A scale construction and validation on attitude towards organic tea : An application of scaling technique

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ABSTRACT

The attitude is understood as the individual belief which influences the behaviour of individuals. Hence, this paper attempts to develop an attitude scale to measure organic tea consumers' attitude towards organic tea. Equal Appearing Interval scaling technique was used to develop the scale with the universe of content of nine statements. The final scale was tested for reliability as well as validity following the empirically proven methods and was administered to a sample of organic tea consumers. Further, the exploratory factor analysis was done for the scale to find out the dimensions and it was conformed to confirmatory factor analysis. It was found that the scale was very reliable and valid. The consumers held an positive attitude towards organic tea.

KEY WORDS : Attitude, Statements, Reliability, Validity, Exploratory factor analysis

How to cite this paper : Sakthirama, V. (2014). A scale construction and validation on attitude towards organic tea– An application of scaling technique. *Internat. J. Com. & Bus. Manage*, **7**(1) : 38-44.

Attitude is the positive or negative feeling associated with a psychological object (Edwards and Kilpatrick, 1948). Many studies reported that people hold and express a particular attitude because they derive psychological benefits by doing so (Smith *et al.*, 1956; Katz and Stotland, 1959 and Katz, 1960).

According to expectancy-value model, attitude towards a behaviour is defined as the sum of behavioural beliefs, the evaluation of consequences of the behaviour, along with the perceived likelihood of those consequences. Hence, the attitude towards behaviour can be described as follows:

$$A_B = \sum_{i=1}^{n} b_i e_i$$

where, *bi* is the belief that performing the behaviour will lead to some consequence *i*, e_i is the evaluation of the consequence *i* and *n* is the number of salient consequences

(Eagly and Chaiken, 1993).

In the field of marketing and social research in general, attitude is considered as main psychographic variable. According to Kotler and Keller (2009), attitude is defined as a person's enduring favourable or unfavourable evaluations, emotional feelings and action tendencies towards some object or idea. Attitude put the consumers into a frame of mind liking of disliking an object, moving toward or away from it. The attitude is thus understood as the individual belief which influences the behaviour of individuals.

The studies such as Schiffersten and Oude Ophuis (1998) ; Von Alvensleben (1998); Tarkiainen and Sundqvist (2005); Chakrabarti and Baisya (2009) and Kim (2011) inferred that consumers have only positive attitude as they believed organic fruits and vegetables were healthy, environmentally friendly and more tasty and nutritious than conventionally grown foods. Hence, to study the attitude of consumer is must to better understanding of their behaviour. So, a scale was developed to measure the mental disposition (attitude) of the respondents about organic tea in varying degrees of favourableness or un-favourableness towards organic tea. This scale was constructed using 'Equal

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Appearing Interval' scaling technique developed by Thurstone and Chave (1929) and validated.

METHODOLOGY

Statements concerning the psychological object *i.e.* 'organic tea' with respect to health benefits, quality, certification, convenience, price, packing, familiarity, sensory appeal, natural content benefits, environmental friendliness, benefits, welfare benefits, economic benefits, political and religious values benefits etc. were formulated. Altogether 65 statements were formulated which were then organized and structured in the form of items. The items were screened by following the informal criteria suggested by Edwards (1969) for editing the statements to be used in the construction of the attitude scale. Based on the screening, 50 items were finally selected which formed the universe of contents (Appendix-I).

APPENDIX -I

Attitude of consumers towards organic tea

Please state the following statements given below for its favourableness / unfavourableness with respect to attitude of consumers towards organic tea. You may please indicate your opinion in the five point continuum ranging from 'Most unfavourable' to 'Most favourable' with scores ranging from one to five, respectively. Kindly note that it is not intended to measure your attitude towards organic tea, but to assess the degree of favourableness or unfavourableness of the statements so as to construct an attitude scale as suggested by Thurstone and Chave (Equal appearing interval scale).

A————————B————————C————————D————————E
1   2   3   4   5
Most unfavourable Neutral Most favourable
(MUF – Most Unfavourable UF – Unfavourable N – Neutral
F – Favourable MF – Most favourable)

These 50 items were then subjected to judge the opinion on a five-point continuum ranging from most unfavourable to most favourable. The items were sent to 50 judges comprising of faculty of State Agricultural Universities, Scientists from research organizations and Retail Managers of organic stores. Out of 50 judges, 32 judges responded. The scale values and Q values were then computed for these 50 items as suggested by Thurstone and Chave (1929).

ANALYSIS AND DISCUSSION

The findings of the present study as well as relevant discussion have been presented under following heads :

Selection of attitude items:

The attitude items to be included in the final attitude scale were selected based on the following criteria:
– The statements selected should represent the universe of content with respect to organic tea.
– The statements selected should adequately represent the

domains such as health benefits, quality, certification, convenience, price, packing, familiarity, sensory appeal, natural content benefits, environmental friendliness benefits, welfare benefits, economic benefits, political and religious values benefits etc.
– The scale values of the selected attitude items should have equal appearing interval *i.e.* distributed uniformly along the psychological continuum.
– Those items with high scale values and smaller Q values should be selected as far as possible.
– There should be more or less equal number of statements with favourable and unfavourable attitudes as far as possible.

The scale values were arranged in descending order of magnitude and the difference between the successive scale values and the cumulative total of the computed differences were worked out. Considering the time limitation from consumers' point of view, it was decided to select nine statements to constitute the attitude scale. Since the selected scale values should have equal appearing interval and distributed uniformly along the psychological continuum, it was necessary to form nine compartments so as to select nine statements at one statement from each compartment (Appendix-II). The basis for forming the compartments was that, each compartment should be equally spaced in the continuum. For this purpose, the cumulative total was divided by nine, which worked out to 0.252 and this formed the width of the class intervals. Each class interval represented a compartment for the selection of the attitude items.

To select the attitude items from the nine compartments, the scale values and the corresponding Q values were considered (Appendix-III). Based on the criteria already mentioned, items having high scale values and low Q values were selected at one item from each compartment. Care was also taken to ensure that the selected items represented the universe of content and covered different aspects of organic tea. Thereby, nine items were selected with equal appearing interval and with a uniform distribution along the psychological continuum. The attitude items finally selected with corresponding scale values are presented in Table 1.

Test of reliability of the scale:

The reliability of the scale was determined by 'split-half' method. The split-half method is regarded as the best method for measuring reliability (Garrett and Woodworth, 1973). Nine selected attitude items were divided into two equal halves by odd-even method (Singh, 1986). The two halves were administered separately to 30 consumers in a non-sampling area (Appendix-IV). The scores were subjected to product moment correlation test in order to find out the reliability of the half-test. The half-test reliability co-efficient (r) was 0.750, which was significant at five per cent level of probability.

APPENDIX –II : Computation of equal appearing intervals

Sr. No.	Statement No.	Scale value	Q value	Difference between successive scale values	Cumulative value of the differences	Equal appearing class intervals	Compartments
1.	2	4.13	1.88				
2.	22	4.00	1.47	0.13	0.125		
3.	18	4.00	2.19	0	0.125		
4.	31	3.64	2.25	0.36	0.482	0.252	I
5.	44	3.64	3.07	0.00	0.482		
6.	27	3.59	1.90	0.05	0.534	0.505	II
7.	3	3.39	1.76	0.20	0.736		
8.	30	3.33	2.23	0.06	0.792	0.757	III
9.	35	3.25	2.28	0.08	0.875		
10.	5	2.90	2.06	0.35	1.225	1.010	IV
11.	36	2.72	2.00	0.18	1.403	1.262	V
12.	37	2.50	2.00	0.22	1.625	1.515	VI
13.	42	2.50	2.17	0.00	1.625		
14.	13	2.41	1.59	0.09	1.716	1.767	VII
15.	25	2.25	1.38	0.16	1.875		
16.	17	2.23	1.85	0.02	1.898		
17.	11	2.21	1.21	0.01	1.911		
18.	24	2.17	1.19	0.05	1.958		
19.	43	2.17	1.54	0.00	1.958		
20.	29	2.17	1.54	0.00	1.958		
21.	39	2.17	1.92	0.00	1.958		
22.	41	2.14	1.31	0.02	1.982		
23.	4	2.14	1.94	0.01	1.989		
24.	26	2.12	1.59	0.02	2.010	2.020	VIII
25.	33	2.10	1.87	0.02	2.025		
26.	8	2.10	1.00	0.00	2.025		
27.	28	2.10	1.40	0.00	2.025		
28.	50	2.10	1.15	0.00	2.025		
29.	16	2.10	1.20	0.00	2.025		
30.	7	2.08	1.48	0.02	2.042		
31.	21	2.07	1.21	0.01	2.054		
32.	45	2.05	1.79	0.03	2.080		
33.	34	2.04	1.56	0.01	2.087		
34.	10	2.00	1.38	0.04	2.125		
35.	6	2.00	1.35	0.00	2.125		
36.	20	2.00	1.67	0.00	2.125		
37.	19	2.00	1.42	0.00	2.125		
38.	12	2.00	1.71	0.00	2.125		
39.	40	1.97	1.03	0.03	2.158		
40.	9	1.96	1.42	0.01	2.163		
41.	23	1.94	0.97	0.02	2.188		
42.	48	1.94	0.97	0.00	2.188		
43.	38	1.92	1.38	0.02	2.208		
44.	47	1.91	0.92	0.00	2.213		
45.	15	1.91	0.92	0.00	2.213		
46.	32	1.90	1.53	0.01	2.225		
47.	46	1.88	1.01	0.02	2.250		
48.	49	1.88	1.01	0.00	2.250		
49.	14	1.86	1.14	0.02	2.268		
50.	1	1.85	0.96	0.00	2.272	2.272	IX

Bolded statements No. are selected statements

Sr.No.	Statement No	Statements	S value	Q value
		APPENDIX – III: Selection of attitude items based on Scale values and Q values		
1.	2	Drinking organic tea is bad®	4.13	1.88
2.	22	Organic tea is not cheap	4.00	1.47
3.	18	Organic tea texture is good	4.00	2.19
4.	31	Organic tea is not suitable for children ®	3.64	2.25
5.	44	Organic tea is easily available in shops and supermarkets	3.64	3.07
6.	27	Organic tea have lower quality than conventional ®	3.59	1.90
7.	3	Drinking organic tea is foolish ®	3.39	1.76
8.	30	Organic tea can be consumed by all age groups	3.33	2.23
9.	35	I would go out of my way to buy organic tea	3.25	2.28
10.	5	Organic tea has no chemical hazard	2.90	2.06
11.	36	I would buy organic tea to help support organic farming	2.72	2.00
12.	37	Certified organic tea will not increase the value of the product ®	2.50	2.00
13.	42	I prefer to buy locally produced organic tea	2.50	2.17
14.	13	Organic tea is simple and quickly to prepare	2.41	1.59
15.	25	Organic tea helps me to control weight	2.25	1.38
16.	17	Organic tea looks nice	2.23	1.85
17.	11	Organic tea helps to cope with stress	2.21	1.21
18.	24	Organic tea is low in calories and fat	2.17	1.19
19.	43	I feel that I have a responsibility to purchase organic tea products	2.17	1.54
20.	29	Organic tea is a good health supplement	2.17	1.54
21.	39	Organic tea production is essential for sustainable agriculture	2.17	1.92
22.	41	Government subsidies of organic tea production are fair to farmers for increase the production	2.14	1.31
23.	4	Drinking organic tea is wise	2.14	1.94
24.	26	Organic tea is available in limited shops	2.12	1.59
25.	33	Organic tea helps to maintain good skin	2.10	1.87
26.	8	Organic tea is superior in flavour	2.10	1.00
27.	28	Organic tea helps to minimize the occurrence of heart diseases	2.10	1.40
28.	50	Organic tea in familiar brand that will be believable product	2.10	1.15
29.	16	Smell of organic tea is good	2.10	1.20
30.	7	Organic tea is superior in taste	2.08	1.48
31.	21	Organic tea is expensive	2.07	1.21
32.	45	Organic tea is produced in a way that human and animals' rights have been respected	2.05	1.79
33.	34	Certified organic tea is costly	2.04	1.56
34.	10	Organic tea helps to relax	2.00	1.38
35.	6	Organic tea is superior in quality than conventional tea	2.00	1.35
36.	20	Organic tea contains no artificial ingredients	2.00	1.67
37.	19	Organic tea contains no additives	2.00	1.42
38.	12	Organic tea keeps the person to wake/alert	2.00	1.71
39.	40	By growing organic tea, farmers are benefited with higher premium	1.97	1.03
40.	9	Organic tea contains high antioxidant	1.96	1.42
41.	23	Organic tea is good value for money	1.94	0.97
42.	48	Organic tea is packed in an environmentally friendly way	1.94	0.97
43.	38	I am interested in organic tea, but it seems expensive	1.92	1.38
44.	47	Organic tea is produced with natural inputs	1.91	0.92
45.	15	Organic tea is nutritious	1.91	0.92
46.	32	Herbal blended organic tea is a good food supplement as well as medicine	1.90	1.53
47.	46	Organic tea is prepared in an environmentally friendly way	1.88	1.01
48.	49	Organic tea has less chemical hazards	1.88	1.01
49.	14	Organic tea is healthy food	1.86	1.14
50.	1	Organic tea is good for overall health	1.85	0.96

® - unfavorable statements, Bolded statements are selected statements

Further, the reliability co-efficient of the whole test was computed using the Cronbach's alpha value. According to Singh (1986), when the mean scores of the two groups are of narrow range, a reliability co-efficient of 0.50 or 0.60 would suffice. Hence, the constructed scale is reliable as the estimated alpha value was greater than 0.60.

Table 1: Final set of selected attitude items with S and Q values					
Sr. No.	Statement No.	Scale value	Q value	Statement	Nature of the statement
1.	31	3.64	2.25	Organic tea is not suitable for children.	Unfavorable
2.	27	3.59	1.90	Organic tea has lower quality than conventional.	Unfavourable
3.	3	3.39	1.76	Drinking organic tea is foolish.	Unfavourable
4.	5	2.90	2.06	Organic tea has no chemical hazard.	Favourable
5.	36	2.72	2.00	I would buy organic tea to help/ support organic farming.	Favourable
6.	37	2.50	2.00	Certified organic tea will not increase the value of the product.	Unfavourable
7.	42	2.50	2.17	I prefer to buy locally produced organic tea.	Favourable
8.	29	2.17	1.54	Organic tea is a good health supplement.	Favourable
9.	40	1.97	1.03	By growing organic tea, farmers are benefited with a premium price.	Favourable

APPENDIX – IV: Reliability of the attitude scale

Sr. No	Statements	SA	A	N	D	SD
i.	Organic tea is not suitable for children					
ii.	Organic tea has no chemical hazard					
iii.	Certified organic tea will not increase the value of the product					
iv.	Organic tea is a good health supplement					
v.	Drinking organic tea is foolish					
vi	Organic tea has lower quality than conventional tea					
vii	I buy organic tea to help support organic farmer					
viii	I prefer to buy locally produced organic tea					
ix.	By growing organic tea, farmers are benefited with higher price					

Please rate your opinion about organic tea by√ mark in appropriate place. (Strongly agree-SA, Agree-A, Neutral-N, Disagree-D, Strongly Disagree-SD).

APPENDIX – V: Content validity of attitude scale

Attitude of consumers towards organic tea

Please state the following statements given below for its adequacy of the content with respect to attitude of consumers towards organic tea. Sampling adequacy of the content of a measuring instrument (Kerlinger, 2002) was used to measure content validity of the attitude scale. You may please indicate your opinion that the extent to which each attitude item covered the different aspects of organic tea or judge each item for its presumed relevance to the property being measured with a four-point continuum of 'most adequately covers', 'more adequately covers', 'less adequately covers' and 'least adequately covers'. Scores of 4, 3, 2 and 1 were given for the points on the continuum respectively.

A --B--C--D			
1	2	3	4
Most adequately covers	Neutral		Least adequately vovers
(Most AC – Most adequately covers,	More AC– More adequately covers,	Less AC – Less Adequately Covers,	Lest AC – Least adequately covers)

Sr.No.	Statements	Most AC	More AC	Less AC	Lest AC
1.	Organic tea is not suitable for children				
2.	Organic tea has lower quality than conventional tea				
3.	Organic tea has no chemical hazard				
4.	I buy organic tea to help support organic farmer				
5.	Certified organic tea will not increase the value of the product				
6.	I prefer to buy locally produced organic tea				
7.	Organic tea is a good health supplement				
8.	By growing organic tea, farmers are benefited with higher price				
9.	Drinking organic tea is foolish				

Name and Address   Signature

Content validity of the scale:

Content validity of the scale referred to the representativeness or sampling adequacy of the content of a measuring instrument (Kerlinger, 2002). Content validation was carried out by subjecting the selected nine attitude items to judges' opinion. Experts in the selected field of study formed the judges. They were asked to indicate the extent to which each attitude item covered the different aspects of organic tea or judge each item for its presumed relevance to the property being measured (Appendix-V). The responses were obtained on a four-point continuum of 'most adequately covers', 'more adequately covers', 'less adequately covers' and 'least adequately covers'. Scores of 4, 3, 2 and 1 were given for the points on the continuum, respectively. Totally 30 judges responded by sending their judgments. The mean score (2.5) was fixed as the basis for deciding the content validity of the scale *i.e.* if the overall mean score of the attitude items as rated by the judges was above 2.5, the scale will be declared as valid and if not otherwise. In the present case, the overall mean score was worked out as 3.0 (most adequately covers and more adequately covers) therefore, the constructed attitude scale is said to be valid.

Administration of the scale:

The nine attitude items selected were arranged randomly in order to avoid biased responses. A five-point continuum of 'Strongly agree', 'Agree', 'Neutral', 'Disagree' and 'Strongly disagree' was used as response categories. The scoring procedure adopted is presented in Table 2.

This scale was administered to obtain responses of 300 organic tea consumers. The score obtained for each statement was summed up to arrive at the attitude score for that respondents. The score ranged from 45 (maximum) to 9 (minimum).
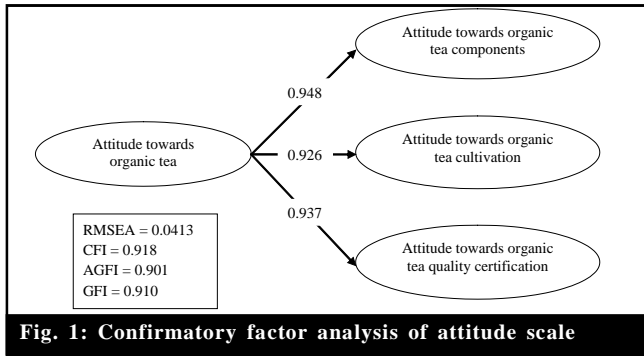
Exploratory factor analysis of attitude scale:

Exploratory factor analysis was done to identify the grouping of factors influencing the attitude variable (Table 3). Factor analysis was conducted separately on the nine items which were developed for this study as attitude scale towards organic tea. The analysis was performed using the principal factor method of extraction, along with varimax rotation. All nine items were loaded onto three factors or dimensions of attitude towards organic tea scale such as attitude towards organic tea components, attitude towards organic tea cultivation and attitude towards organic tea quality certification. Cronbach's alpha of the scale is 0.943 as good internal reliability (Singh, 1986). The results are presented in Table 3. This factor accounted for 71.14 per cent of the variance among the items. Eigen value obtained for this factor was 6.403. The values for each item were summed and then divided by nine to return the scale to values ranging from one to five. The mean was 4.65 (SD = 0. 549) indicating that respondents had positive attitude towards organic tea purchase (Table 3).

Convergent and discriminant validity of attitude scale with confirmatory factor analysis:

Then structural equation model was used as confirmatory factor analysis to conform the group dimensions of attitude scale. This is again the validation to the scale. The result of confirmatory factor analysis of attitude scale has been shown in Fig. 1.

Confirmatory factor analysis (CFA) was performed to check the convergent and discriminant validity of the constructs (Anderson and Gerbing, 1988). According to the criteria suggested, the overall fit of confirmatory factor analysis was evaluated. Based on the result of structure

Table 2: Scores used for the attitude statements

Sr. No	Nature of the statement	Scores				
		Strongly agree	Agree	Neutral	Disagree	Strongly disagree
1.	Favourable	5	4	3	2	1
2.	Unfavourable	1	2	3	4	5

Table 3: Exploratory factor analysis of attitude scale

Sr. No.	Statement	Factor 1 Attitude towards organic tea components	Factor 2 Attitude towards organic tea cultivation	Factor 3 Attitude towards organic tea quality certification
1.	Organic tea is not suitable for children	0.838		
2.	Drinking organic tea is foolish	0.919		
3.	Organic tea has no chemical hazard	0.921		
4.	Organic tea is a good health supplement	0.823		
5.	I buy organic tea to help/ support organic farming		0.894	
6.	I prefer to buy locally produced organic tea		0.880	
7.	By growing organic tea, farmers are benefited with a premium price		0.593	
8.	Organic tea has lower quality than conventional			0.771
9.	Certified organic tea will not increase the value of the product			0.900

Eigen value = 6.403, Variance accounted for = 71.142 per cent, Cronbach's alpha = 0.943, Mean = 4.65, S.D. = 0.549

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Fig. 1: Confirmatory factor analysis of attitude scale

equation model, the model was fit with the Chi-square (χ^2) of the model is 125.16, at significant at one per cent level. The Adjusted Goodness-of-Fit Index (AGFI), a measure of the relative amount of variance and covariance of sample and is jointly explained by hypothesized model and the index. The index ranges from zero to 1.00 and values closer to 1.00 is indicative of good fit. The Comparative Fit Index (CFI) value ranges from zero to 1.00. The CFI value of greater than 0.90 was considered a well-fitted model . In this study, AGFI (0.901) and CFI (0.918) indicated that the model fitted the data well in the sense that the hypothesized model adequately described the sample data.

The Root Mean Square Error of Approximation (RMSEA) was first proposed by Steiger and Lind in 1980, was only recently been recognized as one of the most informative criteria in covariance structure modeling. RMSEA value less than 0.05 indicated a good fit and values as high as 0.08 represented reasonable errors of approximation in the population (Browne and Cudeck, 1993). In this study the RMSEA value for the model was 0.041 and it was indicative of good fit between the hypothesized model and the observed data.

The path co-efficient of three factor dimensions of attitude towards organic tea scale such as attitude towards organic tea components, attitude towards organic tea cultivation and attitude towards organic tea quality certification were 0.948, 0.926 and 0.937, respectively.The overall fit indices suggested that the CFA models were satisfactorily fitted. Hence, the attitude scale was validated through confirmatory factor analysis.

Conclusion:

The attitude scale developed proven scientific methodology with nine statements and reliability of the scale was tested. Also the scale validated with content validity and construct validity. Hence, attitude towards organic tea scale was very suitable to measure the attitude of organic tea consumers.

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