

# Profiling nutritional gatekeepers: three methods for differentiating influential cooks

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## Abstract

While nutritional education often focuses on food consumers, this research focuses on cooks. How can we determine the characteristics that define cooks who are capable of changing the taste preferences and eating habits of their family from those who are less influential? Using in-depth interviews, focus groups, and a survey of 770 North Americans, we examine three suggested domains—cooking behaviors, food usage, and personality—and show that the domain of personality most effectively differentiates between segments of cooks. Furthermore, personality segmentation enables researchers and those in public policy to identify which cooks are likely to be most socially influential, inclined toward healthy behavior, predisposed to new foods, and eager to learn.

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## 1. Introduction

Nutritional education often focuses on the consumers of foods. In this research, we move the focus to the cook. Studies conducted during the American rationing years of the 1940s found that cooks served as the nutritional gatekeepers of the household, and they provided the food that determined the family's nutritional well being (Mead, 1945). Cooks (or primary meal planners) still serve as nutritional gatekeepers, and they influence what their family considers nutritious and appropriate to eat (Pliner & Stallberg-White, 2000).

Given the influence that good cooks can have on long-term eating habits, it is curious why effective methods have not been developed to differentiate or categorize those cooks who are most predisposed to nutrition-related behavior. While cooking behaviors, food usage, and personality factors have been suggested as potentially differentiating domains, no systematic study of these has yet been done. This research examines three questions: (1) Which domain—cooking behavior, food usage, or personality—best differentiates between various sub-segments of good cooks? (2) What are these sub-segments? (3) How do characteristics of good cooks correlate with tendencies toward nutrition-related behaviors?

After providing a background on the common and distinct characteristics of good cooks, this paper describes segmentation measures that were developed and used to differentiate 770 cooks. The results indicate that segments based on personality factors were most differentiating and showed the strongest correlations with nutrition-related behaviors.

## 2. Distinguishing characteristics of the gatekeeper

In the rationing years of the 1940s, the United States government sponsored numerous studies about the adequate nutrition of the general population and about the role of the meal planner. While it was then observed that food reaches the table through various “channels” that are controlled by gatekeepers (Lewin, 1951; Wansink, 2002), we now know that the actions and enthusiasm of these gatekeepers can also help develop beliefs and preferences about food (Birch, Zimmerman, & Hind, 1980; Hendy & Raudenbush, 2000).<sup>1</sup>

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<sup>1</sup> While some have shown that wives have historically had a great deal of control over what their families ate (Lewin, 1951; Wansink, 2002), others have doubted their influence is this significant (McIntosh & Zey, 1989; Schafer & Bohlen, 1977), pointing toward the finding that 68% of housewives in their study never served a disliked dish twice (Schafer & Bohlen 1977). Much of this research focused on gender issues (husband–father versus wife–mother) and did not control for the quality of the food served or for the effort invested in preparing it. In this study, we examine gatekeepers who accomplished, good cooks and who may not necessarily be a housewife, a mother, or female.

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The role of the gatekeeper has expanded beyond the stay-at-home housewife notion (McIntosh & Zey, 1989) to encompass a more diverse demographic who shop, cook, and control consumption for the family. In this study, we examine gatekeepers who are the primary meal planners and cooks, and who are not necessarily female or a stay-at-home parent. Instead of focusing on all meal planners, there are benefits of focusing only on those who are more serious about this role. The influence of these involved or “good cooks” is much higher than convenience-cooks or carry-out cooks with less involvement in food preparation. Past work shows that these good cooks were more effective in encouraging their families to consume organ meats during rationing years of World War II (Lewin, 1951). Even today, recent studies show that people who like the taste of soy (versus those who eat it primarily for health purposes) all indicate they live with a “good cook” (Wansink & Chan, 2001).

Good cooks who serve as gatekeepers are defined as primary meal planners who prepare favorable food for their family. Such cooks often describe themselves as being better than average cooks and are defined by others as better than average. Yet not all cooks are the same. There are likely to be very different types or segments of good cooks, and there are likely to be a number of dimensions or characteristics on which they can be defined.

As is detailed later, studies that follow the development of good cooks (including master chefs) most commonly note several characteristic domains on which they might be differentiated: their cooking behavior, their food usage, and their personality.<sup>2</sup> One domain in which these gatekeepers can be differentiated is in their *cooking behavior*. Good cooks are distinguished from average cooks by a number of behavioral dimensions, including by the types of meals they make (Verlegh, Math, & Candel, 1999), by how they cook (recipes vs. instinct), by how much they entertain, and by how much they experiment with new recipes and spices (Mendelson 1996).

Good cooks can be distinguished by their cooking behavior, yet they may also be distinguished by their *food usage* (Murcott, 2000). Prior research about the method of choosing ingredients found that when cooks make food choices, they often use choice heuristics to reduce the number of available alternatives (Brinberg, Axelson, & Price, 2000). Once they find a nutritional and palatable combination, they can repeatedly experiment with those ingredients when creating other recipes

<sup>2</sup> It is initially interesting that demographic characteristics such as age, gender, income, or education, have not been suggested as having differentiating power. Nevertheless, this is consistent with past studies that show that such demographic characteristics are not robust predictors and often mask more meaningful commonalities (Sudman & Wansink, 2002).

(Day, Kyriazakis, & Rogers, 1998). As a result, it may be that the types of foods a person cooks or eats can be used to differentiate them as cooks. Different general categories of food that are often referenced are meats, vegetables, dairy products, and desserts (Daria, 1993; Franey, 1994; Lowe, 2000).

Biographies of passionate chefs indicate high levels of ambition, creativity, experimentation, and hard work (Smith, 2000). These characteristics of professional cooks are not far removed from those of their amateur counterparts. Ruhlman (1997) and Smith (2000) note that good cooks can often be identified by their *personalities*. They can be adventurous, creative, ambitious, and willing to try new foods in ways that will enhance their enjoyment of cooking. However, one cook may be well-liked and light-hearted while another cook may be dominant and competitive (Meiselman, 2000).

While unpublished efforts have used the five factor personality model to examine cooks, these efforts have not been particularly useful. These five personality dimensions are coarse enough to explain large deviations in behavior, but are not fine-tuned enough to determine the more subtle factors that differentiate between segments of good cooks. To accomplish this, a series of in-depth interviews with cooks needs to be conducted to determine—in their own words—the best bases for differentiation.

### 3. Method

Just as career surveys recommend suitable professions for individuals by differentiating people on the basis of their personality and behavior, this study assesses segments of cooks by differentiating them on the basis of their cooking behavior, food usage, and personality. While anecdotes and the literature suggest that cooks might vary in these three general domains, there is little specific guidance as to which of these domains best differentiates good cooks. Furthermore, there is little guidance given as to what measures can be used to measure personality, cooking behavior, and food usage.

#### 3.1. Measure development and prestudies

To develop a set of scales that can be used to differentiate cooks, a two-stage process was used. First, 87 people between the ages of 23 and 82 were given open-ended questionnaires asking them to describe their personality, the foods they had cooked for dinner in the past two weeks, and the ways in which they had cooked and entertained in the past month. They were then asked scaled questions (1 = disagree; 9 = agree) related to how skilled and proficient of a cook they were, and they were asked to differentiate themselves from less (or more) proficient cooks they knew. Finally, a series of

scale questions were asked to validate and clarify differentiating characteristics that had been suggested by the literature.

Second, a series of demographically matched focus groups of self-classified “good” cooks, “bad” cooks, and a mixed group were conducted to better understand the differentiating characteristics related to personality, behavior, and food usage. Two focus groups were conducted for each of the three segments of cooks and the groups ranged in size from 8 to 12 individuals. The results of these six focus groups, the survey, and past literature were combined, and the resulting measures were pretested with a sample of 41 adult consumers who were of a similar sample as those people ultimately used in the main study. Based on these results, redundant or non-diagnostic measures were eliminated and unclear questions were clarified.

Finally, a national survey of 2000 people provided key information on cooks and their lifestyles. The names of these individuals were obtained through a list service that obtained the names through census data. The mail survey was used to identify those who are the primary shopper and meal planner in their household. Following the survey, participants were asked to rate their personality on series of nine-point scales (1 = strongly disagree; 9 = strongly agree). Some basic health related personality traits and food usage were used in the survey to examine health-related tendencies of cooks for the purpose of face validity and to suggest productive future avenues for research.

### 3.2. Measures

The basic survey was broken into sections of questions related to cooking behaviors, food usage, personality, cooking proficiency, nutritional predispositions, and demographics. The questions related to cooking behaviors were asked in the form of frequency questions (“I tried \_\_ new recipes last month”) or in the form of the nine-point Likert-scaled statements noted earlier (“I

consider myself a creative cook”). Out of those nine questions used to measure cooking behavior, five were Likert-scaled and four were frequency questions. Seven questions related to food usage were asked in the form of frequency questions (“How many times in the past month have you served chicken?”). Twenty-four questions related to personality characteristics (such as “healthy,” “stockpiler,” and “giver”) were rated by respondents on a scale of 1 (“does not describe me”) to 9 (“best describes me”).

In order to differentiate good cooks from the average and below average cooks, a series of questions were asked on both comparative and absolute levels. On nine-point Likert scales, respondents were asked whether they disagreed or agreed with statements that they were good cooks, that others viewed them as good cooks, and that they were relatively better cooks than their friends. These three measures had a coefficient of reliability of 0.82, and they generated enough variation to distinguish a group of 317 respondents (out of 508 primary meal planners and 770 total responses) that could clearly be identified as relatively better cooks than the remaining respondents. For ease of description, these two groups will be defined as “good cooks” and “average cooks” even through the difference is relative.

As Table 1 indicates, these two groups are well distinguished from each other. Good cooks are more actively involved in cooking activities such as trying more new recipes ( $F_{1, 501} = 34.04$ ;  $P < 0.01$ ), having more cookbooks ( $F_{1, 504} = 61.81$ ;  $P < 0.01$ ), using more spices ( $F_{1, 505} = 124.12$ ;  $P < 0.01$ ), having guests over for dinner more frequently ( $F_{1, 500} = 16.53$ ;  $P < 0.01$ ) and making more casseroles ( $F_{1, 498} = 4.26$ ;  $P < .05$ ). Also, good cooks are more likely to cook by instinct ( $F_{1, 505} = 103.69$ ;  $P < 0.01$ ) and describe themselves as creative cooks ( $F_{1, 505} = 338.03$ ;  $P < 0.01$ ). These results lend further support for the important distinction between good and average cooks, and they motivate further analysis based on this distinction.

Table 1  
Behaviors that differentiate good cooks from average and below average cooks

|   | Good cooks<br><i>N</i> = 317 | Average and below<br>average cooks <i>N</i> = 191 | <i>F</i> Test |
|---|------------------------------|---|---------------|
| I often cook new recipes <sup>a</sup>                         | 6.96                         | 4.87  | 136.97*       |
| I have many cookbooks <sup>a</sup>                            | 6.78                         | 5.05  | 61.81*        |
| I usually cook new recipes by instinct <sup>a</sup>           | 7.03                         | 5.09  | 103.69*       |
| I consider myself a creative cook <sup>a</sup>                | 7.21                         | 4.52  | 338.03*       |
| I use a wide variety of spices <sup>a</sup>                   | 6.70                         | 4.62  | 124.12*       |
| I tried __ different recipes in the past 12 months            | 15.01                        | 6.95  | 34.04*        |
| I had guests over for dinner __ times in the past 12 months   | 15.34                        | 9.41  | 16.53*        |
| I used the oven to cook dinner __ times in the past 12 months | 100.84                       | 86.54   | 2.38          |
| I made __ casseroles in the past 12 months                    | 19.62                        | 11.55   | 4.26*         |

\*  $P < 0.05$ .

<sup>a</sup> Nine-point Likert scale (1: Strongly disagree, 9: Strongly agree).

There are a number of target measures that are of interest when adopting new foods and establishing new, healthy eating behaviors. In prior studies of functional food adoption, four important characteristics of adoptability are whether a person was socially influential, inclined toward healthy behavior, predisposed to new foods, and eager to learn (Hunt & Hillsdon, 1996). These four behaviors were measured on Likert scales (1 = strongly disagree; 9 = strongly agree) based on their answers as to whether they considered themselves, socially influential, inclined toward healthy behavior, predisposed to new foods, and eager to learn. By determining the correlation of these factors to various cooking behaviors, food uses, and personality measures, we will have some indication of what domain best helps differentiate dimensions of good cooks that most correlate with target behaviors we believe relate to nutritional predispositions.

### 3.3. Sample

As before, survey respondents were chosen randomly from a commercial mailing list service which provided random data that was collected based on census data and phone records. A representative sample from 50 US states were mailed eight page questionnaires, and they were given honor payments of \$3.00 for their participation in the study (Sudman & Wansink, 2002). Of the 2000 surveys that were mailed, 770 (38.5%) were returned in a timely enough manner to be included in the analysis. The respondents ranged in age from 21–74 and were not informed about the objectives of the research until they returned the survey. The average respondent had 1.6 children still living at home, and 70% are Anglo-American, 61% are female, and their average income is between \$30,000 and \$50,000.

Out of the surveys issued, 770 responses were returned. Of those responses, 508 survey participants are “primary meal planners”. Out of these 508 primary meal planners, 317 were considered “good cooks” based upon their self-ratings. These 317 individuals who were identified as both “a primary meal planner” and “a good cook” were selected for the following tests. The remaining 191 were conservatively designated as “average cooks and below average cooks” to provide a point of comparison with the “good cooks.”

### 3.4. Data analysis

To avoid redundancy while defining segments of cooks, we used factor analysis with a varimax rotation as a data reduction and dimensional segmentation technique. Nine items for cooking behavior, 34 items for personality, and seven items for food usage were used for the factor analyses.

First, we standardized cooking behaviors, food usage, and personality characteristics on nine-point scales,

according to the percentiles of each factor. Specific combinations of variables correlate within segments, but not between segments. All the communalities are above 0.5, and the eigenvalues are above 1.0. Using SPSS v. 9.1, all of factor analyses were obliquely rotated because each factor may not be perfectly independent of other factors. The purpose of the factor analysis in this study is to identify meaningful dimensions of good cooks, not to reduce a larger number of variables to a smaller set of uncorrelated variables for subsequent use in other analyses. For this purpose, an oblique solution was most appropriate (Hair, 2002), and the correlations between factors are shown in the Appendix.

We begin the interpretation of the factor analysis with the first variable on the first factor and move horizontally from left to right, looking for the highest loading for that variable on any factor (Hair, 2002). Hence, the highest loading for each variable on any factor was regarded to represent the factor. The cumulative percentage of the variance explained by each component from the rotated solution was 59.20% for cooking behavior factors, 64.20% for food usage factors, and 68.5% for personality factors. Eigenvalues for each factor were 1.5, 1.2, and 1.2.

## 4. Results

### 4.1. Segmenting cooks by their cooking behavior

In analyzing good cooks on the basis of their cooking behavior, we found three distinct behavior categories: the *Recipe Cook*, the *Inventive Cook*, and the *Social Cook* (see Table 2). The cooking behaviors that segment these cooks also differentially correlate with nutrition-related behaviors.

*New Recipe Cooks* try a wide variety of recipes, but almost exclusively use cookbooks. They cook for enjoyment, often preparing food to satisfy only their own tastes rather than various tastes of a large group. *Inventive Cooks* view cooking as a hobby and frequently experiment with new recipes. However, they too use their instincts to create their own combinations of foods and methods, and they enjoy unpredictable outcomes. They cook to satisfy the tastes of themselves and one or two others; they are not concerned about satisfying the diverse tastes of groups. *Social Occasion Cooks* prepare large meals (sometimes using the oven to cook casseroles) that aim to please a wide variety of tastes found in a social gathering. In order to avoid the risk of making large dishes that do not satisfy guests, social cooks rely on standard recipes. Rather than treating cooking as a hobby, they use cooking as a social mediator—a facilitator of acceptance, belonging, and affection (Franey, 1994; Ruhlman, 1997). For them, cooking behavior is less related to the motivation to cook, than to the social

Table 2  
Using cooking behaviors to characteristic cooks

|  | New recipe cook | Inventive cook | Social occasions cook |
|--|-----------------|----------------|-----------------------|
| I often cook new recipes <sup>a</sup>                                    | <b>0.79</b>     | 0.29           | −0.13                 |
| I have __ different cookbooks  | <b>0.76</b>     | 0.09           | 0.08                  |
| I tried __ new recipes last month? <sup>a</sup>                          | <b>0.67</b>     | 0.13           | 0.41                  |
| I usually cook new recipes by instinct <sup>a</sup>                      | −0.02           | <b>0.78</b>    | 0.03                  |
| I consider myself a creative cook <sup>a,b</sup>                         | 0.25            | <b>0.74</b>    | −0.03                 |
| I use a wide variety of spices   | 0.40            | <b>0.59</b>    | 0.0004                |
| I had guests over for dinner __ times in the past 12 months <sup>b</sup> | −0.14           | 0.21           | <b>0.76</b>           |
| I used the oven to cook dinner __ times in the past 12 months            | 0.13            | −0.09          | <b>0.66</b>           |
| I made __ casseroles in the past 12 months                               | 0.39            | −0.32          | <b>0.53</b>           |

Extraction method: principal component analysis; rotation method: varimax with Kaiser normalization; rotation converged in six iterations.

<sup>a</sup> Predisposed toward new foods.

<sup>b</sup> Socially influential.

benefits and social identity that is accrued (Day et al., 1998).

This provides a basis on which to differentiate cooks. As the footnotes in Table 2 indicate, while the Social Occasion Cooks are socially influential, they are not predisposed toward new foods. Both New Recipe Cooks and Inventive Cooks are predisposed to new foods (but not particularly socially influential). What differentiates them is that the former needs the recipe, while the later needs only the inspiration.

#### 4.2. Segmenting cooks by their food usage

On analyzing cooks on the basis of food usage, three categories emerged. As shown in Table 3, the categories were labeled as the *Meat-focused Cook*, the *Vegetable-focused Cook*, and the *Self-regulated Cook*.

Not surprisingly, Meat-focused Cooks are distinguished by their frequent consumption of beef, chicken, and pork, while Vegetable-focused Cooks are characterized as serving and eating five or more fruits or vegetables each day. Self-regulated Cooks consist of people who eat dessert after dinner and drink milk every day. The rules or rituals of the Self-regulated Cook keep their daily lives more conformed to a regular pattern.

This category differs from the other identified categories because it focuses on the behavior patterns used to consume food, whereas the other categories focus on the frequent content of the diet.

Several questions in the survey were used to determine what behavioral dimensions are most related to healthy predispositions to healthy food consumption. Consistent with prior research, when wide varieties of foods are available, heuristics are used to reduce the number of alternatives (Brinberg et al., 2000). The Meat-focused Cook and the Vegetable-focused Cook may use heuristics to form food patterns and adapt new food selections (Lindeman & Väänänen, 2000). Self-regulated Cooks concentrate more on their patterns of eating (e.g. drinking milk and eating desserts every day) rather than the content of the food.

Whereas food usage can indicate what flavors or taste a cook may prefer when they prepare food (such as spicy or bland), it surprisingly does not differentiate segments of cooks as well as behavioral and personality characteristics (cf. McGee, 1999). The study showed few food usage characteristics systematically differentiate these cooks. One reason was because the consumption frequency of many potentially differentiating foods (such as endive, anchovies, leeks, etc.) was too spora-

Table 3  
Using food usage to characteristic cooks

|   | Meat-focused cook | Vegetable-focused cook | Self-regulated cook |
|---|-------------------|------------------------|---------------------|
| Eat beef                                    | <b>0.85</b>       | −0.11                  | 0.11                |
| Eat chicken <sup>a</sup>                    | <b>0.72</b>       | 0.36                   | −0.13               |
| Eat pork                                    | <b>0.72</b>       | −0.11                  | 0.31                |
| Eat broccoli <sup>a</sup>                   | 0.08              | <b>0.86</b>            | −0.03               |
| Eat 5+ fruits/vegetables daily <sup>a</sup> | −0.14             | <b>0.70</b>            | 0.41                |
| Drink a glass of milk <sup>a</sup>          | 0.10              | 0.13                   | <b>0.72</b>         |
| Eat dessert after dinner                    | 0.09              | 0.02                   | <b>0.71</b>         |

Extraction method: principal component analysis; rotation method: varimax with Kaiser normalization; rotation converged in 6 iterations.

<sup>a</sup> Inclined toward healthy behavior.

Table 4  
Using personality dimensions to characteristic cooks

|                                   | Giving cooks | Innovative cooks | Healthy cooks | Athletic cooks | Competitive cooks | Methodical cooks | Stockpiling cooks | Pet owning cooks | Stimulation seeking cooks | Church-going cooks |
|-----------------------------------|--------------|------------------|---------------|----------------|-------------------|------------------|-------------------|------------------|---------------------------|--------------------|
| Real friendly <sup>a</sup>        | <b>0.83</b>  | 0.10             | 0.08          | −0.01          | 0.15              | 0.03             | −0.02             | 0.08             | 0.02                      | 0.03               |
| Well-liked <sup>a</sup>           | <b>0.81</b>  | 0.09             | 0.20          | 0.08           | 0.14              | 0.07             | −0.12             | 0.04             | 0.04                      | −0.06              |
| Outgoing <sup>a</sup>             | <b>0.76</b>  | 0.19             | −0.06         | 0.14           | 0.20              | 0.22             | −0.03             | 0.02             | −0.05                     | 0.06               |
| “Giver” <sup>a</sup>              | <b>0.70</b>  | 0.15             | 0.27          | −0.10          | −0.07             | 0.05             | −0.04             | 0.21             | 0.05                      | 0.09               |
| Enthusiastic <sup>a</sup>         | <b>0.68</b>  | 0.27             | 0.16          | 0.20           | 0.12              | 0.08             | 0.13              | −0.06            | −0.13                     | 0.15               |
| Light-hearted <sup>a</sup>        | <b>0.63</b>  | 0.18             | 0.10          | 0.29           | −0.09             | −0.22            | 0.23              | −0.13            | 0.07                      | 0.02               |
| Witty <sup>a</sup>                | <b>0.60</b>  | 0.42             | −0.04         | 0.19           | 0.16              | 0.07             | 0.09              | −0.11            | 0.13                      | −0.04              |
| Nurturing <sup>a</sup>            | <b>0.50</b>  | 0.15             | 0.43          | −0.02          | −0.19             | 0.09             | 0.11              | 0.26             | 0.16                      | 0.15               |
| Self-sufficient <sup>a</sup>      | <b>0.50</b>  | 0.16             | 0.46          | 0.11           | 0.34              | 0.08             | 0.06              | −0.01            | −0.10                     | −0.16              |
| Flexible <sup>a</sup>             | <b>0.48</b>  | 0.20             | 0.43          | 0.19           | 0.12              | −0.14            | 0.28              | −0.14            | −0.13                     | 0.05               |
| Innovator <sup>b,c</sup>          | 0.37         | <b>0.71</b>      | 0.08          | 0.04           | 0.13              | 0.25             | 0.05              | −0.02            | −0.18                     | −0.09              |
| “Thinks different” <sup>b,c</sup> | 0.18         | <b>0.69</b>      | 0.17          | 0.21           | 0.15              | −0.25            | −0.03             | 0.13             | 0.07                      | 0.12               |
| Trend setter <sup>a,b</sup>       | −0.07        | <b>0.68</b>      | −0.02         | 0.27           | 0.27              | 0.07             | −0.05             | 0.08             | 0.13                      | 0.22               |
| Creative <sup>b</sup>             | 0.42         | <b>0.61</b>      | 0.25          | −0.03          | −0.03             | 0.10             | 0.03              | 0.05             | −0.15                     | −0.20              |
| Curious <sup>a</sup>              | 0.32         | <b>0.49</b>      | 0.32          | 0.12           | 0.08              | 0.26             | 0.23              | −0.05            | 0.08                      | −0.15              |
| Imaginative <sup>a</sup>          | 0.39         | <b>0.49</b>      | 0.32          | 0.12           | 0.08              | 0.26             | 0.23              | 0.05             | 0.08                      | −0.15              |
| Initiator <sup>a</sup>            | 0.36         | <b>0.47</b>      | 0.09          | 0.06           | 0.27              | 0.44             | 0.09              | 0.08             | −0.14                     | −0.05              |
| A bit crazy                       | 0.21         | <b>0.43</b>      | −0.20         | 0.24           | 0.05              | −0.30            | 0.35              | 0.33             | 0.11                      | −0.08              |
| Healthy <sup>d</sup>              | 0.18         | 0.03             | <b>0.68</b>   | 0.23           | 0.10              | 0.17             | −0.23             | 0.11             | −0.11                     | 0.05               |
| Reader <sup>c</sup>               | 0.11         | 0.25             | <b>0.56</b>   | 0.09           | −0.15             | 0.21             | 0.18              | −0.18            | 0.31                      | −0.02              |
| Optimistic <sup>c,d</sup>         | 0.47         | 0.21             | <b>0.51</b>   | 0.02           | 0.19              | −0.09            | 0.12              | 0.05             | −0.11                     | 0.09               |
| Athletic <sup>d</sup>             | −0.06        | 0.12             | −0.02         | <b>0.73</b>    | 0.22              | 0.13             | −0.02             | −0.25            | −0.05                     | 0.06               |
| Nature lover <sup>d</sup>         | 0.29         | 0.04             | 0.26          | <b>0.72</b>    | −0.03             | 0.03             | −0.05             | 0.26             | −0.02                     | −0.03              |
| Earthy <sup>d</sup>               | 0.18         | 0.29             | 0.07          | <b>0.65</b>    | −0.28             | 0.08             | 0.04              | 0.24             | 0.14                      | −0.16              |
| Dominant <sup>a</sup>             | 0.21         | 0.10             | −0.03         | −0.07          | <b>0.79</b>       | 0.11             | −0.01             | −0.08            | 0.19                      | −0.09              |
| Competitive                       | 0.09         | 0.19             | 0.10          | 0.24           | <b>0.68</b>       | 0.11             | 0.05              | 0.20             | −0.14                     | 0.09               |
| Impulsive <sup>b</sup>            | 0.27         | 0.25             | 0.06          | 0.06           | <b>0.50</b>       | −0.21            | 0.39              | 0.02             | 0.25                      | −0.05              |
| Adventuresome <sup>a</sup>        | 0.34         | 0.36             | 0.23          | 0.38           | <b>0.43</b>       | −0.05            | 0.15              | −0.08            | −0.02                     | −0.11              |
| Methodical                        | 0.06         | 0.07             | 0.13          | 0.15           | 0.05              | <b>0.76</b>      | 0.19              | −0.14            | −0.02                     | 0.03               |
| Cultured <sup>a,c</sup>           | 0.34         | 0.42             | 0.08          | 0.12           | 0.18              | <b>0.45</b>      | −0.18             | −0.08            | 0.24                      | 0.14               |
| Stockpiler                        | −0.03        | 0.03             | 0.02          | −0.05          | 0.09              | 0.22             | <b>0.83</b>       | 0.14             | −0.03                     | 0.07               |
| Pet owner                         | 0.03         | 0.03             | 0.02          | 0.06           | 0.11              | −0.10            | 0.12              | <b>0.81</b>      | −0.04                     | −0.02              |
| Needs stimulation <sup>b</sup>    | −0.02        | −0.10            | −0.02         | 0.02           | 0.01              | −0.03            | −0.04             | −0.02            | <b>0.83</b>               | −0.06              |
| Churchgoer                        | 0.14         | 0.03             | 0.04          | −0.06          | −0.04             | 0.04             | 0.05              | −0.03            | −0.07                     | <b>0.89</b>        |

Extraction method: principal component analysis; rotation method: varimax with Kaiser normalization; rotation converged in 14 iterations.

<sup>a</sup> Socially influential.

<sup>b</sup> Predisposed toward new foods.

<sup>c</sup> Eager to learn.

<sup>d</sup> Inclined toward healthy behavior.

dic to produce consistent differences. While this reduced number of characteristics resulted in a reduced number of segments, it also reflects the potential difficulties in trying to differentiate cooks based on their food usage.

#### 4.3. Segmenting cooks by their personality

The factor analysis showed that the 34 personality traits selected in the prestudy differentiated 10 personality seg-

ments of cooks: *Giving Cooks*, *Innovative Cooks*, *Healthy Cooks*, *Athletic Cooks*, *Competitive Cooks*, *Methodical Cooks*, *Stockpiling Cooks*, *Pet-owning Cooks*, *Stimulation-seeking Cooks*, and *Churchgoing Cooks*. Table 4 shows the breakdown of characteristics associated with each segment.<sup>3</sup>

When talking about the personalities associated with food usage, people often refer to ones such as nutrition conscious, weight-watching, fitness-oriented, or gourmet. This analysis indicates that there are a much

<sup>3</sup> We begin the interpretation of the factor analysis with the first variable on the first factor and move horizontally from left to right, looking for the highest loading for that variable on any factor (Hair, 2002). Hence, the highest loading for each variable on any factor was regarded to be significant to represent the factor. We interpreted the level to be a significant factor loading (e.g. 0.34 for a

0.05 significance level) as the necessary condition for being a significant factor cumulative percentage of the variance explained by each component from the rotated solution was (a) 68.5% for personality factors, (b) 64.20% for food usage factors, and (c) 59.20% for cooking behavior factors. Eigenvalue for each factor was 1.02, 1.02, and 1.05.

broader set of personality traits, including Innovative Cooks, Giving Cooks, Competitive Cooks, Stockpiling Cooks, and so forth.

What is also of interest is that this shows how these characteristics are related to different nutrition-related predispositions that may make them influential gatekeepers for nutritional change. Recall that these cooks were asked the extent to which they are (1) socially influential, (2) inclined toward healthy habits, (3) predisposed toward new foods, and (4) eager to learn new ideas.

While Table 4 provides details about the different cooking personality dimensions, what is noted later is which different personality characteristics are most oriented toward the nutrition-related behaviors that would make them effective gatekeepers of nutritional change. Based on Table 4, let us examine four nutrition-related behaviors, and the personality characteristics most related with these behaviors.

1. People who are *socially influential* tend to be friendly, well-liked, outgoing, giving, enthusiastic, trend setting, nurturing, and initiating. These characteristics most correspond to Giving Cooks and also correspond to Innovative Cooks, Competitive Cooks, and Methodical Cooks.
2. People who are *inclined toward healthy behavior* tend to be healthy, nature lovers, athletes, and earthy. Unsurprisingly, these characteristics most correspond to Healthy Cooks and Athletic Cooks.
3. People who are *predisposed toward new foods* are those who are impulsive, curious, imaginative, adventurous, and innovative. These characteristics most correspond to Innovative Cooks, and also correspond to Competitive Cooks and to Stimulation-seeking Cooks.
4. People who are *eager to learn new ideas* are readers, optimistic, cultured, curious, imaginative, self-sufficient, and flexible. These characteristics most correspond to Innovative Cooks, Healthy Cooks, and Methodical Cooks.

Based on this segmentation, if an effort was going to be made to encourage gatekeepers to adopt or substitute a functional food, such as soy, it would not be wise to target all cooks (Wansink, 1994; Wansink & Ray, 1996), or even all good cooks (Chandon & Wansink, 2002). If we believe that four of the nutrition-related behaviors of a potential soy adopter are noted earlier, the ideal segments of cooks to target are not simply the Healthy Cooks and the Athletic Cooks. They are also the Innovative Cooks, Competitive Cooks, Stimulation-seeking Cooks, and Methodical Cooks.

## 5. Discussion

Research summaries related to the rationing years of the 1940s, indicated that good cooks can have a notable impact as nutritional gatekeepers. Unfortunately, they did not indicate the basis on how different types of cooks could be classified and which segments of these cooks would be most effective to target. One of the main objectives of the paper was to examine how potentially differentiating and diagnostic three different domains (behavior, food usage, and personality) can be in identifying good cooks. The objective was not to segment consumers (which would include all dimensions), as much as to point at which of these methods would be most appropriate to use in future analyses. As a result, this paper (and the variables and measures used) can be appropriate for other more applied work.

The most differentiating means of characterizing good cooks is by their personalities, followed by their behavior. Differentiating on the basis of their personality yielded 10 key characteristics (Giving Cooks, Innovative Cooks, Healthy Cooks, Athletic Cooks, Competitive Cooks, Methodical Cooks, Stockpiling Cooks, Pet Owning Cooks, Stimulation seeking Cooks, and Churchgoing Cooks) that were related to all four of the target behaviors. Differentiating on the basis of their behavior yielded three key characteristics (New Recipe Cooks, Inventive Cooks, and Social Occasion Cooks) that were related to two of the target behaviors. Differentiating on the basis of their food usage yielded three characteristics (Meat-focused Cook, Vegetable-focused Cook, and Self-regulated Cook) that were related to one target behavior. These results have important implications for better understanding the gatekeepers who are most likely to initiate nutritional change (Hunt & Hillsdon, 1996).<sup>4</sup>

When considering an education campaign that targets gatekeepers, it must be realized that not all gatekeepers are the same. If an educational program is to be targeted at a limited segment of cooks, it should be targeted at those most relevant and influential. For instance, if the goal is to encourage consumers to eat more soy, there are certain personality segments that would be most promising to target. Table 4 indicates that Innovative Cooks are likely to be most interested in novel foods and are also likely to be socially influential. Additionally, the Healthy Cook segment (besides being inclined toward health) is most likely to be eager to learn. In contrast, the Giving Cook segment, while socially influential, appears to have few other traits that would make us believe she or he would be an adopter of a relatively novel, healthy food.

Food habits are a part of culture, bound to other aspects of living. After determining that personality

<sup>4</sup> We included correlated measures of the related-target behaviors not to show predictability, but to show that differentiating these cooks had some external purpose that would be of value.

defines the best of cooks in Western cultures, it would be valuable to better understand the beliefs and traditions in other parts of the world. The gatekeepers in other countries may not be the cooks. It raises the important question, who besides influential cooks can help change beliefs about the healthfulness of unfamiliar ingredients or foods such as soy.

From a methodological perspective, this research provides three key insights on how to begin differentiating and targeting the cooks who are most likely to innovate and who are most likely to influence others. First, a general observation is made that a person's food usage and cooking behavior is not as influential in differentiating key characteristics of good cooks as their personality. Second, this study provides key measures that have been tested and have been shown as diagnostic in differentiating characteristics. Third, these findings provide evidence of characteristics that are related to selected nutrition-related behaviors and how these relate to the different characteristics of cooks.

This study has limitations. The characteristics of respondents in the survey may be biased toward good cooks because people who are not interested in cooking and food behavior may be less likely to respond to the survey. This non-response and response bias may limit the generalizability of the results. Moreover, this study was comprised of 70% Anglo-Americans who had families. The results may not coincide with generalizations to other types of cooks such as a bachelor who is a connoisseur of food. Further, although converging multiple measures were used, the surveys were still based on self-reports of cooking ability. Their responses may have generated socially desirable responses rather than true responses.

#### Appendix. Correlations between factors

##### *Cooking behavior: component transformation matrix*

| Component | 1     | 2     | 3    |
|-----------|-------|-------|------|
| 1         | 0.79  | 0.55  | 0.27 |
| 2         | 0.20  | -0.64 | 0.74 |
| 3         | -0.58 | 0.53  | 0.62 |

## 6. Summary

Most past efforts to study nutrition education have focused those who eat foods. Based on gatekeeper research from the 1940s, this research suggests that the cooks are also responsible for nutrition. Yet all cooks are not created equal. In investigating three domains for differentiating cooks, it was found that personality characteristics are the most differentiating and relate most to nutrition-related characteristics such as social influence, health inclinations, propensity towards new foods, and learning tendencies.

Cooks are not only gatekeepers but are also opinion leaders (Wansink, 2002). Past efforts to target opinion leaders for nutrition change involved targeting cooks who are healthy or athletic. Let us assume an effort to encourage the use of a functional food is to be targeted at opinion-leading, gatekeeping cooks. If this is the case, a broad education effort targeting all cooks would be too general, and a narrow education effort targeting only healthy or athletic cooks would be too narrow. The best campaign would also target innovative cooks, competitive cooks, stimulation-seeking cooks, and methodical cooks.

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##### *Food usage: component transformation matrix*

| Component | 1     | 2     | 3    |
|-----------|-------|-------|------|
| 1         | 0.83  | 0.31  | 0.47 |
| 2         | -0.50 | 0.78  | 0.37 |
| 3         | -0.25 | -0.54 | 0.80 |



## Personality: Component transformation matrix

| Component | 1      | 2     | 3     | 4      | 5      | 6      | 7     | 8      | 9     | 10     |
|-----------|--------|-------|-------|--------|--------|--------|-------|--------|-------|--------|
| 1         | 0.69   | 0.52  | 0.32  | 0.25   | 0.26   | 0.11   | 0.13  | 00.06  | 00.02 | 00.00  |
| 2         | -0.52  | 0.42  | -0.33 | 0.41   | 0.45   | -00.00 | 0.16  | 00.07  | 0.16  | -0.15  |
| 3         | -0.20  | 00.01 | 0.19  | 00.04  | 00.09  | 0.81   | -0.21 | -0.44  | -0.13 | 0.11   |
| 4         | -0.15  | -0.12 | 0.36  | 0.76   | -0.41  | -0.13  | -0.22 | 0.10   | -0.10 | -00.03 |
| 5         | -0.26  | 0.54  | 0.20  | -0.24  | -0.60  | 00.02  | 0.38  | -0.10  | 0.15  | 00.03  |
| 6         | -0.16  | -0.24 | 0.24  | -00.01 | 0.15   | 0.21   | 0.60  | 0.48   | -0.42 | 0.18   |
| 7         | -00.03 | -0.38 | 0.38  | 00.02  | 0.14   | 00.09  | 0.28  | -00.07 | 0.70  | -0.34  |
| 8         | 0.14   | -0.17 | -0.28 | 0.29   | -00.07 | -00.05 | 0.33  | -0.31  | 0.26  | 0.71   |
| 9         | 0.14   | 00.01 | -0.35 | 00.04  | -0.29  | 0.48   | -0.17 | 0.62   | 0.36  | 00.05  |
| 10        | -0.26  | 0.14  | 0.43  | -0.21  | 0.26   | -0.17  | -0.39 | 0.26   | 0.26  | 0.55   |

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