran, 2002). Research is needed that looks more closely at how intentions change over time and how such changes may impact future behavioral choices.

Purpose of Present Study

This paper describes the development and psychometric validation of four scales created to measure our model's core constructs among a heterogeneous sample of patients with cardiac-related symptoms presenting to an emergency department setting. We conducted factor analyses and calculated internal consistency reliabilities on each of the scales, and repeated this if the measure was taken across more than one time anchor. Construct validity was established through examining the inter-relations between and across the scales. We examined specific hypotheses that were rooted in Self Regulation Theory, our own observations, and the extant literature:

Method

Part One: Measurement Development through a Qualitative Study

During the first phase of developing the measures, we interviewed a sample of 50 tobacco users who were experiencing cardiac-related symptoms, such as chest pain and shortness of breath, to help guide item generation. Research staff used a semi-structured interview to elicit each participant's cognitive and emotional reactions over the course of the health event. The study was approved by each hospital's Institutional Review Board and all subjects consented to participate. Inclusion criteria were: (1) adults 18 years old; (2) presenting with chest pain, chest pressure, shortness of breath, or syncope; (3) having a cardiac evaluation consisting of an electrocardiogram and cardiac enzyme tests; and (4) being an active smoker of 1 cigarette per day. Exclusion criteria were (1) presentation with illicit drug use or alcohol abuse; (2) chest pain resulting from trauma; and (3) inability to participate in an interview (e.g., severe medical illness, cognitive insufficiency, insurmountable language barrier).

Patients were approached close to the end of their medical visit to ensure that the majority of the acute health event had transpired prior to interview. Participants were heterogeneous, and there was a wide range of actual disease severity, from some patients having mild chest pain and being discharged home from the emergency department to some having an acute myocardial infarction resulting in multi-vessel coronary artery bypass graft (CABG) surgery. The items on the semi-structured interview consisted of open-ended and fixed answer (e.g., Yes/No). To reduce bias, the interviews started with broad, open-ended questions before incorporating drill-down questions about specific constructs of interest, including smoking-related causal attributions, perceived illness severity, event-related emotions, and intention to quit smoking. We assessed reactions across the event, including at initial symptom onset, arrival to the hospital, and at time of enrollment. Reflective listening and summative statements were utilized to encourage elaboration in response to the open-ended questions. The semi-structured interviews were digitally recorded. Fifty participants (30 men and 20 women) completed the semi-structured interview. The average age of participants was 51 (± 12) years old, and ranged from 23 to 82 years old. The sample comprised 66% whites and 34% blacks, with 10% identifying themselves as Hispanics. Twenty-five subjects were recruited from the emergency department (and were discharged home), and 25 were recruited from inpatient units to ensure a broad range of medical severity.

Part Two: The Psychometric Study

Procedures—A new sample of subjects was enrolled to examine the psychometric properties of the scales created by the Qualitative Study. The eligibility criteria, settings, methods of approach, and enrollment process were identical to those described in the Qualitative Study.

Participants—Three hundred participants (156 men and 142 women) completed the assessment. Patients were enrolled from both the emergency department ($n = 114$) and from inpatient units ($n=186$). The average age of participants was 52 (± 11.14) years old, and ranged from 20 to 84 years old. The sample comprised 77% whites and 18% blacks, with 4% of the total sample identifying themselves as Hispanic/Latino.

Measures—All subjects completed the four measures (see below). Several of the constructs hypothesized to fluctuate over time were rated across multiple time anchors. In such cases, subjects were told to think about the specific time anchor (e.g., when you first started experiencing symptoms) and rated the same items for each time anchor. Because the multiple ratings were burdensome to subjects, we used discretion in deciding which constructs needed to be repeatedly assessed and how many anchors to use. No more than three anchors were used (symptom onset, hospital arrival, near discharge).

Smoking-related causal attribution: Participants were asked to answer seven questions that tapped into their beliefs about the association between smoking and their current health problem (Table 1). The responses were based on a five-point scale, where one indicated ‘no link’ and five indicated ‘extremely strong link.’ Causal attribution was assessed *only once* and was anchored to the “current health problem” that brought the participant to the hospital. We did not assess causal attribution across more than one time anchor, because our experiences during the Qualitative Study suggested that this is not a construct that fluctuates markedly over short periods.

Perceived illness severity: Perceived illness severity was assessed with eight items and was repeated for three different time anchors: initial symptom onset, arrival to the hospital, and time of enrollment, which generally happened shortly before discharge from the hospital

after the acute nature of the illness had subsided (Table 2). The items were each rated on a five-point Likert-type response scale, where one indicated 'Strongly Disagree' and five indicated 'Strongly Agree.'

Event-related emotions: Event-related emotions were assessed using 11-items assessing a variety of positive and negative emotions, such as fear, sadness, anxiety, and happiness (Table 3). It was administered using the same three time anchors as perceived illness severity. The emotions were each rated on a five-point Likert-type response scale, where one indicated 'Not at All' and five indicated 'Extremely.' Based on our developmental work during the Qualitative Study, we expected there to be two subscales consisting of event-related *negative* emotions and event-related *positive* emotions.

Intention to quit smoking: Intention to quit smoking was assessed using seven items that asked patients about intention to quit smoking using two time anchors: 1) before their health event began, and 2) at the present time (Table 4). We chose to assess intention to quit smoking at only these two time periods because the team's experience suggested that patients do not think about their smoking at symptom onset or at admission to the hospital, because they are preoccupied with their symptoms.

Results

Factor Analyses and Reliability Estimates

Smoking-related causal attribution—Factor analysis showed that one factor solution is most appropriate for this scale (see Table 1). When including all seven items, results showed a borderline acceptable internal consistency estimate ($\alpha = .75$). Removing individual items did not markedly alter the internal consistency.

Perceived illness severity—Exploratory factor analyses were conducted for the perceived illness severity scale using the time anchors of *symptom onset*, at *hospital arrival*, and at *enrollment*. The scree plot tests suggested that a one factor solution was most appropriate for perceived illness severity at all three time anchors. As shown in Table 2, the factor loadings are very similar across time. The internal consistency estimate was also examined at three time points. The alpha coefficients were consistent across the three time points (.82, .81, and .81, respectively).

Event-related emotions—The results from exploratory factor analysis showed two factors at all three time periods. The first factor consisted of eight items that assessed negative emotions such as fear, anxiety, sadness, and anger (event-related *negative* emotions), whereas the second factor appears to tap into positive emotions such as at ease, happy and relaxation (event-related *positive* emotions). The factor structures were very similar at all three time points (Table 3). Cronbach's alphas for the event-related negative emotions scale was strong (.84, .86, .89, respectively). The alphas for event-related positive emotions were weaker (.69, .57, .72, respectively), possibly due to the small number of items in this factor.

Intention to quit smoking—Factor analysis results demonstrated one factor at both time periods with good factor loadings that were consistent across the two assessments (see Table 4). Alphas at both time anchors were in an acceptable range (.82 and .87, respectively).

Validity estimates

Construct ratings over time—For perceived illness severity, the repeated measures ANOVA showed that the scale scores at three times were statistically different ($F(2, 554) =$

16.13, $p < .001$, $\text{partial } \eta^2 = .055$), following a quadratic trend ($F(1, 277) = 40.09$, $p < .001$, $\text{partial } \eta^2 = .126$). As Figure 2 illustrates, perceived illness severity peaked upon hospital presentation. Post hoc analysis revealed that all means were statistically significantly different from each other (for all $p < .05$). These patterns confirmed Hypothesis 1.

Similarly, for event-related emotions, the repeated measures ANOVA indicated that the scale scores at three time points were statistically significantly different for both negative event-related emotions ($F(2, 550) = 111.02$, $p < .001$) and positive event-related emotions ($F(2, 550) = 110.04$, $p < .001$). Both of these constructs followed strong quadratic trends (see Figure 3). For negative event-related emotions, the means at the first two times were not significantly different, but the time three mean rating was substantially lower than the first two. A similar pattern was observed for positive event-related emotions, but in the reverse direction. These patterns confirmed Hypothesis 1.

Finally, the scale score of quit intentions near discharge from the hospital ($M = 3.52$, $SD = .89$) was statistically higher than retrospective ratings of *before* the medical event began ($M = 3.03$, $SD = .87$) ($F(1, 278) = 104.92$, $p < .001$, $\text{partial } \eta^2 = .274$) (see Figure 4). These patterns confirmed Hypothesis 2. The correlation between the two time anchors was strong ($.59$, $p < .001$).

Correlations within and between constructs—Intercorrelations between all included variables were examined (see Table 5). Each repeated measures construct correlated significantly with itself over time. Assessment points that were closer together correlated more strongly than those that were farther away. As expected (Hypothesis 3), perceived illness severity correlated positively with event-related negative emotions and negatively with event related positive emotions. Generally, correlations within ratings of constructs over time (e.g., perceived severity at times one and two) was stronger than correlations between constructs at each time anchor (e.g., perceived severity and event-related negative affect at time one).

Finally, all constructs were statistically related to intention to quit at time two (near discharge) in the expected direction, though the effect sizes were typically small to modest. As would be predicted, the event-related constructs were more closely associated with intention to quit at time two (near discharge) than time one (pre-event).

Discussion

This study set out to develop and establish the psychometric properties of scales to assess both cognitive and affective constructs related to an acute health event. The scales assessing perceived severity, negative emotional reactions, and intention to quit smoking appeared to be reliable, with internal consistencies $>.80$ across all time anchors. Smoking-related causal attributions exhibited marginally acceptable reliability (.75). Positive emotions exhibited the lowest alphas, ranging from .57 to .72. Further exploration will be necessary to confirm the reliability in other samples, and to determine how the reliability of the borderline and underperforming scales might be improved.

In general, construct validity was supported by the factor analyses, which demonstrated stable factor structures across time anchors, and confirmation of the hypothesized relations between the constructs. For example, perceived illness severity was positively correlated with itself over time, and with event-related negative emotions within each time anchor. Put differently, the more serious the event is perceived at one time point, the more serious it is perceived at other time points and the more negative the emotions that are elicited by the event. Perceived illness severity, event-related emotions, and smoking-related causal

attribution were related to intention to quit smoking in the predicted direction, though the magnitude of the relations was generally small to moderate. Interestingly, the variable most strongly related to current intention to quit was retrospectively rated intentions to quit *before* the event. This supports contentions by Boudreaux and colleagues (2011) that background or tension factors are also important to consider when modeling the influence of sentinel events. Further work will be needed to determine how the event-related constructs actually relate to behavior change and whether their effect is partially mediated by quit intentions, as suggested in the conceptual model depicted by Boudreaux and colleagues (2011).

Our results hold two important implications for developing conceptual models to explain how discrete events influence behavior change. First, repeated assessment of constructs over serial time anchors, rather than aggregated or global ratings, should be strongly considered. Multiple time anchors may be necessary to measure some constructs adequately, especially those expected to change rapidly over time like perceptions of severity or emotional reactions. The observed changes in mean ratings over the three time anchors for severity and emotional reactions supports serial assessments. Patients tended to report strong negative emotions at initial symptom onset that persisted through arrival to the hospital but which decreased dramatically towards the end of the visit, while ratings of positive emotions show a reversed pattern. Reinforcing the principle that serial assessments are needed, the correlations across the time anchors within each construct were statistically significant, as we expected, but were not sufficiently large as to suggest the measures were redundant. For example, correlations across time ratings for perceived severity ranged from .41 to .65. Because the scales demonstrated strong factor structures and alpha coefficients across the time anchors (see Tables 1-4), the changes in mean ratings over time and the magnitude of the correlation coefficients were not likely to be due to psychometric insufficiency. The measurement strategy used in this study, though complex and characterized by limitations, such as the potential for retrospective recall bias (e.g., Conway & Ross, 1984), is nevertheless worthy of consideration for future studies seeking to explore health events and behavior change. We currently know little about whether health behavior change is more likely in patients with a particular profile of severity or emotional reactions (e.g., low-low-low vs. high-high-high vs. low-high-low), or if it is simply an average of the various time points, or even a function of the maximum peak rating regardless of when it occurs. Serial assessments are required to shed light on the nuances of these relations.

The second implication of our findings is that both cognitive *and* affective constructs should be included. While negative affect, in general, has typically been regarded as a retardant to change and a promoter of relapse, negative emotional reactions to a sentinel health event may actually be a *motivator* of change. Some novel research has demonstrated that anxiety and a sense of “looming vulnerability” can lead to an increase in smoking cessation attempts (McDonald, O'Brien, Farr, & Haaga, 2010). Others have also shown that level of worry correlated positively with quit attempts, particularly in those with high self-efficacy and strong beliefs in the value of quitting (Dijkstra & Brosschot, 2003). The emotional response to acute illnesses can be complex, as demonstrated by the observed changes in emotions over time and the results of factor analyses that suggested there were two distinct subscales – negative and positive emotions. In our sample, negative emotional reactions, such as fear and anxiety, showed relatively weak but statistically significant associations with quit intentions. The time anchor that showed the strongest relation was the time of arrival to the hospital, which is likely to coincide with their peak arousal. Our findings confirm earlier published findings that emotional reactions to an emergency department visit are positively associated with intention to quit smoking (Boudreaux, Moon, Baumann, Camargo, O'Hea, Ziedonis, 2010).

Conclusion

The assessment scales crafted to measure cardiac/smoking cessation related constructs appear to be worthy of further study. In particular, our measures of perceived illness severity, event-related negative emotions, and intention to quit seemed very strong. Assessment of event-related perceptions and emotional reactions will likely need to be completed serially over the event chronology. Further, the relation between an acute health event and smoking cessation is likely to be very complex and probably depends not only on cognitive perceptions, like illness severity and causal attribution, but also on emotional reactions. Thus, we recommend both be assessed when considering health behaviour changes.

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Figure 1. Hypothetical model of a sentinel health event and smoking

Figure 2. Perceived severity of health event

Time 1 (symptom onset), Time 2 (arrival to hospital) and Time 3 (at time of enrollment, near discharge)

Figure 3. Negative and positive event-related emotions

Legend: Time 1 (symptom onset), Time 2 (arrival to hospital) and Time 3 (at time of enrollment, near discharge)

Figure 4. Intention to quit smoking

Legend: Time 1 (before noticed any symptoms) and Time 2 (at time of enrollment, near discharge)

Table 1
Factor loadings of smoking-related causal attribution scale items

Items	Factor Loading
My current illness is due to a health problem caused by smoking.	.749
Smoking is one of many causes of my health condition.	.746
There is no relationship between my smoking and my current illness. ¹	.581
Smoking is making my health worse.	.568
Quitting smoking could improve my health.	.418
Smoking does not concern me because most smokers die from reasons unrelated to smoking. ¹	.401
My current illness would have happened whether I smoked or not. ¹	.323
% of Variance Explained	32.94%
	Alpha
	.75
	Mean (SD)
	3.55 (.72)

Note. $N = 275$. Items are listed by the size of factor loadings

¹ Reverse-coded Items

Table 2
Factor loadings and psychometric data of perceived illness severity scale items across three time points

Items	Symptom Onset	Hospital Arrival	Near Discharge
My illness is something minor. ¹	.765	.758	.757
My symptoms are something simple. ¹	.700	.694	.752
I am pretty sick.	.689	.690	.694
Something is seriously wrong with me.	.653	.688	.659
I have a life-threatening illness.	.563	.558	.633
My symptoms are probably nothing important. ¹	.560	.520	.502
I should not be too concerned with my symptoms. ¹	.557	.490	.585
This is the worst I've ever felt.	.408	.381	.202
% of Variance Explained	38.55%	37.15%	38.63%
	Alpha		
	.822	.809	.806
	Mean (SD)		
	3.39 (.82)	3.62 (.73)	3.48 (.73)

Note. $N = 275, 280, 267$, respectively. Items are listed by the size of factor loadings.

¹ Reverse-coded items

Table 3
Factor loadings and psychometric data of event-related emotions scale items across three time points

Items	Symptom Onset		Hospital Arrival		Near Discharge	
	F1	F2	F1	F2	F1	F2
Sad	.794	-.236	.746	-.266	.806	-.100
Angry	.674	-.216	.614	-.164	.632	.070
Stressed	.659	.137	.727	.090	.742	.090
Frustrated	.646	-.096	.653	-.012	.737	-.002
Nervous	.594	.313	.698	.188	.800	.033
Hopeless	.593	-.231	.589	-.175	.687	-.132
Afraid	.522	.357	.681	.219	.797	-.012
Anxious	.500	.343	.619	.178	.592	.103
Relaxed	-.153	.780	-.142	.771	-.006	.835
Happy	-.165	.684	-.108	.656	-.055	.655
At ease	-.115	.563	.104	.448	.047	.593
% of Variance Explained	45.31%		45.72%		52.54%	
Correlation between Factors	.420		.339		.382	
	Alpha					
	F1	F2	F1	F2	F1	F2
	.84	.69	.86	.57	.89	.72
Mean (SD)						
F1	F2	F1	F2	F12	F	
2.67 (.89)	1.63 (.78)	2.63 (.94)	1.60 (.69)	2.06 (.92)	2.32 (.90)	

Note. $N = 271$. Higher factor loadings were identified by bold-face. Items are listed by the size of factor loadings at Symptom Onset. Factor 1 coincides with negative emotions and Factor 2 coincides with positive emotion.

Table 4

Factor loadings and psychometric data of the intention to quit smoking scale across two times

Items	Symptom Onset	Hospital Arrival
I intend to quit smoking sometime within the next 30 days.	.801	.832
I intend to keep smoking. ¹	.689	.768
I have decided to quit smoking today.	.665	.722
I will probably continue to smoke. ¹	.637	.696
I am very excited about quitting smoking.	.635	.552
I am highly motivated to quit smoking.	.627	.786
I am not thinking about quitting smoking. ¹	.400	.549
% of Variance Explained	41.75%	50.19%
	Alpha	
	.824	.869
	Mean (SD)	
	3.01 (.87)	3.48 (.90)

Note. $N = 275$. Items are listed by the size of factor loadings.

¹ Reverse-coded items.

Table 5

Correlations between variables included

	Pearson Correlations											
	1	2	3	4	5	6	7	8	9	10	11	12
1. PS1												
2. PS2	3.64	.58										
3. PS3	3.49	.41	.65									
4. NegEmo1	2.69	.34	.32	.34								
5. NegEmo2	2.63	.18	.36	.37	.67							
6. NegEmo3	2.07	.21	.26	.31	.60	.71						
7. PosEmo1	1.63	-.23	-.30	-.20	-.24	-.08	.01					
8. PosEmo2	1.61	-.10	-.35	-.28	-.11	-.31	-.17	.48				
9. PosEmo3	2.32	-.14	-.22	-.25	-.13	-.22	-.37	.20	.42			
10. CA	3.57	.13	.23	.32	.18	.15	.16	-.15	-.11	-.09		
11. QINT1	3.03	.08	.08	.04	.13	.21	.12	.01	-.08	-.01	.17	
12. QINT2	3.51	.12	.24	.28	.15	.23	.10	-.12	-.21	.06	.39	.59

Note. $N = 277 - 282$. All coefficients larger than .12 are significant at .05 and .15 at .01 level. Numbers in the diagonal are Cronbach's alphas. PS(1,2,3) = Perceived Illness Severity at three time anchors; NegEmo(1,2,3) = Event-related negative emotions at three time anchors; PosEmo = Event-related positive emotions at three time anchors; CA = Causal Attribution; QINT(1,2) = Quit Intention at two time anchors.