

Consumer evaluations of brand extensions : an integration of previous research

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Consumer evaluations of brand extensions: an integration of previous research

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1. Introduction

In a replication of earlier research by Aaker and Keller (1990) on evaluation of brand extensions, Sunde and Brodie (1993) report some similar findings but also important differences. An explanation for these differences may be found in the different brands and extensions used in both studies, cultural differences, and differences in analytical methods applied (Aaker and Keller, 1993). The purpose of this additional replication study is to obtain a better understanding of the previous research findings and thus add to the discussion on the consumer evaluation of brand extensions. This may be considered important as the area of brand extension strategy has recently received considerable attention from researchers and the study by Aaker and Keller (1990) is widely cited.

This paper consists of three sections. Section 1 reviews the research by Aaker and Keller (1990), Sunde and Brodie (1993), and the related comment by Aaker and Keller (1993). It ends with three research questions for further testing. Section 2 describes the research designed for this purpose. Section 3 compares the results of the different studies. The original hypotheses set forth by Aaker and Keller structure this part of the paper. The section concludes by linking the results to the research questions posed. Section 4 discusses the findings and develops implications for future research.

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2. Evaluation of previous findings

Due to the largely exploratory nature of much brand extension research, and the need for more general evidence, Sunde and Brodie replicated the Aaker and Keller (1990) study on consumer evaluations of brand extensions. This study reports the attitude toward an extension to be higher when (1) there is both a perception of "fit" between the two product classes along one of three dimensions and a perception of high quality for the original brand or (2) the extension is not regarded as too easy to make. To enhance the value of the replication, Sunde and Brodie retained the same variables and rating scales as Aaker and Keller. However, several of the U.S. brands used in the original research did not possess extensive recognition among the New Zealand test group and were substituted for New Zealand brands. A new product category was also added in the design and different extensions were included.

As in the study by Aaker and Keller, Sunde and Brodie used students in their empirical research. Aaker and Keller used a sample of 107 undergraduate students evaluating 20 brand extensions. Sunde and Brodie used 157 students (half undergraduates/half post-experience business students) and restricted the task of evaluation to nine brand extensions per respondent. Although this lowered the burden placed on the respondents, in contrast to Aaker and Keller, no test on potential for confounding from scaling effects was reported.¹

In analyzing the data Sunde and Brodie again followed Aaker and Keller, with their use of regression analysis. However, no explicit effort was made to isolate the possible influence of collinearity. As the interaction-effects introduced in the full regression model are highly correlated with the variables of which they are composed, it is hard to interpret the final results. This is reflected in the divergent results of the main-effects-only model and the full model. The same is true for the findings by Aaker and Keller, as can be deduced from a comparison between their full model and the partially reported results of their main-effects-only model.

To select the brands and extensions, Sunde and Brodie used the same criteria as Aaker and Keller, i.e., respondent relevance, high quality, strong brand image, and limited extensions before. As quality happens to be an independent variable in the theoretical model, one wonders whether selecting only high quality brands would allow the variable to show up significantly in the regression analysis. Sunde and Brodie do not mention to have looked at this problem, although in their main-effects-only regression model almost all variables do have significant values. Aaker and Keller in their comment on differences between the findings of the replication study and their own study, do not mention little variation in some of the variables as a possible explanation either.

In their comment on the replication study Aaker and Keller (1993) propose three types of possible causes for the differences between Sunde and Brodie's findings and those of their study: (1) the different brands and extensions used in both studies; (2) cultural differences; and (3) methodological differences. However, looking at the previous analysis of both studies the latter cause may be of major concern. In order to study this possibility more closely the following research questions were formulated:

¹ Only no statistically significant difference between the samples of undergraduate students and post-experienced students was reported.

Research question 1:

How may limited control for a possible scaling effect have influenced Sunde and Brodie's results?

Research question 2:

How may limited control for collinearity have influenced the results of the previous studies?

Research question 3:

How may limited variation in the values of variables (e.g. quality) have influenced the outcome of the regression analyses of the previous studies?

Through further replication research, we intend to answer these questions.

3. Research approach

For this replication study we used a Dutch data base containing information on the evaluation of 3 to 4 brand extensions for 25 brands. Both the brands and the brand extensions had been selected after a pretest among 40 marketing students checking on e.g. the variation in the quality perception of the original brand and the variation among the extensions as far as the degree of fit with the original product category of the brand was concerned. The data had been gathered by a quota sample of 151 respondents living in three city types (small, middle, large) in the Netherlands. They were also stratified according to family life cycle stages so as to match the family life cycle distribution of the Dutch population. A subset of 7 brands was selected for this research in order to match the type of brands used in the other studies (mainly non durables and brands which had not been extended broadly). Table 1 shows the brands and their extensions. The subset contained 693 cases.

Except for the variable referring to supplier difficulty in making an extension (*DIFFICULT*) all variables used in the original research by Aaker and Keller were present. The absence of this variable may not create major problems. *DIFFICULT* was only significant in Aaker and Keller's results and may have been sensitive to extensions identified as less likely in the pretest, but still included in the actual research. *DIFFICULT* may also be ambiguous as the basis upon which a respondent would make his/her decision may be a function of experience. Muthukrischnan and Weitz (1991) showed that experts and non-experts evaluate brand extensions differently because of variations in product knowledge, technology and production.

All variables were measured on rating scales similar to the previous research: the perceived quality of the extension (1 = inferior, 7 = superior); the likelihood of trying the extension (1 = extremely unlikely, 7 = extremely likely); *QUALITY*, the overall quality of the original brand (1 = inferior, 7 = superior); *TRANSFER*, the usefulness of manufacturing skills and resources in the original product class for making the extension product (1 = extremely unhelpful, 7 = extremely helpful); *SUBSTITUTE*, substitutability of the original and extension products in use (1 = extremely unlikely, 7 = extremely likely); *COMPLEMENT*, complementarity of the original and extension product classes in use (1 = extremely unlikely, 7 = extremely likely).

Table 1: Brands used in the additional replication study

| brand | original product category | extensions introduced |
|------------------------------|---------------------------|--|
| 1. van Dale 2. Kramers | dictionary | translation computer opinion magazine crossword magazine fountain pen |
| 3. Lätta 4. Zeeuws meisje | butter | cheese cake licorice bread |
| 5. Remia | mayonnaise | orange juice chips biscuit |
| 6. Kips | paté | chicken-curry salad cheese canned vegetables |
| 7. Ariël | washing powder | carpet cleaning powder desinfecting soap woolen sweater washing machine |

The same two model specifications were used as in the other studies with the exception of the variable *DIFFICULT*, as previously discussed. The first model specification included the variables *QUALITY*, *TRANSFER*, *SUBSTITUTE*, and *COMPLEMENT* (main-effects-only model). The second specification included the interaction terms of *QUALITY* with each fit variable (full model). The dependent variable for both models was the attitude towards the brand extension (*ATTITUDE*). This was measured as the mean of the perceived quality of the extension and the respondent buying intention (Cronbach = 0.88).²

² The correlations between perceived likelihood of trial and perceived quality of the extension for all three studies compare as follows: Aaker and Keller 0.67; Sunde and Brodie 0.49; this study 0.82.

A check was made on the possibility of a scaling effect, due to the fact that one respondent had evaluated more than one extension (i.e. about 18 extensions). A main-effects-only model was run both with data standardized with each subject³ and using the raw data. The regression results were almost identical ruling out the possibility that scaling effects would confound the findings.

To eliminate problems of multi-collinearity associated with the interactions in the full model, the residual centering method was applied (Lance, 1988). This method includes only the additional explanatory value of an interaction over the individual variables from which it is composed (i.e. the residual).

4. Results

The results from this replication study, that of Sunde and Brodie, and the original Aaker and Keller study show noticeable similarities and differences (see table 2).

Looking at the overall results, we note that both replication studies provide greater explanatory power due to their higher adjusted R²'s. Furthermore, when comparing the results from the main-effects-only model and those of the full model, the results of our application are more stable. Sunde and Brodie lose *TRANSFER* and *COMPLEMENT* within their full model as opposed to their main-effects-only model, while Aaker and Keller lose *COMPLEMENT* and *SUBSTITUTE* and perhaps others. The results of the other authors seem clearly influenced by multi-collinearity, whereas ours profit from the applied residual centering method.

Next we look at the results by means of the hypotheses formulated by Aaker and Keller.

Hypothesis 1: Higher quality perceptions toward the original brand are associated with more favorable attitudes toward the extension (i.e. *QUALITY* and *ATTITUDE* are positively related). Aaker and Keller found no evidence for this direct relationship, whereas both replication studies do. The latter is in line with findings of a more recent study by Keller and Aaker (1992). However, it is important to note that in this later study, Aaker and Keller pretested and manipulated the quality of the core brand (p41). The conclusion is that the hypothesis holds. In fact both replication studies show *QUALITY* to be one of the most important variables explaining the variance in attitude towards the extensions.

Hypothesis 2:⁴ The "fit" between the two involved product classes has a direct positive association with the attitude toward the brand extension (i.e. *TRANSFER*, *COMPLEMENT*, and *SUBSTITUTE* are positively related with *ATTITUDE*).

³ Each subject's mean was subtracted for each specific value for the dependent and independent variables, and this difference was divided by the standard deviation.

⁴ The hypotheses 2 and 3 of the original paper by Aaker and Keller were reversed!

Table 2: Comparison of the results of the regression model

| | Aaker & Keller | | Sunde & Brodie | | This study | |
|--------------------------------|--|------------------|---|-------------------|---|-------------------|
| | Standardised regression co-efficient | t-Value | Standardised regression co-efficient | t-value | Standardised regression co-efficient | t-value |
| Main-effects-only model | | | | | | |
| <i>QUALITY</i> | NA | NA | 0.38 | 5.3 ^a | 0.25 | 9.1 ^a |
| <i>TRANSFER</i> | 0.24 ^a | NA | 0.21 | 3.1 ^a | 0.58 | 18.9 ^a |
| <i>COMPLEMENT</i> | 0.17 ^a | NA | 0.29 | 4.2 ^a | 0.01 | 0.3 |
| <i>SUBSTITUTE</i> | 0.08 ^a | NA | 0.13 | 1.9 ^c | 0.08 | 2.7 ^a |
| <i>DIFFICULT</i> | NA | NA | 0.00 | 0.1 | OFR | OFR |
| | Adjusted R ² = 0.26 Sample size = 2140 | | Adjusted R ² = 0.48 Sample size = 1413 F-Value = 29.3 ^a | | Adjusted R ² = 0.48 Sample size = 693 F-Value = 162.1 ^a | |
| Full model | | | | | | |
| <i>QUALITY</i> | 0.01 | -0.1 | 0.67 | 3.1 ^a | 0.24 | 9.0 ^a |
| <i>TRANSFER</i> | 0.15 | 2.0 ^b | 0.16 | 0.4 | 0.60 | 19.2 ^a |
| <i>COMPLEMENT</i> | -0.02 | -0.4 | 0.24 | 0.7 | -0.00 | -0.0 |
| <i>SUBSTITUTE</i> | -0.08 | -1.0 | 0.99 | 2.4 ^b | 0.06 | 2.0 ^b |
| <i>QUALITY*TRANSFER</i> | 0.12 | 1.4 | 0.07 | 0.1 | 0.08 | 2.8 ^a |
| <i>QUALITY*COMPLEME</i> | 0.25 | 3.2 ^a | 0.05 | 0.1 | -0.02 | -0.6 |
| <i>QUALITY*SUBSTITU</i> | 0.18 | 2.1 ^b | -0.99 | -2.1 ^a | -0.07 | -2.4 ^b |
| <i>DIFFICULT</i> | 0.12 | 6.2 ^a | 0.00 | 0.00 | OFR | OFR |
| | Adjusted R ² = 0.26 Sample size = 2140 | | Adjusted R ² = 0.48 Sample size = 1413 F-Value = 19.3 ^a | | Adjusted R ² = 0.49 Sample size = 693 F-Value = 95.0 ^a | |

^a p < 0.01

^b p < 0.05

^c p < 0.10

* apparently highly significant but significance level not stated in the original paper

NA = not available

OFR = omitted from research

remark: For this study (i.e. the additional replication study) the residuals of the interactions were included and not the interactions themselves. Furthermore, given the high t-value for *TRANSFER* the main-effects-only model was also run excluding this variable. The results did not change except for a drop in R² to 50% of its current value.

The results from the main-effects-only models from both previous studies show *TRANSFER*, *COMPLEMENT*, and *SUBSTITUTE* to be statistically significant. Our results confirm these direct effects as far as *TRANSFER* and *SUBSTITUTE* are concerned, but not for *COMPLEMENT*. In fact hardly any impact of the *COMPLEMENT* variable is encountered. This is puzzling as in the other studies *COMPLEMENT* was significant at the 0.01 level. From our findings *TRANSFER* stands out as the most important variable, a result which matches the finding of Aaker and Keller. Sunde and Brodie (i.e. in their main-effects-only model) find *TRANSFER* to be the second most important variable. However, in their full model, the impact of *TRANSFER* on *ATTITUDE* has disappeared and probably picked up by other variables.

Hypothesis 3: The 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 (i.e. *QUALITY*TRANSFER*, *QUALITY*COMPLEMENT*, and *QUALITY*SUBSTITUTE* all have a positive direct effect on *ATTITUDE*).

Aaker and Keller found support for this hypothesis as both *QUALITY*COMPLEMENT* and *QUALITY*SUBSTITUTE* had a positive, significant value. Sunde and Brodie found only a high negative value for *QUALITY*SUBSTITUTE*. In their interpretation they do not go into this finding. They just point to the possible presence of high collinearity and state their regression results to be inconclusive. However, our more controlled results show a negative and significant value for *QUALITY*SUBSTITUTE* too. So, there may be reason to believe a high quality brand should not extend into products considered to be a substitute for the core product of the brand. This could imply that in the case of a high quality perception (which may be related to a high brand prestige perception), the mind-positioning is too strong and makes it difficult to gain consumer acceptance of the extension by consumers. In contrast to Aaker and Keller both replication studies do not support *QUALITY*COMPLEMENT*. However, in contrast to the previous studies our study does find support for the interaction *QUALITY*TRANSFER*. This may be caused by the fact that in our equation both *QUALITY* and *TRANSFER* have a direct effect on *ATTITUDE* of their own, whereas in the other studies *either QUALITY or TRANSFER* is significant. Apparently varying the quality of the brand and the degree of fit in combination with controlling for multi-collinearity paid off.

We conclude that there is support for hypothesis 2 for *QUALITY*TRANSFER*. For *QUALITY*SUBSTITUTE* the relationship seems to be significant, but negative. Finally, for *QUALITY*COMPLEMENT* we wish to be cautious in conclusions. In our main-effects-only model *COMPLEMENT* is not significant. This in contrast to the previous studies. Overall, we therefore believe the evidence to suggest limited support for *QUALITY*COMPLEMENT*.⁵

⁵ As mentioned before, our analyses were based on a data base which contained more brands and brand extensions. For this study a subset of brands was created taking into account the criteria used by Aaker and Keller (1990) and Sunde and Brodie (1993). However, additional analyses were run including some brands which had not been extended before but related to high involvement products (i.e. durables). These analyses do show a significant value for *COMPLEMENT*. Therefore, caution has to be taken when interpreting this specific relationship. At the same time a decrease in the t-value of *QUALITY*SUBSTITUTE* was noted.

Given the research questions, the following conclusions are drawn.

Research question 1 dealt with possible scaling effects in the results of Sunde and Brodie. We believe the evidence across all three studies to show this to be doubtful. Neither Aaker and Keller nor we could detect any scaling effects. As Sunde and Brodie had already limited the burden placed on their respondents by having them evaluate only nine extensions per person, one concludes that little or no effect should be present.

Research question 2 dealt with collinearity. A clear impact from collinearity could be seen comparing the results of the main-effects-only model and the full model of both previous studies. The results showed little stability, making the outcome of their full models hard to interpret. This in contrast to our results. Derived by the residual centering method, they were clearly more stable. All direct effects present in the main-effects-only model were retained in the full model. This would probably have been true for the full models of the other studies if they had controlled for collinearity. The additional replication study thus made a better interpretation of the previous results possible. It is found that beside *SUBSTITUTE* both *QUALITY* and *TRANSFER* have a direct effect but a joint interaction effect as well. In addition, the interaction effect of *QUALITY*SUBSTITUTE* is shown as negative for the brands we studied.⁶

Research question 3 focused on the measurement of the variables included in the model. It stated that previous research may not have proved the significance of certain variables due to little variation in their values. The results from the main-effects-only model show Sunde and Brodie to have no problem here as all variables have significant t-values, except *DIFFICULT*. For Aaker and Keller's research the picture is less clear since they do not report the full results of their main-effects-only model. However, a lack of significance for *QUALITY*, also in the main-effects-only model, is most probable for else Aaker and Keller would have surely reported it. It would have contributed to the support of their hypotheses.

5. Implications

Just like the results of Sunde and Brodie, our results are closer to the original hypotheses of Aaker and Keller than their own findings. This is reflected in the greater explanatory power of the regression results (adjusted R²'s 0.48/0.49 versus 0.26). Especially the impact of the main effects of the model was reconfirmed, except for the fit variable *COMPLEMENT*. In addition the interaction effect of *QUALITY*TRANSFER* was identified to be significant. This effect was found by neither of the previous studies. Furthermore, a negative sign was encountered for the interaction *QUALITY*SUBSTITUTE*. As Sunde and Brodie came up with the same result we may consider this to be more than a statistical artifact.

The advantage of the additional replication study is in the interpretation of the differences between the findings of Aaker and Keller, and Sunde and Brodie. We showed that the new methodology (i.e. the residual centering method) provided the key to a better understanding of the findings, due to more stable results. Analyzing the results of the main-effects-only models

⁶ see note 5.

and the full models together pointed to important similarities between all three studies. *QUALITY* and *TRANSFER* stand out as the most important variables explaining attitude towards the brand extensions. *SUBSTITUTE* is significant as well but its regression coefficient is much smaller. The role of *COMPLEMENT* seems less clear as this variable turned up significant in both previous studies but not in ours. Maybe, criteria of brand and brand extension selection beyond the ones currently applied are at stake (e.g. level of involvement). More research is needed.

The results on the interaction terms are most in line with Sunde and Brodie's findings, as *QUALITY*COMPLEMENT* is not significant and *QUALITY*SUBSTITUTE* is significant, but has a negative sign. Still, the regression coefficient of *QUALITY*SUBSTITUTE* of both replication studies differs substantially: -0.99 versus -0.07. However, as Sunde and Brodie note we must be aware of possible collinearity effecting their results.

More important to note is the general lack of increase in R^2 between the main-effects-only model and the full model of *all* three studies. It implies that although some interactions are significant they do not add to the explanatory power of the model. To improve the current model of consumer evaluation of brand extensions future research should better look for new and/or improved variables before elaborating on the interactions between *QUALITY* and the fit variables.⁷ Improvements in measuring the quality of the brand by including the prestige of the brand (Park *et al.*, 1991) and elaborating on the attitude towards the extension concept may be considered (c. Sunde and Brodie, 1993).

Beside differences in analytical methods used, Aaker and Keller (1993) mention differences in the choice of brands and extensions (c. Boush and Loken, 1991) as well as cross-cultural effects as possible causes of different results. However, looking at the findings of the three studies, the similarities stand out. This suggests the impact of the data collection across countries and of different brands and extensions used (within the boundaries of the selection criteria applied), to be limited. Moreover, it suggests the underlying construct of the model to be relatively robust for this kind of variations.

The limited influence of culture, brands and extensions on the model may also be true for the variable difficult to make (*DIFFICULT*), which was omitted from our research. In their discussion on the comparison of their own findings and those of Sunde and Brodie, Aaker and Keller especially point to the impact of cultural differences on the variable *DIFFICULT*. As discussed earlier, turning this variable into a less ambiguous one (c. Muthukrischnan and Weitz, 1991) and controlling the research conditions more adequately may already generate different results which may add to the interpretation of the differences in the findings of Aaker and Keller, and those of Sunde and Brodie. To test the real cultural impact, multinational brands should be selected.

⁷ We would like to thank Louis P. Bucklin for his helpful comments on a previous version of this paper.

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