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A Single-Item Measure Approach to Consumer-Based Brand Equity Based on Evolutionary Psychology and Neuroscience

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Abstract

This report suggests a single-item measure, the so-called BE_AB index, of consumer-based brand equity (CBBE) with the aim of capturing this index to control a brand in the long run, particularly in light of competing brands. This approach is inspired by aspects from evolutionary psychology (EP) and neuroscience (NS). The empirical data (N=299 subjects) support an equal level of validity as the already approved CBBE model of Yoo & Donthu(2001), and the steps to prove the content validity of the BE_AB model are in line with those published by them. In addition, a structural equation model was used to assess the validity of the new measurement model, further supporting the developed model. Overall, the CB_AB index appears to be an acceptable new option for measuring CBBE holistically.

Keywords: Brand Equity; Evolutionary Psychology; Neuroscience, Single-item measurement

1. Introduction

There is broad consensus among practitioners and academics that brand equity can be used to control the success of marketing activities over time (Keller, 2007). The question remains, however, of how to measure brand equity (BE). In identifying an appropriate measurement model for brand equity, two basic approaches have been established. One focuses on the financial aspects of brand equity (Farquhar, 1989; Simon & Sullivan, 1993). The second approach focuses on the consumer perspective, the so-called consumer-based BE (CBBE), which encompasses all of the questions about how to obtain a consumer-oriented value proposition (VP) (Farquhar, 1989; Lassar, Mittal, & Sharma, 1995). This report is only focused on the measurement of CBBE. Empirical attempts to measure CBBE can be classified into two approaches. If the purpose of the measurement is to analyze all of the different CBBE drivers for the sake of deriving measures for improvement, then the construct needs to be captured in all its facets (Homburg & Giering, 1996). However, if the intention is to control a brand in the long run, particularly in comparison to competing brands, an aggregated CBBE value would be appropriate (Ambler, 2003). In this case, it is particularly important that the measurement model be simple to use and as parsimonious as possible. If not, an empirical survey may become impractical due to the length of the questionnaire, which is likely to lead to unanswered or rather arbitrarily answered questions, both of which will reduce the validity of the results (Dolbier, Webster, McCalister, Mallon, & Steinhardt, 2005). For the sake of practicality, this report suggests a new easy-to-use and easy-to-understand CBBE single-item measurement model that is as valid as already approved models and is thus well applicable for the controlling purposes, especially for practitioners. The theoretical principles of this model are based on findings from evolutionary psychology (EP) and aspects of neuroscience (NS), which are outlined in the following section.

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1.1 Theoretical aspects of this Measurement Approach

Each organism tries to both survive and reproduce itself. This urge toward survival and reproduction is an evolutionary process identified by Darwin Charles(1859). In line with this reasoning, it is only logical that the goal of all organisms is to grow old healthily and to keep their reproductive capacities. All these behaviors that were particularly advantageous in past for increasing survival and reproduction have proven to be valuable and have been passed on from generation to generation. These experiences finally resulted in a genetic adaptation that helps us and our offspring optimize survival and reproduction (Buller, 2005; Marks & Nesse, 1994). These adaptations allow humans to recognize and to react to threats quickly(Green & Phillips, 2004; Nesse, 1990; Öhman, Flykt, & Esteves, 2001). This responsiveness is facilitated by the release of neurotransmitters that provide energy for escaping or possibly engaging in a fight (Cohen & Wills, 1985; Taylor et al., 2000). People have developed similar innate response patterns toward objects (in this report, these are human beings, animals, items, or even symbols) that facilitate life, such as budding trees, green meadows, and ripe fruit (Orians & Heerwagen, 1992), or whenever one realizes that he or she is part of a social group, because the formation of collaborative alliances is one of the crucial elements in human evolution (Cosmides & Tooby, 1992). Apart from these innate reaction patterns that help us survive, it is necessary to find an appropriate reproduction partner. For this purpose, humans face two challenges: Someone needs to be perceived as a selectable partner and he or she has to filter an appropriate partner out of a variety of possibilities. This selection process is based on a perception of a potential partner that corresponds with his or her ability to survive in a hostile and competitive environment and on whether he or she is willing to take care of the offspring. Thus, being healthy, strong, powerful, and possessing the willingness to invest in the partner's and offspring's life are indicators of whether a mate meets these requirements. In contrast, being weak, ill, feeble, and self-interested indicates the opposite (Buss, 2009; Fetchenhauer & Bierhoff, 2004; Saad, 2013). To assess whether a potential partner has sufficient capabilities for survival and qualities for successful common breeding, humans depend on various signals which are important cues to gain an archetypical perception of certain mates(Bliege Bird & Smith, 2005). These signals are related to (1) physical appearance, such as full lips, smooth and firm skin, a favorable fat distribution, symmetrical face, and athletic abilities, which point to a person's reproductive value (Buss & Schmitt, 1993; Gangestad & Thornhill, 1997; Nesse, 1990; Symons, 1989); (2) the availability of resources, such as nutriment (Buss, Shackelford, Kirkpatrick, & Larsen, 2001); and (3) behavioral aspects, such as the extent to which a potential mate behaves cooperatively and altruistically, which are both indices of willingness to invest in a partnership and offspring (Buss, 1989; Buss et al., 1990).

In addition to these innate aspects, mankind learns to assess objects and situations according to the principle of reward and punishment. While a positive effect of this principle is enhanced quality of life resulting in increased well-being, a negative effect lies in decreased quality of life, leading to pain and/or negative emotions. Consequently, when confronted with a certain object, the brain automatically assesses such objects and triggers reactions that are both innate and based on personal experiences and observations. In the event of an overall positive assessment, such an object and the situation in which the object occurs is liked. Hence, future perceptions of such, or similar, objects or corresponding situations are considered particularly attractive and effective in obtaining an individual "incentive salience" leading to appetency and a longing to repeat this experience (Berridge & Robinson, 1998; Birbaumer & Schmidt, 2006). In the event of an overall negative assessment, such an object and the corresponding situation are disliked. Therefore, such objects are allocated an individually negative value, which leads to an inherent aversion to the objects and situation (Damasio & Carvalho, 2013). So it can be assumed that each individual develops a holistic positive or negative affect toward objects that reflect the initial archetypal assessment moderated by previous personal experiences with them. Thus, it appears plausible that the same mechanisms are activated when brands are perceived. In the event of unknown brands, the ostensible assessment is derived from the overall appearance. This means that a brand incorporates certain cues (such as an outstanding design) that appear to be surrogates for power, competence, youthfulness, etc. This, as a result, tends to increase the status or social prestige of the consumer who possesses such a branded product (O'Cass & McEwen, 2004). Consequently, a person could be spontaneously affected even by unknown brands. On this note, if a consumer is already familiar with a brand, then this intuitive assessment is superimposed by all of the cues that have led to brand knowledge (e.g., advertisement and/or product and brand experience).

Overall, people gain an intuitive and holisticaffection for or refusal to a certain brand. This leads to the hypothesis that CBBE can be easily measured with the following approach: “Please indicate spontaneously how affected or unaffected you are by this brand.” [Response scale: "+3= highly affected” to “-3=absolutely unaffected”] Transferred to marketing terminology, this question measures the VP of a brand as perceived by a customer (Kotler & Bliemel, 2001). To take into account all of the competing brands within an industry, the USP is of significant importance (Levitt, 1986; Reeves, 1961). As illustrated in the next section, this value can be easily calculated from the different measured brand values and subsequently condensed into the so-called Brand-Equity_Affection-Based index (BE_AB index).

1.2 Calculation of the BE_AB index

First, the BE_AB index is calculated with fictitious data consisting of four “competing brands”, called "A", "B", "C", and "D", and four respondents (Subjects 1 to 4). The assumed answers of the request “Please indicate spontaneously how affected or unaffected you are by this brand” are shown in table 1. To unify all calculations, it is recommended that the scale be transcoded from “+3 to -3” to “+6 to 0”. Thus, this value represents the perceived VP. Subsequently, all brand difference values (DVs) have to be computed. For example, the difference between brand “A” and brand “B” for subject 1 is DV_AB = "VP brand A" minus "VP brand B"=6-0=6. This step has to be performed for all subjects and brands. In the next step, all calculated DVs must be summarized to an accumulated brand affection value. This value, calculated per subject, corresponds to the individually perceived USP (USP$_{ind}$), e.g., for subject 1: USP$_{ind}$=DV_AB+DV_AC+DV_AD = 6+3+2=11.00 (see table 1).All of the USP$_{ind}$ values have to be averaged over all subjects to obtain the USP$_{total}$ of a brand (e.g., for brand “A”: 11.00+6.00+3.00+1.00=21.00; USP$_{total}$ = 21/4=5.25). To interpret the USP$_{total}$ and VP better and to do so independently of the used scale, it is recommended that the USP$_{total}$ be expressed as a percentage that leads to the USP index. On a scale of “+6 to 0”, the maximum possible difference is +6 or -6. In the event of four brands, a value of +18 (=100%) or -18 (=0%) can be theoretically reached. Accordingly, the percentage of USP$_{total}$=5.25 results in 64.58% (=USP index). Similarly, the VP index is the percentage of the average VP values (VP index=75.00%). These two values could be seen as formative indicators for BE_AB index (see figure 1). To obtain a single value for long term comparisons, the VP index and the USP index can be condensed by means of arithmetic averaging. [e.g., for subject 1: BE_AB index = (VP index+USP index)/2=64.58+75.00=69.79]

Raw data from the questionnaire
[Original Scale: +3 … -3]

Subject 1	Brand Affection Value (=VP)
Brand A	3
Brand B	-3
Brand C	0
Brand D	1

Subject 2	Brand Affection Value (=VP)
Brand A	2
Brand B	1
Brand C	1
Brand D	-2

Subject 3	Brand Affection Value (=VP)
Brand A	1
Brand B	1
Brand C	-1
Brand D	0

Subject 4	Brand Affection Value (=VP)
Brand A	0
Brand B	-2
Brand C	1
Brand D	0

Raw data from the questionnaire
[New Scale: +6 … 0]

Subject 1	Brand Affection Value (=VP)
Brand A	6
Brand B	0
Brand C	3
Brand D	4

Subject 2	Brand Affection Value (=VP)
Brand A	5
Brand B	4
Brand C	4
Brand D	1

Subject 3	Brand Affection Value (=VP)
Brand A	4
Brand B	4
Brand C	2
Brand D	3

Subject 4	Brand Affection Value (=VP)
Brand A	3
Brand B	1
Brand C	4
Brand D	3

Table 1: Left side: Exemplary raw data (Scale: +3=highly affected … -3=Absolutely Unaffected). Right side: Exemplarily calculation of the BE_AB index

2. Study Design and Results

To test our model, all full-time and part-time students from the University XXX (N = app. 1.400) were invited via e-mail to fill out an online questionnaire, which resulted in N=299 completed questionnaires (157 women and 142 men). The mean age of the participants was M=25.76 years (range 18-56 years; SD=5.932). Each respondent evaluated eight brands in two different industries (four brands from the Austrian beer industry and four from the Austrian textile and clothing industry). Additionally, for the sake of validation, the four indicator questions from the OBE model of Yoo & Donthu(2001)were answered for one specific brand in each chosen industry. First, the VP, USP, and BE_AB indices were calculated as described. Then, the averaged OBE values were computed for each industry separately. All of the results are provided in table 2.

Industry	VP index	USP index	BE_AB index	OBE
Beer	M=59.66 (SD=31.67)	M=51.81 (SD=15.37)	M=55.74 (SD=22.27)	M=59.46 (SD=26,50)
Textile	M=37.89 (SD=25.44)	M=41.94 (SD=11.22)	M=39.91 (SD=16.83)	M=25.83 (SD=19,46)

Table 2: Absolute Values of the Different Indices

Now the question remains whether the suggested measure of BE_AB index correlates closely with the accepted measure of Yoo & Donthu(2001) and how the PLS path models, as suggested by Hair, Ringle, & Sarstedt(2011), fit the empirical data (see figure 1). For the path model estimation, the software application SmartPLS version 2.0 was applied (Ringle, Wende, & Will, 2005).

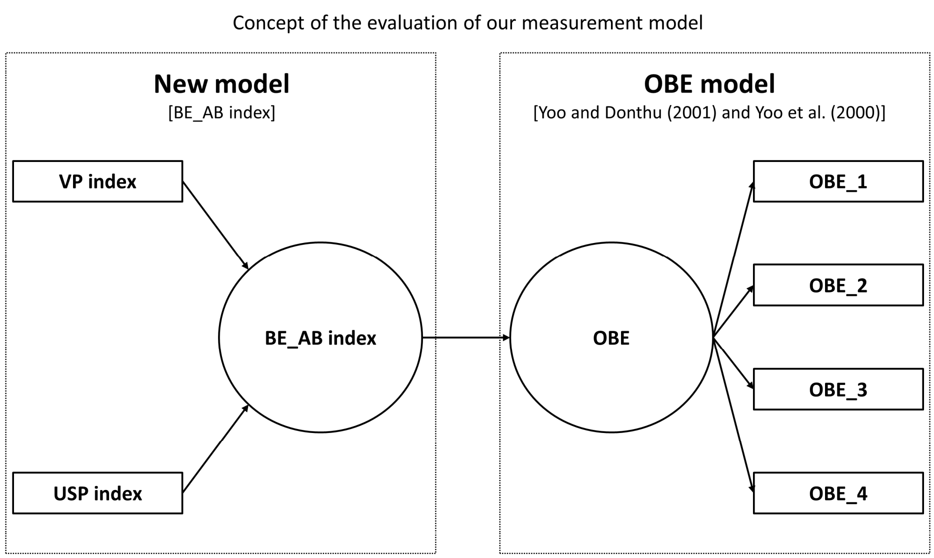

Figure 1: Path Model for the Model Validation

Figure 2 provides the loadings, weights, and path coefficients with all of the corresponding t-values of the estimation.

The goal of the estimation via PLS is to explain the variance of the endogenous variable (=OBE) to determine whether this BE_AB approach to measuring CBBE leads to comparable results. The present research identified R^2 values of 0.485 (beer-industry) and 0.312 (textile and clothing industry), which indicate a moderate and a weak effect (Hair et al., 2011), respectively. The correlations between the OBE and BE_AB indices were 0.632 and 0.502 ($p<0.0001$) for the beer and textile industries, respectively. These results also support the convergent validity of the BE_AB index, as in the publication by Yoo & Donthu (2001).

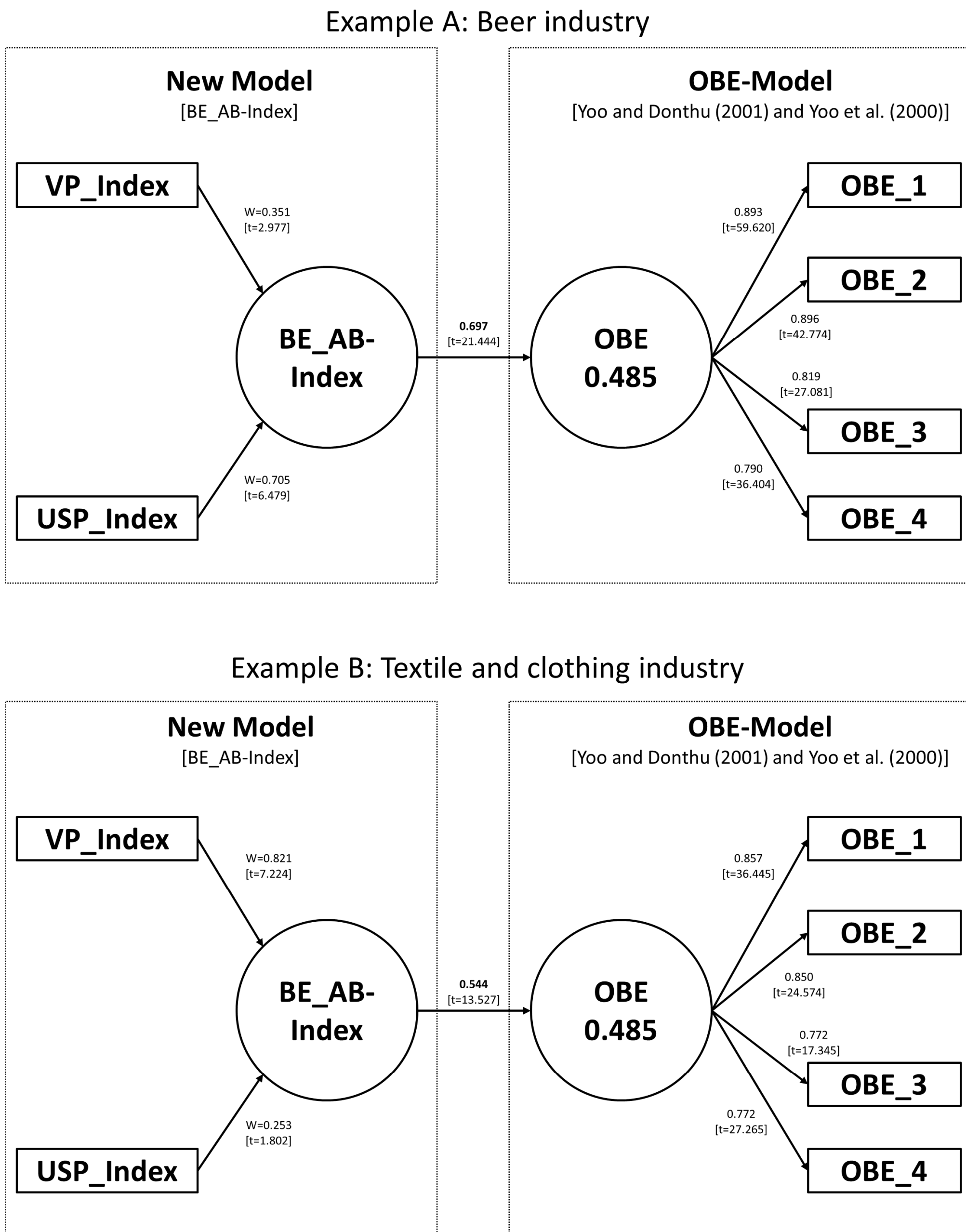

Figure 2: Parameter of the Estimation from the beer Industry and the Textile and Clothing Industry

3. Discussion

This report describes a methodologically simple way to measure CBBE validly. The empirical data support the assumption that the suggested BE_AB single-item model leads to results that are as good as those obtained from measurement models with many indicators. The central argument made here is based on consumers' innate ability to automatically assess objects that result in a certain affection or aversion which can be easily captured.

However, the major added value of the BE_AB index lies in its simplicity and in the lack of applicable models for business (see literature reviews for diverse CBBE models provided by Christodoulides & De Chernatony(2010) and Shankar, Azar, & Fuller(2008)).

Most of the existing CBBE models have been developed to analyze a single brand in a single category. In cases where many brands have to be considered at the same time, existing models may be inappropriate. If someone wants to measure a CBBE index in an industry with five competitive brands and he or she draws on the OBE model with the four indicator questions, then the number of questions is four times higher than that of the suggested BE_AB model. This overload of questions is likely to lead to problematic responses while at the same time decreasing the validity of the results (Dolbier et al., 2005; Stanton, Sinar, Balzer, & Smith, 2002). If this issue is ignored, the probability of the results being arbitrary is high despite the use of validated measurement models. A further aspect serves as a strong argument for a single-item measurement model. That is, to fully validate a measurement model based on conventional fit measures, at least four indicators per construct are required (Bagozzi & Yi, 1988; Jöreskog & Sörbom, 1982). This point is particularly crucial because it is often difficult to find a sufficient number of reflective indicators that capture truly different aspects of a construct (Hair et al., 2011). Consequently, it is often the case that semantically very similar questions are formulated to fulfill statistical requirements rather than gain additional insights. Thus, the questionnaire is artificially extended, and the likelihood of random answers is enormous (Rossiter, 2002; Stanton et al., 2002). A closer look at the model of Yoo & Donthu(2001) allows for critical analysis on whether these questions are semantically different enough to measure CBBE without any confounding effects. In other words, is it realistic that randomly selected subjects of a target group really differentiate among these four questions?

1. OBE1. It makes sense to buy X instead of any other brand, even if they are the same.
2. OBE2. Even if another brand has the same features as X, I would prefer to buy X.
3. OBE3. If there is another brand as good as X, I prefer to buy X.
4. OBE4. If another brand is not different from X in any way, it seems smarter to purchase X.

Hence, it is legitimate to consider whether the suggested single-item model or the OBE model leads to more valid results. For the sake of obtaining an overall CBBE value - and this is the intention of the BE_AB model - Rossiter(2002) explicitly stated that a single-item measurement is certainly valid and that the combination of similar items lowers the validity. In this context, the received R^2 values of 0.485 (beer-industry) and 0.312 (textile and clothing industry) of the PLS path model can be seen from a different angle. It may be speculated that the moderate and weak R^2 values are a result of the OBE model rather than of the BE_AB model. If analysis of the variety of different antecedences of CBBE is required, a more elaborate CBBE measurement model is indisputably necessary. In such a case, the researcher must focus on already validated models (see, e.g., Lassar et al.(1995), Park & Srinivasan(1994), Shankar et al. 2008) and Yoo & Donthu (2001)).

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