The relative importance of primary food choice factors among different consumer groups: A latent profile analysis

Abstract

Food choices determine consumers' dietary and energy intakes, and in turn their risk of obesity and diet-related diseases. Factors affecting food choices are complex, varied, and inter-connected. The aims of this study were to assess the relative importance of four factors influencing food choices (taste, price, healthiness, and convenience) and identify segments of consumers according to their ratings. Australian consumers (n = 1,558) aged 18+ years completed an online survey assessing a range of factors influencing their food choices, including the perceived importance of taste, price, healthiness, and convenience. Latent profile analysis was undertaken to identify segments, with bivariate analyses then conducted to describe the differences between the derived segments. Overall, taste was reported to be the dominant factor determining food choices (Mean (M)=4.42; SD=0.72; z-score=0.43), followed by price (M=4.19; SD=0.78; z-score=0.15), healthiness (M=4.07; SD=0.82, z-score=0.00), and finally convenience (M = 3.79; SD = 0.82, z-score=-0.35). However, there were variations in absolute and relative ratings across the four identified segments. Two segments ('*High involvement*' and '*Taste focused*', together accounting for 53% of the sample) rated taste highest, and the other two segments ('*Moderate involvement*' and '*Indifferent*', 47% of the sample) rated price highest. Age, gender, residential location, and responsibility for grocery shopping were associated with segment membership. Understanding the dominant drivers of food choices across different consumer segments is useful for the development of tailored nutrition promotion messages and interventions to address obesity and other diet-related diseases.

Keywords: food choice; taste; food cost; convenience; latent profile analysis

1. Introduction

The Australian Dietary Guidelines recommend consuming a wide variety of foods daily from the five main food groups (vegetables, fruit, grain cereals, lean meats and alternatives, and dairy foods and alternatives), and limiting ‘discretionary’ foods containing high levels of saturated fat, added salt, or sugars (National Health and Medical Research Council (NHMRC), 2013). However, few Australians meet these recommendations. Less than 10% of adults eat the recommended five serves of vegetables daily, and discretionary foods contribute more than 35% of adults’ daily energy intakes (Australian Bureau of Statistics (ABS), 2016). This situation is similar around the world, and increasing numbers of people are consuming suboptimal diets that are inconsistent with dietary guidelines (Haack & Byker, 2014; Raulio et al., 2015; Rodríguez-Rodríguez et al., 2017). Poor dietary patterns and high-energy intake contribute to obesity and a range of other nutrition-related diseases that are significant public health concerns globally (World Health Organization (WHO), 2017).

Achieving a healthy diet and a healthy weight are substantial challenges. Once an individual is overweight or obese, it is very difficult to lose weight or maintain weight loss (Sumithran et al., 2011). This is confounded by a global transition in the food supply to greater availability of highly palatable, cheaper, and energy-dense foods (Crino, Sacks, Vandevijvere, Swinburn, & Neal, 2015; Popkin, 2017; Vandevijvere, Chow, Hall, Umali, & Swinburn, 2015). The heavy promotion of these energy-dense and nutrient-poor foods adversely influences consumers’ food choice decisions (Vukmirovic, 2015). Interventions designed to counteract these forces need to be based on a detailed understanding of the factors that facilitate or hinder healthy food choices.

Among other early research on food choice motives, Steptoe, Pollard, & Wardle (1995) developed the Food Choice Questionnaire that addresses nine factors that potentially

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51 influence food decisions: sensory appeal (encompassing appearance, taste, and smell), price,
52 healthiness of the food, convenience (easiness to prepare and availability), mood (comprising
53 mood improvement and stress reduction), natural content, weight control, familiarity, and
54 ethical concern. Of these factors, studies from different countries have consistently identified
55 taste, price, healthiness, and convenience as dominating food choices (Aggarwal, Rehm,
56 Monsivais, & Drewnowski, 2016; Glanz, Basil, Maibach, Goldberg, & Snyder, 1998;
57 Hebden, Chan, Louie, Rangan, & Allman-Farinelli, 2015; Prescott, Young, O'Neill, Yau, &
58 Stevens, 2002; Steptoe et al., 1995). While some differences have been found in how people
59 prioritise these factors, taste is typically ranked as most important, with the other factors
60 varying in their relative subsequent positions (Glanz et al., 1998; Markovina et al., 2015;
61 Onwezen et al., 2012; Prescott et al., 2002; Sautron et al., 2015; Verain, Sijtsema, &
62 Antonides, 2016). Understanding the different consumer segments that exist in relation to the
63 prioritisation of these food choice factors is important for a wide range of public health
64 policies (Grier & Bryant, 2005). These include policies relating to food advertising
65 regulations, food taxation, reformulation targets, and population nutrition education
66 programs.

67 Approaches to market segmentation vary according to the criterion variables under
68 investigation (i.e., food choice factors in this instance), the predictor variables selected (e.g.,
69 demographic characteristics), and the analytical method used. Many segmentation studies to
70 date investigating food choice factors have focused on specific food products (e.g., Ares &
71 Gámbaro, 2007; Bernués, Olaizola, & Corcoran, 2003; O'Connor, Cowan, Williams,
72 O'Connell, & Boland, 2006; Realini et al., 2014; Verain et al., 2016), and those that have
73 looked at factors affecting food choice in general have been mainly conducted in Europe
74 (e.g., Honkanen and Frewer, 2009; Kornelis, Herpen, Lans, & Aramyan, 2010; Milošević et
75 al., 2012; Onwezen et al., 2012). In addition, there is the potential to undertake more

comprehensive segmentation analyses by including a broader range of potential explanatory variables. Examples of such variables include health-related special dietary requirements, perceived nutrition knowledge, perceived diet healthiness, and grocery-buying role in the household (James, 2004; Moorman, Diehl, Brinberg, & Kidwell, 2004; O'Brien et al., 2014; Shatenstein, 2008; Sobal & Bisogni, 2009; Worsley, 2002).

In terms of analytical methods, most food choice factor segmentation studies to date have used cluster analysis (e.g., Ares & Gámbaro, 2007; Bernués et al., 2003; Honkanen and Frewer, 2009; Milošević et al., 2012; O'Connor et al., 2006; Verain et al., 2016). In recent years, latent profile analysis has emerged as an advanced method that involves classifying individuals into different segments based on a probabilistic model-based approach that describes the distribution of the data after taking uncertainty about segment membership into account. This analysis uses statistical tests selecting the best model so that the choice of the segments is less arbitrary, thereby outperforming the traditional cluster analysis explanatory approach (Fraley & Raftery, 1998; Hagenaars & McCutcheon, 2009; Magidson & Vermunt, 2002). To date, however, few studies have employed this approach in the context of food choice research (exceptions include Kornelis et al., 2010; Realini et al., 2014), and there remains the potential to use this sophisticated analysis method to obtain a deeper understanding of the interplay between different choice factors across different consumer segments.

The present study aimed to assess (a) the relative importance of the food choice factors of taste, price, convenience, and healthiness in determining consumers' food choices; (b) identify segments of consumers based on these ratings; (c) describe the characteristics of derived segments; and (d) consider the results for the food policy and program implications. This study extends prior food choice segmentation research by investigating across food types, applying a wide range of predictor variables, and using latent profile analysis to

101 identify discrete consumer segments. The results are interpreted in terms of the implications
102 for nutrition policies and programs.

104 2. Materials and methods

106 This study was part of a larger research project assessing the influence of nutrition
107 information and food labelling on Australians' food choices (Authors, 2017). Ethics approval
108 for the project was obtained from the Curtin University Human Research Ethics Committee
109 (approval number: RDHS-11-15) and all participants provided informed consent.

111 2.1. Sample

112 In total, 1,558 adults completed an online survey via PureProfile, a web panel
113 provider with ISO accreditation (Standards 20250 and 26362). Gender, age, and SES quotas
114 were set to ensure gender and age population representativeness and an over-sampling of
115 lower SES respondents (see Table 1). The intentional over-representation of lower SES
116 respondents reflects their greater risk of nutrition-related problems, including obesity
117 (Australian Institute of Health & Welfare (AIHW), 2016; Bonaccio et al., 2012).

119 *Insert Table 1 here*

121 2.2. Measures

122 Captured socio-demographic information included gender, age, education (1-
123 <Tertiary education; 2- ≥ Tertiary education), annual gross household income (1 - Less than
124 \$30,000 to 8 - \$250,000 or more), parent status, and residential postcode (used to determine
125 SES according to the Australian Bureau of Statistics' Socio-Economic Indexes for Areas

(SEIFA) classification (ABS, 2018) and metropolitan or regional location, as per the Australian Statistical Geography Standard (ABS, 2013)). For each of the food choice factors of taste, price, convenience, and healthiness, respondents were asked “*How important are these things to you when choosing food to eat or buy for yourself?*”, with responses recorded on five-point scales ranging from 1 - *Very unimportant* to 5 - *Very important*.

A range of potential predictor variables was included in the present study based on those proposed or demonstrated to be related to food choice decisions in previous research (Moorman et al., 2004; O’Brien et al., 2014; Sobal & Bisogni, 2009; Steenhuis, Waterlander, & de Mul, 2011; Wardle et al., 2004). Respondents reported whether they were the main grocery buyer for the household (1- *Yes*, 2 - *No*, and 3- *Share job equally*; responses were dichotomised in to 1 - *Yes* and 2 - *No or share responsibilities*). Respondents also reported whether they had any special dietary requirements relating to diabetes, heart disease, high cholesterol, and/or high blood pressure. Responses for each health condition were combined to create a special dietary requirement variable (1 - *Had no special dietary requirements* and 2 - *Had a special dietary requirement*). Self-rated nutrition knowledge was assessed with the item “*Compared to most people, I know quite a lot about nutrition*”, with response options ranging from 1 - *Strongly disagree* to 5 - *Strongly agree*. Respondents rated the perceived healthiness of their diet on a four-point scale: 1 - *I eat a very healthy diet* to 4 - *I eat a very unhealthy diet* (reverse coded for analysis purposes). Body Mass Index (BMI) was calculated from respondents’ self-reported weight and height.

2.3. Data analyses

Latent profile analysis was conducted using the rated importance of the food choice factors of taste, price, health, and convenience as continuous variables (Hagenaars & McCutcheon, 2009). Z-scores for each of the rated food choice factors of taste, price,

healthiness, and convenience were calculated to standardise the data within each consumer (M = 0 and SD = 1), and then used to compute models characterised by two- to six-profile segments. The robust maximum likelihood estimation was used for each of the computed models, with 300 iterations and a constraints value of 15 to restrict the class-specific residual variances equal across the latent classes to attain model parsimony (Muthén & Asparouhov, 2009). The 300 best solutions were then retained for final stage optimisation (Hipp & Bauer, 2006). The selection of the optimal model was made by considering statistical criteria and whether additional segments provided any further information, with the aim being the attainment of solution parsimony (Swait, 1994). The fit statistics of Akaike Information Criteria (AIC), Bayesian Information Criteria (BIC), Sample-size Adjusted BIC (SABIC), and entropy values were examined to determine the optimal model. Exhibiting the lowest AIC, BIC, and SABIC and a higher entropy value are indicative of the optimal solution (DiStefano & Kamphaus, 2006; Fraley & Raftery, 1998; Nylund, Asparouhov, & Muthén, 2007). Further considerations were the ease of interpretation of the solution and the derivation of a model that did not include a segment comprising less than 5% of the sample (Marsh, Lüdtke, Trautwein, & Morin, 2009; Nylund et al., 2007). One-way ANOVAs were then computed to test for significant differences in the z-scores of the food choice factors between the derived segments, and mean-comparison tests were used to test for significant differences within segments on the z-scores of the food choice factors. Each respondent was allocated to a latent profile based on the highest posterior probabilities approach. To test for significant differences between the derived segments, bivariate analyses were conducted, either one-way ANOVAs (with Bonferroni post-hoc tests for continuous predictor variables) or chi-square tests for categorical predictor variables (with multiple chi-square comparison tests used when significant outcomes emerged for predictor variables with more than two categories). All analyses were conducted using Stata version 15.1 software (StataCorp, 2017).

3. Results

3.1. Descriptive statistics

Across the entire sample, taste was rated as the most important determinant of food choice, with a mean score of 4.42 on the 5-point scale (SD = 0.72, z-score = 0.43). This was followed by price (M = 4.19, SD = 0.78, z-score = 0.15) and healthiness (M = 4.07, SD = 0.82, z-score = 0.00). Convenience was rated lowest (M = 3.79, SD = 0.82, z-score = -0.35). The z-score differences between the four food choice determinants were significant ($p < 0.001$ for each paired comparison).

3.2. Fit statistics

The computed 2-to 6-segment models were converged on well-replicated solutions. The AIC, BIC, and SABIC values continually decreased as the number of segments increased. The 4-segment model was selected as the most appropriate profile solution based on: (i) relatively low AIC, BIC, and SABIC values than the preceding models; (ii) the fourth segment provided a different mean pattern of the food choice factors than the segments identified in the 3-segment model, thereby providing new information; (iii) the 5- and 6-segment models did not provide distinct latent profiles compared to the 4-segment model (Marsh et al., 2009); (iv) the 5- and 6-segment models included at least one segment comprising less than 5% of the sample; and (v) ease of interpretation and parsimony of the solution. In terms of entropy values, the 2- through 6-segment models resulted in similar outcomes. The entropy value of 0.997 for the 4-segment model indicates that 99.7% of the sample was classified appropriately, which is far higher than the 'high' threshold of ≥ 0.80 .

(Clark & Muthen, 2009; Kamata, Kara, Patarapichayatham, & Lan, 2018). The average posterior probabilities of the 4-segment model ranged from 0.79 to 1.00 (Segment 1: mean = 0.88, 95% CI [0.87, 0.89]; Segment 2: mean = 1.00, 95% CI [1.00, 1.00]; Segment 3: mean = 0.79, 95% CI [0.77, 0.82]; Segment 4: mean = 0.99, 95% CI [0.98, 1.00]), demonstrating a high classification level and well-separated profiles (>0.70 rule-of-thumb: Nagin, 2005).

Insert Table 2 here

3.3. Four-segment latent profile solution

The means and corresponding z-scores for the food choice factors across the four segments are shown in Table 2 and the distribution patterns of the derived latent profile segments are depicted in Figure 1. Each of the four segments was narrowly spread over the latent space. However, the classes were well separated from each other and classified appropriately as the average posterior probabilities and entropy values indicate. Segments 1 and 3 prioritised taste while Segments 2 and 4 prioritised price. Segments 1 and 2 comprised the largest number of respondents, together accounting for 83% of the total sample. These two segments had relatively high scores for all variables, indicating that these four factors are key food choice criteria for the large majority of Australian consumers. Z-scores for all factors were especially high for Segment 1 relative to the other segments, with the partial exception of taste for which both Segment 1 and Segment 3 had the highest mean and the highest z-score. In accordance with the high scores across all four food choice factors, Segment 1 was given the title *High involvement*. This terminology derives from the consumer research literature where involvement refers to a consumer's level of interest in a particular product (Mittal and Lee, 1989).

Members of Segment 2 demonstrated the second highest scores for each factor, with relatively little variability across the four factors. This segment was titled *Moderate involvement* to align with the moderate z-scores and means of around 4 on the 5-point scales. Segment 3 was characterised by a substantially higher score for taste relative to the three other factors, illustrating the particular importance of this choice criterion for members of this group. This segment was accordingly titled *Taste focused*. Segment 4 comprised respondents with the lowest scores for all four food choice factors, and was the only segment for which taste ranked last. Based on this profile, Segment 4 was titled *Indifferent*.

Insert Table 2 here

Insert Figure 1 here

3.4. Characteristics of segment members

Table 3 describes the identified segments according to the predictor variables applied in the analyses. The two segments of *High involvement* and *Indifferent* featured the most distinguishing characteristics. The *High involvement* segment was the only one dominated by women, and it had a significantly larger proportion of those who described themselves as the primary grocery shoppers in their households. Those allocated to this group were least likely to live in the metropolitan area and were older on average compared to members of the *Moderate involvement* and *Indifferent* segments. By comparison, most members of the *Indifferent* segment were male and on average they were the youngest in the sample, the most likely to live in metropolitan areas, and the least likely to do the household food shopping. There were no unique characteristics attributed to those in the *Moderate involvement* and *Taste focused* segments.

Insert Table 3 here

4. Discussion

This study aimed to assess consumers' relative ratings of the primary factors determining their food choices and identify segments according to these ratings. Among the four identified segments, taste was rated highest for two of the segments and also received *an average* rating of 4 or more on a 5-point scale for three segments that together comprised 93% of the sample. This finding relating to the importance of taste in driving food choices is consistent with previous studies (Aggarwal et al., 2016; Glanz et al., 1998; Hebden et al., 2015; Honkanen and Frewer, 2009; Onwezen et al., 2012; Prescott et al., 2002; Sautron et al., 2015; Steptoe et al., 1995; Verain et al., 2016), and illustrates that taste perceptions should play a central role in interventions designed to improve people's diets.

Of the four segments identified in the present study, the *High involvement* and *Taste focused* segments provided the highest possible ratings for taste (average rating of 5 on a 5-point scale; z-score = 1.13), while the *Moderate involvement* and *Indifferent* segments prioritised price. By comparison, members of the *Indifferent* segment were more likely to live in metropolitan areas and to be younger, the latter being consistent with previous studies finding younger people to be less interested in food generally (Ares & Gámbaro, 2007; Carrillo et al., 2011). The *Taste focused* segment tended to be comprised of older respondents relative to respondents assigned to groups that prioritised other choice factors or were *Indifferent*. While dietary guidelines for chronic disease prevention urge consumers to prioritise health when making dietary decisions, this choice factor ranked third for a large majority of the sample, including those with special dietary requirements, higher perceived

healthiness of usual diet, and higher self-rated nutrition knowledge. These outcomes highlight the importance of ensuring that healthy foods are presented as tasty and affordable to increase their overall attractiveness (Pettigrew, 2016).

The relatively low rating of convenience in the present study was unexpected given previous research indicating that this factor is often ranked second after taste (Hebden et al., 2015; Honkanen and Frewer, 2009; Milosevic et al., 2012; Onwezen et al., 2012; Prescott et al., 2002). This variation in results may be at least partially attributable to the different cultural contexts (Honkanen and Frewer, 2009; Milosevic et al., 2012; Onwezen et al., 2012) and age groups under study (Hebden et al., 2015). A further reason may be the ‘hygiene factor’ phenomenon that occurs when specific factors are not considered to be as critical as others because although they are important, they are not frequently encountered as problems (Lee, Chen, & Huang, 2018). The extensive availability of packaged foods in many countries may make convenience an assumed attribute and hence one that is less salient in purchase decisions compared to factors with greater variability.

Of note is that health-related variables such as BMI, self-rated nutrition knowledge, being on a special diet, and perceived healthiness of usual diet were not significant predictors of segment allocation. In the case of BMI, the results are consistent with previous work indicating that weight status is not significantly associated with taste and price preferences (Cox et al., 1998; Hebden et al., 2015; Honkanen & Frewer, 2009; Salbe, DelParigi, Pratley, Drewnowski, & Tataranni, 2004). The lack of prior research including special dietary requirements, nutrition knowledge, and perceived diet healthiness as food choice predictors precludes comparisons to previous literature on the basis of these variables. However, the non-significant results relating to being on a special diet were unexpected given that respondents with these specific conditions might have been expected to congregate into segments that rated health more highly.

4.1. Policy and practice implications

Given evidence that food promotion plays an important role in consumers' expectations of food acceptability (Elder & Krishna, 2010; Krishna, Cian, & Sokolova, 2016), the results of the present study highlight the importance of promoting the tastiness of healthy foods and demonstrating ways to make healthy foods more pleasurable to help shift entrenched beliefs about healthy foods being less enjoyable (Freeland-Graves & Nitzke, 2013; Mela, 2006; Raghunathan, Naylor, & Hoyer, 2006). Interventions focusing on the palatability of healthy foods have reported improvements in diet quality without encouraging overconsumption (Leahy, Birch, & Rolls, 2008; Poortvliet et al., 2007). However, such efforts need to be accompanied by broader food advertising regulations to limit the highly prevalent unhealthy food marketing that tends to focus on taste (Galbraith- Emami & Lobstein, 2013).

The second ranking of price in this study has implications for food pricing policies and interventions. Healthy foods are often perceived as expensive (Carrete & Arroyo, 2014; Pettigrew & Pescud, 2013), yet healthier diet baskets for the average family household have been found to be less costly than unhealthy food baskets (Lee, Kane, Ramsey, Good, & Dick, 2016). Public health groups and governments could engage in efforts to correct misperceptions about the cost of healthy foods, including through the use of consumer education programs that have been demonstrated to be effective in this regard (Pettigrew, Moore, Pratt, & Jongenelis, 2016; Pettigrew, Jongenelis, Biagioni, Pratt, & Moore, 2018). Other potentially useful strategies include increasing the cost of unhealthy foods using policies such as taxation and providing subsidies for healthy foods such as fruit and vegetables (Andreyeva, Long, & Brownell, 2010; Block, Chandra, McManus, & Willett, 2010; Brownell et al., 2010). Interventions that lower the price of healthy foods (Ball et al.,

2015; Horgen & Brownell, 2002; Ni Mhurchu, Blakely, Jiang, Eyles, & Rodgers, 2010) and increase the price of unhealthy foods (Block et al., 2010; Ni Mhurchu et al., 2010; Colchero, Guerrero-López, Molina, & Rivera, 2016) have been demonstrated to produce modest improvements in diet quality.

4.2. Study limitations and strengths

A primary limitation of this study was its cross-sectional design, which prevents determination of the extent to which predictor variables may be merely associated with the food choice factors. In addition, the four food choice factors (taste, price, healthiness, and convenience) were assessed using broad survey items that captured a general snapshot of consumers' relative prioritisation of these factors. It is likely that ratings would vary depending on the foods and purchasing situations under consideration. For example, taste may drive a decision to choose chocolate, healthiness may drive a decision to choose vegetables, and convenience is a likely a dominant factor when selecting takeaway foods. Specific products are also likely to engender a broader range of key food choice factors (e.g., perishability in the case of fruit and vegetables (Chapman et al., 2016) and ethical motives for coffee (Davies and Gutsche, 2016)).

A further limitation was the lack of inclusion of food intake data or other forms of behavioural data. Future studies could build on the present results by incorporating food frequency questionnaires to assess the relationship between stated food choice factors and actual dietary patterns. Alternatively, a combination of in-home observations and interviews could be useful for contextualising the roles of competing food choice determinants. Similarly, questionnaires could include involvement scales (e.g., Marshall & Bell, 2004) that would enable the formal measurement of the involvement construct to determine the extent to which this variable impacts on choice criteria. Finally, the survey questions focused on

factors that influenced individual food choice decisions, and different results may have been obtained if participants with families were asked about their food choice decisions for the entire household. Future research could investigate how food choice factors vary in importance for different food categories versus overall eating patterns and for individuals versus households.

Relatively few differences in consumer attributes between the different segments emerged, indicating that other factors that were not included in this study may be having a substantial influence on the outcomes. These could potentially include a wide range of social, cultural, and environmental factors that are recognised to be important determinants of eating patterns (Cruwys, Bevelander, & Hermans, 2015; Menezes, Diez Roux, Costa, & Lopes, 2018). Future research may attempt to incorporate a more diverse range of predictor variables to provide greater insights into the factors that demarcate particular groups of consumers. Strengths of the present study were the large sample, the intentional over-representation of people from socioeconomically disadvantaged backgrounds, and the use of latent profile analysis methods.

5. Conclusion

This study contributes to the growing evidence that taste and price are the most important factors determining consumers' food choice decisions. Although consideration of food healthiness in consumption decisions is important for preventing nutrition-related chronic health conditions, the findings of the present study show that this factor was rated lower relative to taste and price for the large majority of respondents, regardless of levels of perceived diet healthiness, perceived nutrition knowledge, and having special dietary requirements. This suggests that in order to assist in preventing and controlling obesity and

diet-related diseases, health promotion interventions may need to incorporate messages about healthy foods being tasty and enjoyable and policy interventions should ensure healthy foods are affordable. Traditional nutrition programs and messages that reinforce the importance of healthiness when choosing foods may not be as successful as messaging on taste and price considerations.

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Table 1

Sample profile (n = 1,558)

	Sample %	Australian adult population [^] %
Gender		
Females	50	51
Males	50	49
Age (in years)		
18-35	33	33
36-55	33	34
56+	34	33
Socioeconomic status		
Low	49	40
Medium	32	40
High	19	20

Low Socio-Economic Status category comprised those in Socio-Economic Indexes for Areas (SEIFA) deciles 1 to 4 (ABS, 2018)

[^]ABS, 2017, 2018

Table 2

Mean scores of the food choice factors in the 4-segment latent profile model

	Full sample n = 1,558	Segment 1 <i>High involvement</i> n = 664 (43% of sample)		Segment 2 <i>Moderate involvement</i> n = 631 (40% of sample)		Segment 3 <i>Taste focused</i> n = 151 (10% of sample)		Segment 4 <i>Indifferent</i> n = 112 (7% of sample)	
	Mean (SD)	Mean (SD)	Z	Mean (SD)	Z	Mean (SD)	Z	Mean (SD)	Z
Taste	4.42 (0.72) ¹	5.00 (0.00)	1.13 ^{1a}	4.00 (0.00)	-0.09 ^{2b}	5.00 (0.00)	1.13 ^{1a}	2.63 (0.76)	-1.74 ^{2c}
Price	4.19 (0.78) ²	4.60 (0.50)	0.65 ^{2a}	4.13 (0.62)	0.07 ^{1b}	3.46 (0.78)	-0.75 ^{2c}	3.12 (1.08)	-1.16 ^{1d}
Healthiness	4.07 (0.82) ³	4.39 (0.70)	0.39 ^{3a}	3.98 (0.64)	-0.11 ^{2b}	3.87 (0.93)	-0.24 ^{2b}	2.93 (1.04)	-1.39 ^{1c}
Convenience	3.79 (0.82) ⁴	4.19 (0.67)	0.14 ^{4a}	3.69 (0.66)	-0.46 ^{3b}	3.07 (0.81)	-1.22 ^{4c}	2.88 (0.93)	-1.44 ^{1c}

Note: Different letters within a row indicate significant differences between segments and different numbers within a column indicate significant differences within segments on the z-scores of the food choice factors of taste, price, healthiness, and convenience. Mean scores are out of a maximum of 5.

Table 3
Factors differentiating the profile segment based on the 4-segment model of the latent profile analysis

Predictor variables	Full sample	Profile segment				X^2 - statistic	<i>p</i> -value
		<i>High involvement</i>	<i>Moderate involvement</i>	<i>Taste focused</i>	<i>Indifferent</i>		
		<i>n (%)</i>	<i>n (%)</i>	<i>n (%)</i>	<i>n (%)</i>		
Gender						25.18	<0.001
Female	782 (50)	375 (56) ^a	297 (47) ^b	72 (48) ^b	38 (34) ^c		
Male	776 (50)	289 (44) ^a	334 (53) ^b	79 (52) ^b	74 (66) ^c		
Education level						4.04	0.258
< Tertiary	985 (64)	437 (67)	392 (63)	87 (59)	69 (62)		
≥ Tertiary	553 (36)	220 (33)	229 (37)	61 (41)	43 (38)		
Socioeconomic status						3.93	0.686
Low	765 (49)	332 (50)	300 (48)	80 (53)	53 (47)		
Medium	492 (32)	199(30)	215 (34)	43 (28)	35 (31)		
High	298 (19)	131 (20)	115 (18)	28 (19)	24 (22)		
Location						13.06	0.005
Metropolitan	948 (61)	379 (57) ^a	395 (63) ^b	91 (60) ^b	83 (74) ^c		
Rural	610 (39)	285 (43) ^a	236 (37) ^b	60 (40) ^b	29 (26) ^c		
Had a child(ren) (<18 years)	411 (26)	159 (24)	187 (30)	33 (22)	32 (29)	7.34	0.062
BMI						1.23	0.745

Underweight/healthy	533 (44)	220 (43)	225 (46)	47 (42)	41 (43)		
Overweight/obesity	675 (56)	292 (57)	264 (54)	65 (58)	54 (57)		
Grocery buyer						24.50	<0.001
Main grocery buyer	1062 (68)	487 (73) ^a	413 (65) ^b	94 (62) ^b	68 (61) ^b		
Not/shared grocery buyer	496 (32)	177 (27) ^a	218 (35) ^b	57 (38) ^b	44 (39) ^b		
Had a special dietary requirement ⁺						2.49	0.477
Yes	315 (20)	146 (22)	117 (19)	29 (19)	23 (21)		
No	1,243 (80)	518 (78)	514 (81)	122 (81)	89 (79)		
Continues predictor variables	<i>Mean (SD)</i>	<i>Mean (SD)</i>	<i>Mean (SD)</i>	<i>Mean (SD)</i>	<i>Mean (SD)</i>	<i>F-statistic</i>	<i>p-value</i>
Age (in years)	46.01 (17.35)	47.62 (17.13) ^a	44.61 (17.44) ^b	49.07 (17.17) ^a	40.20 (16.40) ^b	9.17	<0.001
Gross annual household income [#]	3.17 (1.67)	3.08 (1.60)	3.22 (1.67)	3.48 (1.73)	3.11 (1.97)	2.34	0.072
Self-rated nutrition knowledge	3.34 (0.85)	3.39 (0.90)	3.31 (0.80)	3.29 (0.94)	3.25 (0.75)	1.58	0.192
Perceived healthiness of usual diet	2.96 (0.49)	2.96 (0.50)	2.94 (0.48)	2.98 (0.56)	2.96 (0.47)	0.34	0.796

Note: Different letters within a row indicate significant differences between segments ($p < 0.05$). [#]Measured in ranges where a high value indicates a higher gross annual household income (1- *Less than \$30,000* to 8- *\$250,000 or more*). BMI categories as defined by WHO (2004).
⁺Dietary requirement related to at least one of the following health conditions: diabetes, heart disease, high blood pressure, or high cholesterol.

Author statement

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