

# Consumer Evaluation of Brand Extension: Empirical Generalization and Comparative Analysis

Harleen Kaur and Ajay Pandit

## Author biographies:

**Dr. Harleen Kaur** has earned her doctorate with guidance of Prof. Ajay Pandit, also a co-author for this paper, from the Faculty of Management Studies, University of Delhi, Delhi, India. This article is based on her doctoral dissertation research. She is working at the Mata Sundri College for Women as Assistant Professor in the Department of Commerce and Business, University of Delhi, Delhi, India. Her work experience includes teaching to undergraduate commerce and business students for more than seven years.

**Prof. Ajay Pandit's** primary research interests include competitive marketing strategies of firms in India and China. Prof. Pandit worked with industry for four years in a senior position prior to joining academia. He is currently working at the Faculty of Management Studies, Delhi, India as Professor in Marketing and Strategic Management. He is a respected author of several books on Industrial Marketing and Marketing Management with international editions published by reputable publishers.

Contact details of the authors are-

Dr. Harleen Kaur  
Assistant Professor, Department of Commerce and  
Business  
Mata Sundri College for Women  
University of Delhi, Delhi, India  
Mob.: +91-7838381755,  
Email: harleenfms@yahoo.com

Prof. Ajay Pandit  
Professor - Marketing and Strategic Management  
FMS, Delhi University, Delhi, India.  
Mob.: +91-9811006789,  
Email: a.pandit@fms.edu

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## Abstract

Increasing costs involved in building new brands motivate marketers to adopt an alternate route for new product introductions, in the form of brand extensions. Consumer attitude towards brand extensions has been previously studied through multiple replications of Aaker and Keller's attitude based model. While multiple studies exist with comparative analysis of the original model and its replication, there is no such recent comparison of all such studies for more than a decade since Bottomley and Holden (2000). During this period, several replications of Aaker and Keller's model have been performed, some of them being in the emerging economies as well. In the context of India, which is one of the fastest growing emerging economies, there has only been one study of the Aaker and Keller model (Patro and Jaiswal 2003). The study involved hypothetical extensions and used a small sample size. Moving beyond hypothetical extensions, we conducted a replication study with a sample representative of the Indian population, comprising of 837 respondents, using real brands and their real extensions. Regression results from our study are compared with all the replication studies for Aaker and Keller's model, performed and published thus far. We also account for residual centering as proposed in Bottomley and Holden (2000). Our comparison extends the comparative analysis from Bottomley and Holden (2000) with five additional studies, including our own extensive study. Regression results of thirteen data sets in the current study, spread across both developed and emerging economies, reveal general consistency in the significance for quality, fit related variables and interaction between the two on determining attitude toward brand extension, as hypothesized by Aaker and Keller. Primary implication of this comparative analysis suggests that multinational firms planning to enter emerging economies can leverage their parent brand equity and introduce suitable local extensions by considering quality and fit related perceptions of the parent brand and proposed brand extension.

**Keywords:** Empirical generalization, brand extension, consumer behavior, comparative analysis, residual centering

# 1. Introduction

Aaker and Keller (1990), hereafter also referred to as A&K's study on consumer evaluation of brand extensions, is a seminal study in the area of brand extension. The Social Science Citation Index in a search done in August 2001 (Bottomley and Holden 2001) reveals that 92 other published studies have cited the article. Google scholar shows 2360 citations for their inspirational work, as of November 13 (2013). Additionally, principal findings of the A&K study also started to appear in marketing textbooks soon after (Kapferer 1997; Rust, Zeithaml, and Lemon 2000; Schmitt and Simonson 1997) providing further evidence of the impact of their study. Researchers have shown a keen interest in theorizing brand extension after A&K's study. However it is still considered significant to assess the foundations on which this model was built, especially in the context of emerging economies that are increasingly becoming the new markets for the multinational firms. Replication of the A&K model, in the context of emerging economies, has also been performed in some of the recent studies (Guoqun and Saunders, 2002; Patro and Jaiswal 2003), including the current study. In the last decade emerging economies have shown immense growth in trade and changes in the preferences or pattern of consumption, which necessitates revisiting the replication of A&K model in such countries.

A&K hypothesized that consumers' evaluation of brand extensions is primarily based on

1. *Quality* of the original brand,
2. Extent to which the skills/assets associated with manufacturing the original product can be transferred to the extension product category,
3. Interaction of *Quality* of the parent brand with the degree to which the brand extension fits (also called *Perceived Fit*) in the category of the original brand, and
4. Perceived difficulty (*Difficult*) of designing and manufacturing the extension product category

The measures, method and results of the A&K study are discussed in detail in the following sections. Briefly, A&K's study shows that *Quality* of the parent brand is not directly related with the consumer evaluations of the brand extension while *Perceived difficulty* was found to be a significant factor in affecting the evaluation of extension product category. Despite the much-researched A&K model, several replication studies have revealed results contradicting the original A&K study. Two such examples of contradictions are:

1. *Quality* of the parent brand was found to be a key factor in affecting extension evaluation (Sunde and Brodie 1993; Nijssen and Hartman 1994; Olavarrieta, Alarcon, Graf, and Furche 2009) and
2. *Perceived difficulty* was not found to be significant in the later replications (Sunde and Brodie 1993; Alexandre-Bourhis 1994; Bottomley and Doyle 1996; Patro and Jaiswal 2003).

Failures to replicate A&K model clearly calls for further testing the empirical generalizability of its original findings. Sunde and Brodie (1993) was the first to articulate the need for the empirical generalizability of A&K's results, due to different findings observed in their study. In response to Sunde and Brodie (1993), Aaker and Keller (1993) provided two possible explanations for differences in their study and replication studies vis-a-vis disparities in the stimuli, methodologies, and conditions (e.g., different brands in both studies) and cross-cultural differences (Sunde and Brodie's replication was directed in New Zealand while A&K was in the United States). Barwise (1993) also highlighted the utility of further replication of the A&K study using similar stimuli to observe the robustness of A&K's results, as well as their generalizability in different cultural and geographical boundaries, keeping other experimental conditions constant.

Bottomley and Holden (2001) assembled data from replications of A&K conducted across the globe as a common data set and analyzed them by creating Lance's residual centered interaction terms. Together, these studies can be considered to represent a series of close replications (Lindsay and Ehrenberg 1993). A common feature across A&K's study and almost all other replications (Guoqun and Saunders 2002; Patro and Jaiswal 2003; Olavarrieta et al. 2009) is that they are based on student samples with some of them even using similar products, brands and extensions. This study also uses management students as target respondents. Some studies have also extended the A&K model to a different application. As an example Riel, Lemmink and Ouwersloot (2001) replicated and extended A&K's brand extension model in the services context. The current study is limited to replication of A&K's model in the FMCG sector, as per the original study.

Most of the attempts to test generalizability of A&K's model have been in the context of developed countries. However, the findings must possess external validity to be applicable to the marketing scenarios across different countries (Gronhaug, Hem, and Lines, 2002). With this current replication study, we will examine the generalizability and robustness of the A&K's study in the context of an emerging economy - India. This research differs significantly from the earlier Indian replication by Patro and Jaiswal (2003) across multiple dimensions including stimuli, measures, sample size and results. They used hypothetical extensions of some non-FMCG brands, whereas the current study uses real extensions of all real FMCG brands. While they used the same measures as was used by A&K, in the current study, measures for dependent variable, *Attent* and *Quality* have been developed as multi item scales. Further, the current study examines a much larger data set than used by them. Results from this larger data set observe support for the full model as compared to the study by Patro and Jaiswal (2003) that observed support for the main effects model only.

In general, replications are required so as to develop empirical generalizations (Bottomley and Doyle 1996). Several strikingly diverse results in replication studies indicate a need for more empirically supported research that can then be generalized as a basis for designing brand related strategy decisions (Leone and Schultz 1980; Hubbard and Armstrong 1994) as well as promote confidence in the conclusions made on the basis of empirical research (Hubbard and Armstrong 1994).

Results from the current study are reported in Section 3.4, which tests the robustness of the A&K model with a sample representative of the population of India. Recent analytical techniques (Bottomley and Doyle 1996) have been applied to control for multicollinearity, thereby facilitating comparison of results in the current study with A&K's original model and other replication studies across the world.

A mere comparison of the results reported by other replication studies was not appropriate since there were uncertainties in individual studies about several issues such as use of cross-product/residual centered interaction terms and reporting of full or main effects in the statistical models. Therefore, secondary analysis of the 8 data sets by Bottomley and Holden 2001, using the residual centering technique, was used. Bottomley and Holden (2001) used the assembled data set for further analyses of A&K's brand extension model, while correcting for the problem of multicollinearity. To the secondary data set of 8 studies, a study conducted in New Zealand by Barrett et al. (1999), a replication conducted at Chile by Olavarrieta et al. (2009), an Indian study by Patro and Jaiswal (2003), a study conducted in China by Guoqun and Saunders (2002), and results from the current study are added, to make it a comprehensive comparison of thirteen studies (including the original A&K study and twelve replication studies). For comparative analyses, regression results of all the thirteen studies are presented in Table 4, and a comparative summary of hypotheses is presented in Table 5, to test for the empirical generalizability and robustness of A&K's brand extension model across the globe.

To summarize, as primary research contributions, this study

1. is the first of its kind, replicating A&K's work on brand extensions using real FMCG brands and their extensions in the Indian context;
2. extends the work of Bottomley and Holden (2001), by adding 5 additional studies, to make it a comprehensive comparison of thirteen studies for empirical generalizability of the original A&K work.

## 2. Consumer Evaluation of Brand Extension: Aaker and Keller (1990)

Brand extensions provide a way to leverage brand name familiarity, popularity and image for firms to enter new markets, which also reduces the risk of new product failures to some extent. Moreover, brand extensions can decrease the fixed costs relating to distribution due to existing distribution channels and/or increase the efficiency and effectiveness of promotional expenditures (Morein 1975).

Aaker and Keller (1990) proposed an attitude-based brand extension model. The dependent variable in their model was *Attitude towards brand extension*, measured by the average of two variables namely perceived quality of the brand extension and the likelihood of trying the extension. The first independent variable, *Quality* of the original brand, was measured on a seven-point scale (where 1= Inferior quality, 7= Superior quality). The second independent variable, *Perceived Fit* between Parent brand and brand extension was studied, in aspects of product usage (being complements and substitutes) and producer

related (transferability of particular skills and resources from parent brand to brand extension). *Complement, Substitute, Transfer* were all measured on seven point Likert scale where 1= strongly disagree, 7= strongly agree.

The third independent variable studied by A&K was *Difficult*. A&K argued that consumers might find extensions that are very easy to manufacture worthless of an esteemed brand. Further, consumers may not be willing to pay a high price for an easy-to-produce extension of a high-quality brand. Therefore, another product-related variable, difficult, was operationalized, measuring difficulty in production of extension category for the producer of the original, as perceived by the consumers. *Difficult* was measured on a seven point Likert scale where 1= Strongly disagree, 7= strongly agree.

Aaker and Keller (1990) expected some of the independent variables in their study to influence each other e.g. transfer of positive association to the extension product was expected to depend on consumers' perception of fit between the extension category and the parent brand. To measure such cross-influence, cross-product interaction terms, for fit and quality, i.e. for quality and complement, quality and substitute and quality and transfer, were created and analyzed in their work.

They gathered perceptions and evaluations of a set of six actual brands and 20 hypothetical brand extensions from 107 undergraduate business students and ran regressions to test the following hypotheses:

H1: Higher quality perceptions toward the original brand are associated with more favorable attitudes toward the extension.

H2: Transfer of a brand's perceived quality is enhanced when the two product classes in some way fit together. When the fit is weak, the transfer is inhibited.

H3: The fit between the two involved product classes has a direct positive association with the attitude towards the extension.

H4: The relationship between the difficult i.e. difficulty of making the product class of the extension, and attitude toward the extension is positive.

In section 3, A&K's model of brand extension evaluation is tested for the current study and results are compared with that of Aaker and Keller (1990). Following Bottomley and Holden (2001), interaction terms have been corrected for multicollinearity by using the residual centering approach (Lance 1988). Comparative analysis of A&K with twelve other replication studies (including the current study) wherein the effect of multicollinearity is corrected is done in section 3.5. Such comparative analysis will help in establishing the generalizability of Aaker and Keller (1990) in a different culture, social setting and geography, as exist in India.

### 3. Test of Empirical Generalizability of Aaker and Keller (1990) to the Indian Context - Current Study

We now test the empirical generalizability of brand extension model with our data and compare the results with that of Aaker and Keller (1990). This study includes six brands (Dettol, Dove, Garnier, Amul, Horlicks, and Maggi) and their real brand extensions meeting the A&K's criteria of stimuli selection. Using pre-tests, brands that differed in perceived quality as per the respondents, were selected to provide a vigorous test of the generalizability of the results. A one-way ANOVA was used to test for *Quality* differences among six brand names so as to study brands of diverse perceived *Quality* in the FMCG market. *Quality* differed significantly across the six brands [ $F(5, 831) = 6.506, p < .001$ ].

### 3.1 Method

The sample for the current study consisted of Management students from University of Delhi, India. Diversity in the surveyed population was ensured by including the student population from both the full-time and part-time students, across the north and the south campus of the university. The respondents were contacted in their classrooms in the beginning or the end of the class hours with prior permission from the Professor.

Two pre-tests were conducted to identify:

1. Parent brands to be used in the study that meet the criteria of Aaker & Keller (1990), and
2. Real extensions of the selected parent brands that were newly introduced and advertised on television.

Ninety-six management students participated in the first pre-test. Students were surveyed in their classroom, towards the end of lecture, with prior permission from the faculty concerned. The purpose of the first pre-test was to identify potential parent brands that varied in the levels of familiarity and quality with respect to the target population for the final survey and to comply with Aaker & Keller (1990)'s criteria of selection of brands. They selected the original brands based on the criteria of being relevant to subjects, generally perceived as high quality, able to elicit relatively specific associations, and not broadly extended previously. In order to measure subjects' brand associations and attitudes, it was necessary that the selected parent brands be those that are familiar to subjects so that they have salient brand image and product associations in memory. Eight brands were selected from various consumer reports, magazine and newspaper articles for the first pre-test, matching A&K's criteria. Selected brands included Maggi, Dettol, Dove, Horlicks, Vivel, Axe, Amul and Garnier. Respondents were asked to rate given brands on the scale of 1 to 5 where 1 indicated strongly disagree and 5 indicated strongly agree. The Likert statements were designed to ascertain the degree of subjects' familiarity with the brands and perceived quality levels of the brands in the pre-test. Of the given brands, Vivel scored least on familiarity and subjects could not elicit appropriate brand associations for it. As a result, Vivel was dropped for the main study. Based upon this pre-test result, it was observed that several respondents expressed their hesitance to talk about product associations of Axe since many of the advertisements exhibited partial obscenity and were banned consequently in India. Therefore, Axe was also dropped for the main study.

One hundred and twelve management students were surveyed in the second pre-test. Similar to the first pre-test, the students were approached in their classroom towards the end of their class with prior permission from the faculty concerned. The second pre-test was done to identify real brand extensions of the brands selected in the first pre-test. It was intended to ensure that the brand extensions were newly introduced and advertised on television so as to avoid any preconceived notions about the extensions in the minds of the respondents. Respondents were asked to write down the latest brand extension introduced by the given parent brand, the advertisement of which they could recall in their memory. Based upon the responses in the second pre-test, real brand extensions were selected. Based on the first and second pre-tests, the stimuli selected for the main study are –

**Parent Brand**

1. Garnier Fructis Shampoo
2. Amul Butter
3. Dettol Antiseptic Liquid
4. Maggi 2 Minute Noodles
5. Horlicks Health Drinks
6. Dove Cream Bar

**Brand Extension**

- Garnier Color Naturals Hair Color
- Amul Ice-Cream
- Dettol Hand-Wash
- Maggi Healthy Soups
- Horlicks Biscuits
- Dove Conditioner

For each of the selected brands, at least 175 responses were targeted for analysis. To ensure the minimum response across all the brands, as and when the specific pre-determined limit for a brand was reached, the corresponding brand was deleted from the first round of the questionnaire. Of the total 1050 distributed questionnaires, 127 could not be considered due to non-response and 87 were incomplete and hence were not taken into consideration during analysis. A total of 837 responses (an overall response rate of 79.71%) were considered for analysis. The number of responses considered for analysis of each of the selected brands- Garnier, Dettol, Amul, Dove, Horlicks, and Maggi were 137, 148, 131, 137, 133, and 151 respectively. Collected data was validated, edited, codified and machine cleaned before the performing final analysis. Statistical Package for Social Sciences (SPSS) was used for the analysis.

*Measures*

Multiple replication studies in the literature have reported using single item scales as a limitation (Bottomley and Doyle 1996; Barrett et al. 1999; Patro and Jaiswal 2003) and suggested using multiple items scale to measure constructs in further work. Following such observations, in the current study, after a thorough survey of literature, an attempt has been made to develop multi-item scales for the dependent variable *Attitude towards brand extension* (also referred as *Attext*) and an independent variable *Quality*. Since the respondents were analyzing real world products, it was easy for the researchers to include multi-item scales to extract more information about brands from them. *Attext* was operationalized as average of the awareness, perceived quality of extension, like to use, the likelihood of trying the extension, desirability of extension, extension being a good idea and its expected success (Aaker and Keller 1990; Pryor and Brodie 1998; Wu and Yen 2007). Information pertaining to *Attext* was collected from the respondents through seven Likert

statements, each measured using a five-point scale.

Among the independent variables and measures, *Quality* was developed as a multi-item scale, operationalized as average of having superior quality, better features, expected quality from extensions and respondents always benefited from its usage (Aaker 2004; Boush et al. 1987; Lane and Jacobson 1995; Martin and Brown 1990; Smith and Park 1992; Sunde and Brodie 1993). Other independent variables were same as those used in the A&K study vis-a-vis *Substitute* (parent brand and brand extensions are substitutes), *Complement* (parent brand and brand extensions are complements), *Transfer* (parent brand has the right expertise and skill to enter into extension category) and *Difficult* (extension is difficult to make). Five point Likert scales were used to measure the responses for each of the respective statements in the survey.

### 3.2 Regression Model

Following is the regression model used in this study as hypothesized and tested by Aaker and Keller (1990):

$$\begin{aligned} \text{Attent} = & \alpha + \beta_1 \text{Quality} + \beta_2 \text{Substitute} + \beta_3 \text{Complement} + \beta_4 \text{Transfer} + \beta_5 \text{Difficulty} + \beta_6 \\ & \text{Quality*Substitute} + \beta_7 \text{Quality*Complement} + \beta_8 \text{Quality*Transfer} + \varepsilon \end{aligned} \quad (1)$$

To ensure consistency with previous analysis, the full model including interaction terms (*Quality\*Transfer*, *Quality\*Complement*, *Quality\*Substitute*) was analyzed. Lance's residual centering approach was used to address the problem of multicollinearity between the main and interaction effects when calculating the full effects model.

The regression model (from equation 1) was run only on the aggregate data. In this study brand level comparisons could not be done due to stimuli variation in both the studies being compared (primarily since the majority of the brands taken in A&K study are not prevalent in India).

### 3.3 Data Analysis

Regression results, with responses collected from 837 respondents for 6 brands and their extensions, as per equation 1, are reported in table 1. Table 2 reports regression results of Aaker and Keller (1990). Several noticeable differences in the regression results for the current study and A&K's study can be observed. The current study had greater explanatory power with an adjusted R<sup>2</sup> of 0.374 (compared with 0.26 in A&K study) and the regression coefficients differ considerably (See table 2 and table 3).

The assumptions under regression analysis were tested and met. Autocorrelation, i.e. correlation of error

terms across observations, is not evident in the current study as the Durbin Watson statistic is close to 2 (1.913, table 3). Collinearity statistics analysis for the independent variables reported all Variance Inflation Factors (VIF) to be much below 2 and a minimum tolerance value of 0.831 (table 1). Since a VIF value above 10 and a tolerance value below .10 pose multicollinearity problem (Myers, 1986 and Arslan and Atuna, 2010), reported values indicate that no serious multicollinearity problem exists for analysis in the current study. Assumptions related to normality, linearity and homoscedasticity were also tested and met.

### 3.4 Comparison of Results: Current Study with A&K's Original Results

In this section, results from the current study are compared with that of A&K. It is important to note that results from the original A&K study (used for comparison here) did not correct for multicollinearity. However, in view of critical research proposing techniques to reduce the problem of multicollinearity, results from the current study (used for comparison with original A&K model) are after correcting for multicollinearity using Lance's residual centering technique (Lance, 1988). Next, each of the four hypotheses has been taken from Aaker and Keller (1990) for its comparison with the current study.

H1, from A&K, postulates that higher quality perception of the original brand leads to more favorable evaluation of the brand extension. The current study's regression results support H1 while results from Aaker and Keller (1990) (i.e. without residual centering) fail to support H1. In the current study, the coefficient for *Quality* is positive and statistically significant ( $\beta = 0.606$ ,  $p < .05$ ), indicating a direct link between the perceived *Quality* of the brand and the *Attent*. Positive and significant correlation ( $\rho=0.587$ ,  $p < .05$ ) between *Quality* and *Attent* supports the findings of the regression model. On the contrary, the coefficient for *Quality* in A&K study (-0.01) was not statistically significant. Results from the current study, supporting H1, are also consistent with several other replication studies of A&K model (Sunde and Brodie 1993; Bottomley and Holden 2001; Patro and Jaiswal 2003; Olavarrieta et al. 2009).

H2, from the original A&K study, postulates that the transfer of a brand's perceived *Quality* is enhanced when the parent brand and its extension fit well together. This hypothesis was tested on the interaction between *Quality* and three *Perceived Fit* variables vis-a-vis *Complement*, *Substitute* and *Transfer*. The interaction term *Quality\*Complement* was found to be negative and insignificant (not supporting H2) in the current study. Beta estimates for the other two interaction terms *Quality\*Substitute* and *Quality\*Transfer* were found to be statistically significant, with values of .081 and -.060 respectively. A negative and insignificant coefficient of the interaction term *Quality\*Complement* indicates that effect of quality of the parent brand on the evaluation of its extension is not reinforced by higher complementarity between parent brand and its extension. One possible explanation for such a result could be, that consumers might be hesitant of buying several products of the same brand as they might consider it to be giving monopoly to the brand (Olavarrieta et al., 2009). The beta coefficient for the interaction of *Quality* and *Substitute* was positive and

significant ( $\beta = .081$ ,  $p < .05$ ). A positive relationship between *Attext* and *Quality\*Substitute* was also confirmed by positive and significant correlation coefficient ( $\rho = .099$ ,  $p < .05$ ). A possible explanation for this regression result is that picking an extension that is a substitute may not overcome low perceived brand quality (Aaker and Keller 1990).

The negative sign for the coefficient of *Quality\*Transfer* indicates that high quality of the parent brand may not always transfer well to the brand extension and may affect the extension evaluation negatively. This is also illustrated in Garnier, one of the brands selected in the current study. While Garnier is considered a high quality brand, its extension Garnier colornaturals hair color is relatively poorly evaluated due to its lower level of perceived transferability, whereas in the A&K study, the beta coefficients for the interactions of *Quality* with *Complement* (Q\*C) and *Substitute* (Q\*S) are both positive and significant [.25 ( $p < .01$ ) and .18 ( $p < .05$ ) respectively]. The beta coefficient for the interaction of *Quality* with *Transfer* (.12), however, is not significant in A&K study.

In H3, A&K proposed that the *Perceived Fit* between the two involved product classes has a direct positive association with the *Attitude towards brand extension*. Reflecting the A&K study, our regression results also support the role of fit in the formation of *Attext*. A&K explored three components of fit namely, *Complement*, *Transfer*, and *Substitute*, explained already in section 3.1. We examined the relationship of *Attext* with all the three components of fit individually following A&K.

The beta coefficients for two of the product related fit variables, i.e. *Complement* and *Substitute*, are not significant. However, the beta coefficient for *transfer* (producer related fit variable) is positive (.075) and significant ( $p < .05$ ). Results from the current study are in congruence with the results from the original A&K study for H3. A&K's study also suggested *Complement* and *Substitute*, to be statistically insignificant and *Transfer* was observed to be substantial (.15) and significant ( $p < .05$ ).

Transferability came out to be a relatively more important predictor than complementarity or substitutability, though this may reflect relatively few extensions that represent actual substitutes or complements. It might be considered that an extension need not fit well on multiple dimensions of fit to be favorably received by consumers.

H4 proposes that the relationship between the difficulty of making the product class of the extension, i.e. *Difficult* and the *Attext* is positive. Regression results of the current study fail to support H4 while A&K's results support H4. In the current study, *Difficult* has a negative beta coefficient, which is not statistically significant, while in A&K's study the coefficient is positive and statistically significant (.12). Respondents in the current study do not consider the relevance of difficulty of manufacturing the extension as a positive aspect of the parent brand.

It can be concluded that Indian consumers mostly look into the quality of the parent brand and its fitness with extension category, while evaluating brand extension.

### 3.5. Comparative Analysis of A&K's Replication Studies Across the Globe – Extending Bottomley and Holden (2001)

An initial replication study Sunde and Brodie (1993), generated dissimilar results to the original A&K study, prompting Aaker and Keller (1993) to propose that the lack of agreement may be clarified by differences in stimuli and culture of respondents across the globe. Further replications also could not resolve the differences in findings between the original study and replication studies.

Bottomley and Doyle (1996), first, corrected for multicollinearity using the residual centering method (Lance 1988) for modeling their data. They pointed out that the presence of high degree of multicollinearity between the main effects and cross- product or interaction terms possibly aggravated the inconsistency in results. They also observed different results after adjusting for multicollinearity. Bottomley and Doyle (1996) also explored the potential to generalize the results of A&K's study to other product classes (brand extensions) by analyzing at the individual brand extension level. They concluded that the four hypotheses, from the original A&K study, could be generalized across the majority of brand extensions and rejected Aaker and Keller (1993)'s proposition that differences in stimuli (both parent brand and extension effects) and cross-cultural effects may have contributed to the differences in findings.

Further, Bottomley and Holden (2000) reanalyzed and compared the results of eight studies (one original and seven replications) after creating residual centered interaction terms. They find support for the full model despite published contrary results, including Aaker and Keller's own, that support only some of the hypotheses. They also agree with Aaker and Keller (1993) for the differing magnitude of the influence of each of these variables caused by varying brand and culture being studied.

A summary of comparative analysis across multiple studies, for support (or lack of support) corresponding to each of the four hypotheses from original A&K study, is presented in Table 5. In following, this comparison is discussed briefly.

H1 (Perceived *Quality* of the parent brand): A&K's first hypothesis states that consumers' perceptions of higher *Quality* towards the parent brand are associated with favorable attitudes towards the brand extension. Evidence in the literature is presently consistent, the coefficient for *Quality* being positive and statistically significant in all the studies being compared. After correcting for multicollinearity, even Aaker and Keller (1990)'s data was found to be supporting H1 i.e. positive association of the parent brand *Quality* with the *Attitude towards brand extension*. All other studies being compared support H1 including the current study.

H2 (Interaction between *Quality* and *Perceived Fit*): Aaker & Keller's second hypothesis states that the transfer of the parent brand's perceived *Quality* is enhanced when the two product classes fit (*Perceived Fit*)

together and conversely the transfer is subdued when the fit is weak. While in A&K two of the three interaction terms of quality with the measures of 'fit' (*Complement*, *Substitute* and *Transfer*) were found to be strong and statistically significant, none of the replication studies demonstrate significant interaction effects of *Quality* with all three *Pfit* variables. Except for the A&K study, none of the replications have shown significant interactions for both *Complement* and *Substitute*. Four studies (B&D, S&B, H&B-LBS and OAG&F) show interaction between *Quality* and *Transfer* (Q\*T) and interaction between *Quality* and *Complement* (Q\*C) to be significant whereas N&H and the current study show Q\*T and interaction between *Quality* and *Substitute* (Q\*S) to be significantly affecting *Attext*, though with a negative coefficient for Q\*S in N&H and Q\*T, in the current study.

Two studies, namely H&B-Illinois and A-B show no support for the hypothesis at all, i.e. none of the interaction terms were statistically significant. Studies conducted at Essec (H&B) and New Zealand (B, L&V) show a significant effect of Q\*T only, whereas a Chinese replication of the study showed support for Q\*C only.

Although the interaction terms were generally found to be significant in the replication studies, the magnitude of the main effects appear to be greater than the interaction effects; thus it can be concluded that although consumers' perception of the brand's quality is enhanced when parent brand and its extension fit together, this effect is secondary to the main effects in determining consumers' overall attitude towards the brand extension (Bottomley and Doyle 1996; Barrett et al. 1999; Guoqun and Saunders 2002; Patro and Jaiswal 2003).

H3 (*Perceived Fit*): Hypothesis 3 states that the 'fit' between the two product classes has a direct positive association with consumers' attitude towards brand extension. Eleven out of thirteen studies support the hypothesis altogether wherein all the fit variables have been found affecting brand extension evaluation significantly, whereas Nijssen and Hartman (1994) and the current study support the hypothesis only partially. For N&H, *Complement* was not a significant variable, and for the current study only *Transfer* (of all three fit variables) came out to be positive and statistically significant. A potential explanation for the results in the current study could be that broadly all of the extension categories under study were different from the parent brand category.

H4 (*Difficult*): Finally, A&K hypothesize about the positive relationship between the degree of difficulty in manufacturing and designing the extension, i.e. *Difficult* and the *Attext*, implying that firms should avoid extending quality brands to 'easy to produce' product classes because the extension may be perceived as either incompatible or even exploitative (Aaker and Keller 1990). Evidence from the previous studies is mixed with five studies supporting the notion, whereas seven other studies, including the current study failed to find any relationship of *Difficult* with *Attext* in the residual centered full effects models. Literature provides little support for the hypothesis, with beta coefficients being close to zero and not statistically significant in most of the studies. Moreover, in the current study, little support is found for the hypothesis from even the zero-order correlation coefficients (only -.009). We also believe that Indian consumers are not concerned

whether the extension is difficult to make as long as it is of high quality and fitting well with the parent brand.

## 4. Conclusion

In this paper, the generalizability of Aaker and Keller (1990)'s propositions related to the factors of brand extensions evaluation was examined. Their results, with that of twelve other replication studies conducted across the world, were compared after correcting for multicollinearity. Although some differences are found across multiple studies, but general relationships are confirmed. Consumers' attitude towards brand extensions is concluded to be driven by the main effects, moderated by the interactions terms. A majority of A&K's hypotheses were found to be supported after correcting for multicollienarity, with the exception of H4, the degree of difficulty associated with producing the extension, i.e. *Difficult*. A brief discussion on how problems of multicollinearity may have perplexed the results of previous studies has also been provided.

Overall the empirical observations in the current study endorse a "full effects" model than a cautious "main effects only" model, although both B&D and B&H advocate the use of main effects model in their studies. Echambadi, Arroniz, Reinartz, and Lee (2006), in their analysis suggest using theory to hypothesize interaction effects. They further very strongly argue that empirical results used for rationalizing the absence of interactions will constitute a theoretical misspecification and will produce bias results if the coefficient of the interaction term is not zero.

Since the majority of the studies based on Aaker and Keller (1990) were conducted in developed countries, this Indian replication allows us to examine the generalizability and robustness of A&K's brand extension model in the context of emerging economies. This study provides support for H1 (*Quality*). Among the interaction terms, interaction of *Quality* and *Transfer* and interaction of *Quality* and *Substitute* were observed to be significant, though the coefficient of *Quality* and *Transfer* was negative, thus supporting H2 partially. Only *Transfer*, among the three fit variables, was found to have strong positive effect on customers' attitude towards the brand extension (*Attent*), thus partially supporting H3. The relationship of difficulty in making the extension for the parent brand with customers' attitude towards the brand extension (H4) was not supported. Some of these differences can be explained by methodological variations i.e. different extension product categories, different parent brands, sample characteristics, cultural differences, and emerging v/s developed countries, among others. More replications in emerging economies will help generalize Aaker and Keller (1990) and build theory about brand extension evaluation and also. This model may explain the cultural, financial, and geographical differences between developed economies and emerging economies well by conducting more replications with a representative sample (Barrett et al. 1999).

## References

- Aaker, David A. and Keller, Kevin L. (1990). "Consumer evaluations of brand extensions". *Journal of Marketing*, 54 (January), p. 27-41.
- Aaker, David A. and Keller, Kevin L. (1993, January). "Interpreting cross-cultural replications of brand extension research". *International Journal of Research in Marketing*, 10, p. 55-59.
- Alexandre-Bourhis, N. (1994). *L'évaluation des extensions de marque par les consommateurs: Une étude empirique*. IAE-Caen, France: l'Institut d'Administration des Entreprises, Université de Caen, Basse-Normandie, France.
- Barrett, J., Lye, A., and Venkateswarlu, P. (1999). "Consumer perceptions of brand extensions: Generalising Aaker & Keller's model". *Journal of Empirical Generalisations in Marketing Science*, 4 (No. 1), p. 1-21.
- Barwise, T. P. (1993). "Brand equity: Snark or boojum?" *International Journal of Research in Marketing*, 10 (March), p. 93-104.
- Bottomley, P. A., and Doyle, J. R. (1996). "The formation of attitudes towards brand extensions: Testing and generalising Aaker and Keller's model". *International Journal of Research in Marketing*, 13 (No. 4), p. 365-377.
- Bottomley, P. A., & Holden, S. (2001, November). "Do we really know how consumers evaluate brand extensions? Empirical generalizations based on secondary analysis of eight studies". *Journal of Marketing Research*, 38 (No. 4), p. 494-500.
- Echambadi, R., Arroniz, I., Reinartz, W., and Lee, J. (2006). "Empirical generalizations from brand extension research: How sure are we?" *International Journal of Research in Marketing*, 33 (No. 3), p. 253-261.
- Gronhaug, K., Hem, L. and Lines, R. (2002, July). "Exploring the impact of product category risk and consumer knowledge in brand extensions". *The Journal of Brand Management*, 9 (No. 6), p. 463-476.
- Guoqun, F. and Saunders, J. (2002). "Consumer evaluations of brand extensions: Empirical evidence from china". *Asia Pacific Advances in Consumer Research*, 5 (No. 1), p. 395-399.
- Hubbard, R. and Armstrong, J. Scott (1994). *Replications and extensions in marketing: Rarely*

published but quite contrary. *International Journal of Research in Marketing*, 11 (No. 3), p. 233-248.

Kapferer, J. N. (1997). *Strategic brand management* (2nd Edition ed.). Kogan Page: London.

Lance, C. (1988). "Residual centering, exploratory and confirmatory moderator analysis, and decomposition of effects in path models containing interactions". *Applied Psychology Measurement*, 12 (No. 2), p. 163-175.

Leone, R. P. and Schultz, R. L. (1980). "A study of marketing generalizations". *The Journal of Marketing*, 44 (Winter), p. 10-18.

Lindsay, R. M. and Ehrenberg, A. S. C. (1993). "The design of replicated studies". *The American Statistician*, 47 (No. 3), p. 217-228.

Little, T. D., Bovaird, J. A., and Widaman, K. F. (1980). "On the merits of orthogonalizing powered and product terms: Implications for modeling interactions among latent variables". *Journal of Marketing*, 44 (No. 1), p. 10-18.

Morein. (1975). Shift from brand to product line marketing. *Harvard Business Review*, 53 (September-October), 56-64.

Nijssen, E. J. and Hartman, D. (1994). Consumer evaluations of brand extensions: An integration of previous research. Proceedings of the 23d annual conference of the European marketing academy (p. 673–683) Maastricht, The Netherlands: European Marketing Academy.

Olavarrieta, S., Alarcon, F., Graf, I. and Furche, P. (2009). "Determinants of consumer evaluations of brand extensions in Chile and comparison against global evidence". *EsicMarket*, 132 (April), p. 35-54.

Patro, S. K. and Jaiswal, A. K. (2003). "Consumer evaluations of brand extensions: Evidence from India". *Journal of Academy of Business and Economics*, 1 (February), p. 170-178.

Riel, A. C., Lemmink, J. and Ouwersloot, H. (2001). "Consumer evaluations of service brand extensions". *Journal of Service Research*, 3 (No. 3), p. 220-231.

Rust, R. T., Zeithaml, V. A. and Lemon, K. N. (2000). *Driving customer equity: How customer lifetime value is reshaping corporate strategy* (First Edition ed.). The Free Press: Newyork.

Schmitt, B. and Simonson, A. (1997). *Marketing aesthetics: The strategic management of brands*,

identity, and image (First Edition ed.). The Free Press: Newyork.

Sunde, L. and Brodie, R. (1993). "Consumer evaluations of brand extensions: Further empirical results". *International Journal of Research in Marketing*, 10 (No. 1), p. 47-53.

Table 1: Results of the current study: Test of generalizability of A&K's study

<b>Coefficients<sup>a</sup></b>								
Model		Unstandardized Coefficients		Standardized Coefficients	T	Sig.	Collinearity Statistics	
		B	Std. Error	Beta			Tolerance	VIF
1	(Constant)	1.352	.142		9.522	.000		
	Quality	.606	.029	.581	21.030	.000	.987	1.013
	Substitute	-.020	.013	-.043	-1.525	.128	.940	1.064
	Transfer	.075	.021	.101	3.505	.000	.899	1.112
	Complement	.000	.016	-.001	-.020	.984	.866	1.155
	Difficulty	-.007	.008	-.025	-.920	.358	.997	1.003
	Quality*Substitute_rc	.081	.018	.131	4.612	.000	.933	1.071
	Quality*Transfer_rc	-.021	.019	-.034	-1.140	.254	.831	1.203
	Quality*Complement_rc	-.060	.018	-.097	-3.284	.001	.872	1.147
a. Dependent Variable: Attitude_ext								

Table 2: Results of Aaker & Keller (1990)

Independent Var.	Std Regression coefficient	Regression coefficient	T value
Quality	-.01	-.01	-.1
Transfer	.15	.12	2.0
Complement	-.02	-.02	-.4
Substitute	-.08	-.06	-1.0
Q*T	.12	.02	1.4
Q*C	.25	.03	3.2
Q*S	.18	.02	2.1
Difficult	.12	.12	6.2
Adjusted R square = .26			
Dependent variable= Atttext			

Table 3: Model fit statistics: Test of generalizability of A&K's study (Current Study)

Model	R	R Square	Adj. R Square	Std. Error of the Estimate	Change Statistics					Durbin-Watson
					R Square Change	F Change	df1	df2	Sig. F Change	
1	.616	.380	.374	.4866448	.380	63.020	8	823	.000	1.913
a. Predictors: (Constant), Standardized Residual, transfer, difficulty, substitutes, Quality, Standardized Residual, complements, Standardized Residual										
b. Dependent Variable: Attitude_ext										

Table 4: Comparison of regression coefficients of 13 studies- A&K

<b>Variables</b>	<b>A&amp;K</b> US	<b>N&amp;H</b> Netherlands	<b>B&amp;D</b> UK	<b>S &amp; B</b> New Zealand	<b>H &amp; B</b> LBS	<b>H &amp; B</b> Illinois	<b>H &amp; B</b> Essec	<b>A-B</b> France	<b>O,A,G</b> & F Chile	<b>Fu</b> Guoqun China	<b>P&amp;J</b> XLRI, India	<b>BL&amp;V</b> New Zealand	<b>Current Study</b> India
<b>Quality</b>	.22**	.25**	.22**	.25**	.39**	.21**	.46**	.09**	.23**	0.13**	0.23**	0.33*	.606**
	(-11.5)	(-9)	(-11.4)	(-13.1)	(-21.2)	(-7.5)	(-23.7)	(-3.8)	(-2.5)	(-7.9)	(-10.00)	NA	(-21.03)
<b>Transfer</b>	.26**	.60**	.3**	.27**	.14**	.07*	.19**	.27**	.13*	0.21**	0.36**	0.21*	.075**
	(-12)	(-19.2)	(-13.8)	(-12.6)	(-6.8)	(-2.3)	(-8.6)	(-10.8)	(-3.65)	(-10.4)	(-12.8)	NA	(-3.505)
<b>Complement</b>	.17**	0	.31**	.30**	.09**	.10**	.15**	.29**	.21**	0.16**	.31**	0.28*	0
	(-8.2)	0	(-13.3)	(-14.5)	(-4.8)	(-3.5)	(-7.9)	(-11.5)	(-6.72)	(-8.2)	(-11.2)	NA	(-0.02)
<b>Substitute</b>	.07**	.07*	.18**	.18**	.18**	.22**	.15**	.29**	.05*	0.10**	.11**	0.15*	-0.02
	(-3.4)	(-2.3)	(-7.6)	(-8.4)	(-8.7)	(-6.8)	(-7.1)	(-11.9)	(-1.94)	(-4.9)	(-4.1)	NA	(-1.525)
<b>QxT (Resid)</b>	0.03	.08**	.08**	.08**	.06**	0.03	.05*	0.03	.07*	0.02	0.05**	0.06*	-.060**
	(-1.4)	(-2.7)	(-3.4)	(-4.1)	(-3.00)	(-0.8)	(-2.2)	(-1.2)	(-3.21)	(-1.0)	(-1.9)	NA	(-3.824)
<b>QxC (Resid)</b>	.06**	-0.02	.05*	.05*	.05*	-0.02	0.02	0.02	-.004*	0.05**	-0.05	-0.01	-0.021
	(-3.1)	(-.5)	(-2.3)	(-2.3)	(-2.5)	(-.8)	(-0.8)	(-0.9)	(-2.28)	(-2.3)	0	NA	(-1.14)
<b>QxS (Resid)</b>	.05*	-.07*	0.03	-0.01	0.03	-0.01	0.02	0.01	0.03	0.02	-0.06	0.01	0.081**
	(-2.2)	(-2.3)	(-1.2)	(-.6)	(-1.6)	(-.4)	(-1.0)	(-0.2)	-1.33	(-1.1)	(-2.1)	NA	-4.612
<b>Difficult</b>	.11**	OFR	0.01	0.03	.12**	.10**	.07**	0.03	-.07*	0.15**	-0.03	0	-0.007
	(-5.4)		(-0.6)	(-1.6)	(-6.2)	(-3.5)	(-3.6)	(-1.1)	(-2.36)	(-8.3)	(-1.2)	NA	(-0.92)
<b>R2</b>	0.25	0.49	0.49	0.44	0.28	0.17	0.36	0.38	0.4	0.24	0.54	0.5	0.374
<b>Sample size</b>	2101	693	1358	1559	2204	1086	1793	1151	600	2814	924	2130	837

Notes:

Standardized regression coefficients

Figures in parentheses are student t-values. Author details see next page.

#### **Notes regarding the studies tabulated in Table 4**

A&K= Aaker and Keller, original study conducted in USA

S&B= Sunde and Brodie (1993), conducted in New Zealand

N&H = Nijssen and Hartman 1994 conducted their study in Netherlands

B&D = Bottomley and Doyle 1996 is based in UK

A-B = Alexan-dre-Bourhis 1994 in France

Holden and Barwise's three data sets are referred to by the university where the data were collected (i.e., LBS, ESSEC, and Illinois)

Fu Guoqun replicated this model in China(2002)

P&J= Patro & Jaiswal, conducted similar study in XLRI, India (2003)

O,A,G&F= Olavarrieta, Alarcon, Graf and Furche, (2009) conducted the replication in Chile

Barrett, Lye & Venkateswarlu(1999) is a study based in New Zealand

Last column reports results from the current study, FMS, Delhi.

Table 5: Summarized comparison of studies done across the globe

Hypothesis	A&K US	N&H Netherlands	B&D UK	S & B New Zealand	H & B LBS	H & B Illinois	H & B Essec	A-B France	O,A,G&F Chile	Fu Guoqun China	P&J XLRI, India	BL&V New Zealand	Current Study India
H1 (Quality)	Sup.	Sup.	Sup.	Sup.	Sup.	Sup.	Sup.	Sup.	Sup.	Sup.	Sup.	Sup.	Sup.
H2 (Sig. interactions)	Q*C & Q*S	Q*T & Q*S	Q*T & Q*C	Q*T & Q*C	Q*T & Q*C	Nil	Q*T only	Nil	Q*T & Q*C	Q*C only	Q*T only	Q*T only	Q*T & Q*S
H3 (Perceived fit)	T, C & S	T & S	T, C & S	T, C & S	T, C & S	T, C & S	T, C & S	T, C & S	T, C & S	T, C & S	T,C &S	T,C &S	T only
H4 (Difficult)	Sup	OFR	Fail to Sup	Fail to Sup	Sup	Sup	Sup	Fail to Sup	Sup	Sup	Fail to Sup	Fail to Sup	Fail to Sup

Notes:

Sup refers to Supported

OFR refers to Omitted from research