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Promoting fruit and vegetable consumption in different lifestyle groups: Recommendations for program development based on behavioral research and consumer media data

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Abstract

Fruit and vegetable consumption impacts the etiology of cardiovascular disease as well as many different types of cancers. Still, Americans' consumption of fruit and vegetables is low. This article builds on initial research that assessed the validity of using a consumer-based psychographic audience segmentation in tandem with the theory of planned behavior to explain differences among individuals' consumption of fruit and vegetables. In this article, we integrate the findings from our initial analyses with media and purchase data from each audience segment. We then propose distinct, tailored program suggestions for reinventing social marketing programs focused on increasing fruit and vegetable consumption in each segment. Finally, we discuss the implications of utilizing a consumer-based psychographic audience segmentation versus more traditional readiness-to-change social marketing segmentation. Differences between these two segmentation strategies, such as the ability to access media usage and purchase data, are highlighted and discussed.

Introduction

The cornerstone of marketing strategy rests on three main activities: audience segmentation, targeting, and positioning (Arnould, Price, & Zinkhan, 2004; Kotler & Zaltman, 1971). Audience segmentation involves dividing a population into identifiable, subgroups with similar characteristics. Segmentations can be based on a variety of characteristics such as needs, lifestyle, purchase behavior, demographics. Once a population has been segmented into subgroups, a few subgroups are then identified as target audiences. That is, they comprise the portion of a population on which marketing and communications efforts will be focused. The product or service being marketed is then “positioned” among its competitors as offering a unique attribute or benefit that each target audience desires (Arnould et al., 2004; Kotler et al., 1971; Rossiter & Percy, 1997).

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This “segment→target→position” approach is easily conceptualized within the practice of health communication and health marketing when a corporation or hospital system tries to market a health-related product or service because their health marketing efforts frequently address secondary or tertiary health prevention behavior¹. Within these two prevention contexts, it is relatively easy to identify meaningful segmentation approaches. For example, purchase behavior or decision-making strategy can be used to classify individuals into customer segments for different health/medical product or service offerings. Then, in a secondary or tertiary prevention context, health marketers can easily select target audiences based on specific business objectives or desired health outcomes. Moreover, in these situations it is relatively easy for health marketers to assess their competition and then attempt to “position” their product/service within a unique, but desirable subset of health or healthcare-related purchase options.

Conceptualizing the “segment→target→position” approach is more challenging when the “health product” is a primary health prevention behavior or activity. Two major factors contribute to this challenge. First, given an ideal world, everyone would engage in activities that promote good health and work to prevent the onset of deleterious health conditions and diseases, and any health communication touting the benefits of primary prevention activities would reach every audience segment at risk for these conditions and diseases. Segmenting and targeting specific audience groups runs the risk of being perceived as inherently exclusive, perhaps even discriminatory. In a primary prevention health marketer's ideal world, avoiding this stigma is desirable. Second, the difficulty in identifying distinct competitors for primary prevention makes it challenging to “position” primary prevention activities. Competitors are simply more vague and diluted in this context. Certainly, one might identify fast food restaurants as competitors of the *More is Better* campaign (formerly the 5-A-Day for Better Health campaign) (www.fruitsandveggiesmatter.gov). Yet other competitors exist in divergent industries (e.g., companies in the snack food industry, the carbonated beverage industry), and their products' impact on individuals' health will likely differ as well. Both these factors highlight the challenge of developing sophisticated primary health prevention campaigns.

Audience Segmentation for Public Health Communication Campaigns

Only within the last 15 to 20 years have public health communication professionals begun to advocate for more sophisticated campaigns. Slater (1995), in *Designing Health Messages*, cited prominent public and health communication researchers such as Atkin & Freimuth (1989), Grunig (1989), and Rogers & Storey (1987), declaring “Audience segmentation is the foundation upon which the success or failure of a public communication effort is built” (p. 186).

¹Health prevention behavior exists on a continuum: primary prevention activities are those activities that are undertaken to prevent the onset of a specific health condition; secondary prevention activities are those that are undertaken to identify and treat individuals with risk factors for specific health conditions, but who have not yet been clinically diagnosed with the condition; and tertiary prevention activities are those that are undertaken to help individuals manage an established disease, which emphasizes attempts to restore physical functioning and minimize effects of the disease (U.S. Preventative Services Task Forces' Guide to Clinical Preventive Services (2d edition, 1996), (pp xli).

Still, many initial audience segmentation efforts today fall back to epidemiologic reporting systems, which describe the distribution of illness and disease across geography and demography (Institute of Medicine, 2002). Epidemiology certainly is useful for identifying groups of individuals who are disproportionately at risk for or exhibit negative health outcomes (Friis & Sellers, 1999). For example, African American women over 40 years of age were significantly less likely to obtain a mammogram than Caucasian women in the same age bracket in 1987 (Breen, Wagener, Brown, Davis, & Ballard-Barbash, 2001), which ultimately put them at greater risk of dying from breast cancer. Using statistics about mammography screening behavior, health behaviorists developed numerous health interventions targeting African America women over the age of 40, and successfully closed the gap between African America women's mammography screening behavior and Caucasian women's screening behavior by 1998 (Breen et al., 2001). Still, epidemiologic population descriptions are not the only basis for audience segmentation, and, in fact, they may not be as effective as other audience classification approaches.

In the 1980s and 1990s, public health interventionists began to recognize that other segmentation approaches, in addition to demography and geography, might prove useful for behavior change initiatives. While demographic and geographic audience segmentations can be helpful because they are relatively static and enduring nature, they are also inflexible and do not account for the idiosyncrasies of the health behavior in question. Dynamic segmentations, on the other hand, are unique to each health behavior and may vary by health behavior. These segmentation approaches are not mutually exclusive; both can be used in tandem. When paired together, enduring and dynamic segmentation variables can generate strong marketing programs and/or campaigns because enduring variables are often used to determine appropriate dissemination and delivery strategies, while dynamic variables help inform positioning and messaging decisions (Rothschild, 1987).

Using health behavior theory, Prochaska, DiClemente, and Norcross (1992) expanded the concept of audience segmentation in public health intervention research to include dynamic segmentations by applying a staging algorithm to affected populations. Prochaska and colleagues' algorithm classifies individuals based on their motivational readiness for behavior change (i.e., stage of change). They subsequently identified theoretical constructs used to move an individual from one stage of motivational readiness to another and/or measure an individuals' progression toward behavior change. In this way, Prochaska et al. were some of the first behaviorists to combine audience segmentation with theoretical constructs from behavior change research. In the past, these two concepts had been treated as distinct elements of health interventions and campaigns. In very simple terms, Prochaska et al.'s approach, widely known as the transtheoretical model (TTM), is a combination of audience segmentation and segment-targeted, theory-based behavior change variables that can be used to guide and measure interventions.

The transtheoretical model (Prochaska et al., 1992) gained popularity quickly. Many health marketers have used the “stages of change” approach for primary prevention interventions, targeting individuals in one or more stage of motivational readiness and tailoring their interventions to a targeted stage of motivational readiness (Dallow & Anderson, 2003; Grimshaw & Stanton, 2006; Jackson, Asimakopoulou, & Scammell, 2007; Norman et al.,

2007; Pagoto, McChargue, & Fuqua, 2003; Richards, Kattelman, & Ren, 2006; Woods, Mutrie, & Scott, 2002). Perhaps the TTM's recent popularity is not only based on its alternative approach to traditional demographic and geographic audience segmentation variables, but also its integration of two historically distinct concepts in public health – audience segmentation and health behavior theory. This integration is an important innovation in public health because it helps guide health behaviorists in developing primary prevention interventions by identifying relevant theoretical constructs that health marketers should address at each stage of motivational readiness. Thus, the TTM provides health marketers with a “road map” of sorts for intervention development.

In this paper, we propose that Prochaska and colleagues' (1992) integrated approach can be used in an enduring audience segmentation context as well. To support our hypothesis we focus on fruit and vegetable consumption, integrating an enduring audience segmentation with the theoretical constructs of the theory of planned behavior (Ajzen, 1991). The constructs of the theory of planned behavior (TPB) are reviewed in Table 1 and presented in their traditional structure in Figure 1.

In the tradition of Prochaska and colleagues (1992), we explore the intersection of health behavior theory and audience segmentation. We, too, propose using an audience classification or segmentation algorithm outside the scope of traditional public health segmentation variables. Specifically, we focus on integrating a psychographic audience segmentation with the TPB. Psychographic segmentations expand upon traditional demography and geography to describe lifestyle issues, activities, interests, and opinions. They attempt to identify values, personality characteristics, and self-concept perceptions that motivate individuals' behavior (Arnould et al., 2004; Mowen, 1995; Rothschild, 1987).

Psychographic Audience Segmentations in Public Health Campaigns

The concept of segmenting audiences based on social class, lifestyle, and personality congealed in the late 1960s as two lines of research – quantitative personality effects research and qualitative consumer motivation research – began to blend together (Wells, 1975). Psychographic research, as it began to be called by market researchers, “combines the objectivity of the personality inventory with the rich, consumer-oriented, descriptive detail of the qualitative motivation research investigation” (Wells, 1975, p. 196). Studies from the marketing discipline support the premise that psychographic variables influence behavior (e.g., purchase behavior, advocacy behavior) (Shrum, McCarty, & Lowrey, 1995; Solomon, 1988), and as a result, they provide a fertile basis for audience segmentations.

Yet, while marketers routinely engage in audience segmentation research and frequently employ psychographic variables as a basis for this research, few formal health behavior studies have looked at how the American population might be divided into different psychographic groups and leveraged to impact public health (Maibach, Maxfield, Ladin, & Slater, 1996; Murry, Lastovicka, & Austin, 1997; Patterson, Haines, & Popkin, 1994; Slater & Flora, 1991). One of the more recent studies in this select discipline of health marketing was performed by Maibach and colleagues (1996). Their research classified individuals based on health lifestyle patterns (i.e., a psychographic segmentation). Follow-up research performed by Glanz and associates assessed the predictive validity of the lifestyle

classification scheme (Glanz, Basil, Maibach, Goldberg, & Snyder, 1998). The classification algorithm developed through Maibach and Glanz's studies explained variation in seven out of 16 health-related criterion variables better than demographics alone. When compared with demographic variables, the psychographic segmentation variable was equally good at explaining variation in health behavior for four of the 16 criterion variables.

In a recent study by Dutta-Bergman (2005), similar psychographic-health behavior relationships were noted. Dutta-Bergman found that a general psychometric measure of college students' health lifestyle explained 16.8% of the total variation in attitudes toward fruit and vegetable consumption. Moreover, in a separate sample, Dutta-Bergman found that health lifestyle variables (e.g., frequency of regular exercise, efforts to eat a healthy diet, and indications of alcohol usage) significantly predicted fruit and vegetable consumption, after controlling for demographic variables (i.e., gender, education, age and income). Moreover, in previous research, Dutta-Bergman (2003) showed that psychographic variables can be used to explain media consumption in a health context. This empirical evidence lends support for our decision to employ a psychographic audience segmentation in this study.

Furthermore, our decision to focus on an enduring, psychographic audience segmentation is also rooted in the reality that lifestyle-induced chronic diseases are becoming endemic in the United States. Thus, we believe that enduring psychographic audience segmentations may hold value beyond that of demographic and geographic segmentation for primary prevention of chronic disease. In support of our point of view, several researchers have noted that psychographic variables are able to predict health behavior. And more specifically, personality and lifestyle differences have been noted as behavioral determinants in a number of primary prevention studies that assessed dietary habits (McGinnis & Foege, 1993; Rhodes, Courneya, & Hayduk, 2002). Building on previous theory-based research, this paper explores ways in which an enduring, consumer-based psychographic segmentation can be integrated with health behavior theory to better inform primary prevention efforts in the area of fruit and vegetable consumption research – a lifestyle-based health behavior.

Research Findings

As part of a larger research study, we examined the validity of using the TPB to explain variation in fruit and vegetable consumption, as well as the validity of using a consumer-based audience segmentation tool (VALS™) to identify differences across determinants of fruit and vegetable consumption. After we confirmed the efficacy of using the TPB and VALS to explain variation in fruit and vegetable consumption, we assessed the potential impact of our findings on future health marketing campaigns aimed at increasing Americans' fruit and vegetable consumption. The remainder of this paper briefly explains our initial exploratory research using the TPB and VALS. It then describes group consumption habits and marketplace behavior based on the VALS algorithm. Finally, it suggests how theory-based and market-based research results might be integrated to promote increased fruit and vegetable consumption in the future.

Overview of initial, theory-based exploratory research

Our initial research focused on fruit and vegetable consumption because it is affected by individuals' lifestyles and it has been positively linked to decreased risk of several different types of cancers, including those of the prostate, lung, stomach, endometrium, mouth, and pharynx (Ames & Wakimoto, 2002; Block, Patterson, & Subar, 1992; Steinmetz & Potter, 1991; Steinmetz & Potter, 1996). Our research follows that of the National Cancer Institute (NCI), which began a national social marketing campaign in 1999 encouraging Americans to consume five servings of fruit and vegetables every day via the *5-A-Day for Better Health* campaign (Havas et al., 1995). From its inception, campaign planners recognized the strong link between fruit and vegetable consumption and consumer lifestyle behavior.

Consequently, they organized their efforts using a consumer-based campaign planning model. After consulting the TTM to segment their audience and proprietary databases to select their media, they enlisted influential corporations and professional associations within the produce industry as partners for the campaign (Lefebvre et al., 1995). Despite its efforts to integrate consumer lifestyle behavior, NCI continued to rely heavily on Prochaska's et al's (1992) stages of change and traditional demographics – public health's tested segmentation variables (Lefebvre et al., 1995).

We expanded upon NCI's initial fruit and vegetable campaign by employing a proprietary psychographic audience segmentation algorithm (VALS) as a segmentation alternative. Stanford Research Institute Consulting – Business Intelligence (SRIC-BI), created the VALS psychographic segmentation algorithm more than three decades ago. The VALS algorithm classifies individuals into audience segments according to: primary behavioral motivations (i.e., ideals, self-expression, and achievement), which are based on personality, lifestyle, interests, opinions; the breadth and depth of resources an individual has at his or her disposal; and demographic characteristics (www.sric-bi.com/VALS). In a health context, VALS has been used successfully to launch a new type of surgery for a Minnesota medical center, as well as to introduce new safety innovations to the automotive industry (SRI Consulting Business Intelligence [SRIC-BI], 2005b). Given the link between dietary habits and consumer personality and lifestyle (McGinnis et al., 1993; Rhodes et al., 2002), we initially hypothesized that VALS could function as a strong alternative to the traditional enduring segmentation variables used in public health and the original 5-A-Day campaign.

To test our hypothesis, we conducted a series of multi-group structural equation model comparisons. Our analyses showed significant differences in the predictive ability of the TPB across VALS. Additional details about the methods, analysis, and results of these model comparisons can be found in a related paper (Della, DeJoy, & Lance, 2007). Essentially, the results of our initial analyses demonstrated that the VALS audience segmentation variable moderated TPB construct relationships. Figure 2 presents the parameter estimates for the TPB within each VALS group. Solid lines indicate statistically significant relationships at the $p < .05$ level, while dotted lines indicate nonsignificant relationships. In general, the attitude-intention relationship was weak, and not statistically significant, in most groups. The relationship between perceived behavioral control and behavioral intention, however, was usually statistically significant. There were also differences across groups with regard to model mediation. In some groups the relationship

between perceived behavioral control and fruit and vegetable consumption behavior was fully mediated through behavioral intention. In other groups these relationships were partially mediated, and in one group no mediation occurred (i.e., only a direct effect existed).

Overview of consumer behavior and marketplace differences by VALS group

Differences in consumer behavior across the audience segments were obtained from SRIC-BI. Due to small sample sizes in three groups, only five of the eight VALS segments were assessed in our research: Innovators, Thinkers, Believers, Achievers, and Makers.² Table 2 presents the primary motivation, resource level, and segment descriptions for each of the five VALS groups assessed. Table 3 outlines more specific consumer behavior information about each VALS group. Specifically, SRIC-BI (2005a) tracks and/or purchases this information on each segment: marketplace consumption behavior (e.g., products and services typically purchased), personal interests (e.g., hobbies and activities), and media usage habits (e.g., radio stations listened to most frequently, magazines subscribed to most often). For instance, SRIC-BI reports that Thinkers are reflective and informed individuals (www.sric-bi.com/VALS/types). According to SRIC-BI, Thinkers are primarily motivated by ideals, which means that they value order, knowledge, responsibility, and moral principle. Thinkers tend to be well-educated and active information gatherers who are generally informed about world events and who are always looking for opportunities to broaden their knowledge. They are willing to consider new ideas but, as generally conservative and practical consumers, they seek durability, functionality, and value in their purchases. This group accesses the Internet, but is not necessarily savvy with a mobile phone. Not surprisingly, members of this group tend to access media that provide information on history and self-betterment.

In contrast, Makers are motivated by self-expression because they like to create, fix, and build things themselves (www.sric-bi.com/VALS/types). According to SRIC-BI, these individuals are responsible, practical, and self-sufficient. They generally stand in opposition to social controls that endanger one's ability to be self-reliant, and they have the constructive skills to support their independent positions. As such, they are respectful of government authority but dislike government intrusion on individual rights. They believe in organized labor and are suspicious of new ideas and big business. Because SRIC-BI has found that Makers experience the world by working on it (i.e., building, fixing, and creating), Makers appear to value behavior that positively impacts the physical environment. Unimpressed by prestigious material possessions, SRIC-BI reports that they generally live within the traditional American context of family, work, and rest, and show little interest in events outside of this context. Given their approach to life, it is not surprising that Makers attend auto shows and are interested in collections, such as electric trains, figurines, and sports trading cards. Finally, MSRIC-BI's (2005a) data show that this group listens to country music and appreciates faith and inspirational radio stations. As is evidenced by this description of the Maker segment, and the preceding description of the Thinker segment,

²Multi-group structural equation modeling requires group sizes in the range of N=200 or more (Boomsma, 1982; MacCallum, Widaman, Zhang, & Hong, 1999). In our initial analyses, three groups (the Striver, Experiencer, and Survivor groups) did not meet the minimum sample size requirements.

SRIC-BI collects extensive descriptive data and in-depth segment profile data for each of its VALS audience segments.

Moving From Research to Practice

The results from our research, which cross-references the TPB and VALS with supplementary segment-specific consumer information from SRIC-BI, can provide a strong foundation for segment-tailored program development. As was the case with Prochaska and colleagues' (1992) work, the integration of segmentation and health behavior theory provides a “road map” for future intervention development. Specifically, VALS, as an enduring segmentation variable derived from lifestyle-based behavior and personality characteristics, lends strategic insight into attitudes, opinions, activities, interests, and media usage behavior that can be used to plan messaging and dissemination strategies. The TPB, on the other hand, can be used to focus message development on important determinants of fruit and vegetable consumption. In this section, we make programmatic and media recommendations for each VALS audience segment. We follow our recommendations with a discussion of the ramifications of our approach on public health marketing and communications practice.

The Innovator Segment

Implications for Product Development—According to SRIC-BI, Innovators have high levels of resources and exhibit high levels of innovation (see Table 2). They also are motivated, to some extent, by all three primary motivations (i.e., ideals, achievement, and self-expression) (www.sric-bi.com/VALS/types). The group is composed of trend-setting, high-tech individuals whose fruit and vegetable consumption behavior, according to our research results, is strongly influenced by perceived behavioral control (see Figure 2). As such, a new interactive, technology-based program might be most successful with this audience. Specifically, a program that increases perceived behavioral control and that could be positioned as the newest trend among community and business leaders might help increase fruit and vegetable consumption among individuals in this audience group.

Such a program might involve developing elements designed to increase these individuals' perceived behavioral control, such as an online application for selecting and purchasing fruit and vegetables via the Internet or a personal digital assistant and/or a fee-for-service fruit and vegetable delivery that provides fresh fruit and vegetables every few days. The intervention or program might even consist of a downloadable e-reminder program to accompany online purchases, and it could be designed to provide reminders to snack on fruit and vegetables at specific times throughout the day. It could also be used to track daily fruit and vegetable intake. Or, it could provide the user with a “return-on-investment” email every month to highlight how much is being spent for the service, how many servings of fruit and vegetables are being consumed, and how this rate of consumption is impacting the user's lifetime cancer risk (obviously presented as an estimated range).

Implications for Product Promotion—A free trial period could help expose Innovators to the e-program and delivery service and the accompanying electronic tracking/update program. Because SRIC-BI (2005a) data shows that Innovators attend live theatre and dance

performances (see Table 3), promotional messaging could be placed, and perhaps even tied-in, with live theatre and dance materials (e.g., tickets or programs). Promotional taglines linking the desired behavior with the theatre and dance message placement would help maintain relevance with this group.

Finally, our research also showed that subjective norms had a significant effect on fruit and vegetable consumption behavior in this group. This information could be used to identify a relevant messages source, such as a prominent spokesperson (e.g., a recognizable CEO). Similarly, using information from SRIC-BI, we suggest creating messages with tone and personality that reflect the characteristics of the audience segment itself – sophisticated and take-charge, but curious.

Strategic Media Suggestions—Because SRIC-BI reports that more trend-setting, high-tech oriented individuals comprise this segment (www.sric-bi.com/VALS/types), a strong media strategy might try to reach segment consumers via high-tech or cutting-edge media outlets. For instance, a combination of new media (e.g., Internet-based business wikis and blogs, technology-oriented podcasts) and wireless communications (e.g., SMS or text messages and videocasts) could be used to introduce this segment to the electronic reminder program and delivery service. Additionally, new product introduction press releases could be targeted at highly downloaded RSS feeds from key business news websites. Other media approaches for targeting this segment might include purchasing print advertising space in premier business, investment, and technology-oriented magazines. Finally, creative in-store advertising could be employed at consumer electronics retail outlets.

Thinker Segment

Implications for Product Development—According to SRIC-BI, Thinkers have high levels of resources and are motivated primarily by ideals (www.sric-bi.com/VALS/types). Because of their idealism, SRIC-BI reports that Thinkers tend to base their decisions on abstract, idealized criteria (e.g., integrity, quality, and tradition). Reviewing the results of our study, we note that behavioral intention completely mediates the relationships between the distal antecedents of the TPB and fruit and vegetable consumption behavior (the outcome variable in our study). As such, the behavioral intention construct elicits the strongest total effect on fruit and vegetable behavior for the Thinker group. Given this complete mediation, we conclude that Thinkers probably approach behavior change through a progressive, step-by-step process. In support of our conclusion, SRIC-BI reports that Thinkers possess an information-seeking nature and high levels of resources, likely to enhance their ability to exert strong volitional control over their own behavior. To this end, pairing the VALS enduring segmentation with a dynamic segmentation based on motivational readiness (e.g., the TTM's stages of change segmentation) might have the greatest impact on Thinkers' fruit and vegetable consumption because the program would focus on changing behavior in a step-by-step manner. Our research also shows that perceived behavioral control is the strongest distal antecedent of consumption. Therefore, coupling the paired segmentation approach suggested above with program elements that target low self-efficacy and perceptions of control might boost the effective of programs targeting this VALS group.

Implications for Product Promotion—Given SRIC-BI's description of Thinkers as knowledgeable and responsible individuals, messages emphasizing their personal responsibilities to serve as a positive role model for others might prompt Thinkers to increase their fruit and vegetable consumption. Also, SRIC-BI reports that Thinkers are reflective individuals who are open to broadening their own personal knowledge (www.sric-bi.com/VALS/types). Therefore, messages prompting self-reevaluation might motivate Thinkers to begin eating additional servings of fruit and vegetables each day.

Additionally, SRIC-BI's information about Thinkers corroborates our research findings that Thinkers take a step-by-step approach to behavior change and are likely to engage in more cognitive processing of information than the other VALS segments studied. That is, SRIC-BI's data indicate that Thinkers “actively seek out information in the decision making process” and are likely to “ask physicians about advertised prescriptions” after seeing a direct-to-consumer advertisement (SRIC-BI, 2005a). As such, it is probably safe to assume that this segment will cognitively process media messages about fruit and vegetable consumption more than other VALS segments.

Based on both SRIC-BI's (2005a) data about Thinkers and our research findings, it appears that messages disseminated from credible sources (e.g., the National Cancer Institute) should reach and motivate Thinkers best. Additionally, direct-to-consumer-like “calls to action” could be used to prompt Thinkers to obtain more information. Accordingly, any program aimed at this group would definitely benefit from integrating multiple communication components (e.g., Internet information, physician communications, informational brochures).

Strategic Media Suggestions—Given Thinkers' tendencies to elaborate on direct-to-consumer advertisements, listen to classical radio stations, and seek information on-line (see Table 3), it seems likely that Thinkers will be receptive to messages about increasing fruit and vegetable consumption if they are contained within the context of informational media vehicles (e.g., the evening news, direct-to-consumer commercials, or online health/wellness websites). It might also be prudent for health marketers to ensure that messages about fruit and vegetable consumption are returned as a top search results on popular Internet search engines when users search for information on related topics (e.g., various cancers, weight management/obesity, diabetes, cardiac health). Thinkers' quests for information may also lead them to subscribe to and read reputable news papers (e.g., New York Times, Washington Post, Chicago Tribune). As such, frequent efforts to place stories/messages in these media outlets should successfully reach the Thinker segment. Finally, short reminders to eat more fruit and vegetables might reach this audience if they are placed within the programming of classical radio stations and venues such as National Public Radio.

Believer Segment

Implications for Product Development—Data from SRIC-BI indicate that Believers have low levels of resources and exhibit low levels of innovation (www.sric-bi.com/VALS/types). Like Thinkers, however, they are primarily motivated by ideals. They tend to base their decisions on abstract, idealized criteria (e.g., integrity, quality, and tradition), and are

moralistic, conventional individuals. As such, SRIC-BI reports that they tend to follow very entrenched daily routines.

Our theory-based research showed that only the perceived behavioral control construct within the TPB exhibited a significant effect on consumption behavior for Believers. For this group, behavioral intention did not translate to actual behavior. Combining segment information from our research with information from SRIC-BI, we suggest that any program targeting the Believer segment should directly address perceptions of control over eating more fruit and vegetables each day. A skill-based intervention highlighting how fruit and vegetables can be incorporated into entrenched daily routines might help increase fruit and vegetable consumption quantity in this group.

Implications for Product Promotion—Believers are also deeply committed and loyal to family, religion, and community (www.sric-bi.com/VALS/types). As a result, skill-building seminars and classes held at local churches and community-based organizations could be effective means of communicating with Believers. Because their leaders would be more likely to be viewed as credible sources of information, community and religious organizations could serve as key partners in communicating straight-forward and morally rooted messages to this VALS segment.

Strategic Media Suggestions—On a broader scale, SRIC-BI (2005a) reports that this segment listens to gospel, faith, and inspirational radio stations more frequently than other segments. Therefore, public health marketers looking to communicate with this segment beyond local churches and community-based organizations would be prudent to purchase air time during local gospel or faith-based radio programs. And even though SRIC-BI reports that this segment does not purchase many books, it seems likely that this group might be more likely to subscribe to faith or inspirational print media (e.g., “Guidepost” magazine) than the other segments assessed in this study. Finally, SRIC-BI reports that Believers are interested in cooking. Thus, skill-building messages could be placed within local cooking or food preparation television segments, as well as targeted toward specific communities via cable programming on the Food Network and the Discovery Home Channel.

Achiever Segment

Implications for Product Development—According to SRIC-BI, Achievers have high levels of resources and exhibit high levels of innovation (www.sric-bi.com/VALS/types). They are motivated primarily by achievement, and accordingly, they tend to base their decisions on expected reactions, concerns, and desires of friends and family or of people in social circles to which they belong or seek entry. Achievers lead goal-oriented lives and value products that demonstrate success and prestige to their peers. In reviewing our research results for this group, it is important to note that all of the TPB's constructs impact Achievers' consumption behavior. While the perceived behavioral control construct exhibited the strongest overall effect on their fruit and vegetable intake, intention also exhibited a significant direct effect on their consumption behavior. Coupling our research results with SRIC-BI's information about Achievers, we believe that a graduated goal-setting approach, whereby achieving small objectives leads to a larger goal, aligned with a

graduated rewards program that demonstrates success and prestige, could motivate this group to consume more fruit and vegetables.

Implications for Product Promotion—In addition to their need for social acceptance and success, SRIC-BI reports that Achievers are interested in products and services that will save time and energy in their busy schedules (www.sric-bi.com/VALS/types). Incorporating convenience and image into a goal-based program might prove a potent combination for this audience. For example, combining innovative, convenient, and prestige packaging with informational communication messages and relevant outcome rewards (e.g., a lunch tote that outwardly represents “fruit and vegetable consumption” success) might effectively motivate Achievers to change their consumption behavior.

Strategic Media Suggestions—Additionally, SRIC-BI (2005a) reports that this segment is interested in and plays adventure or role-playing video and online games (see Table 3). Such games could provide an excellent venue for embedding messages that encourage fruit and vegetable consumption. What is more, adventure and role-playing games possess an inherent element of competition, which should appeal to Achievers' need for success and prestige. As such, these games could also be used to create scenarios in which Achievers practice fruit and vegetable consumption behavior online and receive virtual rewards for meeting virtual fruit and vegetable consumption goals.

Media usage data from SRIC-BI (2005a) also indicates that this segment rents a lot of movies on DVD. As such, health marketers may want to create and place relevant health promotion messages at the beginning of rented movies (i.e., rented DVDs, digital on-demand, pay-per-view). What is more, partnerships with leading video rental outlets might help health marketers reach this segment. Messaging and incentive “teasers” could be bundled with video mail delivery services such as Netflix™ and Blockbuster's Total Access™ service.

Finally, SRIC-BI's (2005a) data also indicate that Achievers are interested in personal and business self-help information. Thus, health marketers may be wise to prominently place their messages on self-help oriented websites. In similar fashion, developing partnerships with suppliers of self-help information (such as self-help books and CDs), might prove to be successful. For instance, health marketers could attempt to develop partnerships with organizations such as Amazon.com through which customers ordering products from self-help (e.g., “For Dummies” series, “Rich Dad, Poor Dad” series) or business-help genre would receive additional information about fruit and vegetable programs targeted at Achievers.

Maker Segment

Implications for Product Development—According to SRIC-BI data, Makers are motivated primarily by self-expression, and because of this they tend to engage in behavior that emphasizes individuality and personal challenge (www.sric-bi.com/VALS/types). Unlike other VALS groups, our research results showed that the perceived behavioral control and the behavioral intention constructs of the TPB exhibited equivalent effects on consumption behavior in the Maker group. What is more, our research findings indicated

that the attitude construct exerted significantly more impact on Makers' behavior than it did on the behavior of any other group. As a result, traditional education messages and program elements designed to affect attitudes, intentions and perceived behavioral control may be most appropriate for this audience segment.

Data from SRIC-BI also show that Makers possess low levels of innovation and resources (www.sric-bi.com/VALS/types). Thus, our initial recommendation of using traditional education messages to communicate with this VALS group aligns with the fact that Makers are not very innovative. Makers' low resource levels suggest that health marketers should also address availability and pricing as potential barriers to increasing perceived behavioral control among individuals in this group. Moreover, SRIC-BI states that “Makers experience the world by working on it” (www.sric-bi.com/VALS/types). According to SRIC-BI, Makers have the energy and wherewithal to initiate large projects and complete them.

Based on SRIC-BI's information about this segment and our research findings, we suggest repositioning current obstacles to increasing fruit and vegetable consumption among individuals in the Maker group as constructive projects that help increase self-sufficiency. For example, an encouraging skill-based intervention component (e.g., a video-based lesson) that teaches Makers how to grow their own fruit and vegetables, even in urban environments, could help elevate Makers' perceived behavioral control and assist them in overcoming issues of availability and price. Likewise, easy-to-read direct mail pieces with quick recipes and advice on how to incorporate homegrown fruit and vegetables into daily eating habits could bolster attitudes toward consumption, increase self-efficacy for consumption, and heighten perceptions of self-sufficiency.

Implications for Product Promotion—Because SRIC-BI reports that this group can be resentful of government intrusion on individual rights, a not-for-profit message sponsor with no perceived political alignment (e.g., the American Cancer Society) might be accepted as a more credible source of information than a message from a government agency. Additionally, based on data from SRIC-BI and our own research, we recommend that messages targeting Makers present information with a practical, no-nonsense, can-do tone. And, messages should emphasize how increased fruit and vegetable consumption is a means to a self-sufficient lifestyle. The bottom line for Makers is: increased fruit and vegetable consumption protects people from disease, which ultimately allows people to remain independent and self-sufficient.

Strategic Media Suggestions—Finally, based on SRIC-BI (2005a) data, communication messages aired on country music radio stations could be used to reach this audience (see Table 3). What is more, SRIC-BI's data indicate that individuals in this segment are interested in automobiles. Based on this information, health marketers could assume that print messages placed in automotive and mechanics magazines might reach Makers. Plus, messages displayed at large auto racing events (e.g., NASCAR) could be used to communicate with Makers. Finally, SRIC-BI has also found that members of the Maker segment are interested in cooking. As such, messaging placed during local cooking shows and local cable feeds of Food Network could help health marketers reach the Maker segment.

Discussion

This paper presented the results of integrating audience segmentation and theoretical research within the context of fruit and vegetable consumption. Segment-specific results from our traditional theory-based research (conducted as part of a larger study) were presented using the TPB. We then paired our research results with data from SRIC-BI's consumer-based research on activities, interests, and consumption behavior for the five different psychographic VALS audience groups we assessed. Ultimately, the findings from our theory-based research and SRIC-BI's audience segmentation research were integrated and used to make marketing and communication recommendations for increasing fruit and vegetable consumption within each VALS group.

Our research followed in the tradition of Prochaska and colleagues (1992), which broke new ground in public health by melding the strategies used for audience segmentation with the strategies traditionally used for theory-based message and program development in public health. Unlike Prochaska et al., however, we employed an enduring, psychographic audience segmentation rather than a dynamic, motivational readiness segmentation. We chose to focus on an enduring, psychographic audience segmentation because we believe that, in addition to dynamic segmentations, lifestyle-based enduring segmentations may hold additional value for primary prevention of chronic disease. We are convinced that our innovative and integrative approach has allowed us to make strong recommendations for segment-tailored health marketing programs and campaigns for each VALS audience segment assessed in this study.

Although our recommendations are evidence-based, we strongly suggest that any recommendations made within this paper be pilot tested with each target audience prior to implementation. We advise health marketers to conduct additional research to test and confirm the soundness of our program proposals, as well as our promotion and media suggestions. Finally, we would direct health marketers to seek additional information about each VALS audience. It is important to identify additional communication vehicles and venues for promoting VALS-specific health marketing programs, and it is critical that message tone and personality be confirmed prior to program implementation.

Conclusions

Our study suggests that audience segmentation research and traditional health behavior theory research can be successfully integrated to yield strong health marketing and communication ideas. Moreover, our study indicates that psychographic audience segmentations can be valuable tools for developing and designing lifestyle-based primary prevention campaigns. Additional research is still needed, however, to compare the effectiveness of using traditional enduring segmentation variables (i.e., geography and demography) in primary prevention health campaigns versus the effectiveness of using psychographic segmentation variables to address primary prevention issues of fruit and vegetable consumption. Nevertheless, our study results suggest that psychographic segmentations hold strong promise for primary prevention health marketing of fruit and vegetable consumption in that they can provide valuable information for determining message tone, personality, and source, as well as important data for selecting appropriate

media dissemination vehicles. Our study results also support the validity of integrating psychographic audience segmentations with traditional health behavior theory to guide actual program development and message dissemination.

Limitations

While psychographic audience segmentation variables appear to be a viable, and perhaps more effective, alternative to traditional enduring segmentation variables, their biggest drawback can be cost. Their use generally requires more initial outlay than demography or geography because psychographic segmentation algorithms must either be purchased from companies that have developed proprietary classification formulas or they must be developed in-house using surveys and multivariate data analyses. To mitigate financial outlays associated with using psychographic segmentations, we suggest exploring creative approaches. For example, health marketers interested in using psychographic segmentations could develop corporate partnerships that would allow them access to their partners' segmentation algorithms or their partners' raw data at discounted prices. These types of partnerships, however, require due diligence, and perhaps even some type of oversight review, to avoid ethical compromises.

Despite their potential drawbacks, psychographic audience segmentations possess value that primary prevention practitioners have yet to tap. We maintain that their potential benefits outweigh their disadvantages. Purchasing psychographic segmentation information often affords practitioners access to information that they would have to purchase during a later phase of campaign development (e.g., media usage data). Moreover, many psychographic segmentations are augmented via data appends. These appends frequently contain information on consumer purchases (e.g., products/services that specific segments purchase), consumer interests (e.g., hobbies, clubs, groups in which specific segments participate), and additional consumer demographics (e.g., total household aggregate automobile value). Such data are far outside the typical parameters that health marketers use to profile audience segments for primary prevention efforts. These data should help health marketers develop more precise, tailored, and relevant primary prevention efforts.

In conclusion, we are convinced that psychographic audience segmentations possess latent value, untapped by most primary prevention practitioners. The fact that psychographic audience segmentations are based on lifestyles, coupled with the fact that they can viably be integrated with traditional health behavior theory, make psychographic segmentations, such as VALS, promising tools for communicating and marketing lifestyle-based primary prevention health behavior.

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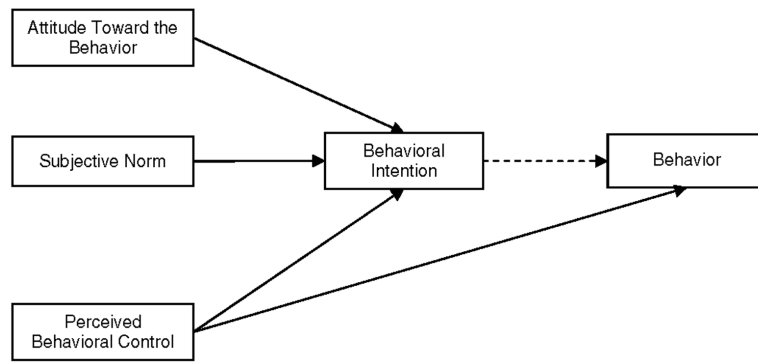
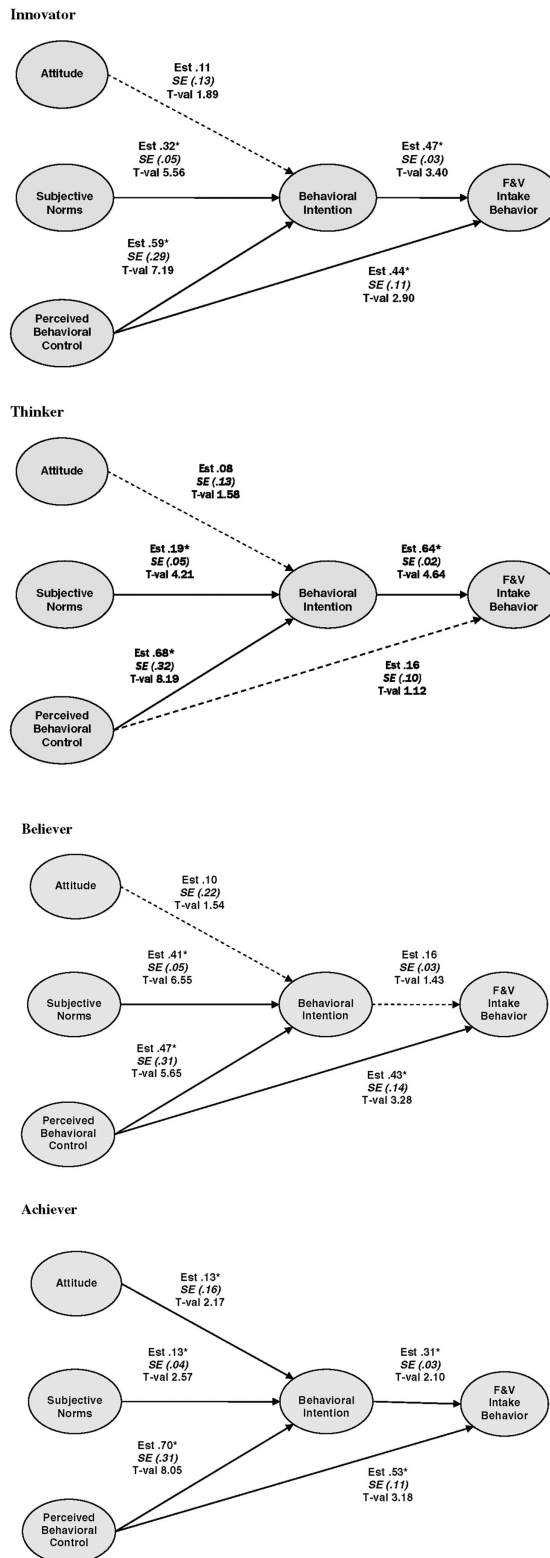


Figure 1. The theory of planned behavior (Ajzen, 1991; Montañó & Kasprzyk, 2002)



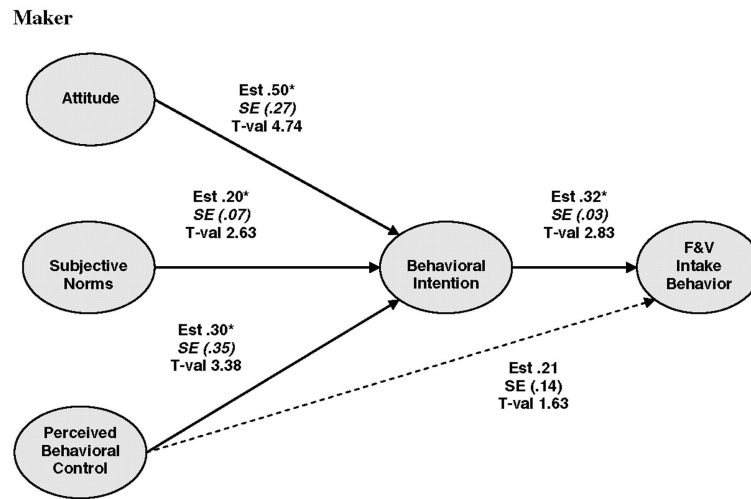


Figure 2. Standardized structural equation parameter estimates for each VALS group

Table 1

Description of theory of planned behavior constructs (Montaño & Kasprzyk 2002)

| Construct | Definition |
|-------------------------------------|---|
| <i>Behavioral Intention</i> | Perceived likelihood of performing the behavior |
| <i>Attitude</i> | Global evaluation of the behavior |
| <i>Subjective Norm</i> | Belief about whether most people approve of the behavior |
| <i>Perceived Behavioral Control</i> | Global measure of perceived control over the behavior that includes both internal self-efficacy and perceptions of external controllability |

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Table 2

SRIC-BI segment descriptions for each VALS group (www.sric-bi.com/VALS/types)

| Segment | Adjectives | Motivations | Description |
|----------------|--|--|--|
| 1. Innovators | Take-charge Sophisticated Curious | High resources: motivated by ideals, achievement, and self-expression | Innovators are successful, sophisticated, take-charge people with high self-esteem. Because they have such abundant resources, they exhibit all three primary motivations in varying degrees. They are change leaders and are the most receptive to new ideas and technologies. Innovators are very active consumers, and their purchases reflect cultivated tastes for upscale, niche products and services. |
| 2. Thinkers | Reflective Informed Content | High resources: motivated by ideals | Thinkers are motivated by ideals. They are mature, satisfied, comfortable, and reflective people who value order, knowledge, and responsibility. They tend to be well educated and actively seek out information in the decision-making process. They are well-informed about world and national events and are alert to opportunities to broaden their knowledge. |
| 3. Believers | Literal Loyal Moralistic | Low resources: motivated by ideals | Like Thinkers, Believers are motivated by ideals. They are conservative, conventional people with concrete beliefs based on traditional, established codes: family, religion, community, and the nation. Many Believers express moral codes that are deeply rooted and literally interpreted. They follow established routines, organized in large part around home, family, community, and social or religious organizations to which they belong. |
| 4. Achievers | Goal oriented Brand conscious Conventional | High resources: motivated by achievement | Motivated by the desire for achievement, Achievers have goal-oriented lifestyles and a deep commitment to career and family. Their social lives reflect this focus and are structured around family, their place of worship, and work. Achievers live conventional lives, are politically conservative, and respect authority and the status quo. They value consensus, predictability, and stability over risk, intimacy, and self-discovery. |
| 7. Makers | Responsible Practical Self-sufficient | Low resources: motivated by self- expression | Makers are motivated by self-expression. They express themselves and experience the world by working on it—building a house, raising children, fixing a car, or canning vegetables—and have enough skill and energy to carry out their projects successfully. Makers are practical people who have constructive skills and value self-sufficiency. They live within a traditional context of family, practical work, and physical recreation and have little interest in what lies outside that context. |

Table 3

SRIC-BI (2005a) activity, interest, and media information for each VALS group

| Sample of Characteristic Behavior | Media Usage |
|---|---|
| Innovators | |
| <ul style="list-style-type: none"> Actively work as a volunteer Take vitamin supplements Access the Internet at home, make purchases on-line, and track investments on-line Buy 15 or more books a year Own the latest and greatest cell phone with all the features Easily spend over a \$1,000 on clothing each year Attend dance performances, live theatre, and museums | <ul style="list-style-type: none"> Listen to folk music, jazz, and classical radio stations Interested in history and biography genres |
| Thinkers | |
| <ul style="list-style-type: none"> Actively work as a volunteer Take vitamin supplements Ask physicians about advertised prescriptions Access the Internet at home, make purchases on-line, and track investments on-line Buy 15 or more books a year Not savvy cell phone users Spend over just a \$1,000 on clothing each year Attend live theatre and museums | <ul style="list-style-type: none"> Listen to light classical, classical and easy listening radio stations Interested in both history, fictional stories/novels, and personal/business self-help |
| Believers | |
| <ul style="list-style-type: none"> Take some vitamin supplements (e.g., Gingko biloba) Do not regularly access the Internet at home Ask physicians about advertised prescriptions Trying to quit smoking Do not many buy books Not savvy cell phone users Do not spend more than \$1,000 on clothing each year | <ul style="list-style-type: none"> Listen to gospel, easy listening, and faith/inspiration radio stations Interested in romance, religion, and cooking genres |
| Achievers | |
| <ul style="list-style-type: none"> Take some vitamin supplements Make purchases, track investments, and play games online Do not ask physicians about advertised prescriptions Heavy users of fast food/drive through restaurants Rent a lot of DVDs; sometimes buy books Own the latest and greatest cell phone with all the features Spend more than \$1,000 on clothing each year | <ul style="list-style-type: none"> Listen to contemporary Christian, business/professional and soft rock radio stations Interested in children's books Interested in programming, personal/business self-help information Interested in adventure/role playing genres |
| Makers | |

| Sample of Characteristic Behavior | Media Usage |
|---|--|
| <ul style="list-style-type: none">• Trying to quit smoking• Do not make purchases on-line• Sometimes ask physicians about advertised prescriptions• Sometimes uses fast food/drive through restaurants• Do not buy many books or rent DVDs• Not savvy cell phone users• Most spend less than \$1,000 on clothing each year• Attend auto shows and country music performances• Interested in collections (e.g., electric trains, figurines, and sports trading cards, stamps, and coins) | <ul style="list-style-type: none">• Listen to country music and faith/inspiration radio stations• Interested in cooking/cookbooks |

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