CHAPTER 4

CHAPTER 4

Data Analysis: Study of Children's attitude towards TV advertising and how it impacts the buying behaviour of parents

In this chapter, the results of the survey conducted for Study of Children's attitude towards TV advertising and how it impacts the buying behaviour of parents are presented. This chapter begins with an introduction to Children's attitude towards TV advertising and how children influence parents buying behaviour. It proceeds with descriptive statistics of demographic characteristics. It is further divided onto analysis which is presented in four sections: identifying the critical constructs which influence the attitude of children towards TV advertisements through factor analysis using principal axis factor method and reliability of constructs, identifying the relation among the constructs using Confirmatory factor analysis. Finally using path analysis to find out whether attitude of children towards TV advertisements causes pester power and finally, how pester power of children influences the buying behavior of parents. Confirmatory factor analysis using structural equation modeling was used to examine the model fit for the hypothesized instrument, analyze reliability and validity at the construct level and the instrument level followed by hypotheses testing.

4.1 Introduction to Attitude of children towards Advertisements

There is some literature examining the attitude of children towards Advertisements. “Some have focused on developing measures of children's attitudes toward television advertising or attitudes toward the brand” (Derbaix and Pecheux 2003; Macklin and Machleit 1989; Pecheux and Derbaix 1999; Rossiter 1977). Others have more specifically studied the effect of advertising on attitudes. Moore and Lutz (2000) found that “young children's (seven- to eight-years-old) liking of an ad influenced their attitudes toward the brand”. They further found that older children's (10- to 11 -years-old) liking of an ad influenced their attitudes toward the brand through multiple persuasive routes, consistent with the literature concerning adults' attitude toward the brand. Similarly, Phelps and Hoy (1996) “found that third- and sixth-graders' attitude toward the ad influenced their attitudes toward both familiar and unfamiliar brands, and also impacted their purchase intentions". "Attitudinal effects refer to the extent to which children like or dislike an advertisement" (Rossiter, 1979). "Literature has been so far in agreement that kids like entertaining advertisements especially the up-tempo music, humour and cartoon characters" (Goldberg and Gorn, 1978). "Children have been found to get attracted to memorable catchphrases and jingles" (Bartholomew and O'Donohoe's, 2003). Television and advertising touches every person's life today. Advertising to children has become a big business which includes advertising both traditional (say toys and cereals) as well as nontraditional products (say video games) to children. Over the decades, marketers have tried to find the most effective ways to reach children through television advertising. The marketers have used several different advertising mechanisms to reach the children. "These include mechanisms like portrayal of fun, action, emotion, product appearance, or highlights of new product features" (Barcus 1980; Kunkel 1992). "It has also been found in research that children do not focus much upon the product information which includes product features, price, or product performance" (Van Evra 1998). "Instead, advertisers rely on strong visual images, including both live action and animation, to reach children" (Edell 1988).

4.2 Buying decision of parents getting influenced by children

McNeal and Yeh (1997) demonstrated that "children have great influence on their parents spending". In a review of marketing literature, from the USA mainly, Roedder John (1999) finds that "older children have more influence than younger children". "Younger children influence indirectly by their mere presence and by their special needs, setting certain limits and demands to what the family can do" (Fodness, 1992; Thornton *et al.* , 1997). Children have certain levels of influence depending upon the product categories. They have a major influence on products like toys and clothes, a moderate influence on deciding holidays and restaurants and have least influence upon deciding consumer durables and expensive goods. "Some children have been observed to influence decisions for family products also, such as holiday/vacations" (Belch et al. 1985); movies (Darley and Lim 1986); "and eating at particular restaurants or even decision making for the family to eat out" (Filiatrault and

Ritchie 1980). When it comes to last product categories children are more influential in early stages of decision making and they have lesser influence when final decisions are made. “Pleasing the child is an important motive for parents”, mentioned by Ryan (1992) and Johns and Gyimothy (2002). “The satisfaction of children is highly rated by parents” (Thornton *et al.* 1997).

“Children influence indirectly and in a passive way by indicating what they like and what they do not like (Roedder John, 1999) and young children might use very direct approaches to influence” (Rust, 1993)”. “Children might initiate the purchase, collect information about alternatives, suggest retail outlets, and have a say in the final decision” (Roedder John, 1999). “As children grow older, strategies such as bargaining, compromising and persuasion are employed, and asking for products with no argumentation turns into discussions and compromises between parents and children” (Rust, 1993). Lindstrom (2003) “maintains that children's indirect influence is very important as well”. The influence of children is not just a one-way unsophisticated process with a screaming child in a supermarket, as the process is thought of stereotypically, but a two-way communicative and multifaceted process between the child and an adult often encouraging the child's participation.

4.3 Descriptive Analysis

According to several researches done earlier, if the sample size is large enough, the sampling distribution of any statistic will be normal or nearly normal. The shape of any normal curve can be appropriately determined by evaluating mean and standard deviation of the statistics pertaining to a sample (assuming that the statistic came from a ‘large’ sample). Therefore in this study, descriptive statistics like mean, standard deviations, skewness, and kurtosis values were evaluated for individual item of a particular construct and also for the summated scale. Summative scale scores are calculated by taking the sum or mean of the scores obtained from a survey of corresponding set of items. The concept of summative scales assumes that each of the corresponding is of a construct has a similar and positive relationship with the target construct and produces a measure which approximates to a linear relationship with the construct. Thus the mean and standard deviation values were calculated to understand whether the data is normally distributed.

A distribution graph of a sample data is symmetric if it looks the same to the left and right of the center point (mean value). Skewness is a measure of lack of symmetry in a data set so by skewed to a particular direction means that the tail of the curve is longer in that direction relative to the right tail. Skewness to the left of the central point indicates that the data show negative values while right skewness indicates data exhibit positive values (NIST/SEMATECH e-Handbook of Statistical Methods). Kurtosis is a measure of the peak relative to a normal distribution i.e. data sets with high kurtosis tend to have a distinct peak near the mean value and has a sharp decline with heavy tails while data sets with low kurtosis show a flat top near the mean rather than a sharp peak. In extreme cases we obtain a uniform distribution. The histogram can effectively depict both the skewness and kurtosis of a data set. So, to analyze the variability and the location of a data set a further characterization of the data was done by evaluating skewness and kurtosis. "The range of acceptable limits for Skewness is -1 to 1, and the range of acceptable limits for Kurtosis is -1.5 to 1.5" (Hair et al., 2007).

4.3.1 Entertainment

Item descriptive of the factor Entertainment is given in table 4.1:

Items	N		Mean	Std. Deviation	Skewness	Kurtosis
	Valid	Missing				
Ent_i1: *Kids find TV ads entertaining and funny (they like humour, cartoon characters used*	400	0	4.01	0.949	-.883	0.283

in the advertising which makes them laugh)						
Ent_i2 : *Kids find TV ads enjoyable (they like up tempo music and jingles used in the advertising)*	400	0	3.97	0.982	-.877	0.241
Ent_i3 : *Kids find TV ads engaging (animated characters used in the advertising engages children)*	400	0	3.82	1.047	-.734	-.184

Table 4.1: Descriptive statistics for Entertainment construct

Table 4.1 captures the mean, standard deviation, skewness, and kurtosis values for each individual item which measure Entertainment. All three of the items means have values around more than 3 and more towards 4, which is greater than the mid point indicating that users agree with the questions posed to measure the construct. Since none of the value goes towards 1 (Strongly disagree), but the overall response is accepted to be positive without any disagreement. The values of skewness and kurtosis are well within the acceptable limits for each item thus conforming to a normal distribution.

Next, we construct a summated scale out of the items to gain an overview of the normality of Entertainment a whole. The same parameters were evaluated for a summated scale of Entertainment as tabulated in table 4.2:

Items	N		Mean	Std. Deviation	Skewness	Kurtosis
	Valid	Missing				
Ent	400	0	3.93	0.856	-.555	-.176

Table 4.2: Descriptive statistics for summated scale of Entertainment

Figure 4.6 gives the normal distribution graph of the summated scale of Entertainment

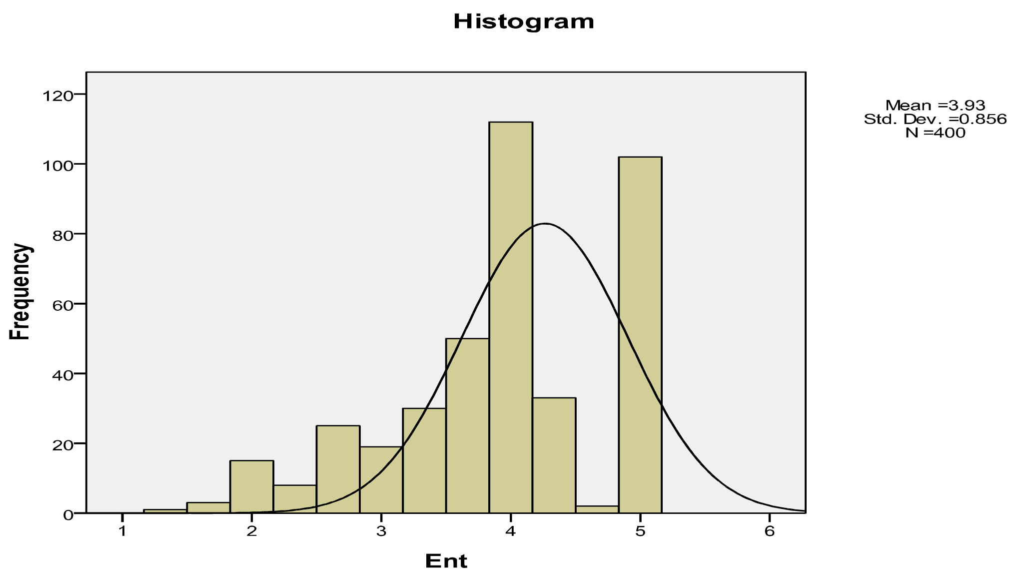


Figure 4.6 Distribution curve for Entertainment Summated scale

The histogram for the summated scale shows a normal curve with two major peak points between 3.5 and 4.5. The bulk of the distribution lying between2.5 and 4.5 with a mean of 3.93, thus showing an overall agreement in responses to the items used to measure Entertainment. While a large number have expressed agreement, frequency shows a good concentration at a value of 4 depicting high agreement. A standard deviation of 0.85 is within limits. The skewness shows a small but positive value, indicating the bulk of the responses lie to the right side of the curve. The kurtosis value is -.176 is within the acceptable limits, depicting the peak is normal and not caused due to outliers.

4.3.2 Information

Item descriptive for the factor Information is given in table 4.3:

Items	N		Mean	Std. Deviation	Skewness	Kurtosis
	Valid	Missing				
Inf_i1: Kids feel TV ads provide relevant product information	400	0	3.77	0.822	-1.045	1.803
Inf_i2: Kids feel TV ads are useful	400	0	3.70	0.714	-.862	1.348
Inf_i3: Kids feel TV ads are informative (keeps them upto date with information)	400	0	3.68	0.745	-1.180	.921

Table 4.3: Descriptive statistics for Information construct

The mean, standard deviation, skewness, and kurtosis values for each individual item which measure Information are shown in table 4.3. All three item means pertain to values very close to 4, conveying that users overall agree with the questions framed to assess the factor. None of the values are near 2 thus evidently indicate that all users have strong positive opinion and are not undecided about the measure. The values of skewness and kurtosis are at times deviating from the acceptable limits reflecting not a very normal distribution of the data set. This is followed by a summated scale evaluation to check the normality of Information as a whole. The same parameters were evaluated for a summated scale of Information as tabulated in table 4.4:

Items	N		Mean	Std. Deviation	Skewness	Kurtosis
	Valid	Missing				

Inf	400	0	3.71	0.609	-1.321	1.786

Table 4.4: Descriptive statistics for summated scale of Information

Although the skewness and kurtosis are going little out of the specified range, it can be concluded that may be the respondents may not well understood the item. Since the theory says that information is an important aspect which kids gain through television advertisements, it was decided to keep this factor. The histogram below (figure 4.6) for the summated scale shows a normal curve and a single major peak point at 4. The bulk of the distribution lies between values 3and 4.5 with a mean of 3.71, showing an overall agreement in responses. A standard deviation of 0.60 is within limits. The skewness shows a negative value of -1.32 indicating the bulk of the responses lie to the left side of the curve. The kurtosis value is positive with a value of 1.78 and is slightly outside the acceptable limits for a normal curve. It can be inferred since the peak is too high, and most of the responses are moving towards 4 and there is a deviation from the limits given for kurtosis, may be the dimension is not well understood by the respondents.

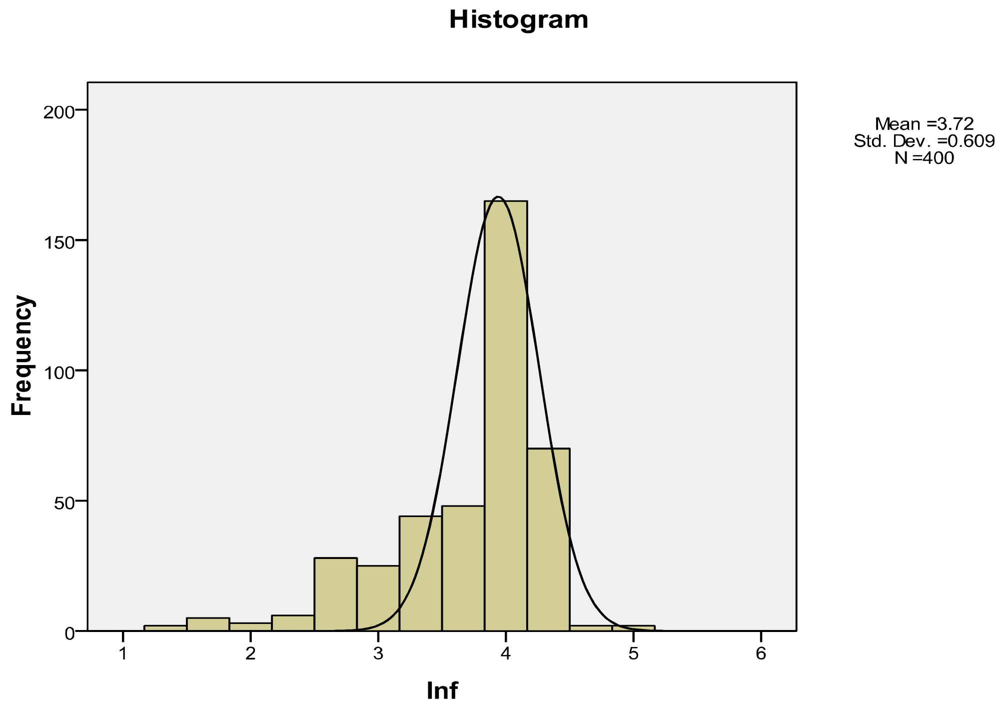


Figure 4.6: Distribution curve for Information Summated scale

4.3.3 Credibility

Item descriptive is given in table 4.5 for Credibility:

Items	N		Mean	Std. Deviation	Skewness	Kurtosis
	Valid	Missing				
Cred_i1: Kids find TV ads credible (they find TV advertisements believable)	400	0	3.34	0.889	-.839	0.208
Cred_i2: Kids find TV ads trustworthy (they feel TV advertisements	400	0	3.52	0.864	-.363	-.504

never lie to them)						
Cred_i3: Kids find TV ads honest	400	0	3.40	0.986	-.161	-1.120

Table 4.5: Descriptive statistics for Credibility

Table 4.5 provides a measure of individual item for Credibility. There are three items and all three have a mean value of more than 3 which is more towards 4 which explains that respondents feel children find advertisements to be credible enough and hold a strong opinion about the factor. The values of skewness and kurtosis confirm normal distribution of the data set.

The same parameters were evaluated for a summated scale of Credibility as tabulated in table 4.6:

Items	N		Mean	Std. Deviation	Skewness	Kurtosis
	Valid	Missing				
Cred	400	0	3.42	0.726	-.522	-.317

Table 4.6: Descriptive statistics for summated scale of Credibility

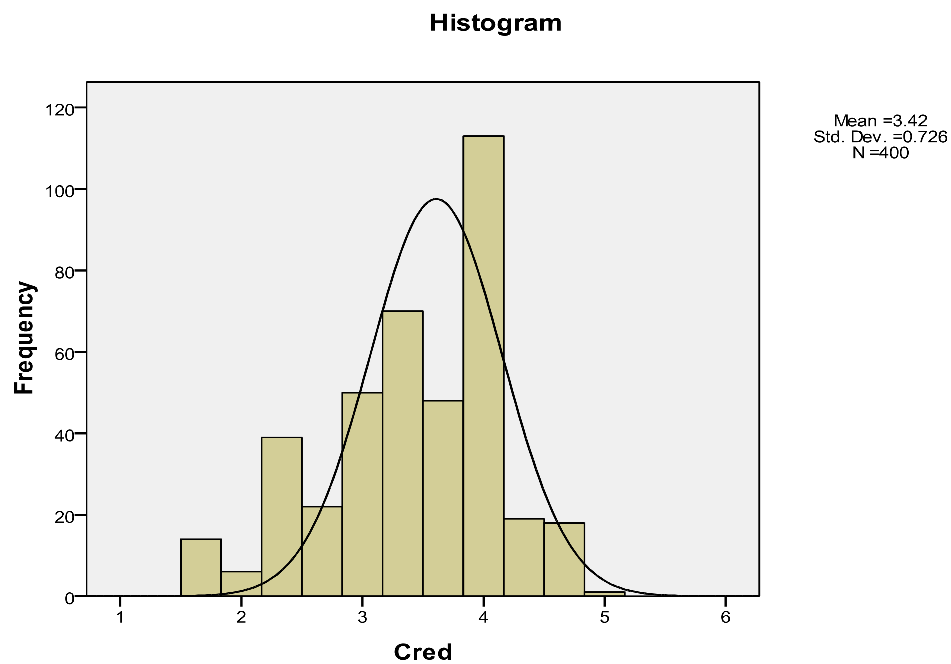


Figure 4.7: Distribution curve for Credibility summated scale

The plot above (figure 4.7) for the summated scale shows a normal curve and a single major peak point between 3 and 4. The next highest peak is between 3 and 4 with an overall mean of 3.42. The results explain that users usually agree with the items in the summated scale. A standard deviation value of 0.726 is well within limits and suggests a low variation from the mean. A negative value of skewness suggests that some of the respondents are disagreeing on this construct but the bulk of the responses lie around the mean value with a slight left side skewness. The kurtosis value is -.31 and is also within the acceptable limits for a normal curve.

4.3.4 Likability

Item descriptive is given in table 4.7 for Likability:

Items	N		Mean	Std. Deviation	Skewness	Kurtosis
	Valid	Missing				
Lik_i1: Kids like to have products advertised on TV	400	0	3.43	0.950	0.688	0.139
Lik_i2: *Kids like most television ads*	400	0	3.59	0.919	0.279	-.655
Lik_i3: *Kids find TV ads are for fun*	400	0	3.52	0.971	-.305	-.950

Table 4.7: Descriptive statistics for Likability

Table 4.7 provides a measure of individual items for Likability. There are three items and all of them have a mean which approximates to a value of 3.5. The mean value obtained explains that users overall agree about the questions framed to measure this particular construct. Standard deviation values are less than the mean which signify that people accord to the implication of the construct. The values of skewness and kurtosis are within the acceptable range and conform to the normality condition of normal distribution of the sample data set.

The same parameters were evaluated for a summated scale of Credibility as tabulated in table 4.8:

Items	N		Mean	Std. Deviation	Skewness	Kurtosis
	Valid	Missing				
Lik	400	0	3.51	0.771	-.422	-.276

Table 4.8: Descriptive statistics for summated scale of Likability

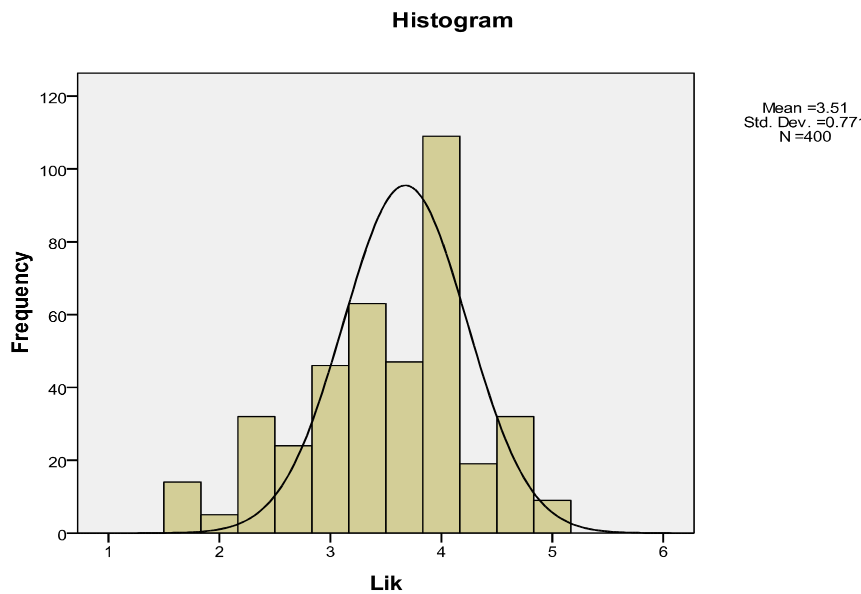


Figure 4.8: Distribution curve for Likability summated scale

The plot in figure 4.8 shows a normal curve for the summated scale of Likability. The histogram graph indicates a single major peak point towards 4. The mean value reads 3.51 implying that bulk of the population are in compliance with the items of the summated scale with very little disagreement on the same. A standard deviation value of 0.77 is low and suggest that there is very little variance. Though skewness value of -.422 is well within the acceptable limits, kurtosis exhibits a value of -.276 which is within the accepted limit. The curve is peaked in comparison to the normal curve. Since kurtosis is not the only factor to determine normal probability of the sample set, so we consider the factor in spite of this deviation.

4.4 Validity

Heeks and Bailur (2007) "mentioned that validity and reliability are two important criteria to be verified for a proposed scale". Validity of a scale can be established by verifying content validity, convergent validity and discriminant validity.

“Content Validity is a minimum psychometric requirement for construct validation of a new measure” (Hinkin, 1995). While forming the questionnaire, all 12 is included in it were administered by experts, so validity of the content was already verified.

Convergent validity verifies the internal consistency of is in a construct and discriminant validity ascertains that all constructs are different and no two construct measure the same criteria. “Convergent validity can be proved by factor loading” (DeCoster, 1998). Though four factors were found in the pilot test, to confirm the observation we performed factor analysis using Principal Axis Factoring method using varimax rotation (orthogonal) and Kaiser Normalization. We chose Principal Axis Factoring method over Principal Component Analysis as our sole purpose was not data reduction but to study the correlated pattern of is derived from pilot study.

We used confirmatory factor analysis with structured equation modeling to check the model fit of data. Preliminary scale reliability was estimated by Cronbach’s Alpha.

4.4.1 Sample Size

We used SPSS 16.0 to conduct the entire analysis. We had performed exploratory factor analysis to understand how the items were loading on factors. In this exercise we found four factors which distinctly loaded 12 items in total. To make our analysis robust we checked with the sampling criterion. Researchers generally use Kaiser-Meyer-Olkin (KMO) value to decide adequacy of sampling in factor analysis. “KMO is calculated as the sum of all the squared correlation coefficients divided by the sum of all the squared correlation coefficients plus the sum of all of the squared partial correlation coefficients” (Norusis, 2003).

Table 4.9 describes the criteria used to assess the sampling adequacy (Kaiser, 1974):

KMO Value	Description
0.90	Marvelous

0.80	Meritorious
0.70	Middling
0.60	Mediocre
0.50	Miserable
Below 0.50	Unacceptable

Table 4.9: KMO value range for sampling adequacy

The minimum permissible value accepted for sampling adequacy is >0.5. We obtained a value of 0.767 which was appreciably good indicating that factor analysis was appropriate for the data.

Another school of thought standardizes the sample size by measuring subject to item ratio. "In a majority of the studies in our survey (62.9%) researchers performed analyses with subject to item ratios of 10:1 or less" (Costello & Osborne,2005) . In our study subject responded was 400 while items measured were 12 and the ratio is >10:1. Hence we proceeded with the study further.

4.4.2 *Identifying the critical constructs which influence the attitude of children towards TV advertisements*

Convergent Validity

To reaffirm the observation of the pilot study, we performed a factor analysis using Principal Axis Factoring method with varimax rotation. As discussed earlier, convergent validity is measured by factor loading obtained through factor analysis.

Factor analysis is a statistical method used to find a small set of unobserved variables (also called latent variables, or factors) which can account for the covariance among a larger set of observed variables (also called manifest variables). A factor is an unobservable variable that is assumed to influence observed variables. “Scores on multiple tests may be indicators of intelligence” (Spearman, 1904); “political liberties and popular sovereignty may measure the quality of a country’s democracy” (Bollen, 1980); “or issue emphases in election manifestos may signify a political party’s underlying ideology” (Gabel & Huber, 2000). “Factor analysis is also used to assess the reliability and validity of measurement scales” (Carmines & Zeller, 1979). “A factor (unobserved latent variable) is assumed to exert causal influence on observed variables, while the underlying causal relationship is reversed in principle component analysis; observed variables are linear combinations of latent variables in factor analysis, while principle components are (weighted) linear combinations of observed variables” (Hatcher, 1994: 9-10, 69). “Principle components account for total variance, while factors account for the common variance (as opposed to unique variance) of a total variance” (Brown, 2006: 22; Hatcher, 1994: 69)”. “The factor analysis reveals latent variables that cause the manifest variables to co-vary” (Costello and Osborne, 2005).

Data screening in factor analysis is second important procedure after measuring sampling adequacy (section 4.4.1). Field (2005) “says that while conducting factor analysis, inter-correlation between variables need to be studied”. Manifest variables which do not show any correlation with other variables need to be excluded. Similarly manifest variables which show very high correlation should also be excluded to avoid multicolinearity.

“Rotation improves the interpretability of factors by maximizing the loading of each variable on anyone of the extracted factors while minimizing loading on the rest” (Field, 2005). Choice of rotation depends on whether the researcher wants to think whether the extracted factors should be related or be independent. Varimax rotation is an orthogonal rotation which allows us to consider that the factors are independent of each other. Hence Varimax rotation was chosen for the study.

Table 4.10 below shows the factor loading with varimax rotation and Table 4.11 gives the variance details of the sample data set.

Rotated Component Matrix

	Component			
	1	2	3	4
Kids feel TV ads provide relevant product information	0.843			
Kids feel TV ads are useful	0.686			
Kids feel TV ads are informative (keeps them upto date with information)	0.719			
Kids find TV ads entertaining and funny (they like humour, cartoon characters used in the advertising which makes them laugh)		0.693		
Kids find TV ads enjoyable (they like up tempo music and jingles used in the advertising)		0.830		
Kids find TV ads engaging (animated characters used in the advertising engages children)		0.880		
Kids find TV ads credible (they find TV advertisements believable)			0.661	
Kids find TV ads trustworthy (they feel TV			0.838	

advertisements never lie to them)				
Kids find TV ads honest			0.822	
Kids pay more attention to TV advertisements				0.761
Kids feel good while viewing advertisements				0.886
Kids like to have products advertised on TV				0.779

Table 4.10: Rotated Factor Matrix

Factor	**Initial Eigenvalues**		
	Total	**% of Variance**	**Cumulative %**
1	2.337	19.473	19.473
2	2.044	17.036	36.510
3	1.967	16.393	52.902
4	1.923	16.028	68.930

Table 4.11: Eigen Values and Cumulative Variance

Four factors had Eigen value >1 which suggest that four factors could be extracted in this study (Field, 2005). These four factors explain ~68.93% of total variance. “Statisticians (Costello & Osborne, 2005; Field, 2005) suggest a minimum value of 0.4 for acceptable factor loading and a value of 0.5 determine a strong loader”. Our results reflected a value >~ 0.6 (shown in Table 4.10), for each loading thus verifying convergent validity for the proposed scale.

4.5 Scale Reliability testing

Reliability testing was conducted to assess the internal consistency of the measurement scale. It was estimated by using coefficient of α (alpha) or Cronbach’s alpha (α). “The range of acceptable values adapted from Hair et al. (2007, pg. 244)” are given in table 4.12:

Alpha coefficient	**Acceptance**
< 0.6	Poor
0.6 to < 0.7	Moderate
0.7 to < 0.8	Good
0.8 to < 0.9	Very good
>= 0.9	Excellent

Table 4.12: Acceptance of Alpha coefficient range

No	**Name of Construct(s)**	**Value of Cronbach’s Alpha**

1	**Information (Inf)** *Kids feel TV ads provide relevant product information* *Kids feel TV ads are useful* *Kids feel TV ads are informative (keeps them upto date with information)*	**0.717**
2	**Entertainment (Ent)** *Kids find TV ads entertaining and funny (they like humour, cartoon characters used in the advertising which makes them laugh)* *Kids find TV ads enjoyable (they like up tempo music and jingles used in the advertising)* *Kids find TV ads engaging (animated characters used in the advertising engages children)*	**0.827**

3	**Credibility (Cred)** *Kids find TV ads credible (they find TV advertisements believable)* *Kids find TV ads trustworthy (they feel TV advertisements never lie to them)* *Kids find TV ads honest*	**0.707**
4	**Likability (Lik)** *Kids like to have products advertised on TV* *Kids like most television ads* *Kids find TV ads are for fun*	**0.746**

Table 4.13: Evaluated Cronbach's alpha for each factor

Each factor exhibited an acceptable value of Cronbach's alpha. The values spanned between a range of 0.7< α<0.8, which is considered to be good (ref: table 4.12) and 0.8<α<0.9, which is considered to be very good (ref: table 4.12). Thus the observation conforms to internal consistency of is of a factor and show satisfactory reliability.

4.6 Scale Refinement

As the scale of 12 items was proposed by factor analysis (PFA), the instrument needed further examination of factor structure and validation. Confirmatory factor analysis (CFA) using Structural Equation Modeling was conducted to check whether the data collected fits the hypothesized model. Maximum likelihood method was used to estimate the model fit. In the present study determination of model fit was done at two levels:

- overall model fit
- individual parameter fit

Individual parameter fit was done by checking the factor loadings and factor co variances (when specified) to ensure the different assumed variables truly measured the factors identified in the research model. The factor structure was refined based on the variance explained, the path loadings, and the standardized residual value and other findings from the model runs.

4.6.1 I*dentifying the relation among the constructs using Confirmatory factor analysis*

A total of 12 items were selected to measure children's attitude and confirmatory factor analysis (CFA) using structural equation modeling (SEM) was conducted. Hair et al. (2006) “defined SEM as a “multivariate technique combining aspects of factor analysis and multiple regression that enables the research to simultaneously examine a series of interrelated dependent relationships among the measured variables and latent constructs (variates), as well as between several latent constructs” (p. 710). “In the present research, SEM was carried out using AMOS” (Arbuckle & Wothke, 1999), to

(a) examine the interrelationships among variables included in the research design; and

(b) assess the validity of the instruments.

Dependence of the Buying behaviour of parents on children's pester power and children's attitude was further studied to establish the relation between the them.

Path coefficients were calculated for each of the items contributing to four different constructs and further those of the constructs to children's attitude. The validity of this measurement model was dependent on its goodness-of-fit and on the construct validity of its component variables. Goodness-of-fit determines how well the measurement model reproduces the covariance matrix among indicator items. Thus, the estimated covariance matrix is compared mathematically to the actual observed covariance matrix. “Closer values of these two matrices indicate good model fit” (Hair et al., 2006; p.745).

“Byrne (1998) mentioned chi-square (χ^2) statistic to be a fundamental measure of model fit. Various other tests of the overall fit for SEM models presently exist”. “Marsh et al. (1988) classified these tests into absolute fit indexes and relative or incremental fit indexes”. Absolute fit measures are a direct measure of how well the model specified by the researcher, represent the collected data while incremental fit measures assess how well a specified model fits relative to alternative baseline model(s).

In this study , the absolute fit measures included the $\chi2$ statistic, the $\chi2/df$ ratio, the root mean square error of approximation (RMSEA), the goodness-of-fit index (GFI) and the root mean square residual (RMR)or standardized root mean square residual(SRMR). This RMR value varies with the scale that is used in the questionnaire. Sometimes, the questions can be rated in a 5 point scale as well as in a 7 point scale in the same questionnaire, depending on the characteristics of parameters being measured. In such situations, researchers opt for the standardized root mean square residual value.

Incremental fit measures included the comparative fit index (CFI), the adjusted goodness-of-fit index (AGFI), the normed fit index (NFI); and a measure of parsimony fit, the parsimony goodness-of-fit index (PGFI) and parsimony normal fit index (PNFI).

Analysis in this study was done in two steps:

- Evaluation of Measurement model
- Evaluation of the general structural model

Defining the Measurement model

The measurement model was drawn based on literature review and principal factor analysis, consisting of different variables as listed below:

Variables:

- Number of variables : 28
- Observed, endogenous variables (12): 12 factor items
- Unobserved, exogenous variables (16): 12 error terms + 4 order factors

Parameters:

i. Fixed: Weights (16): 12 error term regression paths and 4 factor loadings(fixed to 1)
Variances (0): 0 labeled variances

ii. Unlabeled :Weights (8) : 8 factor loadings (no constraint)
Variances (16): 12 error variances and 4 factor variances

Co-variances (7): between four factors

Analysis of Measurement model

The model fit indices were found to be in the acceptable range suggesting a good model fit. To reaffirm the model fit the model was tested for any misspecification. AMOS shows two types of information which help to detect model misspecification (1) Standardized residuals and (2) modification indices

We considered the modification indices for examining model misspecification. This information reflects the extent to which the hypothesized model is appropriately described. "Modification index can be conceptualized as a χ^2 statistic with one degree of freedom" (Jöreskog & Sörbom, 1993), so for each fixed parameter the value MI shown corresponds to expected drop in overall χ^2 value if the parameter were to be freely estimated. There is thus an expected parameter change (EPC) value associated with an MI value.

It was noted (ref: Appendix IV a) that the MI for the covariance between error term 6 and error term 3 has a high value (23.910) with an EPC ('Par change') value of 0.62. This was quite high to be neglected and thus the model was redefined including the covariance between the respective error terms.

The refined model is shown in fig 4.9(measurement model)

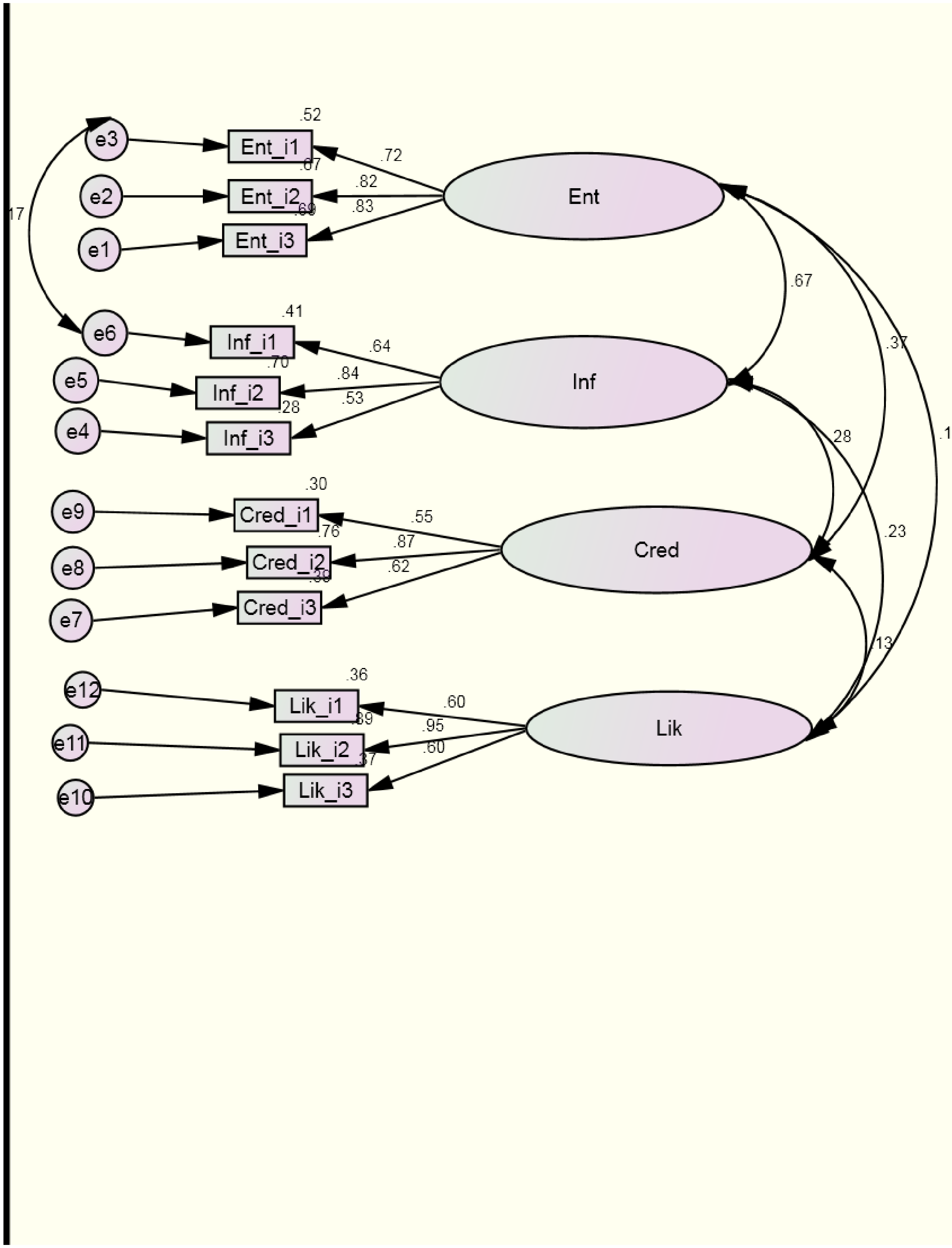


Figure 4.9: Measurement model

Changes in model fit indices were noted by incorporating the covariance. CMIN/DF value dropped to 2.98 against 3.09, GFI value changed to 0.944 from 0.940; RMSEA dropped to 0.070 from 0.072. Changes were also reflected in other model fit indices. The following values were observed for the measurement model after refinement:

Type of measure	**Observed values**	**Level of acceptable fit**
Absolute fit measures:		
Goodness-of-fit index (GFI)	0.944	>0.90
Root mean square error of approximation (RMSEA)	0.070	Marginal fit <0.090 Acceptable <0.080, Good fit <0.050,
χ^2/df (CMIN/DF)	2.982	Lower limit:1.0 upper limit 2.0/3.0 or 5.0
RMR/SRMR	0.046	0-1
Incremental fit measures:		

Tucker –Lewis index (TLI)	0.915	> 0.90
Adjusted goodness-of-fit index (AGFI)	0.907	> 0.80
Comparative fit index (CFI)	0.939	>0.90
Incremental fit index (IFI)	0.940	>0.90
Normed fit index (NFI)	0.913	> 0.90 < 0.95 marginal > 0.95 is good < 0.90 poor
Parsimonious fit measures:		
Parsimony goodness of fit Index (PGFI)	0.569	0-1
Parsimony normal fit index (PNFI)	0.650	0-1

Table 4.14: Observed values of model fit for mesurement model

No other MIs were considered as the corresponding ‘Par Change’ values were found to be negligible.

According to statisticians (Janssens et al., 2008; Byrne, 2010) factor loadings for latent variables must be significant (test statistics = critical ratio = C.R. > ±1.96) and have values > 0.50. Factor loadings in CFA are given by regression weights. The present study, it was found that all of the item loadings are over 0.5, and all critical ratios are > 1.96 for the measurement model. The standard regression weights and the critical ratio (C.R.) are given in table 4.15:

			Standardized Regression Weights	Regression Weights	Critical Ratio
Ent_i3	<---	Ent_1	0.829	1.000	
Ent_i2	<---	Ent_1	0.819	0.926	16.301
Ent_i1	<---	Ent_1	0.724	0.796	14.668
Inf_i3	<---	Inf_1	0.528	1.000	
Inf_i2	<---	Inf_1	0.838	1.657	9.109
Inf_i1	<---	Inf_1	0.639	1.382	8.638
Cred_i3	<---	Cred_1	0.623	1.000	
Cred_i2	<---	Cred_1	0.871	1.225	8.971
Cred_i1	<---	Cred_1	0.546	0.791	8.828
Lik_i3	<---	Lik_1	0.604	1.000	
Lik_i2	<---	Lik_1	0.946	1.482	9.18
Lik_i1	<---	Lik_1	0.598	0.969	10.056

Table 4.15: Factor loadings for measurement model

4.7 Model Reliability and Validity

4.7.1 Construct validity

“Reliability refers to the accuracy and precision of an instrument’s measurement procedure and thus estimates a relative lack of error in an instrument (Thorndike, Cunningham, Thorndike, & Hagen, 1991)”. “Reliability is expressed as a function of properties of the contributing factors and underlying groups, the test employed for the assessment and the purpose of assessment (Suhr, 2009)". There are two methods to assess reliability:

a) evaluating Cronbach's Alpha (Cronbach,1951),

b) measuring Composite reliability (CR) and average variance extracted (AVE).

Cronbach's alpha is derived from classical test theory model and is obtained under the assumption that all factor loadings are constrained to be equal, and all error variances are constrained to be equal (assumption of parallelity). It is an index of internal consistency and used frequently in multi i measure of construct in a research. "Coefficient alpha or Cronbach's alpha exhibits a high value thus underestimating reliability in case of multidimensional scale or where there are multiple constructs (Schmitt, 1996)".

Thus, a method is needed for a researcher to evaluate reliability of the composite score more precisely. The reliability estimate by Structural equation modeling (SEM) is a better approach as it permits estimation of the reliability index and coefficient of a composite test for congeneric measures and does not possess underestimation property of Cronbach's alpha. "This method also helps to explore the factorial structure of an item set, and its use in scale reliability estimation" (Raykov, 1997). SEM uses Composite reliability method for assessing reliability.

"Composite reliability is a measure of the overall reliability of a collection of heterogeneous but similar items and thus assesses the internal consistency of a measure" (Fornell & Larcker, 1981). Composite reliability is like the reliability of a summated scale and average variance extracted is the variance in the indicators explained by the common factor average trait-related variance extracted. "According to Dillon and Goldstein and Bagozzi (1991), a variance extracted of greater than 0.50 indicates that the validity of both the construct and the individual variables is high". AVE's above 0.5 are treated as indications of convergent validity. The composite reliability estimates the extent to which a set of latent construct indicators share in their measurement of a construct, whilst the average variance extracted is the amount of common variance among latent construct indicators. "A composite reliability value of ≥ 0.7 is considered to be acceptable" (Hair et al., 1998).

Composite reliability (Fornell & Larcker, 1981, p: 45) as well as average variance extracted ((Fornell & Larcker, 1981, p: 46) are calculated from standardized regression weight (in AMOS) exhibited by individual items given by equation (1) and equation (2)". "Since AVE suggests that the latent construct accounts for a majority of the variance in its indicators on average, a value greater than 0.50 is desirable" (Fornell & Larcker, 1981).

Convergent Validity/Average Variance extracted = ∑ (standardized loadings) ^{2} / [∑ (standardized loadings) ^{2} + ∑measurement error]

= ∑ (standardized regression weight) ^{2} / [∑ (standardized regression weight) ^{2} + ∑1- squared regression weight] …………………..equation 1

Composite Reliability = (∑ standardized loading) ^{2} / [∑ (standardized loading) ^{2} + ∑measurement error]

= (∑ standardized regression weight) ^{2} / [(∑ standardized regression weight) ^{2} + ∑1- squared regression weight] ………………………..equation 2

The figures are shown in table 4.16. Columns 3 of table 4.24 show the change in Cronbach's alpha value of the composite score if the corresponding items were deleted. A lesser value than the composite score of the factor asserts the reliability of the scale. In this study, composite scale reliability showed a Cronbach's alpha (or simply alpha) value of 0.774, thus value estimated for each item deleted should be less or equal to 0.774. Studies (Hair et al., 1998; Field, 2005) "suggest that 0.7 ≥ α ≤ 0.8 is considered to be acceptable and value > 0.8 is considered to be appreciably good for a scale". Since the composite score is near to 0.8 and abide by the requisite condition, it can be affirmed that the scale is reliable and can be used for our purpose. Composite reliability and average variance extracted values for each construct were tabulated in columns 4 and 5. Columns 3 reveal the alpha values of the composite scale if the specific item is deleted.

No	Name of Construct(s)	Cronbach's Alpha if item deleted	CR	AVE
1	**Information (Inf)**		0.72	0.48
	Kids feel TV ads provide relevant product information	0.753		
	Kids feel TV ads are useful	0.749		
	Kids feel TV ads are informative (keeps them upto date with information)	0.765		
2	**Entertainment (Ent)**		0.83	0.62
	Kids find TV ads entertaining and funny (they like humour, cartoon characters used in the advertising which makes them laugh)	0.744		
	Kids find TV ads enjoyable (they like up tempo music and jingles used in the advertising)	0.739		
	Kids find TV ads engaging (animated characters used in the advertising engages children)	0.746		
3	**Credibility (Cred)**		0.73	0.48
	Kids find TV ads credible (they find TV advertisements believable)	0.764		

	Kids find TV ads trustworthy (they feel TV advertisements never lie to them)	0.753		
	Kids find TV ads honest	0.770		
4	**Likability (Lik)**		0.77	0.53
	Kids pay more attention to TV advertisements	0.769		
	Kids feel good while viewing advertisements	0.767		
	Kids like to have products advertised on TV	0.777		

Table 4.16: CR, AVE and Cronbach's alpha of indicator items at construct level

AVE can also be computed by averaging the square of each sub-dimension's standardized loading on the second-order construct (or averaging the squared multiple correlations for the first-order sub-dimensions). "In either case, values greater than 0.50 mean that, on an average, a majority of the variance in the first-order sub-dimensions is shared with the second-order latent construct" (MacKenzie et al., 2011).

Table 4.17a, 4.17b, 4.17c reflects values for composite reliability (CR) and average variance extracted (AVE) for the Children's attitude, Pester power and Buying behavior of parents.

Dimensions	Standardised Regression	Composite	AVE

			Weights	Reliability	
Catt_i1	<---	Catt	0.87		
Catt_i2	<---	Catt	0.50		
Catt_i3	<---	Catt	0.65	0.72	0.48

Table 4.17a: Composite Reliability (CR) and Average Variance Extracted (AVE) of Children's attitude

Dimensions			Standardised Regression Weights	Composite Reliability	AVE
Pest_i1	<---	Pest	0.96	0.65	0.42
Pest_i2	<---	Pest	0.43		
Pest_i3	<---	Pest	0.37		
Pest_i3	<---	Pest	0.4		

Table 4.17b: Composite Reliability (CR) and Average Variance Extracted (AVE) of Pester power

Dimensions			Standardised Regression Weights	Composite Reliability	AVE
BBP_i1	<---	BBP	0.62		
BBP_i2	<---	BBP	0.56	0.57	0.31

BBP_i3	<---	BBP	0.47		

Table 4.17c: Composite Reliability (CR) and Average Variance Extracted (AVE) of Buying behavior of parents

The CR value of the children's attitude construct was found to be in the acceptable range implying that there is internal consistency among the measures. The result show a low AVE value (< 0.50) indicating there a substantial proportion of variance in the sub dimension and the constructs. Despite the result none of the dimensions were eliminated. According to MacKenzie et al. (2011), "… it is important to remember that sub-dimensions should not be eliminated unless all of the essential aspects of the focal construct domain are captured by the remaining sub-dimensions". Instances where an entire sub-dimension can be dropped without eliminating an essential aspect of the construct domain will probably be rare. "An alternative approach proposed by Little, Lindenberger and Nesselroade (1999) for selecting the final set of formative indicators". They elaborated on the vector aspect of domain sampling and explained that since formative indicators are randomly chosen from the universe of possible indicators to represent the construct's domain, only some of the indicators are close to the core meaning of the construct (centroid in vector terms) compared others. They recommended that to decide on the indicators, the researcher should use theory and prior research as a basis for explaining how a focal construct is related to a set of 'key marker constructs' in its nomological network. Correlations using CFA between focal construct having broad set of potential indicators and the key marker constructs should be first estimated and then re estimated using the same method by dropping one of the indicators of the focal construct. If both the intercorrelations match then the indicator can be safely deleted. The procedure needs to be adopted to identify a parsimonious subset of indicators that is able to reproduce the construct inter correlations obtained from the confirmatory factor analysis of the complete set of indicators.

4.7.2 Discriminant Validity

"Discriminant validity was checked by analyzing the correlation matrix obtained for all 12 items" (Trochim and Donnelly, 2006). It was observed that the correlation coefficients (refer appendix IV b) among the items of the same factor were high (>0.4) at p <0.001, whereas the coefficient with items of other factors were less (<0.2 to nearing zero) and were not within the level of significance. Since each variable of a factor had a strong correlation with all the other variables of the same factor but low correlation with all other variables across the matrix, discriminant validity of the scale was verified. Table 4.28 shows a series of four correlation matrices.

Fornell et al. (1981) suggested that if the AVE for each construct is greater than its shared variance (square of the correlation) with any other construct, discriminant validity is supported. Shared variance and AVE values (refer table 4.18) have been tabulated in table 4.18. Data in the table validate discriminant validity of the model.

	Information	Entertainment	Credibility	Liking
Information	0.686			
Entertainment	.530**	0.79		
Credibility	.205**	.312**	0.69	
Liking	.153**	0.096	.150**	0.73

Table 4.18: Shared variance and AVE values for factors

4.7.3 Nomological Validity

The nomological validity (Freeze & Raschke, 2007) "is crucial in determining whether a hypothesized scale can predict its relationships with other theoretically related outcome variables and constructs appositely".

“Existing literature (Parasuraman et al., 2002; Zhang et al., 2007) assert that positive children's attitude is likely to promote pester power among kids and impact buying behaviour of parents”. In this study a causal relationship was defined which was captured in the structural model (Figure 4.10) to explain the dependency of overall buying behaviour of parents (BBP) on Pester power (pest) and Children's attitude (Catt). BBP was measured as a construct of three items: (i) Overall, children consider TV ads a good thing (ii) Overall, children dislike TV ads, (iii) Overall, I feel kids opinion about TV ads is favourable .

The structural model affirmed a good model fit, with $\chi 2/df$ (CMIN/DF) of 2.29, RMSEA of 0.57, CFI of 0.91, GFI 0.90 and RMR of 0.44. The overall childens attitude (Catt) showed a positive, significant influence on Pester power created (standardized regression weight of 0.92) and also a significant influence on Buying behaviour of parents (standardized regression weight of 0.70) demonstrating the nomological validity of the instrument.

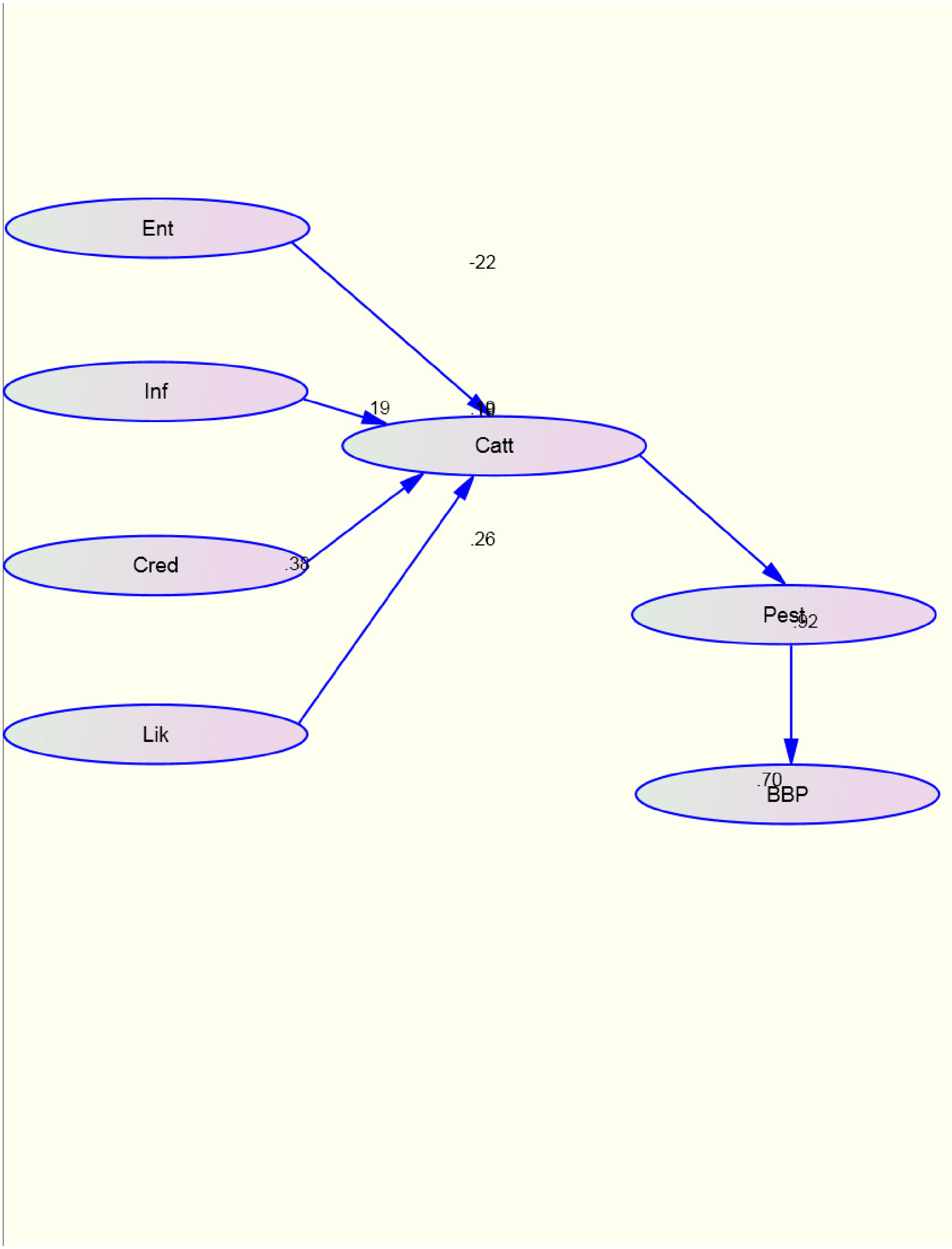

Ent
-22
Inf
19
Catt
.26
Cred
.38
Pest
.92
Lik
.70
BBP

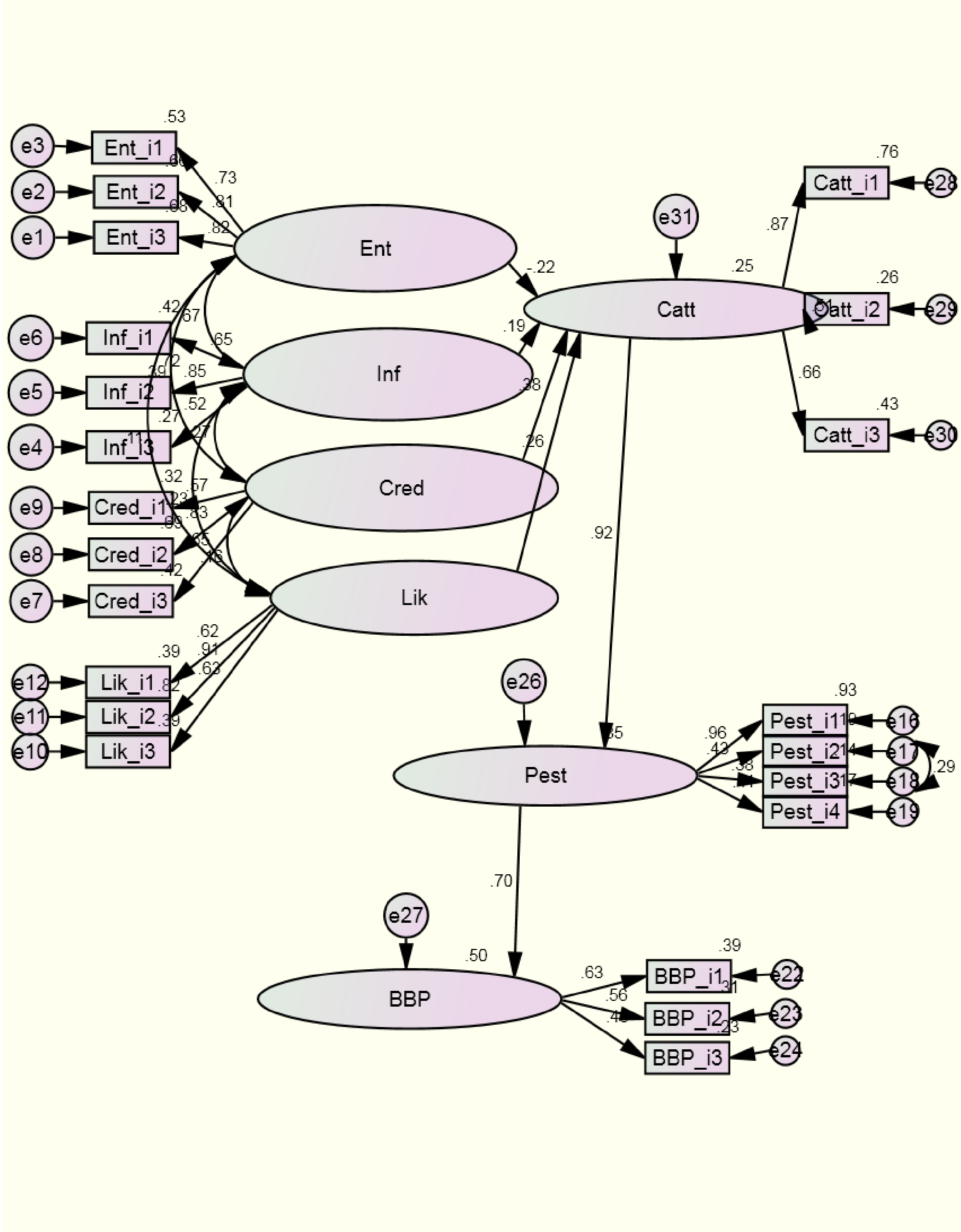
Figure 4.10: Nomological model for Impact of children's attitude towards TV advertisements on Buying behavior of parents.

4.8 Model Specification and Hypothesis testing

Using path analysis to find out whether attitude of children towards TV advertisements causes pester power and how pester power of children influences the buying behavior of parents.

4.8.1 Path Model (Full Structural Model)

The complete path model is a formative model with a nomological network between the constructs which are Children's attitude, Pester power and Buying behavior of (Figure 4.11). As described in the previous section, parameter estimates were all positive except for one and significant demonstrating a valid and reliable model.



Ent
Inf
Cred
Lik
Catt
Pest
BBP
e31
e26
e27
Ent_i1
Ent_i2
Ent_i3
Inf_i1
Inf_i2
Inf_i3
Cred_i1
Cred_i2
Cred_i3
Lik_i1
Lik_i2
Lik_i3
Catt_i1
Catt_i2
Catt_i3
Pest_i1
Pest_i2
Pest_i3
Pest_i4
BBP_i1
BBP_i2
BBP_i3
-.22
.19
.38
.26
.25
.92
.70
.50
.87
.66
.76
.26
.43
.96
.93
.29
.63
.56
.39

Figure 4.11: Path model.

4.8.2 Model Fit

Different criteria are used to determine the overall fit of the models. As shown below in Table 4.16, the goodness of fit index (GFI) has an acceptable value of greater than .90, and the adjusted goodness of fit index (AGFI) has a preferred value of greater than .80. In the present structural model, GFI is 0.904 and AGFI 0.87 which satisfy the acceptable value for the indices. Tucker-Lewis Index (TLI) and Comparative fit index (CFI) are two reliable indicators which exhibit a preferred acceptable value of >0.90. TLI and CFI values in this model are 0.90 and 0.91 respectively which are with the acceptable range. Hu and Bentler (1999) place the cutoff value for RMSEA at .06, whereas Browne and Cudeck (1993) reaffirmed that values less than or equal to .05 indicate a good fit, and values up to 0.08 indicate an acceptable fit. The model shows an RMSEA value of 0.057 which indicates an acceptable fit. According to Kenny (1979, 2011), RMSEA with PCLOSE value > 0 .05, indicate that the fit of the model is “close.” In the present study PCLOSE is 0.50, which is much equal to the recommended value indicating that the model is an acceptable fit.

Type of measure	**Observed values**	**Level of acceptable fit**
Absolute fit measures:		
Goodness-of-fit index (GFI)	0.904	>0.90

Root mean square error of approximation (RMSEA)	0.57	Marginal fit <0.090 Acceptable <0.080, Good fit <0.050,
χ^2/df (CMIN/DF)	2.29	Lower limit:1.0 upper limit 2.0/3.0 or 5.0
RMR/SRMR	0.44	0-1
Incremental fit measures:		
Tucker –Lewis index (TLI)	0.90	> 0.90
Adjusted goodness-of-fit index (AGFI)	0.87	> 0.80
Comparative fit index (CFI)	0.91	>0.90
Incremental fit index (IFI)	0.91	>0.90
Normed fit index (NFI)	0.85	> 0.90 < 0.95 marginal > 0.95 is good < 0.90 poor

Parsimonious fit measures:		
Parsimony goodness of fit Index (PGFI)	0.70	0-1
Parsimony normal fit index (PNFI)	0.72	0-1

Table 4.19: Model fit indices for the Structural model

The hypotheses testing were the next step in the study.

4.8.3 Hypotheses testing using structural equation model

Hypotheses testing were done by inspecting the path loadings and r square values of each structural relation. Table 4.20 below tabulates all the requisite values for the structural model given in figure 4.11

Structural Relations			**Standardised estimates**	**Unstandardised estimates**	**Squared Multiple corelation (R square values**		**S.E**	**C.R**	**P**
Ent_i1	<---	Ent	0.727	0.799	Ent_i1	0.528	0.055	14.625	***
Ent_i2	<---	Ent	0.814	0.926	Ent_i2	0.663	0.057	16.198	***
Ent_i3	<---	Ent	0.824	1.000	Ent_i3	0.679			
Inf_i1	<---	Inf	0.648	1.427	Inf_i1	0.419	0.164	8.71	***
Inf_i2	<---	Inf	0.849	1.698	Inf_i2	0.721	0.184	9.219	***
Inf_i3	<---	Inf	0.522	1.000	Inf_i3	0.273			
Cred_i1	<---	Cred	0.565	0.786	Cred_i1	0.319	0.087	9.039	***

Cred_i2	<---	Cred	0.831	1.124	Cred_i2	0.69	0.113	9.967	***
Cred_i3	<---	Cred	0.648	1.000	Cred_i3	0.419			
Lik_i1	<---	Lik	0.624	0.977	Lik_i1	0.389	0.095	10.257	***
Lik_i2	<---	Lik	0.905	1.370	Lik_i2	0.819	0.135	10.176	***
Lik_i3	<---	Lik	0.625	1.000	Lik_i3	0.391			
Pest_i1	<---	Pest	0.965	1.000	Pest_i1	0.931			
Pest_i2	<---	Pest	0.431	0.422	Pest_i2	0.186	0.048	8.837	***
Pest_i3	<---	Pest	0.379	0.310	Pest_i3	0.143	0.040	7.66	***
Pest_i4	<---	Pest	0.407	0.320	Pest_i4	0.166	0.039	8.303	***
BBP_i1	<---	BBP	0.625	1.000	BBP_i1	0.391			
BBP_i2	<---	BBP	0.560	0.751	BBP_i2	0.314	0.099	7.598	***
BBP_i3	<---	BBP	0.479	0.626	BBP_i3	0.230	0.091	6.871	***
Catt_i1	<---	Catt	0.870	1.000	Catt_i1	0.757			
Catt_i2	<---	Catt	0.506	0.561	Catt_i2	0.256	0.054	10.342	***
Catt_i3	<---	Catt	0.658	0.623	Catt_i3	0.433	0.044	14.292	***

Structural Relations			**Standardised estimates**	**Unstandardised estimates**	**Squared Multiple corelation (R square values**		**S.E**	**C.R**	**P**
Ent	<---	Catt	-0.221	-0.184	Ent		0.075	-2.447	0.014
Inf	<---	Catt	0.118	0.362	Inf		0.173	2.089	0.037

Cred	<---	Catt	0.377	0.425	Cred		0.077	5.503	***
Lik	<---	Catt	0.257	0.306	Lik		0.070	4.385	***
Pest	<---	Catt	0.924	1.30	Pest		0.065	19.974	***
BBP	<---	Pest	0.704	0.430	BBP		0.046	9.275	***

Table 4.20: Path loadings, critical ratios, probability level, and R squared values of the structural model.

From the values given in table 4.30, it is evident that all the relations in the model are supported and most of them positively and significant with p-value < 0.05 though some of the associations between the factors and focal constructs (Catt) are found to be weaker compared to the others.

The factor loadings of all four factors; Entertainment (Ent), Information (Inf), Credibility (Cred) and Liking (Lik) with Children's attitude (Catt) show values of -0.22, 0.19, 0.38 and 0.26 respectively. The critical ratios of the corresponding factors are greater than the threshold value of 1.96 and p value < 0.05 making it evident that all hypothesized relationships are acceptable. Though the factor loadings of Ent and Inf factors are low compared to those of the others, yet the corresponding hypotheses (H3 and H4) are accepted as the composite reliability, (ref Table 4.17) , significant level (p-level) statistics and literature review is strongly supportive of the fact. Table 4.21 gives the summary of the proposed hypothesis status.

This asserted our assumption that Children's attitude towards Television advertisements and Children's Pester power has a positive, significant influence on Buying behavior of parents as shown in figure 4.10.

Hypothesis	Relationship	Empirical support
H1	Entertainment (Ent) is related to Children's attitude.	**Supported**
H2	Informativeness (Inf) is related to Children's attitude.	**Supported**
H3	Credibility (Cred) is related to Children's attitude.	**Supported**
H4	Likability (Lik) is related to Children's attitude.	**Supported**
H5	Children's attitude (Catt) is related to Pester Power.	**Supported**
H6	Buying behavior of parents is (BBP) is related to Pester Power.	**Supported**

Table 4.21: Summary of hypotheses testing

4.9 Conclusion

This chapter proposes an instrument to assess Children's attitude and how it influences the buying behavior of parents. Structural equation modeling has been used with three critical characteristics: (i) goodness of model fit indices (ii) validity at construct and instrument level and (iii) reliability of the hypothesized model were thoroughly examined. Hypotheses testing were done based on the same criteria obtained from the proposed structural model (path model). The next chapter deals with the synthesis of results for children's attitude towards Television advertising and how that impacts the buying behaviour of parents.