



Queensland Government

Increasing vegetable consumption: a means-end chain approach.

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1 **Increasing vegetable consumption: a means-end chain approach**

2 Social marketing is characterised by its use of commercial marketing techniques
3 to promote the adoption of socially desirable behaviours. In the nutrition education
4 sphere, messages conveying the physical benefits of healthy eating are the mainstay of
5 intervention campaigns. Yet the success of such initiatives is variable (for example,
6 Trudeau et al., 1998). A deeper understanding of consumer's health motivational
7 structures may lead to the employment of more effective messages. In this study, a
8 detailed understanding of the health and wellness factors the Australian consumer
9 associates with vegetable consumption was investigated using means-end theory and a
10 laddering technique.

11 High consumption of fruit and vegetables has been associated with a reduced
12 risk of chronic disease (Devine et al., 2008). Strategies designed to increase fruit and
13 vegetable consumption amongst populations may provide salve to the strains of
14 overburdened health systems. As early as 2001, it was reported that an increase in the
15 average Australian fruit and vegetable consumption by one serve a day would result in
16 direct health care system savings of \$513 million a year (Australian Fruit and Vegetable
17 Coalition, n.d.; Marks et al., 2001; Miller, 2002).

18 The 'Go for 2&5'[®] social marketing campaign is an Australian Government,
19 State and Territory health initiative designed to increase fruit and vegetable
20 consumption amongst the population (Department of Health and Aging, n.d., Pollard et
21 al., 2008). The primary message of the campaign involves the health benefits of eating
22 two fruit and five vegetable serves per day. The campaign has enjoyed considerable
23 success achieving 70 per cent recall after the first year for the state of Queensland (Lee,
24 2008). Research commissioned by Horticulture Australia Limited (2006) valued the
25 commercial impact of the first four weeks of the campaign at \$9.8M, or a 100 tonne
26 increase of fruit and vegetable sold for the state of Queensland. This volume translated
27 into an increase of over 0.2 serves per person per day. Ongoing evaluations have since

1 estimated average fruit and vegetable consumption to have increased to between .4 and
2 1.1 of a serve per person per day (Lee, 2008). This represents a “saving” of \$50 million
3 per year in acute treatment services throughout the state (Lee, 2008). The success of the
4 program has also been evident in other Australian states (Pollard et al., 2008).

5 While increased consumption is evident, evaluative surveys reveal that only six
6 per cent of the population report consuming the recommended intake of two fruit and
7 five vegetables every day (Lee, 2008). Consumers perceive the consumption of
8 vegetables to be more difficult to increase than fruit (Ciliska et al., 2000). Fruit is often
9 considered a convenient, snack type option and a relatively effortless foodstuff to
10 include in the diet throughout the day (unpublished research Gething et al., 2009; Lea et
11 al., 2006). In many Western societies vegetables are perceived to be primarily a
12 component of evening meals (Dixon et al., 2004; Hanson et al., 2005). Consequently,
13 many people find it difficult to consider increasing the number of vegetable serves
14 consumed in one day despite comprehending the health messages proffered by
15 intervention programs (unpublished research Gething et al., 2009). Treadeau and
16 colleagues (1998) suggests that dietary interventions may prove more effective if the
17 intrinsic motivations behind desired behaviours are incorporated in messages.

18 Food choices, like other everyday behaviours, are usually based on routine
19 actions with little emotional involvement or importance. Levels of involvement are a
20 critical aspect for marketers and are said to be influenced by intrinsic self-relevance, and
21 by both the person and the product (Blythe, 2008). Feelings of personal relevance are
22 based on the perceived connection between the product and the customer (Walker and
23 Olson, 1991). Consumers who link product features or attributes to important life goals
24 are more likely to exhibit higher involvement with messages because of the significance
25 of the end goal (Verplanken and Svenson, 2001). This suggests that it is possible to
26 move a product from low-involvement to that of higher-involvement through the
27 creation of personal relevance (Blythe, 2008). Means-end chain (MEC) theory is a

1 framework shown to be effective in deciphering the personal relevance of foodstuffs
2 such as vegetable oil (Nielsen et al., 1998), pork (Arvola, 1998), beef (Grunert and
3 Valli, 2001), fish (Valette-Florence et al., 2000) and apples (Jaeger and MacFie, 2000),
4 and as a model for generating marketing communications (see Reynolds and Olson,
5 2001). In the social marketing literature, MEC concepts have been used to understand
6 philanthropic decisions (Reynolds and Norvell, 2001), the effect of cigarette
7 advertisements on women (Boyd et al., 2003), and childhood obesity (Davis and Mort,
8 2006).

9 According to MEC theory, consumer behaviour is driven by the desire to realise
10 psychological end-states of being (Gutman, 1982). The decision to purchase a product is
11 not solely based on its discernible physical characteristics. Rather, it is the functional
12 and psychosocial benefits its use provides, and how these benefits help the consumer
13 attain life goals and values that are the greater motivator (Olson, 1995). A means-end
14 chain shows how consumer's link product attributes to their relevant values and goals
15 through a chain of successively more abstract and personal consequences. To take a
16 food-related example, Shitake mushrooms have an exotic appearance (product
17 attribute), that provide an unusual look to a dish (functional consequence). By using the
18 product in a visually striking dish, the cook may feel more adventurous (psychosocial
19 consequence) which may lead to the attainment of values connected to accomplishment,
20 or social recognition if the meal is consumed in a social setting.

21 Means-end chain data is derived using a laddering interview technique
22 (Reynolds and Gutman, 1988). Laddering interviews are a two step process. First, the
23 product attributes relevant to the consumer are evoked. Various techniques may be used
24 including *a priori* lists developed from the literature and referenced to experts, free
25 listing, free and triadic sorting and by direct elicitation. Second, one-on-one, personal,
26 semi-structured interviews aimed at revealing the attribute-consequence-value
27 connections that consumers make with respect to products are conducted. Analysis then

1 results in a ‘cognitive map’ and appropriate inferences can be used to inform an
2 effective marketing strategy (Olson and Reynolds, 1983).

3 An unabashed commercial tool developed as a practical guide to using means-
4 end-chain data in marketing decisions is the MECCAs model (Means-End Chain
5 Conceptualization for Advertising Strategy) (Olsen and Reynolds, 2008; Reynolds et
6 al.,1997). The MECCAS model identifies four conceptual elements that need to be
7 considered in developing marketing strategy. The message elements refer to the
8 attributes of the product. Consumer benefits are the direct consequences consumers gain
9 through product usage. The leverage point is the way in which the message taps into the
10 consumer’s value system and are usually derived from the psycho-social consequences
11 of the means-end chain. The driving force is derived from exploiting the self-relevant
12 value orientation revealed in laddering interviews. It is seldom explicitly stated in
13 communications, but may be termed the subtext. A final feature of the model, not
14 expressly derived from means-end data, is the executional framework. The executional
15 framework is the details of the finished communications such as script, plot, models and
16 settings. Marketing activities developed using these elements are thought to tap into the
17 consumer mindset, producing a deeper and more persuasive connection with the target
18 market (Jaeger and MacFie, 2000; Reynolds and Craddock, 2001).

19 The aim of this study is to illustrate how means-end chain theory, and principles
20 from the MECCAS model of marketing strategy can inform communications that
21 effectively convey the health messages of vegetable consumption to various publics.

22 **Method**

23 *Data Collection*

24 Data was collected through interviews of 61 inner city residents of an Australian
25 city. Subjects consumed at least two serves of vegetables a day and were responsible in

1 part or whole for shopping in their household. The size of the sample is similar to past
2 studies using means-end chain analysis (for example Barrena and Sanchez, 2009).

3 *Laddering interview*

4 Direct elicitation of the health and wellness attributes of vegetables was used.
5 Direct elicitation is believed to provide a stronger focus on intrinsically relevant
6 attributes (Bech-Larsen and Nielson, 1999) and to be appropriate for low involvement
7 product like vegetables (de Boer and McCarthy, 2003). Furthermore, vegetables are
8 likely to elicit few attributes, making this method less laborious than others for the
9 consumer (Bech-Larsen and Nielson, 1999). With this method, the respondent was
10 simply asked to conceive of the attributes most important to their health when
11 purchasing the vegetables presented. Stimuli for the direct elicitation consisted of staple
12 raw vegetables including lettuce, tomato, carrots, green capsicum and corn on the cob.

13 A soft laddering method that encourages the subject's natural flow of speech
14 was used in the second phase of the interview to determine consumer's value chains.
15 This is in contrast to hard laddering which refers to data collection techniques where the
16 respondent is forced to produce the value chain sequentially, usually through *a priori*
17 lists (e.g. Russell et al., 2004). Although vegetables are a low involvement product,
18 health and wellness is a complex topic likely to elicit complex and detailed responses.
19 Soft laddering was therefore the preferred method, allowing for freedom of articulation
20 in order to capture more complex cognitive structures (Grunert et al., 2001; Russell et
21 al., 2004). Standard laddering questions ask consumers to verbalise why attributes and
22 consequences are important to them. This line of questioning is repeated until final
23 values are elicited and the respondent can give no further insight. Considering this study
24 is restricted to the health and wellness properties of vegetables, a contextually specific
25 line of questioning was deemed appropriate. This technique has been used in
26 commercial (Reynolds, Dethloff and Westberg, 2001), and non-commercial MEC
27 analysis (Reynolds and Norvell, 2001). Based on the attributes elicited in phase one of

1 the interviews, consumers were first asked “*why is that important to your health and*
2 *wellness?*” This question was repeated until a chain of connections was achieved. The
3 time necessary for the completion of the task varied between 20 and 40 minutes,
4 depending on each respondent’s ability to articulate their reasoning.

5 *Data analysis*

6 A catalogue of attribute, consequence and value codes was developed after
7 initial inspection. Data was analysed by means-end chain software (SKYMAX_DG) to
8 generate an individual Hierarchical Value Map (HVM). Arguments with less than six
9 agreeing respondents were omitted from the final cognitive map. This allowed for a
10 balance between visibility and quality of information to draw the HVM (Costa et al.,
11 2004).

12 **Results**

13 Of the sixty one subjects, 78 per cent of participants reported an average weekly
14 vegetable consumption higher than the population for that state (Queensland
15 Government, 2006). Self-reports of vegetable consumption are shown in table 1. The
16 subjects were mainly women (82%), and were typically the main buyer of groceries of
17 the household (84%). Almost half were over 50 years of age and 76 per cent of the
18 sample had attained at least a high school certificate.

19 Having characterised the groups, an HVM was generated and is presented in
20 figure 1. The thickness of the line connecting the HVM components is indicative of the
21 strength of associations with thicker lines representing stronger connections. A
22 summary at the attribute level demonstrates that respondents’ perceived the nutritional
23 components of vegetables, (“absence of fat”, “source of fibre”, “source of
24 vitamins/minerals”, “high nutritional value”), to be important attributes for their health
25 and wellness. However, sensory (“freshness”, “good taste and texture”) and peripheral
26 attributes (“versatility”, “alternative to take-away”) were also evident. The consequence

1 level was logically dominated by health results (“avoid putting on weight”, “boost
2 immune system”, “organs functioning properly”, “avoid constipation”, “avoid chronic
3 disease”, “avoid illness”, “emotional well-being”, “energy and vitality”, “physical well-
4 being” and “maintain an active life”, as well as more psychosocial consequences (“work
5 performance”, “provide for family”), and the more hedonistic “provides eating
6 enjoyment”. At the value level, “live longer”, “enjoy family”, “enjoy life”, and “achieve
7 goals” were important. Not all chains were complete with some attributes linking
8 directly to values, and some chains ending at the consequence level.

9 The MECCAS literature states that effective communications are informed by
10 strong complete MEC chains where connections amongst all levels exist (Reynolds and
11 Craddock, 2001). Considering this, incomplete chains were then removed and only
12 those attributes with at least 50 per cent of interviewee agreement were considered.
13 Linked consequences and values were considered if 20 per cent agreement was reached.
14 One dominant chain remained, which is presented in Figure 2. For this chain,
15 respondents described vegetables as being important for their health and wellness
16 because they were “fresh”, a “source of vitamins and minerals” and of “high nutritional
17 value”. These attributes were important to “maintain energy” which was essential to
18 “maintain an active life”. Maintaining an active life led to the attainment of values
19 related to “enjoying life” and “achieving goals”.

20

1 Table 1

2 Percentage of respondent's self-proclaimed vegetable serves consumed per day.

3 One serve equal to ½ cup cooked vegetables or one cup of salad.

4

Vegetable serves per day	%
5+ serves a day	21
4	34
3	23
2	17
1	4
	8

9

10 Insert Figure 1 here

11 Insert Figure 2 here

12 Discussion

13 In this study, the underlying health values the Australian consumer associates
14 with vegetable consumption was investigated using means-end theory and a laddering
15 technique. A discussion of results will address participant demographics, and the
16 limitations associated with it, and the health motives for the targeted consumers
17 revealed in the means-end chain. In order to address the aims of the study, the dominant
18 chain will be incorporated into an example MECCAS style promotional strategy.

19 Inspection of the demographic breakdown of the subjects reveals a gender skew
20 toward females. The sample was also older than the general population. This can be
21 attributed to the recruitment criteria based on vegetable consumption and shopping
22 responsibility. The results are similar to that described in previous studies in that older
23 people and women consume more vegetables (Lea and Worsley, 2003; Pearson et al.,
24 2005; Thompson et al., 1999), and that women are primarily responsible for grocery
25 shopping (Dholakia, 1999; Pearson et al., 2005).

26 A major limitation of the study is the focus on higher than average vegetable
27 consumption. Nutritional interventions are usually focused on populations with

1 problematic eating behaviours. Although, 79 per cent of the respondents represent less
2 than the ideal consumption of five serves a day, 78 per cent do consume more than the
3 National average of 2.2 serves of vegetables a day. Motivations for vegetable
4 consumption may differ for those who eat less than the average consumption level. For
5 example, those who consume a large amount of convenience foods have been shown to
6 have a restricted intake of vegetables (Gething, unpublished research 2009; Marquis,
7 2005). Although convenience food users do relate food consumption with health
8 outcomes, values related to hedonism and stress have been found to be the greater
9 motivator (Betts et al. 1997; Marquis, 2005; Rappoport et al., 1992). Future research
10 using the methodology employed here might consider those for whom lower vegetable
11 consumption is evident in order to better inform more targeted interventions.

12 Consumer health and wellness motivations for eating vegetables were relatively
13 detailed in this study. Consumers displayed a general knowledge of both macronutrient
14 and micronutrient properties associated with the produce. At the consequence level,
15 consumer responses were specific, numerable and wide-ranging. These findings verify
16 previous studies that show Australian consumers are well educated as to the benefits of
17 consuming vegetables (Cox et al., 1998). However, they may also be indicative of a
18 sample high in health-orientation (Kraft and Goodell, 1993). Differences in health
19 motivations amongst populations have been noted for some time (Boslaugh et al., 2005;
20 Dutta-Bergman, 2003; Dutta-Bergman, 2005; Kraft and Goodell, 1993; Plank and
21 Gould, 1990), with those exhibiting high health-orientation actively seeking health-
22 related information. Importantly, individual differences in health beliefs may affect a
23 person's ability to relate to health communications with assorted approaches appropriate
24 to diverse segments (Geeroms et al., 2008). Although outside the bounds of this study,
25 future research using the methods described here may also consider the additional
26 approach of profiling consumers, either using the primary motivations and dominant

1 pathways apparent in means-end chains (Reynolds and Rochon, 2001), or some
2 additional psychosocial method of aggregation (for e.g. Geeroms et al., 2008).

3 The four values respondents associated with vegetable consumption (“live
4 longer”, “enjoy family”, “enjoy life”, “achieve goals”) were similar to those revealed in
5 other food studies using MEC theory. In a study on apples, Jaeger and Macfie (2000)
6 also found the values “healthy and long life”, “family responsibility”, and “enjoy life”
7 associated with their consumption. In a study on convenience food that included a
8 selection of processed vegetables, de Boer and McCarthy (2003), found the values
9 “good health, long life” and “self-fulfilment”, amongst others, were associated with
10 consumption. Values related to enjoying family and life, living longer and achieving
11 goals have also been found to resonate with women and mature age respondents (Le
12 Page et al., 2005; Nielson et al., 1998). Considering this, it would appear the results
13 from this study are representative at face value.

14 A basic goal of social marketing is to use marketing concepts to bring about
15 socially desirable behaviours. MECCAS derived marketing strategies have proven
16 useful in this way (Boyd et al., 2003; Davis and Mort, 2006; Reynolds and Norvell,
17 2001). An example communication strategy drawn from the dominant MEC is shown in
18 figure 3. The three key attributes for consumers were the “freshness” of vegetables,
19 vegetables as a “source of vitamins and minerals”, and their “high nutritional value”.
20 These relate to the key choice criteria of purchase, and in accordance with the
21 MECCAS model, should be visually and verbally conveyed in communications. A
22 visual and/or verbal narrative should then connect these features to the functional
23 consequence of “maintain energy and vitality”. When this link is communicated
24 effectively, the real and immediate need-satisfying aspect of the product may then
25 become apparent to the consumer (Reynolds, Whitlark and Wirthlin, 2001). However, it
26 is the values of “enjoy life” and “achieve goals” that respondents associated with
27 vegetables that would be the driving force behind any communication. Traditionally,

1 these are thematic and implicit rather than stated (Reynolds and Gutman, 2001).
2 Because it is conceptual, the psycho-social consequences are used to “tap into” this end-
3 goal and create personal relevance. In this instance it is the concept of “maintain an
4 active life” that is used to link features and functional consequences to the higher order
5 values and to drive the product from one of little involvement to higher involvement.

6 The elements of the marketing strategy example are directly derived from the
7 MEC chain. The final feature of a MECCAS strategy involves the executional
8 framework developed by creative professionals as the overall tone and style with which
9 the message is to be communicated (Reynolds and Craddock, 2001). This may be the
10 use of humour, the use of referents as models (Debevec and Romeo, 1992), or some
11 other way with which to connect with the key demographic. For example, in
12 promotional theory, comparative advertising is thought to be a persuasive method of
13 communication (Rose et al., 1993). The presence of two of the attributes “freshness”
14 and “high nutritional value” in the dominant MEC chain suggest that for this group,
15 vegetables may be compared favourably to foods perceived as not fresh (processed) and
16 of low nutritional value. Considering this, our example might directly compare the
17 nutritional value of a plate of fresh vegetables, against that of some nutritionally poor
18 foods. Other contextual factors such as place, people, social setting, and timing of
19 purchases would also be considered by creative professionals when formulating a
20 communications strategy. However, this study serves to demonstrate how a more
21 personally relevant message might be informed by MEC data. The actual development
22 of communications using the MEC data is customarily the responsibility of
23 communications professionals.

24

25 Insert Figure 3 here

1 **Conclusion**

2 The purpose of this study was to illustrate how means-end chain theory can inform
3 communications that effectively convey the health messages of vegetable consumption
4 to various publics. Using a laddering interview technique and means-end theory an
5 example communications strategy was developed from a dominant means-end chain.
6 This study was limited in so far as subjects who consumed less than two serves of
7 vegetables were not recruited for this study. Further research may address more
8 problematic publics exhibiting lower than average vegetable consumption habits in
9 order to contrast their cognitive structures with higher vegetable consuming subjects.

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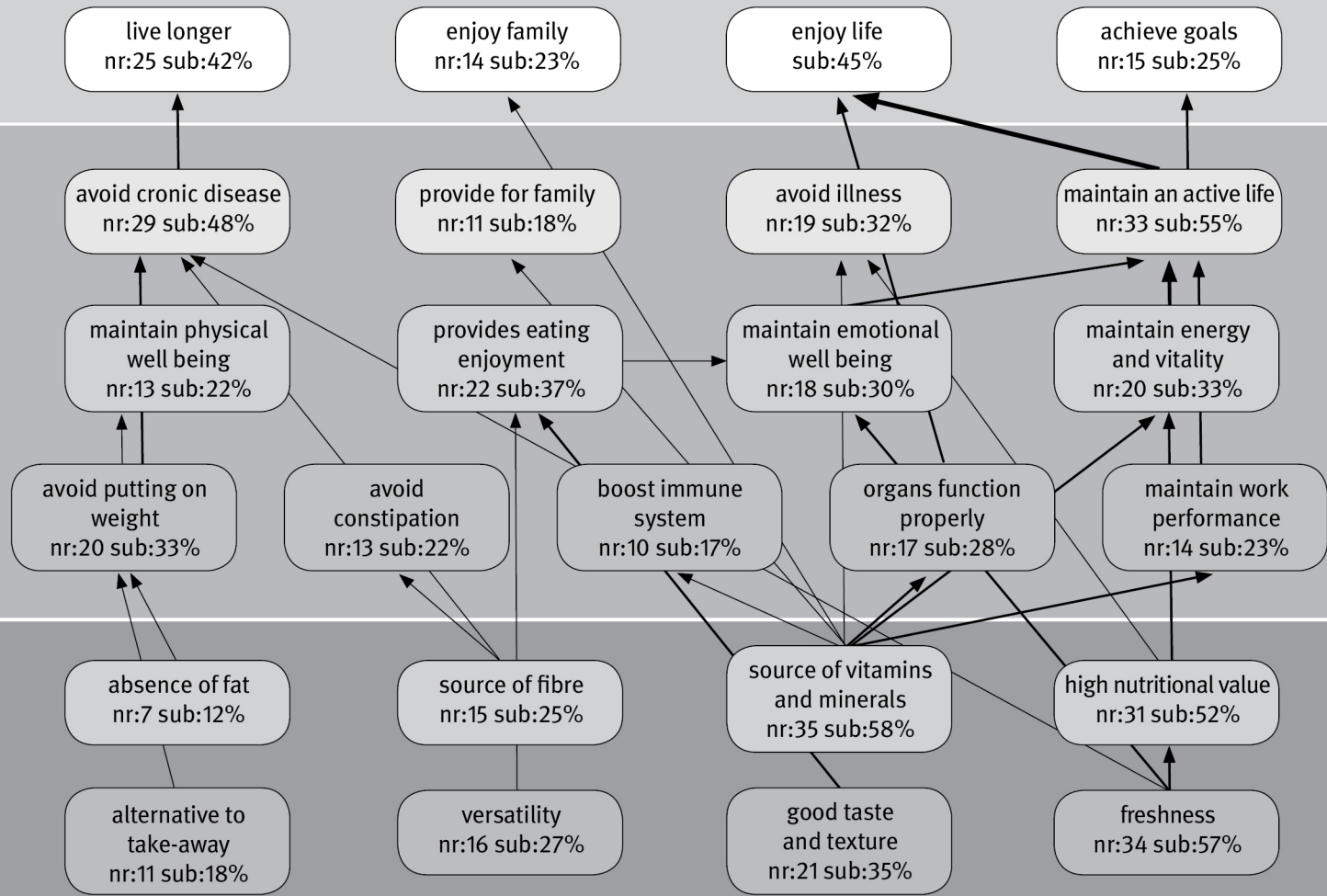
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VALUES

CONSEQUENCES

ATTRIBUTES



VALUES

enjoy life
sub:45%

achieve goals
sub:25%

CONSEQUENCES

maintain an
active life
sub:55%

maintain energy
and vitality
sub:33%

ATTRIBUTES

high nutritional
value
sub:52%

source of vitamins
and minerals
sub:58%

freshness
sub:57%

**ELEMENTS OF
CREATIVE
STRATEGY**

**ELEMENTS OF MARKETING
STRATEGY/COMMUNICATIONS**

**LEVELS OF
MEANS-END
CHAIN**

