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Research Article

Avoiding poor health or approaching good health: Does it matter? The conceptualization, measurement, and consequences of health regulatory focus☆

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Abstract

This research presents a new scale, the health regulatory focus scale, which measures an individual's tendency to use promotion or prevention strategies in the pursuit of health goals. We conducted five studies in France to develop the scale which is made up of two subscales for prevention and promotion. We also tested the scale's psychometric properties and demonstrated its two-factor dimensionality, internal and test–retest reliability, and convergent, nomological, predictive and discriminant validity. The health subscales showed good predictive validity in that they correlated with health behaviors better than the general regulatory focus subscales. For instance, health promotion focus predicted dentist visits while general promotion focus did not, and health prevention focus predicted the use of prescription and over-the-counter drugs while general prevention focus did not. Also as expected, general prevention focus predicted avoidance of risky vacation behaviors while health prevention focus did not. The health subscales either did not correlate or correlated weakly with positive and negative affectivity and general risk aversion indicating good discriminant validity. The one-year test–retest reliabilities were adequate for both subscales.

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Keywords: Regulatory focus; Health behavior; Motivation; Measurement scale

Introduction

Health is a vitally important issue for consumers, firms, public authorities and societies globally. All over the world individuals and groups regularly experience opportunities, threats, benefits and costs related to health. One global health issue is that many consumers do not avail themselves of or cannot afford adequate medical and/or dental care. For instance, there were close to 1 million visits to emergency rooms for preventable dental

conditions and about 17 million low-income children that lacked dental care in the U.S. in 2009 (Sanders, 2012). Another global health issue is that consumers are often noncompliant even when they are under medical or dental care. For instance, the World Health Organization estimates that globally more than 50% of all medications are prescribed or dispensed inappropriately, and that 50% of patients do not take their medications correctly (WHO, 2010).

Yet another global issue is that consumers increasingly engage in self-help health behaviors pertaining to diet, exercise and medication. For instance, the use of over-the-counter dietary supplements has been rising steadily and currently over 50% of adults use supplements in the U.S. (Gahche et al., 2011). Also, sales of organic food and beverages have grown dramatically to \$26.7 billion in the U.S. (Organic Trade Association, 2011) and

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\$54.9 billion globally (Willer & Kilcher, 2011), due in part to the belief that organic is healthier.

These health opportunities and risks have one important factor in common: they stem from individual consumers' health-related decisions and behaviors which in turn often reflect their motivational states. Whether consumers avail themselves of medical or dental care, comply with that care, and/or engage in self-help related to health often depends in part on whether consumers are motivated to engage in these behaviors or not. And this may depend on their health regulatory focus and specifically whether they are motivated by health gains indicating a promotion focus, or by avoiding health losses indicating a prevention focus. Regulatory focus theory (Higgins, 1997) has been developed to explain these two fundamentally different motivational states and the effects on decision-making and behavior; and general measures of regulatory focus have been developed as well (e.g., Higgins et al., 2001). However, the objective of this paper is to introduce a domain-specific health regulatory focus measure because we believe that such a measure is needed for the vitally important area of human health.

Regulatory focus theory posits that people experience one of two motivational states at any one time, and that these states influence the strategies people use when they pursue goals (Higgins, 1997). Specifically, regulatory focus theory proposes that the human motivational system is based on two different needs: the need for nurturance resulting in a promotion focus, and the need for security resulting in a prevention focus (Higgins, 2002). The theory further proposes that promotion focused people tend to adopt approach strategies in life; they seek gains and opportunities for advancement and achievement. In contrast, prevention focused people tend to adopt avoidance strategies; they concentrate on avoiding losses and averting threats to their safety and security (Avnet & Higgins, 2003; Higgins, 1997, 2002).

Although researchers have generally assumed that regulatory focus is invariant across disparate domains including health (Fuglestad, Rothman, & Jeffery, 2008; Keller, 2006; Lee & Aaker, 2004), some studies that used general measures of regulatory focus in the health domain did not find the results they expected (Schokker et al., 2010; Uskul, Keller, & Oyserman, 2008; van Kleef, van Trijp, & Luning, 2005; Vartanian, Herman, & Polivy, 2006). This might be because the health domain involves novel situations (e.g., doctor's visits) that are not necessarily captured by general measures of regulatory focus. Or this might be because general measures of regulatory focus have some shortcomings (Fellner, Holler, Kirchler, & Schabmann, 2007; Summerville & Roese, 2008). For instance, the two main measures that are used to measure general regulatory focus have been found to be poorly correlated (Summerville & Roese, 2008) and to suffer from low convergent validity (Haaga, Friedman-Wheeler, McIntosh, & Ahrens, 2008).

There are also theoretical reasons to believe that people may experience regulatory focus differently in the health domain. For instance, general regulatory focus is shaped during the early stages of development, particularly during childhood, and interactions with family members are therefore essential to the development of this motivational system (Higgins, 1997). However, past research indicates that health selves are often

shaped during midlife (Hooker & Kaus, 1992) when interactions involve a larger and more complex social world. Therefore, it is theoretically possible for an individual to be promotion oriented in general but prevention oriented when it comes to health issues or vice versa; and therefore general measures of regulatory focus might not accurately capture their health regulatory focus.

Consumer researchers have already applied regulatory focus theory to the health domain and have shown that general regulatory focus affects health behavior change (Fuglestad et al., 2008). However, virtually most of this research has used priming techniques to induce a temporary prevention or promotion orientation (e.g., Keller, 2006). Although this body of research is extremely important, it can be difficult for policy makers to use these priming techniques in applied settings. Thus our goal was to develop a measure of chronic health regulatory focus that can help researchers, practitioners, marketers and advertisers target their messages and interventions more effectively at two fundamentally different types of consumers, those who are health prevention focused and those who are health promotion focused.

We define chronic health regulatory focus as a chronic tendency or an enduring predisposition to adopt avoidance or approach self-regulatory strategies when pursuing health-related goals. Specifically, health promotion focused consumers are concerned about improving their health state or attaining health-related gains, whereas health prevention focused consumers are concerned about protecting their health state or avoiding health-related losses.

We believe that our new health regulatory focus measure can facilitate research in the health area because our measure should be more sensitive to health-related phenomenon. Several published studies in the health domain have not found some of the hypothesized effects for regulatory focus and this may be because general regulatory focus measures were used. In a recent study for instance, Schokker and colleagues did not find the expected interaction effect for regulatory focus on motivation to participate in a diabetes program (Schokker et al., 2010). The researchers studied diabetes sufferers, and used the general promotion/prevention scale after removing the more academic items that were developed for students. Nevertheless, the researchers were unable to confirm their hypothesis that promotion focus participants would be more motivated to manage their diabetes when exposed to positive role models if they had high self-efficacy (Schokker et al., 2010).

Using the promotion/prevention scale, Vartanian et al. (2006) did not find the expected effects of regulatory focus on dieting. Specifically, they failed to confirm their hypotheses that promotion focused consumers would engage in more promotion-related dieting behaviors (e.g. planning their diet and limiting daily intake), and that prevention focused consumers would engage more on prevention-related dieting behaviors (e.g. avoiding overeating and avoiding dessert). Finally, Uskul and colleagues did not find the expected relationship between prevention focus and worrying about ill health (Uskul et al., 2008). At least some of these results might possibly have been significant if a health related regulatory focus measure had been used instead of a general regulatory focus measure.

Our research introduces and validates a domain-specific health regulatory focus scale consisting of two subscales that

measure health prevention focus and health promotion focus. We show that individuals have either a chronic health prevention or promotion focus, that their health focus predicts many health behaviors, and that health regulatory focus is weakly correlated with a general prevention or promotion focus. Efforts to develop domain-specific regulatory focus scales for other domains are already underway. For instance, recent research has developed and tested an employee-specific scale that outperforms general regulatory focus scales in predicting employee behavior (Neubert, Kacmar, Carlson, Chonko, & Roberts, 2008). Likewise, our research shows that our new health regulatory focus scale outperforms general regulatory focus scales in predicting health behaviors.

Theoretical background

Regulatory focus theory posits that two different motivational systems may operate during goal pursuit (Higgins, 1997). When needs for nurturance are salient, people tend to be promotion focused; that is, they focus on approaching gains and seeking out opportunities for advancement and achievement. When needs for security are salient, people tend to be prevention focused; that is, they focus on avoiding losses and averting hazards and threats to safety (Avnet & Higgins, 2006). Prevention and promotion foci activate different neurological structures. Prevention focus is associated with higher activity in the right prefrontal cortex, whereas promotion focus is associated with higher activity in the left prefrontal cortex (Amodio, Shah, Sigelman, Brazy, & Harmon-Jones, 2004).

Regulatory focus is dispositional and chronically accessible but it can also be temporarily primed. Chronic regulatory focus is believed to be a response to specific experiences during childhood (Higgins, 1997) including cultural experiences (Lee, Aaker, & Gardner, 2000). In addition, regulatory focus can be primed by manipulating salient needs (Crowe & Higgins, 1997), target goals (Freitas, Liberman, & Higgins, 2002), or message frames (Zhu & Meyers-Levy, 2007).

Regulatory focus influences consumer behavior by altering the use of goal pursuit information and strategies. For example, promotion focused consumers heavily weight information related to accomplishment and advancement, whereas prevention focused consumers favor information about security and protection (Pham & Higgins, 2005). In addition, promotion focused consumers tend to rely on positive information (Wang & Lee, 2006) and affective information (Pham & Avnet, 2004) whereas prevention focused consumers tend to rely on negative and objective information. Further, regulatory focus influences how people represent information, with promotion focused consumers representing objects at a higher and more abstract level and prevention focused consumers representing objects at a lower and more concrete level (Lee, Keller, & Sternthal, 2010).

Regulatory focus theory appears to be particularly relevant in the health domain. Many health behaviors seem to be directed toward the avoidance of a negative state or “feared self” reflecting a prevention focus, or toward the approach of a positive state or “hoped self” reflecting a promotion focus (Sullivan & Rothman, 2008). However, a domain-specific health regulatory focus scale

might be better able to measure health foci and predict health behaviors than the more general regulatory focus scales.

Limits of general regulatory focus scales and the need for a health specific scale

The most commonly used measures to assess general regulatory focus are the regulatory focus questionnaire and the promotion/prevention scale (Summerville & Roese, 2008). The regulatory focus questionnaire (Higgins et al., 2001) is composed of two subscales that assess promotion and prevention pride. Consumers with a history of success in attaining promotion goals develop pride about their accomplishments and use eagerness to propel themselves towards attaining new goals. On the other hand, consumers with a history of success in attaining prevention goals develop pride about avoiding hazards and use vigilance as a means to realize new goals. The alternative promotion/prevention scale (Lockwood, Jordan, & Kunda, 2002) was developed to examine the influence of negative and positive role models on undergraduate students, primarily regarding their pursuit of academic goals.

Recent studies question the reliability of these scales, however (Fellner et al., 2007; Haws, Dholakia, & Bearden, 2010; Summerville & Roese, 2008). These studies indicate that the regulatory focus questionnaire and the promotion/prevention scale are poorly correlated (Summerville & Roese, 2008) and suffer from low convergent validity (Haaga et al., 2008; Haws et al., 2010). Further, the items about the importance of obligations and duties might actually be measuring collectivism (Ouschan, Boldero, Kashima, Wakimoto, & Kashima, 2007).

Extant research suggests that a one-size-fits-all approach to measurement scales has several limitations (Bandura, 2006). Most importantly, general domain measures may not fully capture phenomena in specific settings (Bearden, Hardesty, & Rose, 2001). For instance, a scale measuring consumer emotional ability outperforms the domain-general alternative when applied to consumer contexts (Kidwell, Hardesty, & Childers, 2008). Correspondingly, many domain-specific health scales have been developed that outperform more general measures. Examples of domain-specific health scales include health locus of control (Wallston, Strudler Wallston, & DeVellis, 1978), attitude toward risk in the health domain (Weber, Blais, & Betz, 2002), and health self-efficacy (Anderson, Winett, & Wojcik, 2000; Colletti, Supnick, & Payne, 1985).

We believe that a domain-specific health regulatory focus scale is needed for several reasons. First, although child-caregiver interactions mold the initial regulatory focus (Higgins, 1997), research indicates that health selves become predominant only in midlife (Hooker & Kaus, 1992). Thus, someone could be promotion focused in general because his or her parents encouraged engagement in rewarding activities but become prevention focused concerning health because a friend gets cancer. In effect, health experiences during adulthood may be a decisive factor in shaping the health motivation system (Hooker & Kaus, 1992).

Second, health decisions often differ from those made in other domains. For instance, many health decisions involve

high risk and impact key aspects of consumers' lives including survival and well-being (Menon, Raghurir, & Agrawal, 2008; Stremersch, 2008). Moreover, people tend to hold naïve or lay beliefs about health which influence their judgments and behaviors (Ragunathan, Naylor, & Hoyer, 2006; Wang, Keh, & Bolton, 2010).

Third, current general regulatory focus scales have not been developed with the objective of studying health behaviors. The promotion/prevention scale was designed to assess questions related to academic performance (Haws et al., 2010) and the regulatory focus questionnaire was designed to assess relevant childhood experiences (Higgins et al., 2001). This might be one of the reasons why general regulatory focus measures have sometimes produced null results in the health domain. That is, some studies have been unable to show the hypothesized effects of regulatory focus on health behaviors (Uskul, Keller, & Oyserman, 2008; Schokker et al., 2010; van Kleef et al., 2005; Vartanian et al., 2006). These null effects might signal that the measures used were suboptimal.

Overview of scale development

These are the steps we used to develop the health regulatory focus scale and assess its dimensionality, reliability and validity. First, we conducted an extensive literature review and eight in-depth interviews with a diverse set of consumers to generate possible health prevention and health promotion scale items. Next in Study 1 ($n = 189$), we purified the scale items and verified the scale's two-factor dimensionality, i.e., prevention and promotion subscales. In Study 2 ($n = 1600$), we further verified the scale's two-factor dimensionality and assessed each subscale's internal reliability and convergent, nomological, and predictive validity.

In Study 3 ($n = 307$), we focused on predictive validity and found that the health prevention and promotion subscales predicted various health behaviors better than the general regulatory focus subscales. In Study 4 ($n = 307$), we obtained evidence for both discriminant and predictive validity by measuring a different set of health and other behaviors, measuring several personality traits, and including three measures of general regulatory focus. In Study 5 ($n = 178$), we showed that the health prevention and promotion subscales had adequate one-year test–retest reliabilities and we obtained more evidence of discriminant validity.

Item generation

To develop our new scale, we first generated a large number of health-specific prevention and promotion items using two sources. We began by adapting items that appear in commonly used general regulatory focus scales so that they referred to the health domain (Haws et al., 2010). For example, we adapted the item "I often worry that I will fail to accomplish my academic goals" from the promotion/prevention scale (Lockwood et al., 2002) to "I often worry that I will fail to accomplish my health goals." In addition, we conducted eight in-depth consumer interviews with French adults to generate new items (65% female, mean age 37, 100% in workforce). The interview protocol included a range of open-ended questions that dealt with personal conceptions of health, health

goals and health behavior strategies. These procedures generated a pool of 50 items, half prevention and half promotion focused.

Then we asked four experts in consumer behavior research to classify each of the 50 items as either promotion or prevention focused after reviewing the standard definitions of these constructs. Nineteen items were deleted because less than half of the expert judges could agree on their classifications. The 31 items that passed this initial screen, including 16 promotion and 15 prevention items, were used in Study 1 (see Appendix A).

Study 1. Scale purification and dimensional structure

Study 1 was conducted to purify the 31 initial scale items and verify the scale's two-factor dimensional structure. We recruited 189 French adult participants from an on-line consumer panel (59% female, mean age 38, age range 19 to 61, 100% in workforce). We asked them to indicate their level of agreement with each of the 31 items using a response scale that was anchored from 1 (strongly disagree) to 7 (strongly agree).

We analyzed the data as follows. We began by conducting an exploratory factor analysis and using three standard criteria to select the final scale items (Hair, Black, Babin, Anderson, & Tatham, 2009). First, the communalities among the items making up a factor should be higher than .5, which led us to exclude 2 health promotion and 2 health prevention items. Second, the correlation between each item and the factor where it is loaded should be higher than .5, which led us to exclude 9 health promotion and 10 health prevention items. Third, the items that reduce the Cronbach alpha and the explained variance should be eliminated, but this did not require us to exclude any additional scale items. After applying the Kaiser–Meyer–Olkin test of sampling adequacy and the Bartlett test of sphericity, we established the final number of factors using the Kaiser test, parallel analysis, and Velicer's MAP test (Hair et al., 2009). The final model was a two-factor solution with eight items, five promotion and three prevention, that explained 57.6% of the variance. The correlation between the two factors was low ($r = .16, p < .001$).

The eight final health regulatory focus scale items are in Table 1. The five promotion focus subscale items deal with embracing new experiences and opportunities and seeking pleasurable experiences in the health domain. This is in line with the past literature that shows that promotion focused consumers are likely to embrace new experiences and opportunities and focus on positive affective information (Pham & Avnet, 2004; Pham & Higgins, 2005). The three prevention subscale items deal with concerns about problems and mistakes that could lead to harm in the health domain. This is in line with past research indicating that prevention focused consumers are especially concerned about averting hazards and threats to their safety (Avnet & Higgins, 2006; Wang & Lee, 2006).

The health prevention and promotion subscales, with three and five items respectively, are similar in length to other widely used subscales including those in the regulatory focus questionnaire (five and six items), health locus of control scale (Form C which has 2 subscales with 3 items each and 2 subscales with 6 items each), and behavioral inhibition and activation scale (five and

Table 1
The health regulatory focus scale factor structure (Study 1).

Items	Promotion	Prevention	Communalities
Promotion items			
1. I do not hesitate to embrace new experiences if I think they can improve my health.	.82		.65
2. If I succeed in reaching a health goal, this motivates me to go further.	.79		.61
3. I think that taking care of my health is pleasurable.	.76		.56
4. I see myself as someone who does my utmost to improve my health.	.70		.55
5. If I see a good opportunity to improve my health, I take advantage of it right away.	.73		.56
Prevention items			
1. I frequently think about the health problems I may have in the future.		.80	.64
2. When I implement a health behavior, it's because I want to protect myself from getting sick.		.74	.54
3. I often worry about mistakes I could make concerning my health.		.70	.54
% of variance explained	38.1	20.1	

Note — The response scale was anchored from 1 (strongly disagree) to 7 (strongly agree).

seven items) (Dholakia, Gopinath, Bagozzi, & Natarajan, 2006; Higgins et al., 2001; Wallston, Stein, & Smith, 1994). The results also show that our eight item scale solution is optimal.

Study 2. Dimensionality, internal reliability and convergent, nomological and predictive validity

Study 2 was conducted to further verify the health regulatory focus scale's two-factor dimensionality, for prevention and promotion foci. It also examined the prevention and promotion focus subscales' internal reliability and convergent, nomological, and predictive validity. Study 2 tested the final eight-item scale from Study 1 using a new sample of 1600 French adult participants (66% female, mean age 37, age range 18 to 85, 72% in workforce). Participants were recruited from a national online consumer panel.

Dimensionality, internal reliability and convergent validity

First we used confirmatory factor analysis to verify that the health regulatory focus scale measured two higher-order or latent factors: health promotion focus and health prevention focus (see Fig. 1). All indicators confirmed that a two-factor model fit the data well (GFI = .98, AGFI = .95, CFI = .97, TLI = .98, RMSEA < .08). The correlations between the scale items and the associated latent construct (prevention or promotion) were always over .5, and the error or unexplained variance was below the acceptable threshold of 2.58 (Hu & Bentler, 1998).

However, the correlation between the two latent constructs (prevention and promotion) was higher in Study 2 than in Study 1 ($r = .57$, $p < .001$). To check whether a one-factor model represented a better solution, we used chi-square to compare the fits of the two models (Anderson & Gerbing, 1988). The results clearly suggested that a two-factor solution fit the data better. The increase in chi-square from a two-factor to a one-factor model was 283.37 ($p < 0.01$) indicating that the one-factor model fit less well. Moreover, for the one-factor model, the AGFI, RMSEA and CAIC were all below acceptable levels (Hu & Bentler, 1998).

Study 2 also indicated that the health regulatory focus subscales exhibited good internal reliability (Nunnally & Bernstein, 1994).

The Cronbach alpha was superior to the suggested threshold of .70 for both promotion ($\alpha = .88$) and prevention ($\alpha = .77$) (Hair et al., 2009). The Rhô de Jöreskog statistics confirmed the subscale reliabilities (promotion = .88 and prevention = .77) (Fornell & Larcker, 1981).

Convergent validity was tested by first verifying that the items comprising each dimension (prevention and promotion) had significant links with their associated latent variables. This condition was satisfied because all beta coefficients for the scale items were significant (see Fig. 1). The second test for convergent validity was that each scale item shared more variance with its dimension than was unexplained. Specifically, the variance extracted by the items for each dimension should have been higher than .50 (Fornell & Larcker, 1981) and it was. The variance extracted was .59 for promotion and .53 for prevention. These results confirm the convergent validity of the health regulatory focus scale.

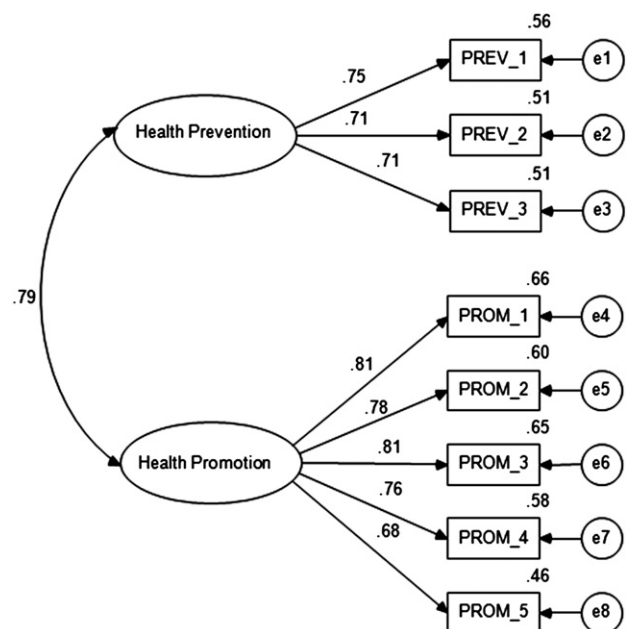


Fig. 1. The two-factor model tested in the confirmatory factor analysis (Study 1).

Nomological validity

Nomological validity, which is a form of construct validity, was tested by examining the correlations between the health regulatory focus subscales and personality traits. We looked at two personality traits that are known to be correlated with regulatory focus and also with health outcomes: optimism and neuroticism. Research indicates that optimistic individuals pay more attention to the positive characteristics of situations (Scheier & Carver, 1985); and therefore optimism has been found to be related to promotion focus (Grant & Higgins, 2003; Haaga et al., 2008). Thus, we expected a positive correlation between optimism and health promotion focus.

Neuroticism is a fundamental dimension of personality that refers to a person's tendency to experience negative feelings that are caused by low self-esteem and insecurity (Smith, Pope, Rhodewalt, & Poulton, 1989). Neuroticism is a strong correlate of prevention focus (Amodio et al., 2004; Cunningham, Farb, & Nezlek, 2005; Haaga et al., 2008). Moreover, the use of the behavioral inhibition system, which is considered similar to prevention focus (Dholakia et al., 2006), correlates with neuroticism (Carver, Sutton, & Scheier, 2000; Carver & White, 1994; Elliot & Thrash, 2002). Thus, we expected a positive correlation between health prevention focus and neuroticism.

Optimism was measured using the life orientation test which has six target items and four filler items and uses a seven-point response scale (totally agree to totally disagree) (Scheier, Carver, & Bridges, 1994). The Cronbach alpha was .79. Neuroticism was measured using the two standard items from the Ten Item Personality Inventory (Gosling, Rentfrow, & Swann, 2003). This inventory uses a seven-point response scale (totally agree to totally disagree). The correlation between the two neuroticism items was .35 ($p < .001$).

We then calculated the correlation between each construct and health prevention and promotion foci. As expected, there was a positive correlation between optimism and health promotion focus ($r = .19$, $p < .01$) and between neuroticism and health prevention focus ($r = .15$, $p < .01$). No significant correlation was found between optimism and health prevention ($r = -.02$, $p = .37$) or between neuroticism and health promotion focus ($r = -.01$, $p = .55$). These results provide support for the nomological validity of the health regulatory focus subscales.

Predictive validity

Next, we tested the validity of the health regulatory focus subscales in terms of predicting various health behaviors. We expected that health promotion focus would positively affect, and that health prevention focus would negatively affect, health behavior variety. Past research suggests that promotion focused consumers exhibit a greater need for variety (Pham & Higgins, 2005). Moreover, promotion focused consumers are motivated to capitalize on as many opportunities as possible to increase their chances of achieving goals (Higgins, 1997). Promotion focus also entails a more creative thought process (Lieberman, Molden, Idson, & Higgins, 2001). As a result, promotion focused consumers look for a wider variety of options and generate larger consideration

sets than do prevention focused consumers (Pham & Chang, 2010). To sum up, a great deal of research suggests that promotion focus should increase and prevention focus should decrease health behavior variety.

We measured health behavior variety by asking participants to indicate whether they had adopted each of nine different health behaviors: eating fresh fruits and vegetables, reducing salt intake, reducing fat consumption, reducing sugar consumption, exercising regularly, paying attention to the amount of alcohol they drink, avoiding smoking, eating fish twice a week, and eating three dairy products every day. We adapted these nine focal health behaviors from a prior study (Jayanti & Burns, 1998). We then created a health behavior variety index by counting the health behaviors exhibited; and the index ranged from 0 (none of the nine behaviors) to 9 (all of the nine behaviors).

Next, we ran a regression analysis using the health regulatory focus subscales as the independent variables and the health behavior variety index as the dependent variable. The results were consistent with expectations. Health promotion was positively associated with the health behavior variety index, while health prevention was negatively associated with it (β promotion = .40, $t(1597) = 13.19$, $p < .001$; β prevention = $-.08$, $t(1597) = 2.65$, $p < .01$).

Other dependent variables used to test predictive validity were subjective health state or the perception of being in good versus poor health, and body-mass index (BMI) or the ratio of weight to height. We expected that prevention focus would predict poorer health on these measures because it generates psychological consequences that could be detrimental to health. For example, prevention focus has been shown to be related to personality traits (Moss, 2009) that in turn are related to obesity (Ternouth, Collier, & Maughan, 2009). Further, prevention focus has been shown to be related to pessimism (Grant & Higgins, 2003; Haaga et al., 2008) that in turn enhances the risk of dying from heart disease (Giltay, Geleijnse, Zitman, Hoekstra, & Schouten, 2004) and deters recovery from coronary surgery (Scheier et al., 1989). Also, studies have associated pessimism with poor overall health (Peterson, Seligman, & Vaillant, 1988). Other studies have found a correlation between the avoidance goals that go along with a prevention focus and more reported physical symptoms of illness (Elliot & Sheldon, 1998). Therefore, we expected prevention focus to be associated with poor health as measured by a lower subjective health state and a higher BMI.

We measured subjective health state by asking participants to indicate their current perceived health on a five-point scale (1 = very poor to 5 = very good). This measure has been extensively used in the health literature and it has been shown to be a good indicator of life expectancy (Idler & Benyamini, 1997). We also measured participants' height and weight to calculate BMI. Next, we ran a regression analysis using the health regulatory focus subscales as the independent variables and subjective health state and BMI as the dependent variables. As expected, health promotion focus was positively related to subjective health state ($\beta = .26$, $t(1597) = 7.95$, $p < .001$) and health prevention focus was negatively related to subjective health state ($\beta = -.21$, $t(1597) = 6.61$, $p < .001$). Moreover,

health promotion focus was associated with a lower BMI ($\beta = -.09$, $t(1583) = 2.80$, $p < .01$), whereas health prevention focus was marginally associated with a higher BMI ($\beta = .05$, $t(1583) = 1.55$, $p = .12$). These results provide support for predictive validity.

Study 3. Predictive validity over a general measure of regulatory focus

The goal of Study 3 was to test the validity of health regulatory focus in terms of predicting health behaviors better than a general measure of regulatory focus. We used the regulatory focus questionnaire as the general measure of regulatory focus because it appears to be the most reliable general measure (Haws et al., 2010). The health behaviors we studied were consumption of organic food and functional food, health information seeking, and the number of physician and pharmacist visits.

Because promotion focus emphasizes preference for gains (Higgins, 1997), we expected that it would predict consumption of products that are used to achieve a good health state. Examples would be organic food which is grown without chemical fertilizers or herbicides, and functional food where biological ingredients are added for health benefits. Moreover, functional food can be considered innovative, and past research has shown that promotion focused consumers are more likely to purchase innovative products (Herzenstein, Posavac, & Brakus, 2007). Also organic food consumption is often motivated by better taste (Magnusson, Arvola, Hursti, Åberg, & Sjöden, 2003), and/or a desire for social status (Griskevicius, Tybur, & Van den Bergh, 2010) and these motivators are associated with a promotion focus.

Another dependent variable that we studied is health information seeking. Pham and Higgins (2005) show that a general promotion focus increases people's desire to search for information because promotion focused consumers want to consider as many options as possible to maximize gains. Moreover, promotion focused consumers are prone to form larger consideration sets (Pham & Chang, 2010). Thus health promotion focused consumers should consider more information sources when searching for health information.

Our final dependent variables were the number of physician and pharmacist visits. One strategic means to stay healthy involves approach behaviors (Sullivan & Rothman, 2008), which are defined as behaviors that are health enhancing (Maes & Gebhardt, 2000). Visiting a general physician for regular consultations and checkups, following up with a physician specialist, and going to a pharmacist regularly to refill medications are typically considered approach health strategies, and promotion focused consumers are motivated to use such strategies (Higgins, 1997). Therefore, health promotion focused consumers should be more likely to visit physicians and pharmacists regularly.

Method

We recruited 307 consumers on street corners in two major cities in France to participate in a health survey (50% female, mean age 39, age range 19 to 88, 49% in workforce). Specifically,

participants were asked to complete a printed survey with the health regulatory focus scale and the general regulatory focus questionnaire (Higgins et al., 2001). The correlation between health promotion focus and health prevention focus was $r = .55$ ($p < .001$). In addition, health promotion focus correlated weakly with general promotion focus ($r = .16$, $p < .01$) and general prevention focus ($r = .12$, $p < .05$) and health prevention focus correlated weakly with general prevention focus ($r = .16$, $p < .01$).

The survey also asked about their consumption of functional foods and organic foods using a five-point frequency scale (1 = never to 5 = every day). It asked about their health information seeking and specifically how often they used different health information sources such as the internet, newspapers and magazines using a five-point frequency scale (1 = never to 5 = very often). Finally, it asked about their visits to general physicians and pharmacists using a six-point frequency scale (1 = never to 6 = 10 times a year or more).

The regulatory focus questionnaire that was included in the survey assessed participants' tendency to use prevention or promotion strategies and their success with those strategies (Higgins et al., 2001). It had 11 items, five for prevention and six for promotion, and a five-point response scale (1 = never to 5 = very often). Items included "I feel like I have made progress toward being successful in my life" (promotion focus) and "Not being careful enough has gotten me into trouble at times" (prevention focus).

Results

To examine the predictive validity of the health regulatory focus subscales and the more general regulatory focus questionnaire subscales, we ran regression analyses using these as independent variables and each health behavior as a dependent variable. As expected, health promotion focus predicted functional food consumption ($\beta = .17$, $t(286) = 2.36$, $p < .05$) and organic food consumption ($\beta = .21$, $t(286) = 2.94$, $p < .001$). There were no significant effects for general prevention or promotion focus or for health prevention focus.

In addition, as predicted, health promotion focus was positively related to health information seeking on the internet ($\beta = .17$, $t(285) = 2.42$, $p < .05$), in newspapers and magazines ($\beta = .23$, $t(300) = 3.34$, $p < .001$), in advertising ($\beta = .21$, $t(283) = 2.90$, $p < .05$) and in nutritional labeling ($\beta = .33$, $t(285) = 4.69$, $p < .001$). Health prevention focus was unrelated to these behaviors.

The general regulatory focus measure yielded four significant but unexpected effects. There was a negative relationship between general promotion focus and information seeking on the internet ($\beta = -.15$, $t(284) = 2.45$, $p < .05$), in newspapers and magazines ($\beta = -.16$, $t(285) = 2.82$, $p < .01$) and in nutritional labeling ($\beta = -.13$, $t(285) = 2.17$, $p < .05$) and a positive relationship between general prevention focus and information seeking in newspapers and magazines ($\beta = .12$, $t(284) = 2.17$, $p < .05$).

Finally, as expected, health promotion focus was associated with more visits to general physicians ($\beta = .19$, $t(286) = 2.76$, $p < .01$) and pharmacists ($\beta = .16$, $t(286) = 2.18$, $p < .05$) but no significant associations were found for health prevention

focus or for general prevention or promotion focus. Overall, these results indicate that the health regulatory focus subscales predict health behavior better than the general regulatory focus questionnaire subscales.

Study 4. Predictive validity over other general measures and discriminant validity

Study 3 had found that the health regulatory focus scale was a better predictor of health behaviors than the more general regulatory focus questionnaire. We had used the most reliable general measure (Haws et al., 2010); still we might have obtained different results if other general measures of regulatory focus had been used. Therefore, a main goal of Study 4 was to test the validity of health regulatory focus at predicting other health behaviors, relative to three widely used general measures of regulatory focus: the regulatory focus questionnaire (Higgins et al., 2001), the promotion/prevention scale (Lockwood et al., 2002), and the composite regulatory focus scale (Haws et al., 2010).

Study 4 also tested whether health regulatory focus was able or unable to predict non-health behaviors, thereby exploring its domain-specific predictive capability. Finally, Study 4 examined the discriminant validity of the health regulatory focus scale by investigating how correlated it was with conceptually different constructs, including positive and negative affectivity and general risk aversion.

Method

We recruited 307 different consumers from an online panel in France to participate in a web-based survey about their health (61% women, mean age 44, age range 19 to 85, 46% in workforce). Participants completed an online survey assessing their health behaviors, their health regulatory focus, and their general regulatory focus using the regulatory focus questionnaire, promotion/prevention scale, and composite regulatory focus scale (Haws et al., 2010; Higgins et al., 2001; Lockwood et al., 2002). Participants completed the health regulatory focus subscales and then the generic regulatory focus subscales. The correlation between the health prevention subscale and the health promotion subscale was $r = .48$ ($p < .001$). The correlations between these health subscales and the general regulatory focus subscales are reported in Table 2.

The survey also measured participants' positive and negative affectivity, general risk aversion, self-esteem and health motivation. It measured positive and negative affectivity using the short version of the PANAS (Watson, Clark, & Tellegen, 1988) ($\alpha = .69$ and $\alpha = .87$ respectively). It measured general risk aversion using the standard six items (Mandrik & Bao, 2005) ($\alpha = .64$), self-esteem using the standard ten items (Rosenberg, 1965; $\alpha = .84$), and health motivation using the standard six items (Jayanti & Burns, 1998; $\alpha = .79$). We did not expect health regulatory focus to be highly correlated with any of these individual difference variables because they are conceptually different.

Next we assessed participants' health behaviors by asking questions about the frequency of visits to the dentist, the use of food supplements and organic food, and the use of prescription and over-the-counter drugs (combined into a single question). These questions employed a usage scale from 1 (never) to 7 (very frequently). We expected that health promotion focus would correlate with the use of organic food and food supplements because these products are used to achieve a good health state. We also predicted that frequency of visits to the dentist would be associated with health promotion focus, since visiting the dentist for routine consultations and checkups is typically considered an approach health strategy, and promotion focused consumers are motivated to use such strategies. In contrast, we expected that health prevention focus would be associated with the use of prescription and over-the-counter drugs, because these drugs are primarily used to treat health problems and prevention focused consumers are vigilant about avoiding problems (Higgins, 1997).

We also measured two risky non-health behaviors. We expected that health regulatory focus would not predict these behaviors but that the general measures of regulatory focus would. Using a seven-point scale from 1 (never) to 7 (very frequently), participants indicated the frequency with which they engaged in two risky vacation behaviors: traveling in a risky country and not booking a hotel in advance. We expected that general prevention focus would be negatively correlated with these behaviors, but that health prevention focus would be uncorrelated with these behaviors.

Results

Discriminant validity

Health promotion focus was not correlated with negative affectivity ($r = -.10, p = .10$) or self-esteem ($r = -.09, p = .11$). It correlated weakly with positive affectivity ($r = .19, p < .001$) and general risk aversion ($r = .13, p < .05$), and it correlated only moderately with health motivation ($r = .46, p < .001$). Similarly, health prevention focus was not correlated with positive affectivity ($r = .05, p = .35$) or self-esteem ($r = .07, p = .22$). It correlated weakly with negative affectivity ($r = .14, p < .05$) and general risk aversion ($r = .14, p < .05$), and it correlated only moderately with health motivation ($r = .42, p < .001$).

Moreover, the results indicate that the health promotion focus subscales are only weakly or moderately correlated with their more general counterparts. The correlation between health promotion focus and general promotion focus was weak based on the regulatory focus questionnaire ($r = .16, p < .01$), the promotion/prevention scale ($r = .21, p < .001$), and the composite regulatory focus scale ($r = .25, p < .001$). The correlation between health prevention focus and general prevention focus was weak to moderate based on the regulatory focus questionnaire ($r = -.06, p = .30$), the promotion/prevention scale ($r = .36, p < .001$), and the composite regulatory focus scale ($r = .27, p < .001$). Overall, these results indicate that the health regulatory focus subscales have discriminant validity.

Table 2

Correlations between the two health regulatory focus subscales and the general regulatory focus subscales (Study 4).

	Regulatory focus questionnaire		Promotion/prevention scale		Composite regulatory focus scale	
	Promotion focus	Prevention focus	Promotion focus	Prevention focus	Promotion focus	Prevention focus
Health promotion focus	.16* *	-.03 NS	.18 **	.21 ***	.25 ***	.22 ***
Health prevention focus	-.11 *	-.06 NS	.36 ***	.19 *	.10 NS	.27 ***

* $p < .05$.** $p < .01$.*** $p < .001$.

Predictive validity

As expected, health promotion focus predicted the use of food supplements ($\beta = .39$, $t(298) = 6.33$, $p < .001$), the use of organic food ($\beta = .30$, $t(298) = 4.50$, $p < .001$) and frequency of dentist visits ($\beta = .20$, $t(298) = 3.02$, $p < .01$); whereas health prevention focus predicted the use of prescription and over-the-counter drugs ($\beta = .21$, $t(298) = 3.15$, $p < .01$). The general measures of regulatory focus were not correlated with any of these behaviors except the use of food supplements and they produced contradictory results regarding food supplements. The promotion subscale of the regulatory focus questionnaire (Higgins et al., 2001) was negatively associated with the use of food supplements ($\beta = -.22$, $t(298) = 3.16$, $p < .01$). In contrast, the promotion subscale of the promotion/prevention scale was positively associated with the use of food supplements ($\beta = .21$, $t(298) = 2.34$, $p < .05$); thus it was consistent with the promotion subscale of health regulatory focus. Overall, these results indicate that the health regulatory focus scale is better able to predict health behaviors than other general measures of regulatory focus. See Table 3 for a summary.

Predicting behavior in a non-health domain

We studied two risky non-health behaviors regarding vacation choices that we expected to be unrelated to health regulatory focus but related to general regulatory focus. Specifically, we ran regressions with the health promotion and health prevention subscales as the independent variables and the vacation behaviors as the dependent variables. As expected, the health subscales did not predict vacationing in a risky country (health promotion

focus: $\beta = .11$, $t(304) = 1.72$, $p = .09$; health prevention focus: $\beta = -.05$, $t(304) = .77$, $p = .44$) or failing to book a hotel in advance (health promotion focus: $\beta = .05$, $t(304) = .69$, $p = .49$; health prevention focus: $\beta = -.02$, $t(304) = .25$, $p = .81$).

Also as expected, the regulatory focus questionnaire's prevention subscale was negatively associated with both risky vacation behaviors: vacationing in a risky country ($\beta = -.21$, $t(304) = 3.78$, $p < .001$), and failing to book a hotel in advance ($\beta = -.19$, $t(304) = 3.38$, $p < 0.001$). This further supports the predictive validity of health regulatory focus scale; it predicted health but not non-health behaviors while the regulatory focus questionnaire did the opposite.

Study 5. Test–retest reliability and further evidence of discriminant validity

Study 5 examined test–retest reliability and further examined discriminant validity. To be reliable, a measure should reflect some stability over time, i.e., the same individual should be consistent when answering the questions at different points in time (Hair et al., 2009). To assess test–retest reliability, we asked the same participants to complete the health regulatory focus scale twice, with one year between the two measurements. 178 French women enrolled in the first study, and 134 also participated in the follow-up study one year later (75% follow-up participation rate; mean age 45; age range 25 to 65; 46% in workforce). The health regulatory focus scale was included in a broader study about water consumption.

The results indicate that the health regulatory focus scale has adequate test–retest reliability. On the health promotion subscale

Table 3

The predictive validity of the health regulatory focus scale (Study 4).

Dependent variables	Independent variables							
	Health regulatory focus scale		Regulatory focus questionnaire		Promotion/prevention scale		Composite regulatory focus scale	
	Health promotion focus	Health prevention focus	Promotion focus	Prevention focus	Promotion focus	Prevention focus	Promotion focus	Prevention focus
Food supplements	.39 ***	.05	-.22 **	-.03	.21 *	-.08	.04	-.12
Prescription and over-the-counter drugs	-.04	.21 **	-.05	.00	-.02	.12	.08	.01
Organic food	.30 ***	.00	-.11	-.04	.01	-.17	.10	-.02
Dentist	.20 ***	.10	.01	.06	-.12	.07	.06	-.08

* $p < .05$.** $p < .01$.*** $p < .001$.

the correlation in response from time 1 to time 2 was .77 ($p < 0.001$), and on the health prevention subscale the correlation in response was .56 ($p < 0.001$), consistent with past studies on test–retest reliabilities (Vandecasteele & Geuens, 2010). The correlation between health promotion focus and health prevention focus was $r = .33$ ($p < .01$) in the first measurement, and $r = .36$ ($p < .001$) in the second measurement one year later.

Study 5 also further examined discriminant validity. We measured health locus of control using the original Form A with 18 items, 6 per subscale (Wallston et al., 1978). These items loaded onto three subscales consistent with past research and all three subscales were reliable (internal health locus of control $\alpha = .68$; chance health locus of control $\alpha = .65$; powerful others health locus of control $\alpha = .73$). Health promotion focus was not significantly correlated with chance health locus of control ($r = -.03$, $p = .69$) and it correlated only moderately with internal health locus of control ($r = .34$, $p < .05$) and powerful others health locus of control ($r = .33$, $p < .05$). Similarly, health prevention focus was not correlated with internal health locus of control ($r = .09$, $p = .21$) and it correlated only moderately with powerful others health locus of control ($r = .39$, $p < .001$) and chance health locus of control ($r = .23$, $p < .01$). These results further indicate that the health regulatory focus measure has good discriminant validity.

General discussion

Summary of findings and implications

The questions that may be asked when a new scale is developed include: Do we need another measure? Do the benefits of having a domain-specific measure outweigh the costs of validating and using the new measure? Our research seems to indicate that the answer to both questions is yes. Prior research suggested that general regulatory focus scales often had limited predictive power in health domains (van Kleef et al., 2005; Vartanian et al., 2006) and other domains (Haws et al., 2010). Thus there appeared to be a need for a domain-specific health regulatory focus scale to assess people's tendency to adopt prevention or promotion strategies during the pursuit of health goals. Our new health scale is not intended to replace general regulatory focus scales, of course, but it offers a domain-specific alternative when needed.

In the five studies reported here, we developed and validated our new health regulatory focus scale. Study 1 addressed item selection and confirmed the two-dimensional structure of health prevention and health promotion. Study 2 demonstrated the scale's internal reliability and its discriminant, convergent, and nomological and predictive validity. For instance, it found that health promotion focused consumers engaged in a greater variety of health behaviors and reported a more positive subjective health state than health prevention focused consumers.

Study 3 showed that the health regulatory focus scale predicted various health behaviors better than a more general measure of regulatory focus. For instance, it showed that health promotion focused consumers bought more functional and organic food, searched more frequently for health information, and visited their

physicians and pharmacists more often. More general regulatory focus did not correlate with these health behaviors.

Study 4 further confirmed the discriminant and predictive validity of the health regulatory focus scale. For instance, it showed that self-esteem, risk aversion, and positive and negative affectivity correlated weakly with the health promotion and prevention foci, indicating good discriminant validity. In addition, health promotion focus predicted the use of food supplements while health prevention focus predicted the use of prescription and over-the-counter drugs, and both indicate good predictive validity. Also as expected, health regulatory focus did not predict non-health behaviors, namely risky vacation choices, and general regulatory focus did.

Study 5 found that the health regulatory focus subscales had adequate test–retest reliability. Participants answered the questions similarly at the retest one year later. Finally, Study 5 obtained further evidence of discriminant validity by showing that health regulatory focus did not correlate highly with health locus of control.

Past research shows that dispositions or personality traits are often associated with health outcomes. For example, alexithymia (difficulty in identifying feelings) and neuroticism have been associated with poor health (Mattila et al., 2009; Mroczek, Spiro, & Turiano, 2009) whereas positive affectivity has been associated with good health (Pettit, Kline, Gencoz, Gencoz, & Joiner, 2001). Health regulatory focus may turn out to be another important individual difference variable because it seems to be correlated with various health behaviors. For instance, health prevention focus seems to be correlated with greater use of over-the-counter and prescription drugs while health promotion focus seems to be correlated with greater use of general physicians, pharmacists and dentists. Health regulatory focus may even be associated with important health outcomes although this requires more research. In any event, health researchers that measure personality traits or other individual difference variables may also want to measure health regulatory focus.

Much of the regulatory focus research has primed a general prevention or promotion focus, assessed the effects of the prime using a general measure of regulatory focus, and then assessed message persuasion (Keller, 2006; Lee & Aaker, 2004). The findings suggest that when the primed regulatory focus matches the message, persuasion is enhanced (Keller, 2006; Lee & Aaker, 2004; Spiegel, Grant-Pillow, & Higgins, 2004). Using our new scale, researchers and practitioners can measure the effects of health primes on health prevention and promotion foci and thus further extend this research into the health domain. Moreover, since priming is often difficult to realize outside a research laboratory, we offer a new measurement scale that practitioners and health marketers can use to assess chronic health regulatory focus. Using our new scale, researchers and policy makers can better understand how health regulatory focus can affect consumers' responsiveness to various health message and interventions. In this way, they can develop more targeted and more effective materials for those with a health promotion focus or a health prevention focus. This would appear to be a promising new line of inquiry.

Limitations and future research directions

A number of limitations to our work should be noted. First, we developed the health regulatory focus scale in France and so it would be useful to validate the scale in other countries. In addition, participants' health behaviors were self-reported in our studies. This factor could introduce some bias, e.g., social desirability bias. Therefore, we encourage future researchers to investigate if there is a relationship between social desirability bias and health regulatory focus.

We did not study chronically or acutely ill consumers; our samples were composed primarily of healthy consumers. We did not study serious health outcomes either. Thus future research should see if there is a relationship between health regulatory focus and acute and/or chronic health problems. Future research should also study the effects of health regulatory focus when consumers are suffering from various health problems, e.g., to see if health regulatory focus affects their coping behaviors.

Finally, we did not concentrate on health maintenance behaviors, such as exercising and eating fresh fruits and vegetables, and these behaviors are especially important for good health (Scammon et al., 2011). Further, past research indicates that prevention focus impairs self-regulation (Trawalter & Richeson, 2006) and this suggests that health prevention focused consumers may have difficulty with health maintenance behaviors. Thus researchers should examine this issue and the specific maintenance behaviors that may be affected.

Appendix A. List of the 31 scale items tested in Study 1

Promotion items tested

1. When I think about how I was a few years ago, I realize that I am in a better physical shape today.
2. Regarding my health, my main goal is to improve my fitness.
3. I often think about how I might improve my health.
4. I often think about what my level of health could ideally be.
5. To improve my health, it is not necessary to deprive myself of the small pleasures of everyday life.
6. When I act to improve my health, I think about the “extras” that being healthy could bring to me (e.g., energy, wellness).
7. Effort could help me to improve my health.
8. When I think about my future self, I imagine that I will be in good health.
9. Health is like a muscle that can be developed with practice throughout one's life.
10. Being healthy is a prerequisite for personal success.
11. I do not hesitate to embrace new experiences if I think they can improve my health.
12. If I succeed in reaching a health goal, this motivates me to go further.
13. I think that taking care of my health is pleasurable.

14. In my daily diet, I pay attention to foods that could be beneficial to my health (e.g., high vitamin and calcium content).
15. I see myself as someone who does my utmost to improve my health.
16. If I see a good opportunity to improve my health, I take advantage of it right away.

Prevention items tested

1. I am concerned about all the diseases we hear about (e.g., cancer, cardiovascular disease) and I try to protect myself from them.
2. Health is an inherited attribute and I believe that I cannot do anything to improve it.
3. Basically, being healthy means not being sick.
4. In my basic diet, I am careful to not eat too many foods that could be harmful to my health (e.g., fat, sugar).
5. Because I have not taken precautions in the past, I have experienced health problems.
6. I often worry about mistakes I could make concerning my health.
7. Regarding my health, I just do what is necessary to avoid being sick and to avoid health problems.
8. When I implement a health behavior, it is because I want to protect myself from getting sick.
9. Even when I experience some unusual symptoms, I rarely feel concerned about my health.
10. I feel uncomfortable when I fail to comply with the health rules I set for myself.
11. In general, I am careful to avoid situations that could adversely affect my health.
12. Regarding my health, I would rather do the same things (e.g., habitually consume a product) than try new things.
13. Regarding my health, my main objective is to prevent any major problems.
14. I frequently think about the health problems I may have in the future.
15. I think everyone is born with “health capital” and we have a duty to safeguard it.

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