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GDAŃSK UNIVERSITY OF TECHNOLOGY
FACULTY OF MANAGEMENT AND ECONOMICS

THE EFFECT OF SOCIAL-MEDIA COMMUNICATION ON CONSUMER PERCEPTIONS OF BRANDS

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GUT Faculty of Management and Economics

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The Effect of Social-Media Communication on Consumer Perceptions of Brands

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Abstract

Researchers and brand managers have limited understanding of the effects of firm-created and user-generated social media communication on brand equity, brand attitude, and purchase intention. Thus, we investigated 504 Facebook users using a standardized online survey across Poland. To test the proposed model, we analyzed 60 brands across three different industries: non-alcoholic beverages, clothing, and mobile operators. In the data analysis, we applied the structural equation modeling technique. The results of our empirical studies showed that user-generated social media communication had a positive influence on brand equity and brand attitude. In addition, the analysis indicated that firm-created social media communication affected only brand attitude. Both brand equity and brand attitude showed a positive influence on purchase intention. Moreover, measurement invariance was assessed using a multi-group structural modeling equation. The findings revealed that the proposed model was invariant across the researched industries.

Keywords: social-media; brand equity; brand attitude; purchase intention; Facebook

JEL: M31; M39; D83

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1. Introduction

In recent years, brand management has been confronting two opposite tendencies: the loss of brand authenticity and the increasing influence of empowered consumers on brand communications (Burmam and Arnhold 2008). The social Web is changing traditional marketing communications. Traditional brand communications that were previously controlled and administered by brand and marketing managers are gradually being shaped by consumers.

The rapid growth in the popularity of social media platforms in recent years has raised the question of whether this phenomenon has reduced marketers' control of brand management (Berthon et al. 2007). During the social media age, knowledge of both the influence of firm-created communication on consumer perceptions of brands and the influence of consumer online content creation on brands is important (Berthon, Pitt, and Campbell 2008; G. Christodoulides 2009).

Social media platforms offer an opportunity for customers to interact with other consumers; thus, companies are no longer the sole source of brand communication (Li and Bernoff 2011). Moreover, consumers are increasingly using social media sites to search for information and turning away from traditional media, such as television, radio, and magazines (Mangold and Faulds 2009).

This article is part of a large study that aims to fill a gap in the literature with respect to understanding the effects of firm-created and user-generated communication on social media, a topic of relevance as evidenced by Villanueva, Yoo and Hanssens (2008), Taylor (2013) and many other recent papers (George Christodoulides, Jevons, and Bonhomme 2012; Smith, Fischer, and Yongjian 2012). Moreover, we aim to compare the effects of social media communication, as they differ significantly in terms of company control. Thus, we form two research objectives that are relevant for companies, brand managers, and scholars (Godes and Mayzlin 2009; Kozinets et al. 2010; Dellarocas, Zhang, and Awad 2007):

- (1) To investigate the effects of firm-created and user-generated social media communication on brand equity, brand attitude, and brand purchase intentions.
- (2) Juxtaposition concerning the effects of social media communication on brand equity, brand attitude, and brand purchase intentions in different industries.

This paper is organized as follows. The first section presents a literature review supporting the conceptual framework and the hypotheses of this study. The second section presents the research methodology used in this study, our data sources, and our estimations. In the third section, we introduce the outline for the quantitative empirical analysis that is used to verify the hypotheses, in addition to the cross-validation of the suggested model across the industries under investigation. The final section provides a summary and discussion of the empirical findings with implications for managers and executives. This article also includes recommendations for further research.

2. Conceptual framework and hypothesis development

Firm-created social media communication

The domination of Web 2.0 technologies and social media has led Internet users to encounter a vast amount of online exposure, and one of the most important is social networking. Social networking through online media can be understood as a variety of digital sources of information that are created, initiated, circulated, and consumed by Internet users as a way to educate one another about products, brands, services, personalities, and issues (Chauhan and Pillai 2013). Companies are now aware of the imminent need to focus on developing personal two-way relationships with consumers to foster interactions (Li and Bernoff 2011).

Furthermore, social media offer both companies and customers new ways of engaging with one another. Marketing managers expect their social media communication to engage with loyal consumers and influence consumer perceptions of products, disseminate information, and learn from and about their audience (Brodie et al. 2013).

In contrast to traditional sources of firm-created communication, social media communications have been recognized as mass phenomena with extensive demographic appeal (Kaplan and Haenlein 2010). This popularity of the implementation of social media communication among companies can be explained by the viral dissemination of information via the Internet (Li and Bernoff 2011) and the greater capacity for reaching the general public compared with traditional media (Keller 2009). Additionally, Internet users are turning away from traditional media and are increasingly using social media channels to search for information and opinions regarding brands and products (Mangold and Faulds 2009; Bambauer-Sachse and Mangold 2011).

User-generated social media communication

The Internet and Web 2.0 have empowered proactive consumer behavior in the information and purchase process (Burmam and Arnhold 2008). In the information era, customers make use of social media to access the desired product and brand information (Li and Bernoff 2011). The growth of online brand communities, including social networking sites, has supported the increase of user-generated social media communication (Gangadharbatla 2008). User-generated content (UGC) is a rapidly growing vehicle for brand conversations and consumer insights (George Christodoulides, Jevons, and Bonhomme 2012).

Because of its early stage of research, there is still no widely accepted definition for user-generated content (OECD 2007). According to the content classifications introduced by Daugherty and colleagues (2008), UGC is focused on the consumer dimension, is created by the general public rather than by marketing professionals and is primarily distributed on the Internet. A more comprehensive definition is given by the Organisation for Economic Co-Operation and Development (OECD 2007): “i) content that is made publicly available over the Internet, ii) content that reflects a certain amount of creative effort, and iii) content created outside professional routines and practices”.

Past studies of user-generated content suggested that consumers contribute to the process of content creation for reasons such as self-promotion, intrinsic enjoyment, and desires to change public perceptions (Berthon, Pitt, and Campbell 2008). In this study, we focused on brand-related UGC, also known as user generated branding (Burmam and Arnhold 2008), concentrating solely on content generated by Facebook users, in an attempt to enrich the current literature on this topic.

Brand equity

The conception of brand equity is a key marketing asset (Styles and Ambler 1995) that can produce a relationship that differentiates the bonds between a firm and its public and that nurtures long-term buying behavior (Keller 2013). The understanding of brand equity and its growth raises competitive barriers and drives brand wealth (Yoo, Donthu, and Lee 2000). Although extensive research has been dedicated to the field of brand equity, the literature on this subject is fragmented and inconclusive (George Christodoulides and De Chernatony 2010).

Thus far, the measurement of brand equity has been approached from two major perspectives in the literature. Some researchers have focused on the financial perception of brand equity (Simon and Sullivan 1993), whereas other scholars have emphasized the customer-based perspective (Aaker 1991; Keller 1993; Yoo and Donthu 2001). Therefore, the dominant stream of research has been grounded in cognitive psychology, focusing on memory

structure (Aaker 1991; Keller 1993). According to Aaker (1991, 15), brand equity can be defined as “a set of brand assets and liabilities linked to a brand, its name and symbol that add to or subtract from the value provided by a product or service to a firm and/or to that firm’s customers”. An alternative concept of consumer-based brand equity was developed by Keller (1993, 02), who defined “the differential effect of brand knowledge on consumer response to the marketing of the brand”. Keller emphasized that brand equity should be captured and understood in terms of brand awareness and in the strength, favorability and uniqueness of brand associations that consumers hold in memory. Thus, consumer-based brand equity (CBBE) can be understood as a concept that predicts that consumers will react more favorably to a branded product than to an unbranded product in the same category (D. A. Aaker 1991; K. L. Keller 1993; Yoo, Donthu, and Lee 2000).

For the purpose of this study, we chose to focus on the cognitive perspective of brand equity, as it is considered the driving force of increased market share and profitability of brands and is strictly based on consumer perceptions.

Brand attitude

According to Mitchell and Olson (1981), brand attitude is defined as a “consumer’s overall evaluation of a brand”. Brand attitude is frequently conceptualized as a global evaluation that is based on favorable or unfavorable reactions to brand-related stimuli or beliefs (Murphy and Zajonc 1993) and is cited as a central component to be considered in consumer-based brand equity and relational exchanges (Lane and Jacobson 1995; Morgan and Hunt 1994).

Multiattribute attitude models (I. Ajzen and Fishbein 1980) postulate that the overall evaluation of a brand is a function of the beliefs about specific attributes of the brand/product. The addition of brand attitude to the conceptual framework proposed in this study aims to enhance our understanding of the effects of social media communication on consumer perceptions of brands.

Effects on brand equity

A consumer’s process of information acquisition relies on both external and internal information sources that together influence his or her overall brand equity judgments and brand choices (Beales et al. 1981). Following the schema theory of Eysenck (1984), a traditional theoretical foundation of the relationship between communication and brand equity, we expect the two forms of social media communication to directly affect brand equity and brand attitude. The framework illustrates that consumers compare communication stimuli with their stored knowledge of comparable communication activities. The level of fit influences subsequent communication stimuli processing and the attitude formation of consumers (Goodstein 1993).

Brand communication positively affects brand equity as long as the message creates a satisfactory customer reaction to the product in question compared to a similar non-branded product (Yoo, Donthu, and Lee 2000). Moreover, communication stimuli cause a positive effect in the consumer as a recipient; therefore, the perception of communication positively affects an individual’s awareness of brands (Bruhn, Schoenmueller, and Schäfer 2012). Previous studies have also indicated that branding communication leverages brand equity by increasing the probability that a brand will be incorporated into a customer’s consideration set, thus assisting in the process of brand decision making and in the process of the choice becoming a habit (Yoo, Donthu, and Lee 2000). Furthermore, in their study of social media campaigns, Li and Bernoff (2011) underscored the features that appeal to consumers to generate brand benefits. Therefore, firm-created social media communication should be perceived by individuals as advertising and arousing brand awareness and brand perception

(MacInnis and Jaworski 1989). Consequently, we assume that a positive evaluation of firm-created social media brand communication will positively influence brand equity. Thus, we have formulated the following hypothesis:

H1a. Firm-created social media communication positively influences brand equity.

The degree of personal relevance and importance of a user-generated social media stimulus is reflected by the level of involvement with a brand (George Christodoulides, Jevons, and Bonhomme 2012). UGC involvement can be considered a form of involvement with products and brands because brand-related UGC is a consumption-related activity (Muntinga, Smit, and Moorman 2012).

Regarding the effect of user-generated social media communication on brand equity, it must be recognized that UGC is not generally guided by marketing intervention or company control (George Christodoulides and Jevons 2011). Positive user-generated content carry information about a product/brand that can be particularly useful for customers in terms of consumer-based brand equity. Moreover, the effects of UGC on social media can lead to an increase in one's brand awareness and brand associations, thus influencing the overall evaluation of a brand. Consequently, we hypothesize as follows:

H2a. User-generated social media communication positively influences brand equity.

Substantial empirical research indicates that brand attitude influences customer evaluations of brands (Aaker and Keller 1990). Therefore, extensions of brand awareness and positive associations should generate greater revenues and savings in marketing costs and should thus create higher profits than those of less liked brands (Keller 2013). In addition to specific brand attributes, strong brand association can lead to an overall brand attitude (Aaker and Keller 1990).

Brand attitude is based on product attributes such as durability, defects, serviceability, features, performance, or "fit and finish" (Garvin 1984). However, brand attitude may also contain affect that is not captured in measurable attributes, even when a large set of characteristics is included. Brand researchers building multiattribute models of customer preference have included a general component of brand attitude that is not explained by the brand attribute values (Srinivasan 1979). Assuming that positive brand evaluations of consumers can reflect perceptions of exclusivity, which contribute to brand equity, we present the following hypothesis:

H3. Brand attitude positively influences brand equity.

Effects on brand attitude

There is a recognized consensus that communication between customers is an influential source of information transmission (Dellarocas, Zhang, and Awad 2007). Because of the development and expansion of social media, communication between individuals who are not acquainted has accelerated (Duan, Gu, and Whinston 2008). In this context, Li and Bernoff (2011) showed that social media channels are a cost-effective alternative to incite peer-to-peer communication. Furthermore, consumer-to-consumer conversations were found to be an important driver of outcomes for companies (Burmans and Arnhold 2008).

We expect firm-created and user-generated social media communication to positively influence brand attitude. According to Ajzen and Fishbein (1975), attitude constitutes a multiplicative combination of the brand-based associations of attributes and benefits based on the assumption that brand attitude is influenced by brand awareness and brand image.

Concerning the influence of brand awareness on brand attitude, the ambiguity of the effect of social media communication on brand awareness must be considered. Because firm-created social media communication is intended to be positive and to increase brand awareness (Li and Bernoff 2011) and because positive user-generated social media communication, thus also increase brand awareness and brand associations (Burmam and Arnhold 2008), we present the following hypotheses:

- H1b. Firm-created social media communication positively influences the brand attitudes of consumers.
- H2b. User-generated social media communication positively influences the brand attitudes of consumers.

Effects on purchase intention

To assess the behavioral influences of social media communication on brand equity and on brand attitude among Facebook users, we added brand purchase intention to the conceptual model. We expect that both brand equity and brand attitude to positively influence the brand purchase intentions of consumers.

Previous studies have suggested that high levels of brand equity drive permanent purchase of the same brand (Yoo and Donthu 2001). Loyal customers tend to purchase more than moderately loyal or new costumers (Yoo, Donthu, and Lee 2000). A positive attitude toward a brand influences a customer’s purchase intention (Keller and Lehmann 2003). In addition, more positive costumer perceptions of the superiority of a brand are associated with stronger purchase intentions (Aaker 1991). Thus, we hypothesize as follows:

- H4. Brand attitude positively influences purchase intention.
- H5. Brand equity positively influences purchase intention.

A proposition of the conceptual framework is summarized in Figure 1.

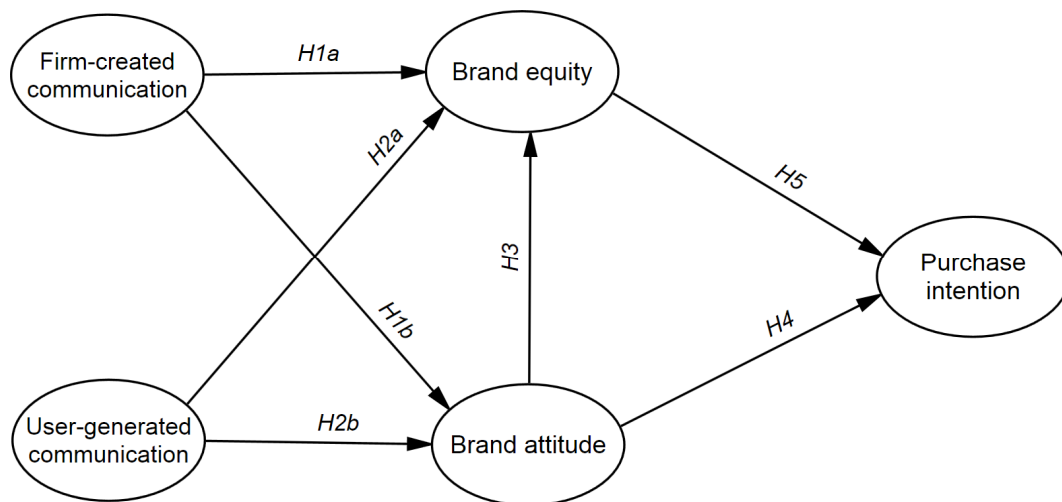


Figure 1. Proposed conceptual framework

3. Research methodology

To test the framework presented in Figure 1, we collected data using a standardized online survey on Facebook. Three product categories were chosen to examine the influence of brand

communication on consumer responses. The product categories were non-alcoholic beverages, clothing, and mobile operators. This selection was based on considerations regarding relevance and variance criteria. A total of 60 brands were analyzed.

Construct equivalence was considered during the selection process (Hair Jr. et al. 2010). The product categories are familiar and well known to Polish social media users. For each category, the respondent indicated a brand that he or she has “Liked” on Facebook. We assume that consumers have been exposed to social media communication from both companies and users from brands that they have “Liked” on Facebook. The product categories and wide gamma of brands also reflect an extensive set of consumer products and provide research generalizability.

A link to the questionnaire was available online for four weeks from March 5 to April 4, 2013. The empirical study used the same questionnaire items for all product categories. The only differences between the questionnaires were the product categories and brand names. The questionnaire was administered in Polish. As recommended by Craig and Douglas (2000), a back-translation process was employed to ensure that the items were translated correctly. As a requisite for the study, the respondents needed to receive news feeds both from the company and from other users with respect to the brand that they had previously “Liked” on the social network site. Each respondent completed one version of the questionnaire evaluating only one brand.

A total of 523 questionnaires were completed. Invalid and incomplete questionnaires were rejected, resulting in 504 valid questionnaires. The profile of the sample represented the members of the Polish population who use social media frequently (SoTrender 2012). Females represented 59.9 percent of respondents. The majority of the respondents were young people, 78 percent were 15 to 25 years old, 20 percent were 26 to 35 years old, and the remainder were 36 to 55 years old. Considering the level of education of the researched sample, 33 percent of the respondents had completed at least some college education, 27 percent had received a high school diploma, and the remainder had obtained a secondary school certificate. Their total monthly household income ranged from ~300 USD to ~810 USD for 25.9 percent of the sample, an income from ~810 USD to ~1460 USD for 29.8 percent, and an income above ~1460 USD for the remainder of the sample.

The items used in this research were adapted from relevant literature and measured using a seven-point Likert scale ranging from 1 for "strongly disagree" to 7 for "strongly agree" (Aaker, Kumar, and Day 2007). Brand equity was measured using the four-item overall brand equity scale adopted from Yoo and Donthu (2001). This scale measures the added value of a branded product in comparison with an unbranded good with the same characteristics. Brand attitude was measured using three items adapted from the works of Low and Jr (2000) and Villarejo-Ramos and Sánchez-Franco (2005). Purchase intention was measured using three items adapted from the research of Yoo, Donthu, and Lee (2000) and Shukla (2011). Finally, firm-created and user-generated social media communication were measured using four items adopted from Mägi (Mägi 2003), Tsiros et al. (2004), and Schivinski and Dabrowski (2013). The complete list of items can be found in Table I of Appendix A.

4. Results

Measurement and structural model

To ensure the reliability, dimensionality and validity of the measures, multi-item scales were evaluated using exploratory and confirmatory techniques. We utilized reflective measurements to evaluate the conceptual model (Edwards and Bagozzi 2000).

To assess the initial reliability of the measures, we employed Cronbach's alpha and exploratory factor analysis (EFA) with varimax rotation on each scale. The Cronbach's alpha values for all constructs were above 0.70. The alpha coefficients ranged from 0.92 to 0.97. Subsequently, an EFA was performed to explore the dimensionality of each construct. All of the items loaded on a single factor, suggesting that user-generated social media communication, firm-created social media communication, brand equity, brand attitude, and brand purchase intentions are unidimensional. All factor loadings exceed the 0.70 threshold, and there was no evidence of cross-loadings (B. Byrne 2010). One item that was used to measure brand equity was excluded from the analysis because of a low loading value (0.62).

To establish convergent and discriminant validity, we used composite reliability (CR), average variance extracted (AVE), maximum shared squared variance (MSV), and average shared squared variance (ASV) (Hair Jr. et al. 2010). The CR values ranged from 0.92 to 0.97, which exceeded the recommended 0.70 threshold value (Bagozzi and Yi 1988). The AVE values were higher than the acceptable value of 0.50 (Fornell and Larcker 1981), ranging from 0.87 to 0.95. All of the CR values were greater than the AVE values (B. Byrne 2010). The values for MSV and ASV were lower than the AVE values, thus confirming the discriminant validity of the model (Hair Jr. et al. 2010). The convergent and discriminant validity values are presented in Table II.

All independent and dependent latent variables were included in one single multifactorial confirmatory factor analysis model in AMOS 21.0. The CFA was performed using the maximum-likelihood estimation. During CFA, the model demonstrated a good fit. The chi-square/df (cmin/df) value was 2.24, the comparative fit index (CFI) value was 0.98, the adjusted goodness-of-fit index (AGFI) value was 0.92, the standardized root mean square residual (SRMR) value was 0.02, and the Tucker-Lewis coefficient (TLI) was 0.98. The root mean square error of approximation (RMSEA) value was 0.05; 90% C.I. 0.04, 0.05. All values were above the acceptable threshold (Hair Jr. et al. 2010).

For model fit, we used structural equation modeling (SEM) in AMOS 21.0. During the SEM procedure, we determined that the model yielded a good fit as recommended in the literature (Hair Jr. et al. 2010). The cmin/df value was 2.21, the CFI value was 0.98, the AGFI value was 0.92, the SRMR value was 0.02, and the TLI value was 0.98. The RMSEA value was 0.04; 90% C.I. 0.04, 0.05.

Table II. Convergent and discriminant validity table chart

	CR	AVE	MSV	ASV	BA	FC	UG	BE	PI
BA	0.971	0.919	0.686	0.464	<i>0.958</i>				
FC	0.951	0.829	0.482	0.325	0.577	<i>0.911</i>			
UG	0.931	0.771	0.482	0.342	0.551	0.694	<i>0.878</i>		
BE	0.921	0.795	0.564	0.409	0.730	0.485	0.552	<i>0.891</i>	
PI	0.946	0.854	0.686	0.445	0.828	0.501	0.529	0.751	<i>0.924</i>

Notes: The square root of the average variance extracted (AVE) values are marked in italics

Results and implications

Firm-created social media communication did not show a positive influence on brand equity; thus, the results do not confirm H1a (p-value 0.45; t-value -0.75; β -0.04). However, firm-created social media communication had a positive effect on consumers' brand attitude, thus supporting H1b (p-value < 0.001; t-value 6.87; β 0.38). User-generated content on Facebook had a positive effect on both brand equity and brand attitude, which supported H2a (p-value < 0.001; t-value 4.64; β 0.24) and H2b (p-value < 0.001; t-value 5.27; β 0.29).

Brand attitude had a significant influence on brand equity, thus supporting H3 (p-value < 0.001; t-value 13.88; β 0.62). Finally, both brand attitude and brand equity had a positive effect on brand purchase intention, leading to the confirmation of H4 (p-value < 0.001; t-value 14.29; β 0.60) and H5 (p-value < 0.001; t-value 7.45; β 0.32). Figure 2 presents the standardized estimates for the model. The tests of our hypotheses and estimates are displayed in Table III.

Table III. Structural results

HYPOTHESIS		p-value	t-value	β	ACCEPTANCE OR REJECTION
H1a	Firm-created social media → Brand equity	0.45	-0.75	-0.04	✗
H1b	Firm-created social media → Brand attitude	***	6.87	0.38	✓
H2a	User-generated social media → Brand equity	***	4.64	0.24	✓
H2b	User-generated social media → Brand attitude	***	5.27	0.29	✓
H3	Brand attitude → Brand equity	***	13.88	0.62	✓
H4	Brand attitude → Purchase intention	***	14.29	0.60	✓
H5	Brand equity → Purchase intention	***	7.45	0.32	✓

Notes: $t \geq 4.64$, p-value ≤ 0.001 ; cmin/df = 2.21; CFI = 0.98; AGFI = 0.92; SRMR = 0.02; TLI = 0.98; RMSEA = 0.04

The final path model of the study is presented in Figure 2.

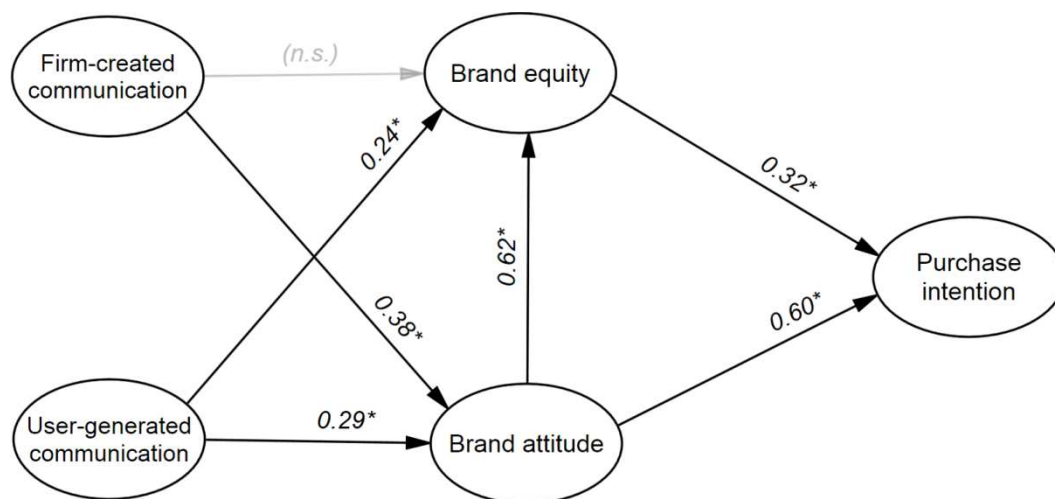


Figure 2. Standardized estimates for the model

Tests for the invariance of a causal structure

The cross-validation of our conceptual model was achieved by testing for invariance across separate validation samples for the three industries under investigation in this study: non-alcoholic beverages, clothing, and mobile operators.

Following the partial invariance test procedures employed by Byrne and colleagues (1998), the first step to test for invariance involved the specification of a full-constrained model set to be equal across the sample of the three industries. This model was then compared to less restrictive models in which the parameters were freely estimated. A classical approach for determining evidence of noninvariance across models is based on the χ^2 difference. Noninvariance is claimed if the χ^2 difference is statistically significant (B. Byrne 2010). However, the χ^2 difference test represents an extremely stringent test of invariance, given that SEM models are at best only approximations of reality (Cudeck and Browne 1983; MacCallum, Roznowski, and Necowitz 1992); thus, we decided that it would be more

reasonable to base invariance decisions on a difference in CFI values exhibiting a probability < 0.01 rather than to base such decisions on $\Delta\chi^2$ (Cheung and Rensvold 2002). Because there is still no consensus on which tests of invariance better represent the phenomena (B. Byrne 2010), we report both the χ^2 difference and CFI difference results when reviewing the results pertinent to cross-validation in this article.

The model used for this analysis is the same as that shown in Figure 2. For purposes of clarity, double-headed arrows representing correlations among the independent factors in the model, indicator variables, and measurement error terms are not included in this figure. Moreover, the path from firm-created communication to brand equity was removed from the analysis, leaving only the statistically significant structural paths under investigation.

Of primary interest in testing for multigroup invariance are the χ^2 and CFI values, followed by the GOF statistics. For the cross-validation analyses, we used AMOS 21.0 software. A summary of the findings are presented in Table IV.

The results related to the multigroup model testing for configural equivalence shows the χ^2 value to be 550.792 with 336 degrees of freedom, with a CFI value of 0.978 and an RMSEA value of 0.03; 90% C.I. 0.03, 0.04. From this information, we determined that the hypothesized multigroup causal structure model fits well across industries. The next step was to determine whether the invariance in the measurement would hold during the SEM procedures. For this step, we determined that all factor loadings were constrained to be equal across industries, with the exception of OBE2, which was freely estimated (Model 2A). A review of the results for Model 2A reveals the fit to be consistent with that of the configural model (CFI 0.978; RMSEA 0.03; 90% C.I. 0.03, 0.04). The $\Delta\chi^2$ reported for the configural model and Model 2A yielded $\Delta\chi^2_{(22)}$ 27.258 (p-value 0.202), whereas the Δ CFI was 0.000. Both the χ^2 and CFI difference tests suggested evidence of invariance.

Assuming that the models are equivalent at the measurement level, the next stage is to test for invariance at the structural level. For Model 3A, all structural path weights were constrained to be equal across industries. This SEM model rendered a χ^2 value of 606.971 with 370 degrees of freedom. Comparison with the configural model presented a $\Delta\chi^2_{(34)}$ value of 56.179, which is statistically significant (p-value 0.010). Moreover, Model 3A yielded a CFI value of 0.976, thus proving the model to be invariant across the studied industries (Δ CFI 0.002). These findings demonstrated that the χ^2 difference test argues for noninvariance, whereas the CFI difference test argues for invariance.

For the purposes of juxtaposition concerning the effects of firm-created and user-generated content on the variables of brand equity, brand attitude, and purchase intention in different industries, we consider it worthwhile to proceed to χ^2 difference test analyses. The $\Delta\chi^2$ values identify which structural paths in the model are contributing to the noninvariant findings.

To test for the invariance of structural weights, we first removed all structural path weight labels, except the label connecting firm-created social media communication to brand attitude (Model 3B). The testing of this model generated a χ^2 value of 580.992 with 360 degrees of freedom. Comparison with the configural model provided a $\Delta\chi^2_{(24)}$ value of 30.2, which is not statistically significant (p-value 0.178). These findings indicate that the structural path between firm-created content and brand attitude is operating equivalently across the three industries.

The next two models (Models 3C and 3D) tested for the invariance of the structural paths between user-generated communication and brand attitude and between user-generated communication and brand equity. The test of the UG-BA path (Model 3C) yielded a χ^2 value of 585.563 with 362 degrees of freedom. These results yielded a $\Delta\chi^2_{(26)}$ value of 34.771, which is not statistically significant (p-value 0.117). Furthermore, the test of the UG-BE path (Model 3D) generated a χ^2 value of 588.22 with 364 degrees of freedom. The $\Delta\chi^2_{(28)}$ value

was 37.428, which is also statistically insignificant (p-value 0.110). These findings advise us that the structural paths weights designed to measure the influence of user-generated content on brand attitude and brand equity are operating equivalently across the three industries.

The next step was to constrain the path from brand attitude to brand equity to be equal. Models 3E, 3F, and 3G tested for the equivalence of this path across the groups. As reported in Table IV, the test of Model 3E yielded a χ^2 value of 600.704 with 366 degrees of freedom. The $\Delta\chi^2_{(30)}$ value was 49.912, which is statistically significant (p-value 0.013). To detect the source of the noninvariance, we proceeded by labeling and testing one industry at a time within the BA-BE structural path. Primarily, we freely estimated the BA-BE path for the non-alcoholic beverage industry (Model 3F). The test of Model 3F presented a χ^2 value of 595.048 with 365 degrees of freedom. These results consequently generated a $\Delta\chi^2_{(29)}$ value of 44.256, which is also statistically significant (p-value 0.035). According to these findings, we continued the analysis by estimating both the non-alcoholic beverage and clothing industries freely (Model 3G). The model yielded a χ^2 value of 588.22 with 364 degrees of freedom. The $\Delta\chi^2_{(29)}$ value was 37.428, which is not statistically significant (p-value 0.110). This information informs that there are differences concerning the structural path from brand attitude to brand equity for the non-alcoholic beverage and clothing industries.

Model 3H tested for the invariance in the structural path between brand equity and purchase intention. This model rendered a χ^2 value of 593.224 with 366 degrees of freedom. Comparison with the configural model yields a $\Delta\chi^2_{(30)}$ value of 42.432, which is statistically significant (p-value 0.066). Similar to the approached used with Model 3E to detect the source of the noninvariance, we labeled and tested one industry at a time. First, we freely estimated the BE-PI path to the non-alcoholic beverage industry, ensuring that the other two industries were constrained to be equal (Model 3I). The test of Model 3I generated a χ^2 value of 589.656 with 365 degrees of freedom. These results consequently presented a $\Delta\chi^2_{(29)}$ value of 38.864, which is not statistically significant (p-value 0.104). These findings show that the structural path between brand equity and purchase intention for the non-alcoholic beverage industry does not operate equivalently to those of the clothing and mobile operator industries.

Finally, the last structural path analyzed was the link between brand attitude and brand purchase intention. The test of Model 3J yielded a χ^2 value of 594.076 with 367 degrees of freedom. These results yielded a $\Delta\chi^2_{(31)}$ value of 43.284, which is statistically significant (p-value 0.07). Proceeding with the analyses, we then removed the structural path label from BA to PI for the non-alcoholic beverage industry (Model K). This model generated a χ^2 value of 590.38 with 366 degrees of freedom. The $\Delta\chi^2_{(30)}$ value was 39.588, which is not statistically significant (p-value 0.113). These findings show that the structural path between brand attitude and brand purchase intention for the non-alcoholic beverage industry does not operate equivalently to those of the clothing and mobile operator industries.

As expected, a review of the results of Model 3K revealed the fit to be consistent with that of the configural model (CFI = 0.977; RMSEA = 0.03; 90% C.I. 0.03, 0.04).

Table IV. Summary of goodness-of-fit statistics for tests for the invariance of causal structure

Model description	Comparative model	χ^2	df	$\Delta\chi^2$	Δdf	p-value	CFI	ΔCFI
1. Configural model; no equality constraints imposed	—	550.792	336	—	—	—	0.978	—
2. Structural model (Model 2A) All factor loadings constrained equal with exception of OBE2	2A versus 1	578.05	358	27.258	22	0.202	0.978	0.000
3. Structural model (Model 3A*) Model 2A with all structural path weights constrained equal	3A versus 1	606.971	370	56.179	34	0.010	0.976	0.002
(Model 3B) Model 2A with structural path between FC-BA constrained equal	3B versus 1	580.992	360	30.2	24	0.178	0.978	0.000
(Model 3C) Model 3B with structural path between UG-BA constrained equal	3C versus 1	585.563	362	34.771	26	0.117	0.978	0.000
(Model 3D) Model 3C with structural path between UG-BE constrained equal	3D versus 1	588.22	364	37.428	28	0.110	0.977	0.001
(Model 3E*) Model 3D with structural path between BA-BE constrained equal	3E versus 1	600.704	366	49.912	30	0.013	0.976	0.002
(Model 3F*) Model 3C with structural path between BA-BE ^{b,c} constrained equal	3F versus 1	595.048	365	44.256	29	0.035	0.977	0.001
(Model 3G) Model 3C with structural path between BA-BE ^c constrained equal	3G versus 1	588.22	364	37.428	28	0.110	0.977	0.001
(Model 3H*) Model 3G with structural path between BE-PI constrained equal	3H versus 1	593.224	366	42.432	30	0.066	0.977	0.001
(Model 3I) Model 3G with structural path between BE-PI ^{b,c} constrained equal	3I versus 1	589.656	365	38.864	29	0.104	0.977	0.001
(Model 3J*) Model 3I with structural path between BA-PI constrained equal	3J versus 1	594.076	367	43.284	31	0.07	0.977	0.001
(Model 3K) Model 3I with structural path between BA-PI ^{b,c} constrained equal	3K versus 1	590.38	366	39.588	30	0.113	0.977	0.001

Notes: $\Delta\chi^2$ = difference in χ^2 values between models; Δdf = difference in number of degrees of freedom between models; ΔCFI = difference in CFI values between models; FC = Firm-created communication; UG = User-generated communication; BE = Brand equity; BA = Brand attitude; PI = Purchase intention; ^b = clothing industry; ^c = mobile operators industry.
* Model noninvariant considering the $\Delta\chi^2$ test.

5. Discussion and conclusions

The central aim of this research is to generate new knowledge about how social media communication affects brand equity and brand attitude and consequently influences consumer purchase intentions.

Because consumers typically judge the information provided by other individuals to be trustworthy and credible (Pornpitakpan 2004), user-generated social media communications have a greater effect on consumers' overall perception of brands than firm-created social media communication. This effect is noticeable in that UGC was found to positively affect both brand equity and brand attitude. Moreover, this finding is also highlighted by the confirmation that firm-created communication positively influenced only brand attitude. Thus, firm-created social media content only serves to build awareness of and positive associations with a brand but does not affect consumer perceptions of brand value. The findings of this research also indicate that brand attitude strongly effects brand equity. These outcomes are of great value to brand and communication managers. Firm-created social media communication does not directly affect brand equity but indirectly influences consumer perceptions of value based on brand attitude.

Concerning the behavioral outcomes in our research, the effect of brand attitude is almost twice as strong as the effect of brand equity on consumer purchasing decisions. However, it is strongly recommended that managers illicit user-generated communication by marketing action programs while maintaining an active profile of social media advertising.

Another important contribution of this article is the juxtaposition concerning the effects of social media communication on brand equity, brand attitude, and brand purchase intention in different industries. Given that the χ^2 difference test represents an extremely stringent test of invariance for SEM models (Cheung and Rensvold 2002), the results of the CFI difference tests in this study showed that the conceptual model operates equivalently across industries. However, the χ^2 difference test is sensitive to small variance in the effects of social media communication across groups. This result was expected, as consumers do not evaluate products from different industries and segments in the same manner (Li and Bernoff 2011; Burmann and Arnhold 2008).

In summary, our findings demonstrate that although firm-created content does not appear to directly influence consumer perceptions of brand equity, this content does affect consumer attitudes toward brands. Moreover, firm-created social media content can create a viral response that can assist in spreading the original advertising to a larger public. Thus, the optimal scenario for communication managers is to attract or encourage consumers to generate content that reflects support for the brands and products of their companies. Hence, the object of firm-created social media content is to increase consumers' brand awareness and brand attitudes rather than to compete with user-generated social media content.

6. Limitations and further research

Although this study makes a significant contribution to the social media communication literature, this research is not without limitations. Therefore, the restrictions of our study can provide guidelines for future research. We suggest that all leading social media sites be analyzed to gain a broader understanding of the firm-created and user-generated social media communication. Moreover, a wider range of industries should be examined in future studies. This practice would provide an indication of how costumers perceive brands from different industries in social media channels.

Finally, because a Central European sample was used in this study, it may be difficult to generalize the results to other cultures. When replicating this research, researchers should consider social, economic, and cultural differences. It is also recommended that such research be conducted in different countries to produce stronger validation and generalization of the findings.

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APPENDIX A

Table I. List of constructs and measurements used

CONSTRUCTS AND MEASUREMENTS	Standardized Loading	CA	CR	AVE	AUTHORS
<i>Firm-created social media communication</i>					
[FC1] I am satisfied with the company's social media communications for [brand]	0.92	0.951	0.951	0.911	(Tsiros, Mittal, and Ross, Jr. 2004)
[FC2] The level of the company's social media communications for [brand] meets my expectations	0.92				(Mägi 2003)
[FC3] The company's social media communications for [brand] are very attractive	0.93				(Schivinski and Dabrowski 2013)
[FC4] This company's social media communications for [brand] perform well, when compared with the social media communications of other companies	0.87				
<i>User-generated social media communication</i>					
[UG1] I am satisfied with the content generated on social media sites by other users about [brand]	0.90	0.930	0.931	0.878	(Tsiros, Mittal, and Ross, Jr. 2004)
[UG2] The level of the content generated on social media sites by other users about [brand] meets my expectations	0.92				(Mägi 2003)
[UG3] The content generated by other users about [brand] is very attractive	0.82				(Schivinski and Dabrowski 2013)
[UG4] The content generated on social media sites by other users about [brand] performs well, when compared with other brands	0.86				
<i>Overall brand equity</i>					
[OBE1] It makes sense to buy [brand] instead of any other brand, even if they are the same	0.91	0.920	0.921	0.891	(Yoo and Donthu 2001)
[OBE2] Even if another brand has the same feature as [brand], I would prefer to buy [brand]	0.87				
[OBE3] If there is another brand as good as [brand], I prefer to buy [brand]	0.89				
[OBE4] If another brand is not different from [brand] in any way, it seems smarter to purchase [brand]*	0.62				
<i>Brand attitude</i>					
[BA1] I have a pleasant idea of [brand]	0.92	0.971	0.971	0.958	(Low and Jr 2000)
[BA2] [Brand] has a good reputation	0.94				(Villarejo-Ramos and Sánchez-Franco 2005)
[BA3] I associate positive characteristics with [brand]	0.97				
<i>Brand purchase intention</i>					
[PI1] I would buy this product/brand rather than any other brands available	0.89	0.945	0.946	0.924	(Yoo, Donthu, and Lee 2000) (Shukla 2011)
[PI2] I am willing to recommend that others buy this product/brand	0.94				
[PI3] I intend to purchase this product/brand in the future	0.89				

Notes: * Item excluded from the analysis

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