

# The Instability of Health Cognitions: Visceral States Influence Self-efficacy and Related Health Beliefs

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**Objective:** To determine how visceral impulses, such as hunger and drug craving, influence health beliefs. **Design:** The authors assessed smokers' self-efficacy and intentions to quit while in a randomly assigned state of cigarette craving or noncraving (Study 1), and assessed dieters weight-loss beliefs while hungry or satiated (Study 2). **Main outcome measures:** Self-efficacy, smoking cessation, weight-loss goals. **Results:** The authors found, in both the context of smoking and weight-loss, that participants in a cold (e.g., satiated) state had different health beliefs than participants in a hot state (e.g., hungry). Specifically, in Study 1, the authors found that smokers who experienced cigarette craving had lower self-efficacy than did satiated smokers. Consequently, smokers who craved a cigarette had less intention to quit smoking in the future compared with satiated smokers. In Study 2, the authors found that hungry dieters had less self-efficacy than did satiated dieters. This difference led hungry dieters to form less ambitious future weight-loss goals and view prior weight-loss attempts with more satisfaction. **Conclusion:** These findings contribute to our understanding of the nature of health beliefs and reveal that health beliefs are more dynamic than previously assumed.

**Keywords:** hunger, smoking cessation, self-efficacy, health goals

The modern lifestyle, with its sedentary jobs and supersized portions, often does not make for a healthy lifestyle. Yet the principle obstacle for many types of health behavior is age-old: visceral drives, such as hunger, drug craving, or sexual arousal, make unhealthy behavior difficult to avoid. Visceral drives provide information about the state of the body and direct behavior toward satisfying bodily needs. Hunger, for example, is a visceral sensation that creates a desire for food consumption, particularly for food that is high in caloric energy (i.e., fatty foods). Therefore, for anyone who tries to reduce caloric intake, hunger makes food consumption a daily temptation that can undermine even the most determined plans to lose weight. Health researchers have long understood that visceral drives can be an impediment to healthy behavior, and have conducted extensive research on ways to dampen the corrupting influence of visceral states. Methadone, nicotine patches, and appetite suppressants, for instance, are all methods used to try and reduce the impulsive influence of particular visceral drives.

Although visceral drives have an undeniable influence on health behavior, empirical studies in a number of domains suggest that people often underestimate this influence (Loewenstein, 1996, 2005). More specifically, when people are in a “cold,” affectively neutral state they tend to underestimate the influence of “hot,”

affective states. For example, in a series of studies Nordgren, van der Pligt, and van Harreveld (2006) used visceral states to hinder participants' performance on a variety of tasks. Afterward, they asked participants to indicate how various factors impacted their behavior. They found that when people were in a hot state (e.g., fatigued), they attributed their behavior primarily to the visceral influence, whereas when people were in a cold state (e.g., nonfatigued), they underestimated the influence of the visceral state and instead attributed behavior primarily to dispositional factors.

In a study designed to test the impact of drug craving on decision-making, heroin users were asked to indicate how much money they would be willing to pay for the heroin substitute Buprenorphine (Badger et al., in press). They found that heroin addicts would value an extra dose of Buprenorphine more highly when they were craving heroin than when they were currently satiated.

The “empathy gap” effect has also been shown to have important implications for people's perception of control. For example, Nordgren, van der Pligt, and van Harreveld (2007) conducted an experiment in which participants watched a video of a man who binge eats. Participants, half of who were hungry and half of who were satiated, were then asked to evaluate the man's (impulsive) behavior. They found that hungry participants made more favorable evaluations of the binge eater than satiated participants. This effect was found to be due to differences in perceptions of control. Unlike hungry participants, satiated participants were under the illusion that hunger craving was easy to control, and therefore perceived binge eating to be undertaken freely (and thus blame-worthy).

In the present study, we examine whether visceral states similarly influence people's perceptions of control over their own health behavior. Control perceptions are crucial to the initiation and maintenance of healthy behavior (Bandura, 1986). For exam-

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ple, research has shown that self-efficacy (i.e., the belief that one can produce a desired effect) influences both weight loss (Schwarzer & Renner, 2000) and smoking cessation (Borland, Owen, Hill, & Schofield, 1991).

On the basis of the hot–cold empathy gap literature we can form two hypotheses about the relationship between visceral states and self-efficacy beliefs. First, we predict that self-efficacy beliefs will vary with one’s visceral state. For example, as a smoker’s urge for nicotine shifts throughout the day between craving and satiation, we expect smokers’ self-efficacy beliefs to fluctuate accordingly. Second, we predict that people will have higher self-efficacy beliefs when in a cold state than when in a hot state. Thus, a smoker should have more confidence that she can quit smoking when she is satiated than when she is craving nicotine.

Of importance, differences in self-efficacy beliefs should, in turn, influence health beliefs that are related to self-efficacy, such as future behavioral intentions (Bandura, 1982). For instance, if satiated dieters believe weight loss is easy to achieve, they should consequently intend to lose more weight compared with hungry dieters who perceive weight loss to be difficult.

### The Present Studies

In two studies, we examined the influence visceral states have on self-efficacy and related health beliefs. We tested this prediction in the context of weight loss and smoking cessation. We expected that participants’ self-efficacy beliefs would vary with their visceral state. More specifically, we expected that people in a hot state (i.e., experiencing hunger or cigarette craving) would have lower self-efficacy ratings than would participants in a cold state. Furthermore, we predicted that differences in self-efficacy would lead to differences in health beliefs related to self-efficacy, such as behavioral intentions.

#### Study 1

The goal of this study was to examine the influence of cigarette craving on self-efficacy and related beliefs. We randomly assigned smokers to either a state of craving or satiation, and then asked them to evaluate how confident they were they could quit smoking (self-efficacy) and indicate their intention to quit smoking (quit intentions). We predicted that self-efficacy and quit intentions would be influenced by smokers’ level of cigarette craving. Specifically, we predicted that satiated smokers would be more confident in their ability to quit smoking than would craving smokers, which, in turn, would lead satiated smokers to form more ambitious quit intentions compared to craving smokers.

#### Method

##### Participants

Sixty-nine smokers (33 men and 36 women) participated for course credit or for money. Participants had to smoke more than five cigarettes per day to be eligible for participation. Participants, who ranged from 18 to 51 years of age, were primarily students and employees of the University of Amsterdam.

##### Procedure

Smokers were recruited through sign-up sheets posted on campus. After signing up for participation, smokers were contacted by

phone several days before the experiment to receive condition assignment. Participants in the satiated condition were asked to smoke at least one cigarette no longer than 15 minutes before the experiment. Participants in the craving condition were asked to abstain from smoking for at least two hours before the experiment. Participants from both conditions were also required to bring one of their own cigarettes with them to the laboratory.

Participants performed the experiment in a computer lab with individual cubicles. Participants in the craving condition began the experiment by watching a 10-min video clip intended to induce cigarette craving. The clip, from the movie *Coffee and Cigarettes*, depicts a conversation between two people about their love of cigarettes. We chose this clip because during the conversation the people smoke continuously, and the camera is often focused tightly on the inhaling and exhaling of cigarette smoke. To further encourage cigarette-craving, smokers held one of their own (unlit) cigarettes in their mouth while they watched the film clip. Afterward, participants filled out a short questionnaire about smoking cessation. Participants in the satiated condition did not watch the film clip and began directly with the smoking cessation questionnaire.

##### Materials

The questionnaire contained four sets of measures: smoking history, cigarette craving, self-efficacy beliefs, and intentions to quit smoking.

*Smoking history.* We assessed participants’ smoking frequency by asking them to indicate “How many cigarettes do you smoke a day?” on a 1 (*less than 5*) to 5 (*more than 20*) point scale. We also assessed whether participants had attempted to quit smoking in the past by asking, “Have you ever attempted to quit smoking?” on a dichotomous “yes” or “no” scale. The two conditions did not statistically differ by either of these two items.

*Cigarette craving.* We assessed participants’ level of cigarette craving by asking them to indicate, “How much craving do you currently have for a cigarette” on a 1 (*no craving*) to 7 (*extreme craving*) point scale. To ensure that participants followed our instructions for condition assignment, we asked participants to report, “How long ago did you last smoke?” on a 1 (*less than a half-hour ago*) to 4 (*more than two hours ago*) scale.

*Self-efficacy.* We assessed participants’ confidence in their ability to quit smoking with three questions: (a) “I can easily quit smoking,” (b) “I have control over my cigarette cravings,” (c) “The impulse to smoke is difficult to resist” (reverse scored) ( $\alpha = .87$ ). These items were measured on a 7-point scale ranging from *strongly disagree* to *strongly agree*.

*Quit intentions.* We asked participants one question to assess their intention to quit smoking. “In three years I will no longer smoke cigarettes.” This item was measured on a 7-point scale ranging from *strongly disagree* to *strongly agree*.

## Results and Discussion

### Manipulation Check

Participants complied with the requirements for condition assignment, as smokers in the satiated condition reported have a cigarette more recently ( $M = 1.08$ ,  $SD = 0.36$ ) than smokers in the

craving condition ( $M = 3.47$ ,  $SD = 0.76$ ),  $F(1, 68) = 79.08$ ,  $p < .001$ ,  $\eta^2 = .81$ . The manipulation itself was successful as smokers in the craving condition reported experiencing more cigarette craving ( $M = 5.50$ ,  $SD = 1.07$ ) than smokers in the satiated condition ( $M = 2.84$ ,  $SD = 1.36$ ),  $F(1, 68) = 79.08$ ,  $p < .001$ ,  $\eta^2 = .54$ .

### Smoking Cessation Beliefs

As expected, smokers in the craving condition had less self-efficacy ( $M = 3.04$ ,  $SD = .89$ ) than smokers in the satiated condition ( $M = 3.86$ ,  $SD = 1.25$ ),  $F(1, 68) = 9.34$ ,  $p = .003$ ,  $\eta^2 = .12$ . Moreover, we found that smokers in the craving condition had less intention to quit smoking in three years time ( $M = 4.46$ ,  $SD = 1.64$ ) than did smokers in the satiated condition ( $M = 5.27$ ,  $SD = 1.57$ ),  $F(1, 68) = 4.26$ ,  $p = .04$ ,  $\eta^2 = .06$  (see Figure 1).

### The Mediating Role of Self-efficacy

We next examined our prediction that self-efficacy mediates the effect of craving state on quit intentions. The necessary conditions for mediation were first established: cigarette craving was negatively correlated with quit intentions,  $r(68) = -0.47$ ,  $p < .001$ ; craving state was negatively correlated with self-efficacy,  $r(68) = -0.34$ ,  $p = .005$ ; and self-efficacy was positively correlated with quit intentions,  $r(68) = 0.54$ ,  $p < .001$ . As predicted, the correlation between craving state and quit intentions was significantly reduced when the mediating variable—self-efficacy—was statistically controlled,  $z = -3.02$ ,  $p = .003$ .

This study demonstrates that how smokers think about smoking is influenced by their momentary state of cigarette craving. In line with research on the hot–cold empathy gap, we found that, compared to satiated smokers, smokers who were craving cigarettes had less confidence in their ability to quit smoking. Differences in self-efficacy, in turn, led smokers who were craving cigarettes to have less intention to quit smoking compared to satiated smokers.

These findings add to a number of studies that have shown that visceral states can influence health beliefs (Ditto, Pizarro, Epstein, Jacobson, & MacDonald, 2006). For example, earlier research has found that sexual arousal influences people's risk perception of having unprotected sex (Blanton & Gerrard, 1997) and influences people's intentions to commit sexually aggressive acts (Loewen-

stein, Nagin, & Paternoster, 1997). Yet the findings from Study 1 are the first to demonstrate a link between visceral states and self-efficacy beliefs.

This study supports the idea that health beliefs are dynamic constructs. The widespread use of health cognitions as a way of predicting subsequent behavior benefits from the assumption that health beliefs change little over time. Yet our findings suggest that two beliefs central to smoking cessations—self-efficacy and intentions to quit—vary with a smoker's state of craving.

A limitation of this study is that it focused on smoking cessation beliefs using a sample of smokers who were not necessarily trying to quit smoking. One possibility is that cigarette craving so readily influenced cessation beliefs because these beliefs were not well established. One of the goals of Study 2, therefore, was to replicate these effects in a sample that was actively engaged in behavioral change.

## Study 2

In Study 2 we sought to replicate the findings from the previous study in the context of another important health behavior—weight loss. To do that, we assessed the weight-loss beliefs of dieters from a commercial weight-loss program. Along the same lines as Study 1, we expected dieters' hunger state to influence their beliefs about the weight loss process. Specifically, we expected that hungry dieters would have less confidence in their ability to diet effectively than would satiated dieters. Furthermore, we predicted that differences in self-efficacy would not only influence weight-loss intentions (as in Study 1), but would also influence satisfaction with past behavior. We reasoned that a dieter who is self-confident should apply a more rigorous standard to interpret past weight-loss efforts. In other words, if dieting is perceived to be very easy, one should expect more from past weight-loss attempts than if dieting is perceived to be very difficult. Overall, we expected that satiated dieters would have higher self-efficacy than hungry dieters, which, in turn, would lead satiated dieters to set more ambitious future weight-loss goals and be less satisfied with their past weight-loss efforts.

Lastly, we tested the notion that weight loss beliefs are sensitive to the degree of the hunger state. Previous research (Nordgren et al., 2006) has found that empathy gaps exist not only between cold and hot states, but also between hot and hotter states. In line with those findings, we expected to find differences not only between satiated and hungry dieters but also between dieters who were mildly and moderately hungry.

### Method

#### Participants and Procedure

A pen-and-paper questionnaire was administered to 307 (297 women and 10 men) members of a commercial weight loss program. Dieters were asked to participate after they had been weighed and were waiting for the program to start. The age of the participants ranged from 21 to 79 years ( $M = 43$ ). Their mean height was 169 cm (range = 150–198,  $SD = 7$  cm), their mean weight was 85 kg (range = 55–157 kg,  $SD = 15$  kg). Their mean BMI was 29.7 kg/m<sup>2</sup> (range = 21.5–48.5,  $SD = 4.8$ ), which is just within the overweight range, bordering on obesity. In the previous

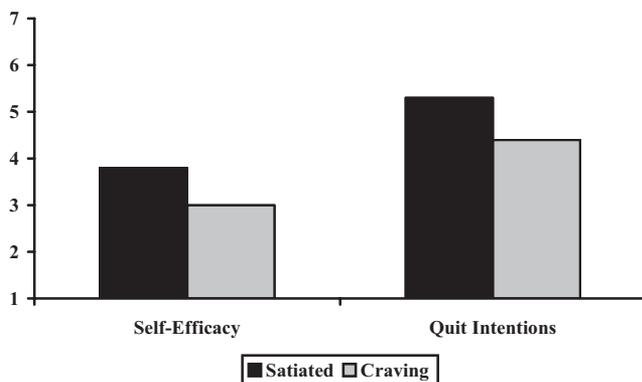


Figure 1. (Study 1): Mean self-efficacy and weight-loss intention ratings by condition (satiated and craved smokers).

week dieters lost an average of 5.16 metric ounces (ranging from a weight gain of 29 ounces to a weight loss of 38 ounces).

**Materials**

The questionnaire contained five components: hunger state, diet history, self-efficacy, weight-loss intentions, and satisfaction with past dieting performance.

**Hunger state.** We used two items to assess dieters current hunger state. Participants were asked to consider "How hungry are you right now?" on a 7-point scale from (1) *not at all hungry* to (7) *very hungry*, and "At the moment, do you have less or more hunger than average?" on a 7-point scale from (1) *much less hunger* to (7) *much more hunger*. The two items were combined to form the current hunger index ( $\alpha = .84$ ). We used this scale to assign participant to hunger state categories. Participants with a score of two or less on the hunger state scale were labeled "satiated" ( $N = 89$ ). Participants with a score on the hunger state scale in between 2 and 6 were labeled "mildly hungry" ( $N = 167$ ), and participants with a score on the hunger state scale of 6 or higher were labeled "moderately hungry" ( $N = 51$ ).

**Diet history.** We asked participants to indicate, "How long have you been on this particular diet?" on a 7-point scale from (1) *less than a week* to (7) *over two years*.

**Self-efficacy.** The self-efficacy questions were developed to measure participants' confidence in their ability to lose weight. Self-efficacy was measured on a 7-point scale ranging from *strongly disagree* to *strongly agree* and contained the following four questions: (a) "I find it hard to stick to my diet," (reverse scored) (b) "I can easily control my appetite," (c) "I can resist tempting foods," and (d) "I am able to restrain myself" ( $\alpha = .83$ ).

**Satisfaction with past outcome.** We used two items to assess dieters' satisfaction with last week's diet outcome ( $\alpha = .81$ ). "I consider last week's outcome to be" (-3) *very bad* to (+3) *very good*, and "I consider this outcome to be" (-3) *very disappointing* to (+3) *very satisfying*.

**Weight-loss intentions.** Finally, we asked dieters to indicate "How much weight do you plan to lose next week?" and dieters were given a space to fill in their weight loss intention. Participants indicated their weight-loss goals in metric ounces. Ten metric ounces are equivalent to one kilogram. We then asked dieters to indicate, "How likely is it that you will attain your goal?" measured on a 7-point scale ranging from (1) *very unlikely* to (7) *very likely*.

**Results and Discussion**

We predicted that dieters' weight-loss beliefs would differ with their momentary state of hunger. To test this prediction, we performed a series of analyses of variance (ANOVAs) with planned linear contrasts, examining whether, for example, satiated dieters (+1) had higher self-efficacy scores than mildly hungry dieters (0) and whether mildly hungry dieters would have higher self-efficacy scores than moderately hungry dieters (-1). Before testing these predictions, we first checked whether there were any background differences between the three groups. We found no differences between average weight, BMI, diet history, or previous week's weight-loss outcome.

**Self-efficacy**

We first examined the prediction that satiated dieters would have great self-efficacy than would hungry dieters. Across conditions we found that satiated dieters ( $M = 5.06$ ,  $SD = 1.40$ ) were more confident in their ability to diet than were mildly hungry dieters ( $M = 4.49$ ,  $SD = 1.46$ ) and moderately hungry dieters ( $M = 3.74$ ,  $SD = 1.11$ ),  $F(2, 306) = 13.82$ ,  $p < .001$ ,  $\eta^2 = .08$ . Individual means all significantly differed from each other. In all further analyses, individual means all differed from each other unless otherwise noted.

**Weight-loss Intentions**

We asked dieters to indicate how much weight they intended to lose next week and indicate how likely it is that they would achieve their goal. As expected, satiated dieters intended to lose more weight in the next week of their diet ( $M = 9.00$  ounces,  $SD = 4.30$ ) than mildly hungry dieters ( $M = 7.76$  ounces,  $SD = 3.84$ ) and moderately hungry dieters ( $M = 5.70$  ounces,  $SD = 2.70$ ),  $F(2, 306) = 11.54$ ,  $p < .001$ ,  $\eta^2 = .07$ . Not only did satiated dieters intend to lose the most weight, satiated dieters were also more confident they would achieve their goal ( $M = 5.78$ ,  $SD = 1.41$ ) than were mildly hungry dieters ( $M = 4.80$ ,  $SD = 1.68$ ) and moderately hungry dieters ( $M = 3.84$ ,  $SD = 1.65$ ),  $F(2, 306) = 24.71$ ,  $p < .001$ ,  $\eta^2 = .14$  (See Figure 2).

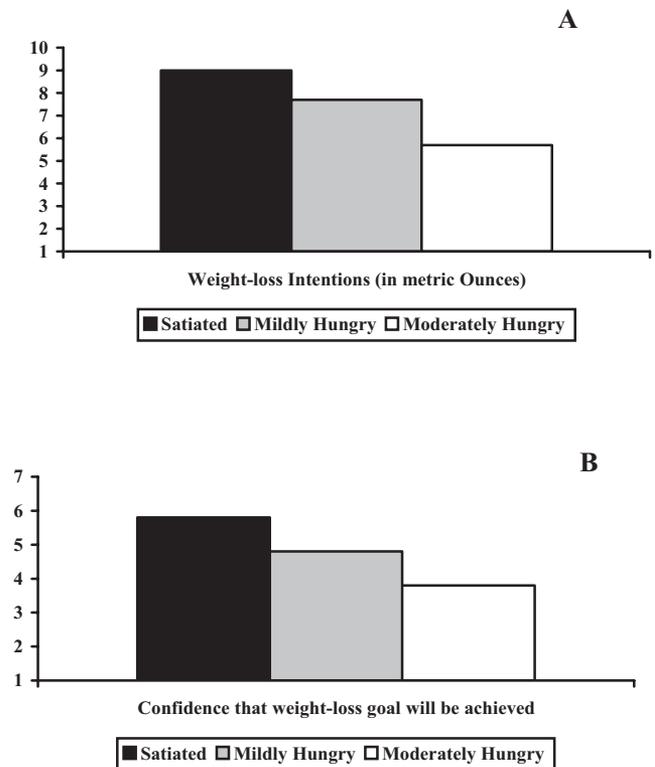


Figure 2. (Study 2): Mean rating of (A) weight-loss goals and mean rating of (B) confidence that weight-loss goals can be achieved by condition (satiated, mildly hungry, and moderately hungry dieters).

In the previous week, the dieters lost on average 5.16 ounces. We used last week's average weight outcome to make a rough approximation of how accurate or realistic dieters' weight-loss goals were for the following week (An instructor of the weight-loss program also confirmed that an average weight-loss of 5.16 ounces was typical for dieters in the program). Satiated dieters aimed to lose almost four ounces more than they had actually lost in the previous week ( $M = 3.82$ ),  $t(83) = 8.10$ ,  $p < .001$ , and mildly hungry dieters aimed to lose almost three ounces more than they had actually lost in the previous week ( $M = 2.73$ ),  $t(165) = 9.16$ ,  $p < .001$ . The weight-loss goals set by the moderately hungry dieters did not statistically differ from their actual weight-loss outcomes in the previous week,  $p = ns$ , suggesting that moderately hungry dieters set realistic weight-loss goals.

### Satisfaction With Past Performance

We next examined the prediction that satiated dieters would be least satisfied with last week's weight loss outcome. As expected, we found that satiated dieters ( $M = 2.91$ ,  $SD = 1.78$ ) were less satisfied with last week's diet performance than were mildly hungry dieters ( $M = 3.92$ ,  $SD = 1.42$ ) and moderately hungry dieters ( $M = 5.05$ ,  $SD = 1.21$ ),  $F(2, 305) = 32.74$ ,  $p < .001$ ,  $\eta^2 = .18$  (See Figure 3).

### Mediating Role of Self-Efficacy

Finally, we examined whether self-efficacy carried the effect of hunger state on weight-loss intentions and satisfaction with prior weight-loss outcomes. The necessary conditions for mediation were first established: hunger was negatively correlated with the weight-loss intentions,  $r(307) = -0.42$ ,  $p < .001$ , and was positively correlated with satisfaction with past outcomes  $r(307) = 0.41$ ,  $p < .001$ ; hunger was negatively correlated with self-efficacy,  $r(307) = -0.29$ ,  $p < .001$ ; and self-efficacy was positively correlated with weight-loss intentions,  $r(307) = 0.34$ ,  $p < .001$  and negatively correlated with satisfaction with past outcomes,  $r(307) = -0.23$ ,  $p < .001$ . As predicted, the correlation between hunger state and weight-loss intentions was significantly reduced when self-efficacy was statistically controlled,  $z = -3.68$ ,  $p < .001$ . Likewise, the correlation between hunger state and

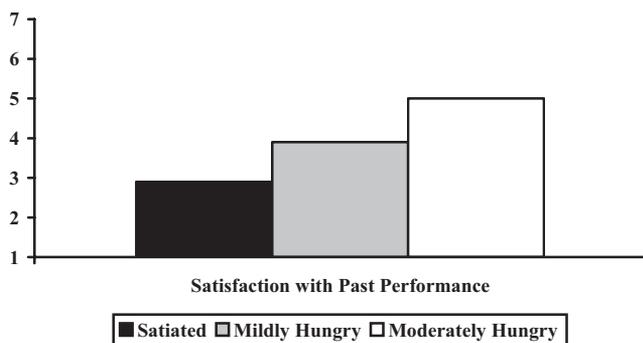


Figure 3. (Study 2): Mean rating of satisfaction with past weight-loss outcome by condition (satiated, mildly hungry, and moderately hungry dieters).

satisfaction with past weight-loss efforts was significantly reduced when self-efficacy was statistically controlled,  $z = 2.03$ ,  $p = .04$ .

This study replicates the finding that visceral states influence people's health beliefs. We found that an increase in hunger was associated with lower diet-efficacy. This difference, in turn, led to changes in health beliefs about both past and future weight-loss attempts. We found that satiated dieters set higher (and more unrealistic) weight-loss goals and were less satisfied with prior weight-loss efforts than were hungry dieters.

### General Discussion

Visceral impulses such as hunger and drug craving have a well-known influence on health behavior. The present study explored the notion that visceral states also influence people's health beliefs. This prediction was based on the hot/cold empathy gap effect—the finding that people generally overestimate the amount of control they have over visceral states. In line with this finding, we found, in both the context of smoking and weight loss, that participants in cold states had higher self-efficacy than did participants in hot states.

Moreover, we predicted that differences in self-efficacy would influence related health beliefs. This prediction was based on the idea that differences in self-efficacy would create different standards by which people set goals and evaluate their past efforts. In Study 1, for example, we found that satiated smokers set more ambitious smoking cessation goals than did craving smokers. In Study 2, we found that the more hungry a dieter was, the more satisfied she was with her past weight-loss efforts. Likewise, we found that the more hungry a dieter was the less weight she intended to lose in the future and the less certain she was that she could attain her weight-loss goal.

An important contribution of these findings is that they reinforce the notion that health cognitions are dynamic constructs. The fact that primary health beliefs, such as weight-loss goals and smoking cessation intentions, change throughout the day has implications for researchers who rely on health cognitions to predict behavior. At the very least, it would seem that researchers should include visceral states in their assessments and, in a longitudinal design, try to ensure that participants are assessed during similar visceral states (immediately after a meal, e.g.). Health researchers may take a further step and measure health cognitions while people are in a hot, visceral state. Although strong visceral states may be infrequent, in our view it is precisely these moments that provide crucial tests of people's ability to maintain their health plans. For example, it could well be that weight-loss beliefs in a hunger state serve as better predictors of future weight-loss outcomes than weight-loss beliefs formed in a satiated state.

The dynamic nature of health beliefs also provides new evidence for why healthy behavior can be so elusive. Research on self-control has shown that setting clear, stable standards is crucial for overcoming temptation (Baumeister & Heatherton, 1996). Setting stable standards is important because it allows for clear decision rules (e.g., I don't eat after 9 p.m.). Stable standards also allow for better preparation and planning. That is, it is much easier to develop a weight loss program when the goal is clear and consistent (e.g., lose five pounds in 30 days) than if the goal is poorly defined and inconsistent. Yet our findings suggest that dieters' and smokers' goals fluctuate with their visceral states.

Research on a wide range of health behaviors has found that people have a tendency to set unrealistic health goals. Prior explanations for this effect have been rooted in motivational theories (e.g., setting and contemplating ambitious goals is pleasurable). Polivy and Herman (2000) for example argue that people set unrealistic goals in order to enjoy a sense of control. The present findings, however, suggest that unrealistic goals are not only rooted in motivational reasoning but also in biased judgment—people enjoy a false sense of control and consequently set unrealistic goals.

This research also contributes to our understanding of self-efficacy. Self-efficacy is often regarded as an unqualified good for health behavior. The present study, however, seems to suggest that too much self-efficacy—or what might be thought of as overconfidence—can be problematic. We found that participants with the highest self-efficacy set the most unrealistic goals. Although there is some dispute over whether unrealistic goals are problematic or not, the consensus of evidence seems to suggest that unrealistic goals can be problematic (Foster, 1995; Brunnermeier, Markus, & Parker, 2005). We also found that higher self-efficacy led to less satisfaction with previous weight-loss attempts. Many people spend quite a large portion of their life battling against unhealthy behavior. To view such sustained efforts with dissatisfaction would seem to have harmful consequences for personal well-being, and may help to explain why dieters often develop lower self-esteem (Polivy, Heatherton, & Herman, 1988).

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