

# **Scale Development for Measuring Health Consciousness: Re-conceptualization**

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## **Introduction**

From a public relations or social marketing perspective, audience segmentation is a primary step in designing effective interventions to improve health knowledge and to promote health attitude and behavior (Atkin & Freimuth, 1989; Donahew, 1990; Grier & Bryant, 2005; Grunig, 1989). However, regarding public health issues, scholars have pointed out that, by and large, only socio-demographic variables (e.g., gender, age, race, education, socioeconomic status, etc.) have been commonly applied in such segmentation procedures and previous research projects (Grier & Bryant, 2005; Kraft & Goodell, 1993; Slater, 1996). Although audience segmentation based on socio-demographic variables necessitates less effort and financial cost, it has definite limitations. For example, Slater and Flora (1989, 1991) found individuals in a similar demographic group might be different in terms of other health-relevant perceptions and/or behaviors.

Health consciousness is a particularly important psychographic variable in further developing audience segmentation pertaining to health issues because previous studies have shown that health consciousness predicts a variety of health attitudes and behaviors (Furnham & Forey, 1994; Gould, 1988, 1990; Iversen & Kraft, 2006; Jayanti & Burns, 1998; Michaelidou & Hassan, 2008; Schafer, Schafer, Bultena, & Hoiberg, 1993). It is also believed that an individual's level of health consciousness is closely related to how he or she seeks and responds to health information (Basu & Dutta, 2008; Dutta-Bergman, 2004b, 2005, 2006; Dutta, 2007; Dutta & Feng, 2007; Iversen & Kraft, 2006; Kaskutas & Greenfield, 1997; Shim, Kelly, & Hornik, 2006). Therefore, taking heed of individuals' health consciousness is important in designing health interventions and segmenting target publics, because it determines their responses to health information and sources of health information.

Specifically, Forthofer and Bryant (2000) explained why identifying individuals with high health consciousness is important in several ways. First, and most fundamentally, different approaches to groups with different levels of health consciousness are feasible, which in turn increases the effectiveness of health intervention. Second, according to Forthofer and Bryant (2000) individuals with high health consciousness are regarded as "targets of greatest opportunity" (p. 37) because they are more likely to be ready to undertake health preventive behaviors. By targeting health conscious individuals, health interventions have a better chance to achieve desirable outcomes (Forthofer & Bryant, 2000). Third, the attitudes or behaviors of health conscious individuals could be diffused among other people who are less likely to change their attitudes or behaviors (Forthofer & Bryant, 2000).

However, in spite of its potential to bolster effective health intervention, a review of previous literature revealed that few studies employed the concept of health consciousness, and, few, if any, conceptualized and operationalized the concept in a manner consistent with other studies. Moreover, the measure of the concept tends to be limited; for instance, the measure either fails to capture the complexity of the concept or lacks reliability by using a single item.

Therefore, this research project attempts to (1) define the concept of health consciousness as a prominent predictor of individuals' health behaviors and behavioral changes, (2) identify major dimensions of health consciousness, and (3) suggest a reliable scale for measuring health consciousness. Thus, the following sections will be devoted to reviewing and critiquing previous studies on health consciousness and other health-related concepts as well as developing a preliminary scale of health consciousness.

Since the concept of health consciousness refers to individuals' comprehensive orientations toward health, rather than issue-specific orientations (e.g., smoking, weight control), it is expected that the scale will be widely used for strategic health interventions in addition to its conceptual and theoretical value. Specifically, it will help segment target publics for health-related campaigns (e.g., obesity, disease prevention, etc.) and create tailored messages in diverse health interventions.

## **Literature Review**

### *Audience segmentation in public health interventions*

Grunig and Repper (1992) defined segmentation as “divid[ing] a population, market, or audience into groups whose members are more like each other than members of other segments” (p. 129). By segmenting publics, the issue can be effectively managed with less cost. In the domain of public health, scholars contended that health intervention becomes more efficient and effective by segmenting audiences into homogenous subgroups (Atkin & Freimuth, 1989; Donahew, 1990; Forthofer & Bryant, 2000; Grier & Bryant, 2005; Grunig, 1989; Rodgers, Chen, Duffy, & Fleming, 2007; Slater, 1996). Individuals in the same subgroup are likely to share “needs, wants, lifestyles, behavior, and values” with regard to health and, therefore, tend to respond similarly to health interventions, including campaign messages (Grier & Bryant, 2005, p. 322).

Forthofer and Bryant (2000) explained two primary reasons why audience segmentation is important in health interventions that aim at changing individuals' health behaviors. By segmenting audiences, it is easier and more feasible to reach the specific subgroup (1) with limited resources and (2) through the best available channels of communication (Forthofer & Bryant, 2000). In other words, audience segmentation contributes to the identification of characteristics of target groups and subsequent health intervention designs (e.g., tailored health messages, selection of communication channels).

In general, the criteria for segmenting publics can be grouped into two variables: objective (e.g., demographics, media use) and inferred (e.g., cognition, attitude) (Berkowitz & Turnmire, 1994; Grunig & Repper, 1992). Cross-situational approaches with objective variables tend to be easy to implement but are likely to miss the dynamic nature of publics, while situational approaches using inferred variables provide greater utility with direct relation to individual orientation to an issue but need more time and effort (Kim, Ni, & Sha, 2008). In this regard, public relations scholars (Berkowitz & Turnmire, 1994; Grunig & Hunt, 1984; Grunig & Repper, 1992; Kim et al., 2008) recommended the combination of inferred and objective variables.

In terms of health-related issues, possible criteria for audience segmentation include behavioral intention, lifestyle, health value, and personality traits (e.g., Grier & Bryant, 2005). Forthofer and Bryant (2000) added additional variables, such as perceived benefits and costs as well as media use, which are variables that have been commonly used for audience segmentation to promote healthy behaviors.

On the other hand, Slater (1999) segmented individuals in relation to a specific health issue based on the transtheoretical model (or stages-of-change model), which is comprised of five stages of health behaviors: (1) precontemplation, (2) contemplation, (3) preparation, (4) action, and (5) maintenance (Slater, 1999). Once people are informed of the positive or negative consequences of health behaviors (precontemplation), they consider enacting the behavior (contemplation). They then carry out the behavior (action) after careful preparation (preparation). In terms of a specific health behavior, Slater (1999) argued that a health campaign can be designed to target a segment of people along these five stages.

Slater and Flora (1989) suggested a new method of audience segmentation called “health lifestyle,” which is an analysis that measures factors beyond demographics. To identify subgroups, Slater and Flora (1989) collected data about health knowledge, health attitude and cognition, perception of social norms, and health behaviors (e.g., dietary habits, exercise, smoking, and alcohol consumption). The analysis resulted in two major clusters (health-oriented vs. non-health oriented) and seven lifestyle patterns, four of which were included in the health-oriented cluster (i.e., healthful adults, healthful young adults, healthful talkers, and young athletes), and three of which were included in the non-health oriented cluster (i.e., unhealthful adults, unhealthful young adults, and worried older adults).

This study proposes the notion of “health consciousness” as a powerful segmentation criterion in diverse health interventions. In this regard, Slater and Flora’s (1989) division of health-oriented vs. non-health oriented audiences is closely related to the notion of health consciousness, and the health lifestyle analysis represents an early attempt to measure one’s level of health consciousness.

### *Dimensions of health consciousness*

This section will discuss five major dimensions identified from previous research focusing on health consciousness. Different approaches to the concept of health consciousness have generated different definitions of the concept. However, five components have consistently appeared in studies over the previous two decades, which are (1) integration of health behavior, (2) attention to one’s health, (3) health information seeking and usage, (4) personal health responsibility, and (5) health motivation.

#### *Dimension 1: Integration of health behaviors*

Like Slater and Flora (1989), Kraft and Goodell (1993) equated individuals’ health consciousness to their orientation toward a wellness lifestyle. To Kraft and Goodell (1993), wellness is a “set of personal activities, interests, and opinions related to one’s health” (p. 18). Kraft and Goodell (1993) identified four sub-dimensions of wellness—(1) concern for hazardous environment, (2) physical fitness, (3) personal responsibility, and (4) nutrition and stress management—and concluded that health conscious persons are characterized as being sensitive to health hazards, responsible for their health, concerned about their physical fitness, and concerned with managing their stress and nutrition. Except for four items that measure personal health responsibility, Kraft and Goodell’s (1993) items are devoted to measuring individuals’ actual behaviors. For example, the items include, “I try to exercise at least 30 min. a day, 3 days each week,” “I avoid foods containing nitrites or preservatives,” and, “My daily meals are nutritionally balanced.” Likewise, many studies in consumer marketing have also approached individual health behavior and/or attitude from a “healthy (wellness) lifestyle” standpoint. Bloch’s (1984) study was a pioneering work in this area and defined a healthy lifestyle as an

individual health orientation toward preventing possible health problems and increasing personal wellbeing.

Such a trend in consumer marketing research has presumably stemmed from the field's interest in the food industry's marketing strategies to attract consumers' attention, which necessitated immediate or direct measures of potential consumers' behaviors rather than a conceptual explication of consumers' psychological states. Because of such purposes, in most of the research relating to this approach, the level of health consciousness was oftentimes understood and measured in terms of individual behaviors, such as food consumption and physical activities (Divine & Lepisto, 2005). Jayanti and Burns's (1998) definition of health consciousness—"the degree to which health concerns are integrated into a person's daily activities"—clearly demonstrated the behavioral aspect of the concept (p.10). For example, Divine and Lepisto (2005) noted that people who enjoy healthy lifestyles tend to prefer to exercise more often and eat white meat, fruits, and vegetables, while avoiding red meat, snack chips, and soft drinks. Similarly, Dutta-Bergman (2004a), referring to health consciousness as healthy activities, used four health-related actions to measure individuals' levels of health consciousness on a 6-point likert scale: healthy eating, exercising, alcohol consumption (negative correlation), and gambling (negative correlation).

Using a national survey, Tabacchi (1987) introduced four groups based on attitude and behavior solely in terms of food consumption: traditional, weight-conscious, health-conscious, and uncommitted. In Tabacchi's (1987) categorization, a health-conscious consumer is different from a weight-conscious consumer, who mainly cares about his or her calorie intake. The characteristics of the health-conscious group include frequent exercise, having a small-size family, and college education. Specifically, in terms of food consumption, the health-conscious group prefers vegetables and fruits, whole grains, broiled or baked fish, and non-fat milk, while avoiding butter/margarine, chemical additives (e.g., sugar substitutes), soda, and fried foods (Tabacchi, 1987). From another survey of Chinese females, Tai and Tam (1997) found that "weight consciousness," "health consciousness," and "environment consciousness" significantly influenced respondents' daily routines. In regard to the detailed items of the survey, the items designed for measuring weight consciousness and environment consciousness also contained health behaviors, including food purchase/consumption and exercise habits, which other studies claimed to be measures of health consciousness (See Appendix 1 for detailed questionnaires of previous research).

#### *Dimension 2: Psychological/Inner state*

Gould's (1998; 1990) viewpoint, however, is somewhat different from those presented in the aforementioned studies. Gould (1998) considered health consciousness solely as a psychological or inner status of a person, including health alertness, health self-consciousness, health involvement, and self-monitoring of one's health. To Gould (1998; 1990), health consciousness is a psychographic variable that is not integrated with visible behaviors. Therefore, measures of attitude and behavior regarding health care and prevention as dependent variables are predicted by health consciousness as an independent variable (Gould, 1988, 1990). For instance, Gould (1990) found that health consciousness was positively correlated with one's dietary lifestyle, such as vitamin intake and calorie reduction, although it was not related to the amount of physical activity. It was also found that high health conscious people are more likely to talk about health and read health magazines (Gould, 1990) and more open to unorthodox medical alternatives while being less skeptical of medical authority (Gould, 1988).

Iversen and Kraft (2006) followed the Gould's (1988; 1990) contention of health consciousness, which focused on one's psychological or inner state. According to Iversen and Kraft (2006), health consciousness is defined as "the tendency to focus attention on one's health" (p. 603). However, Iversen and Kraft (2006) noted that health consciousness is different from health anxiety or fear of being sick or dead. By employing Gould's (1988; 1990) Health Consciousness Scale, Iversen and Kraft (2006) also found a positive correlation between health consciousness and preventive health behavior (e.g., fruit and vegetable consumption and exercise).

Dutta-Bergman (2004b; 2006) and Dutta (2007) also emphasized the psychological characteristic of health consciousness, and tried to differentiate it from three other indicators of health orientation, which were (a) health information orientation, (b) health beliefs, and (c) healthy activities. In this regard, Dutta-Bergman's (2004b; 2006) and Dutta's (2007) conceptualization of health consciousness corresponds to that of Gould (1988; 1990) and Iversen and Kraft (2006), while their general notion of "health orientation" (Dutta-Bergman, 2004b; 2006; Dutta, 2007) is more comparable to that of Kraft and Goodell (1993) and others who focused on actual health behaviors along with attitudes.

### *Dimension 3: Health information seeking and usage*

There has been inconsistency in the definition of health consciousness in regard to whether or not health information-related actions are a part of the health consciousness concept or factors that can be predicted from one's health consciousness.

Some scholars argued that the manner in which an individual uses media or other sources for health information is a major element of health consciousness. For example, Rodgers et al. (2007) suggested individual media use as a health segmentation variable. They contended that including variables regarding media usage along with other traditional audience segmentation criteria (e.g., demographics, health evaluation) increased predictive power of individual health behaviors, and suggested media usage as a basis of effective audience segmentation (Rodgers et al., 2007). With the combination of traditional variables and media usage variables, Rodgers et al. (2007) identified four audience clusters: health uninformed, health autonomous, health conscious, and health at risk. Rodgers et al. (2007) used the term "health conscious cluster" to refer to individuals who are aware of health information and its sources, but who are not necessarily educated about health information or autonomous in information seeking. Therefore, the health conscious group turned out to be moderately engaged in health information seeking and health promoting behaviors, while individuals in the health autonomous cluster were more active in seeking health information from diverse sources, including media channels, and also more active in engaging in health promoting behaviors.

Other scholars also demonstrated that health consciousness is related to audiences' attention to or involvement with health messages (Aldoory, 2001; Iversen & Kraft, 2006). Specifically, Iversen and Kraft (2006) argued that high health conscious individuals perceive health messages as being more personally relevant while processing the argument and recommendations in the messages more thoroughly. To Firnham and Forey (1994), health information seeking is an essential element of health consciousness, along with actual food consumption behaviors. Firnham and Forey (1994) defined health consciousness as one's ecological and self-awareness of lifestyles—including health information seeking, food consumption, concern for the natural environment, and perception of prescription drugs. In a

similar way, Kaskutas and Greenfield (1997) also viewed health consciousness as being composed of concerns for nutrition and health information seeking.

On the other hand, as discussed earlier, a series of Dutta's studies (Dutta-Bergman, 2004b; 2006; Dutta, 2007) considered health consciousness as an important predictor of individuals' health information-related activities such as health information seeking and learning, and the use of communication channels. Therefore, to Dutta (Dutta-Bergman, 2004b; 2006; Dutta, 2007), such actions are consequences influenced by one's health consciousness, rather than health consciousness itself. Specifically, Dutta-Bergman (2005) showed that health consciousness is a positive predictor of individuals' search for additional health information beyond that provided by a doctor. It was also shown that individuals with high health consciousnesses tend to (1) learn more health information from the media (Dutta, 2007); (2) prefer newspapers, magazines, Internet, and interpersonal networks (e.g., family, friends) as primary sources of health information, as opposed to television and radio, which are preferred by less health conscious individuals (Dutta-Bergman, 2004b); and (3) better remember health content and incorporate it in their future behavior (Dutta-Bergman, 2006).

#### *Dimension 4: Personal responsibility*

Previous studies have shown that individuals who are health conscious are likely to take responsibility in managing their own health. Kraft and Goodell (1993) suggested that personal health responsibility is one of the four components that constitute health consciousness. Similarly, Dutta-Bergman (2004a) speculated that health conscious persons are more likely to feel responsible for their health, and closely equated a "health conscious" person to a "responsible" person. Because health conscious persons feel more responsibility to take care of their health, they tend not only to engage in preventive and health-maintaining behaviors in their daily lives but also actively participate in online and/or offline health communities (Basu & Dutta, 2008; Dutta-Bergman, 2004a; Dutta & Feng, 2007).

#### *Dimension 5: Health motivation*

Motivation is another dimension that has been commonly discussed in previous studies. Defining health motivation as "a goal-directed arousal to engage in preventive health behaviors," Moorman and Matulich (1993) argued that health motivation predicts a person's engagement in preventive health behaviors (i.e., health information acquisition behaviors and health maintenance behaviors) (p. 210). According to Jayanti and Burns (1998), health motivation is a relatively stable psychological trait.

Dutta-Bergman (2004a) also regarded health motivation as a major part of health consciousness, and presented it in relation to the degree to which individuals value healthy conditions. In this regard, Dutta's studies (Dutta, 2007; Dutta-Bergman, 2004b; 2006) used an item stating, "Living life in the best possible health is very important to me." Dutta-Bergman (2004a) defined health consciousness as "an indicator of the consumer's intrinsic motivation to maintain good health" as well as "a reflection of his or her responsibility toward health" (p. 398).

Unlike Dutta-Bergman (2004a), however, Jayanti and Burns (1998) emphasized that health consciousness is distinct from health motivation. According to Jayanti and Burns (1998), "health motivation refers to the internal characteristic of a person, whereas health consciousness refers to the external characteristics of how a person's health is taken care of" (p. 10). Unlike Dutta (Dutta, 2007; Dutta-Bergman, 2004b; 2006), Jayanti and Burns (1998) differentiated health value from health motivation by defining health value as "an individual's assessment of

benefits relative to costs in engaging in preventive health care behavior” (p. 8). Therefore, Jayanti and Burns (1998) measured health value by asking how much a specific behavior (e.g., avoiding tension, staying healthy longer, looking younger) is worth the benefit.

In summary, scholars have conceptualized and measured health consciousness differently. This literature review revealed five major dimensions that have comprised the concept of health consciousness: (1) engagement in health behaviors, (2) psychological attention to one’s health, (3) health information seeking and usage, (4) personal responsibility, and (5) health motivation. Therefore, in general, health conscious persons are characterized as actively incorporating healthy behaviors in their daily routines, consistently being attentive to their health conditions, actively seeking and using health information from diverse sources, taking responsibility for their health, and being motivated to stay healthy.

### **Re-conceptualization of health consciousness**

With different approaches to examining health consciousness and applying the concept to diverse health-related issues, previous studies have shown that health consciousness has great power in indicating health-related attitudes and behaviors. In spite of the various definitions and operationalizations of the concept of health consciousness, it holds true across studies that the concept is multifaceted. Given the complexity of the concept, a problem that may be caused by inconsistent use of its definition is that it is hard to comprehensively understand the true nature of the concept and its related phenomena. Because of this, researches perhaps have missed the bigger picture that much previous scholarly effort pertaining to health consciousness can provide.

As discussed, most previous research used actual behaviors, such as food consumption, exercise, and substance use, to measure health consciousness. However, the current study attempts to directly measure underlying psychological traits of the concept, rather than indirectly measuring the concept using visible behaviors. The main idea of this study is that, with the limited number of health behavior measures, the concept is limited in explaining diverse health issues. By understanding the concept of health consciousness as a personal attribute and measuring the psychological basis of the concept, it will have greater power in predicting diverse health behaviors. For example, compared to measuring how much someone cares about his or her health, measuring whether or not someone avoids high-sodium or high-cholesterol foods is less likely to be related to his or her decision to quit smoking or to adhere to a medical diagnosis. By measuring psychological state regarding health, as opposed to measuring actual behaviors, this study presumes that the concept of health consciousness has greater construct validity. In this sense, health consciousness in this study may be a higher-level switch controlling multiple light bulbs in someone’s brain at once while measuring specific health-related behaviors is a lower-level switch that possibly controls one light bulb at a time. Therefore, health consciousness should be understood as a psychological state predicting a variety of related variables (e.g., health attitudes and behaviors), rather than actual specific behaviors. Moreover, presenting the relationship between health consciousness and actual health behaviors will provide opportunities for supporting predictive and/or concurrent validity of the concept. By doing so, the concept of health consciousness can be utilized with greater predictive power regardless of health issues.

However, considering the concept of health consciousness as solely being psychological attention to or self-reflection on one’s health, as Gould (1998; 1990) did, also has limitations. The scope of health consciousness is so biased in regard to a single domain that it cannot capture

the overall orientation toward one's health. Although Gould (1998; 1990) tried to include the multifaceted nature of the concept with four sub-dimensions (i.e., health alertness, health self-consciousness, health involvement, and self-monitoring of one's health), the items seem redundant and, therefore, have less face validity in representing the complexity of health consciousness. This study agrees that consistent attention to and reflection on one's health is a significant aspect of health consciousness, but the concept should contain more than was suggested by Gould (1998; 1990). Based on previous studies, this study proposes that, along with psychological attention and reflection, health consciousness should include personal responsibility and health motivation, both of which have been less investigated by researchers. Therefore, health consciousness is regarded as a composite of self-health awareness (an alternative term referring to Gould's notion of health consciousness), personal responsibility for one's health, and health motivation. In other words, health conscious individuals are likely to be aware of their health condition by paying attention to and reflecting on their health, as well as being responsible for their health and motivated to improve or maintain their health given the high level of health value. According to this re-conceptualization, health consciousness refers to an individual's comprehensive mental orientation toward his or her health, being comprised of self-health awareness, personal responsibility, and health motivation, as opposed to being related to a specific issue (e.g., smoking, exercise, healthy diet)

### **A pilot test**

To test validity and reliability of potential items to be used on a health consciousness scale, both news items and items used in previous studies regarding health consciousness were tested together (See Appendix 1 and 2 for details). 50 students at a large Midwestern University were recruited for an online survey.

#### *Survey questionnaire*

For previous items, the survey questionnaire included all items that have been used for measuring health consciousness in previous studies (Dutta-Bergman, 2004a, 2004b, 2005, 2006; Dutta, 2007; Furnham & Forey, 1994; Gould, 1988, 1990; Jayanti & Burns, 1998; Kraft & Goodell, 1993; Michaelidou & Hassan, 2008; Tai & Tam, 1997), except issue-specific items (e.g., gambling in Dutta-Bergman, 2004a; prescription drugs in Furnham & Forey, 1994) (See Appendix 1 for details about the health consciousness scales from previous research). The health motivation scale (Jayanti & Burns, 1998; Moorman & Matulich, 1993) and health value scale (Jayanti & Burns, 1998) were added into the questionnaire for the current study because these two concepts (i.e., health motivation, health value) also relate to health consciousness according to its new conceptualization in this study. Items measuring environment consciousness and weight consciousness in Tai and Tam (1997) were also included, as they were closely related to the five major dimensions identified from the previous studies. For newly introduced items, several items were created to make up for weak points in the previous scales of personal responsibility and health motivation. For example, new items include, "I should take care of myself to prevent disease and illness," (personal responsibility) and, "Living life without disease and illness is very important to me" (health motivation).

The manner in which individuals use health information has been discussed in relation to health consciousness. However, regardless of whether or not it is an element or consequence of health consciousness, this study points out that previous measures of health information usage were highly limited in that they relied heavily on measuring the use of mass media channels,



such as television and newspaper. Therefore, for the purpose of preliminary exploration, this study included items measuring one's use of health information from four key sources (i.e., mass media, the Internet, interpersonal communication, and medical experts) (See Appendix 2 for details about newly added items).

A total of 99 old and new items were all measured on a 7-point likert scale. Although some items were originally measured on a 5-point likert scale, this study used a 7-point likert scale for all items for comparison purposes. Also, according to DeCoster (2005), a likert scale with seven response options is more reliable than equivalent scales with greater or fewer response options. Respondents were asked to indicate how much they agree with each statement, between 1 (strongly disagree) and 7 (strongly agree), or how much each action was worth the benefit, between 1 (not worth the benefit at all) and 7 (very much worth the benefit). Some items were reverse coded to indicate that higher scores denote higher level of health consciousness. Ideally, the old and new items under the same conceptual sub-dimension should be a cohesive set of items (remaining together in a factor) as a result of factor analysis.

#### *Data reduction: Factor analysis*

A series of principal axis factor analyses using Varimax with Kaiser Normalization were used for data reduction. An initial analysis of a total of 99 items generated 22 factors by using Eigenvalues of 1 or higher. In each step of running a factor analysis, one-item factors, indicating the item does not form a cohesive sub-scale with any other items, and items with below .4 factor loading coefficient were deleted. Such a procedure showed interesting findings from the exploratory pilot test. The items that were first removed from the set were the items asking respondents about weight loss or weight control, which indicates that weight control is not a factor of individuals' thoughts on their health, at least for college students. Next, many of the items measuring stress management and mental health were removed from the original set. Items about attractiveness (e.g., younger looking or a good body shape) were not cohesive measures with other items of health consciousness. Individual habits regarding food consumption or healthy eating (e.g., cholesterol, preservatives, nitrites, vitamin intake, fat, sugar, salt, calorie, calcium, chemicals, ingredients, organic products, etc.) turned out to barely remain together with other health consciousness items. Behaviors regarding substance use (especially for drinking habits) and exercising did not closely correspond with other items. Items about one's awareness of environmental hazards (e.g., air pollution, global warming, alternative energy) were removed as a result of repeated data reduction processes. To some extent, such results of factor analysis supported that actual health behaviors, such as dietary and exercise habits and substance use, may not be valid and/or reliable measures of health consciousness, at least for college students, as has been argued in previous sections of this paper.

Finally, a total of 99 variables were reduced to 17 items with four factors. One of the factors was comprised of six items measuring individuals' health information use or health communication activeness, which refers to the attention and interest in health information as well as interpersonal communication about health. Actual items include, "I am generally attentive to health information from TV and radio" (new item), "I often talk about health with my friends, family or relatives" (new item), "I read more health-related articles than I did 3 years ago" (from Kraft & Goodell, 1993), "I'm interested in information about my health" (from Kraft & Goodell, 1993), "I often read about health in newspapers, magazine, books, etc." (from Furnham & Forey, 1994), "I take much notice of health care recommendations from TV, radio, etc." (from Furnham & Forey, 1994). However, in spite of strong internal consistency (Cronbach's  $\alpha=.898$  with

the six items of health communication activeness; Cronbach's alpha=.884 with all 17 items), the six items were excluded in the final scale of health consciousness because they were more likely to target actual behaviors regarding health information, rather than capturing an individual's psychological trait regarding his or her health. As has been mentioned, this study assumes that how an individual uses and responds to health information is a behavioral outcome of health consciousness.

The other three factors with 11 items were closely related to the reconceptualized health consciousness focusing on either one's self-health awareness, personal responsibility, or health motivation (for the entire list of items, see Table 1). Most of the 11 final items turned out to be from previous studies (Item #1, 2, 3, and 5 from Gould (1988); Item #4, 7, and 8 from Kraft & Goodell, 1993; Item #6 from Michaelidou & Hassan (2008); Item #10 and 11 from Dutta (2007)), rather than the new items introduced in this study (Item #9).

Table 1 shows how the 11 items were loaded to three factors. Four items heavily loaded on factor 1 were mostly from Gould's (1988) items, measuring self-health awareness, or the tendency to focus attention on one's health. Another four items loaded on factor 2 pertained to personal responsibility. The remaining three items pertained to health motivation. The results of a pilot test supported the conceptualization of health consciousness, as consisting of three dimensions (e.g., self-health awareness, personal responsibility, and health motivation).

**Table 1. Rotated Factor Matrix (N=50)**

	Factor		
	1	2	3
I'm very self-conscious about my health.	.816		
I'm generally attentive to my inner feelings about my health.	.771		
I reflect about my health a lot.	.748		
I'm concerned about my health all the time.	.709		
I notice how I feel physically as I go through the day.		.888	
I take responsibility for the state of my health.		.813	
Good health takes active participation on my part.		.490	
I only worry about my health when I get sick. (R)		.405	
Living life without disease and illness is very important to me.			.800
My health depends on how well I take care of myself.			.546
Living life in the best possible health is very important to me.			.500

**Table 2. Item statistics**

	Mean	SD	N
HC1: I'm very self-conscious about my health.	4.94	1.544	50
HC2: I'm generally attentive to my inner feelings about my health.	5.06	1.185	50
HC3: I reflect about my health a lot.	4.70	1.344	50
HC4: I'm concerned about my health all the time.	3.98	1.622	50
HC5: I notice how I feel physically as I go through the day.	5.42	.950	50
HC6: I take responsibility for the state of my health.	5.50	.974	50
HC7: Good health takes active participation on my part.	6.12	.824	50
HC8: I only worry about my health when I get sick. (R)	4.96	1.484	50
HC9: Living life without disease and illness is very important to me.	6.22	1.148	50
HC10: My health depends on how well I take care of myself.	5.44	1.072	50
HC11: Living life in the best possible health is very important to me.	5.56	1.091	50

*Item analysis*

This section addresses the results of item analysis of the final 11 items of health consciousness. First, results of item statistics (Table 2 and 3) show that the mean scores of each item and the overall mean of the scale are generally above 4.0 (neutral), except item #4 ("I'm concerned about my health all the time") with a mean of 3.98. Responses tend to be biased in a positive direction. However, standard deviation of each item, ranging from .824 to 1.622, supports acceptable response variances.

**Table 3. Summary item statistics**

	Mean	Minimum	Maximum	Range	Maximum / Minimum	Variance	N of Items
Item Means	5.264	3.980	6.220	2.240	1.563	.405	11
Item Variances	1.511	.679	2.632	1.953	3.876	.425	11

Table 4 shows the inter-item correlation matrix of the 11 items. Scholars (e.g., Ferketich, 1991) believe that the correlation between items should be higher than .30. As Table 4 shows, most of the correlation coefficients are well above .30 or nearly close to .30. Two items seem problematic in terms of inter-item correlation: #1 ("I'm very self-conscious about my health.") and #8 ("I only worry about my health when I get sick." (Reverse-coded)). Item #1, which

measures one’s self-health awareness, is not highly correlated to the items of two other dimensions. On the other hand, Item #8 is not closely associated with items measuring self-health awareness.

**Table 4. Inter-item correlation matrix**

	HC1	HC2	HC3	HC4	HC5	HC6	HC7	HC8	HC9	HC10	HC11
HC1	1.000	.604	.709	.619	.282	.183	.182	.079	.284	.288	.529
HC2	.604	1.000	.601	.595	.231	.097	.410	.083	.275	.220	.589
HC3	.709	.601	1.000	.690	.357	.304	.291	.086	.361	.306	.395
HC4	.619	.595	.690	1.000	.456	.381	.368	.245	.309	.334	.422
HC5	.282	.231	.357	.456	1.000	.739	.534	.403	.176	.336	.300
HC6	.183	.097	.304	.381	.739	1.000	.458	.367	.210	.293	.211
HC7	.182	.410	.291	.368	.534	.458	1.000	.204	.252	.309	.400
HC8	.079	.083	.086	.245	.403	.367	.204	1.000	.329	.152	.216
HC9	.284	.275	.361	.309	.176	.210	.252	.329	1.000	.517	.470
HC10	.288	.220	.306	.334	.336	.293	.309	.152	.517	1.000	.448
HC11	.529	.589	.395	.422	.300	.211	.400	.216	.470	.448	1.000

In regard to the reliability of the proposed scale, the score of Cronbach’s Alpha for the scale was .851 (Standardized Alpha=.858), indicating highly reliable internal consistency of the scale. Table 5 shows the most important information for the item analysis. First, corrected item-total correlation denotes the correlation between an item and the rest of the scale items. Scholars recommend this score should have values of .20 or higher in order to insist that each item is measuring what the rest of the scale is attempting to measure. Other scholars even insist .3 or higher score of item-total correlation (e.g., Wang, Airhihenbuwa, & Nnadi-Okolo, 1990). In this scale, the corrected item-total correlation scores lie between .302 and .713. Second, squared multiple correlation indicates how much of variability in the responses to an item can be predicted from the other items in the scale. If the score of an item is (nearly) equal to 1, the item can be perfectly (or nearly perfectly) predicted by the remaining items, which indicates the item does not contribute to the variability of the scale and thus should be deleted. Given the score of squared multiple correlation ranging between .299 and .628, Table 5 shows that each item in this scale does contribute to the scale without significant redundancy. The last column (i.e., Cronbach’s alpha if item deleted) shows that, except for Item #8, alpha score would decrease if items were deleted from the original alpha score of .851. In other words, having the items, except Item #8, contribute to the internal consistency of the scale. On the other hand, alpha score would be higher to .861 if Item #8 were deleted.

From the item analysis, some problems of Item #8 (i.e., “I only worry about my health when I get sick.” (R)) have been identified. Nevertheless, the researcher insists on including this item in the scale for several reasons. First, this item has a face validity to point out how a person pays consistent attention to one’s health as well as how he or she takes responsibility regardless of one’s health status. Without this item, measures of personal responsibility would be less

weighted in the scale. Second, in regard to the alpha score, deleting the item does not seem to make a large difference (i.e., .01), and the original alpha score with all 11 items still shows a strong internal consistency (alpha=.851). Third, other scores, such as corrected item-total correlation and squared multiple correlation, showed the item's contribution to the scale. Therefore, it is expected that, if the item is re-tested with different groups of populations, it may show strong or acceptable statistics in the item analysis.

**Table 5. Item-total statistics**

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Squared Multiple Correlation	Cronbach's Alpha if Item Deleted
HC1: I'm very self-conscious about my health.	52.96	56.937	.609	.628	.833
HC2: I'm generally attentive to my inner feelings about my health.	52.84	61.035	.598	.620	.834
HC3: I reflect about my health a lot.	53.20	58.000	.670	.660	.827
HC4: I'm concerned about my health all the time.	53.92	53.912	.713	.607	.823
HC5: I notice how I feel physically as I go through the day.	52.48	63.928	.572	.651	.838
HC6: I take responsibility for the state of my health.	52.40	65.102	.475	.590	.844
HC7: Good health takes active participation on my part.	51.78	66.134	.500	.447	.843
HC8: I only worry about my health when I get sick. (R)	52.94	64.139	.302	.299	.861
HC9: Living life without disease and illness is very important to me.	51.68	63.283	.488	.445	.842
HC10: My health depends on how well I take care of myself.	52.46	64.172	.477	.390	.843

HC11: Living life in the best possible health is very important to me.	52.34	61.658	.623	.552	.833
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## Conclusion

### *Summary*

This study purported to re-conceptualize the concept of health consciousness and to propose a parsimonious yet effective measure of the concept. By reviewing the previous research on health consciousness and other related concepts, this study defined health consciousness as one's orientation toward overall health, rather than toward a specific health issue. Furthermore, this study conceptualized that one's level of health consciousness is comprised of three elements—self-health awareness, personal responsibility, and health motivation—as opposed to engaging actual health behaviors or relying on the tendency to focus attention on one's health. To support the contention of this study, a pilot test was conducted with pre-existing items measuring health consciousness and other health perception-related concepts. Overall, results of the factor analysis generated 11 items of health consciousness scale that are corresponding to the reconceptualization of health consciousness, and item analysis supported that most of the items make a statistically meaningful scale of health consciousness.

### *Future research for scale validation*

As is widely known, validating a scale is a project that cannot be done at one time. Rather, it requires a series of tests and re-tests and a number of editions or modifications in the long term. Therefore, it should be clearly addressed that this study was only a first step to encourage readers and other scholars in this area to recognize problems with regard to the concept of health consciousness and its previous measures. The researcher accepts that the pilot study employed in this study may not be even a block on which to build the validity of the proposed scale. Future research using the scale of health consciousness is necessary to validate the proposed scale. In each process of scale validation, the scale will be modified in the direction of improving the validity and reliability of the scale.

First, several surveys with diverse groups of population, ranging from a convenient sample of college students to a probability sample at a national level, should be conducted. With the repeated measures with different demographic groups, the results of factor analysis and item analysis, indicating the statistical validity and reliability of the scale, should be examined. In addition, to test predictive validity, the scale measures will be correlated to other aspects in relation to health, including health knowledge acquisition, individual attitudes, and behaviors regarding various health issues. Particularly, among many possible attitudinal and behavioral variables, examining the way in which individuals process and respond to health messages from media channels will help in understanding how people with different levels of health consciousness respond to health messages and presumably predict consequences of health messages depending on the health consciousness level. Referring back to the discussion on public health campaigns and audience segmentation, such a validation study will also help PR practitioners and health professionals effectively target the population.

## Appendix 1. Health Consciousness Scales

Source	Sub-dimensions	Items
Kraft & Goodell (1993): p. 23	Health environment sensitivity	I worry that there are chemicals in my food. I'm concerned about my drinking water quality. I avoid foods containing nitrites or preservatives. I read more health-related articles than I did 3 years ago. I'm interested in information about my health. I'm concerned about my health all the time. Air pollution does not bother me. (R)
	Physical fitness	I try to exercise at least 30 min. a day, 3 days each week. I exercise more than I did three years ago. Exercise helps me succeed in all facets of my life. Good health takes active participation on my part. I spend time each day trying to reduce accumulated stress.
	Personal health responsibility	It is the doctor's job to keep me well. (R) My health is outside my control. (R) I believe that the "wellness" idea is a fad. (R) I only worry about my health when I get sick. (R)
	Nutrition and stress management	My daily meals are nutritionally balanced. I try to avoid high levels of cholesterol in my diet. I attempt to avoid stressful situations.
Jayanti & Burns (1998): p. 14	*Modified from Kraft & Goodell (1993)	I worry that there are chemicals in my food. I'm concerned about my drinking water quality. I usually read the ingredients on food labels. I read more health-related articles than I did 3 years ago. I'm interested in information about my health. I'm concerned about my health all the time.
Gould (1988): p. 102	health alertness	I'm alert to changes in my health. I'm usually aware of my health.
	health self-consciousness	I reflect about my health a lot. I'm very self-conscious about my health. I'm generally attentive to my inner feelings about my health.
	health involvement	I'm constantly examining my health. I'm very involved with my health.
	health self-monitoring	I'm aware of the state of my health as I go through the day. I notice how I feel physically as I go through the day.

<p>Michaelidou &amp; Hassan (2008): p. 170</p>	<p>Modified from Gould (1988)</p>	<p>I reflect about my health a lot.  I'm very self-conscious about my health.  I'm alert to changes in my health.  I'm usually aware of my health.  I take responsibility for the state of my health.  I'm aware of the state of my health as I go through the day.</p>
<p>Dutta-Bergman (2004a): p. 402</p>	<p>Healthy Eating</p>	<p>Try to avoid foods that are high in fat.  Try to avoid foods that are high in cholesterol  Nutrition information determines what I buy  Make a special effort to get enough fiber  Am concerned about how much sugar I eat  Try to avoid foods with a high salt content  Try to select food fortified with vitamins  Use a lot of low calorie products  Try to avoid foods with high additives  Careful what I eat to keep weight in control  Am concerned about getting enough calcium</p>
	<p>Alcohol Consumption</p>	<p>Had a cocktail or drink before dinner  Went to a bar or tavern  Had wine with dinner  Had too much to drink</p>
	<p>Gambling</p>	<p>Bought an instant or scratch-off lottery  Bought a state lottery ticket  Participated in a sweepstakes, game etc.  Gambled in a casino</p>
	<p>Exercising</p>	<p>Exercised at home  Walked more than 1 mile for exercise  Jogged  Rode a bicycle</p>
<p>Dutta-Bergman (2005): p. 8</p>	<p>Healthy eating</p>	<p>I try to avoid foods that are high in fat.  I try to avoid foods that are high in cholesterol.  I try to avoid foods with a high salt content.  I am concerned about how much sugar I eat.  I make a special effort to get enough fiber in my diet.  I use a lot of low calorie or calorie reduced products.  I try to select foods that are fortified with vitamins and minerals.  I am careful about what I eat in order to keep my weight under</p>



		control. I try to avoid foods that have additives in them. I am concerned about getting enough calcium in my diet.
Dutta-Bergman (2004b): p. 281 Dutta-Bergman (2006): p. 15 Dutta (2007): p. 5		Living life in the best possible health is very important to me. Eating right, exercising, and taking preventive measures will keep me healthy for life. My health depends on how well I take care of my self. I actively try to prevent disease and illness. I do everything I can to stay healthy.
Furnham & Forey (1994): p. 465	Health information seeking	Do you often read about health in newspapers, magazines, books, etc.? Do you take much notice of health care recommendations from TV, radio, etc.?
	Food consumption	Do you monitor the nutritional value of your food? Do you adjust your diet to suit your state of health? Do you exclude the use of additives and preservatives in your food? Do you look for environmentally friendly products when shopping? Do you exclude animal product from your diet? Do you shop in health food shops?
	Environment awareness	Do you think the government should spend more money on cleaning up the environment? Do you think more money should be put into research for alternative forms of energy (e.g., wind, water)? Do you think that global warming is a priority concern?
	Perception of prescription drugs	Do you think that prescription drugs are always suitable? Do you prefer to avoid taking prescription drugs? Do you inquire about the drugs prescribed (including side effects)?
Tai & Tam (1997): p. 297	NA	I'm more health conscious than most of my friends. I frequently purchase "health food"/"natural food."

*Note.* Items in this table were adopted (copied) from original studies.

## Appendix 2. Scales of related concepts

Source	Scale	Items
Jayanti & Burns (1998), p. 14 adapted from Moorman & Matulich (1993), p. 221	Health motivation	<p>I try to prevent common health problems before I feel any symptoms.</p> <p>I am concerned about common health hazards and try to take action to prevent them.</p> <p>I don't worry about common health hazards until they become a problem for me or someone close to me. (R)</p> <p>Because there are so many illnesses that can hurt me these days, I am not going to worry about them. (R)</p> <p>I don't take any action against common health hazards I hear about until I know I have a problem. (R)</p> <p>I would rather enjoy life than try to make sure I am not exposing myself to a health hazard. (R)</p>
Jayanti & Burns (1998), p. 14	Health value	<p>(Not worth the benefit at all (1) to very much worth the benefit (7))</p> <p>Avoid tension</p> <p>Stay healthy longer</p> <p>Stay fit longer</p> <p>Look younger</p>
Tai & Tam (1997): p. 297	Environmental consciousness	<p>I am willing to pay a little bit higher prices to buy green products.</p> <p>I frequently purchase products which claim to be environmental friendly.</p>
	Weight consciousness	<p>No matter how busy I am, I always find time each week to do a few hours of exercises</p> <p>I'm careful in what I eat in order to keep my weight under control</p> <p>To maintain a nice figure, exercise is very important</p>
New addition	Responsibility	<p>I should take care of myself to prevent disease and illness.</p> <p>I am responsible for maintaining a healthy body weight.</p> <p>I can prevent ill health results if I am careful.</p>
New addition	Motivation	<p>Living life without disease and illness is very important to me.</p> <p>Living life with a nice body figure is very important to me.</p>
New addition	Health information	<p>I often read about health in print media (e.g., newspapers, magazines, books, etc.).</p> <p>I am generally attentive to health information from TV and radio.</p> <p>I often search health information on the Internet.</p> <p>I try to find information in the Internet when I notice unusual symptoms.</p> <p>I often talk about health with my friends, family or relatives.</p> <p>I ask my friends, family or relatives about health information when I notice unusual symptoms.</p>

		<p>I regularly talk with my family doctor.</p> <p>I ask my family doctor about health information when I notice unusual symptoms.</p> <p>I ask any health care providers about health information when I notice unusual symptoms.</p>
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