



# More of the same? Effects of volume and variety of social media brand engagement behavior

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## ABSTRACT

Increasing consumer engagement is a cornerstone of companies' social media efforts. However, how social media brand engagement behavior affects brand performance remains largely unexplored. We capture engagement along two dimensions – volume and variety – and measure brand performance using consumers' brand attachment, attitudes, and purchase intentions. Based on the power law of practice and combining survey measures with social media data, our analyses reveal a diminishing marginal utility of engagement volume, as the positive impact of engagement behavior on brand outcomes declines at higher engagement levels. However, the variation across performed activities attenuates these diminishing returns on engagement volume. We find consistent evidence for these effects across two studies with 1347 consumers who interacted with different brands. The results question companies' often unidimensional focus on increasing engagement volume. Instead, our findings suggest that to maximize brand performance on social media platforms, companies should also encourage engagement variety.

## 1. Introduction

Firms use social media platforms for increasing consumers' brand engagement behavior by nurturing interactions among consumers or direct interactions with the brand itself (Hollebeek, Glynn, & Brodie, 2014; Schamari & Schaefer, 2015; Shawky, Kubacki, Dietrich, & Weaven, 2020). Typical examples of such engagement behavior include sharing, liking, or commenting of brand-specific content (e.g., de Vries, Gensler, & Leeftang, 2012; Luarn, Lin, & Chiu, 2015; Schultz, 2017; Shahbaznezhad, Dolan, & Rashidirad, 2021). The underlying rationale for fostering social media brand engagement behavior is that it positively affects what customers think and feel about a brand (e.g., in terms of brand attachment or attitude towards a brand), which in turn positively affects purchase behavior and ultimately translates into superior firm performance (e.g., Alvarez-Milán, Felix, Rauschnabel, & Hinsch, 2018; Gensler, Völckner, Liu-Thompkins, & Wiertz, 2013; Keller and Lehmann, 2006; Steinhoff, Arli, Weaven, & Kozlenkova, 2019).

The conceptual soundness of the sketched chain of effects notwithstanding, many marketers only attest moderate success of social media

spending to company performance (CMOSurvey.org, 2020). Correspondingly, anecdotal and preliminary empirical evidence suggests that the effects of social media brand engagement might actually decay as the customer relationship matures (Beukeboom, Kerkhof, & de Vries, 2015, p. 35): "(...) effects of exposure to a brand's content are strongest in the first stage where content and conversations are still new and surprising. At a later stage the effects may wear off". We aim to expand existing knowledge on social media brand performance by empirically validating the presumed nonlinear relationship between consumers' social media brand engagement behavior and brand outcomes.

Our investigation contributes to several literature streams. First, we add to a nascent stream of studies connecting companies' social media activities to business outcomes (e.g., Hewett, Rand, Rust, & van Heerde, 2016; Kumar, Bezawada, Rishika, Janakiraman, & Kannan, 2016; Manchanda, Packard, & Pattabhiramaiah, 2015). While these studies generally point to a positive effect of corporate social media initiatives on firm performance, their focus has primarily been on aggregate measures of engagement behavior and related outcomes, leaving consumer-level effects out of the picture (e.g., Chang, Li, Yan, & Kumar,

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2019; Colicev, Malshe, Pauwels, & O'Connor, 2018; Wang & Kim, 2017). However, the ramifications of consumers' engagement behavior remain elusive without a more precise understanding of how such activities influence brand outcomes at the individual consumer level.

Second, consumers' brand engagement behavior in social media can occur in a variety of ways. Consumers can, for instance, like a brand's Facebook or Instagram posts, comment on posts, share content, or post their own content. However, extant consumer-level studies predominantly consider social media participation—i.e., the binary decision of engaging with a brand or not (e.g., Kumar et al., 2016). For instance, previous work has shown that becoming a fan/follower of a firm's social media page increases customers' visit frequency and profitability (Rishika, Kumar, Janakiraman, & Bezawada, 2013). We aim to extend these insights by also accounting for the variety of social media brand engagement types such as posts, comments, shares, and social bookmarking activities, that represent indirect "mechanics of a customer's value addition to a firm" (Pansari & Kumar, 2017, p. 295). A better understanding of the interplay between social media engagement volume and variety would allow companies to improve their social media strategies. On a conceptual level, we thus advance prior research by introducing volume and variety as two distinct dimensions of engagement behavior that are important to consider for enhancing the effectiveness of brands' social media strategies.

Third, drawing on the power law of practice (Newell & Rosenbloom, 1981), we aim to sketch a potential avenue for coping with declining marginal effects of engagement volume (Beukeboom et al., 2015). In particular, we show that instead of the often one-dimensional focus on maximizing a single type of consumer social media activity (e.g., liking content), it is important to engage consumers in a variety of activities to mitigate the "volume-trap".

Across two studies in two different brand contexts with 1,347 participants (automotive brand,  $n = 688$ ; workshop brand,  $n = 659$ ), we analyze combined individual consumer-level survey data and actual behavioral data monitored on the respective brands' social media pages. Our empirical analyses provide evidence for a diminishing marginal utility of engagement volume – measured as the aggregated number of an individual consumer's social media likes, comments, and posts related to the focal brand within a three months period. More precisely, the positive effect of engagement on brand outcomes, such as brand attachment and attitude towards the brand, declines at higher volume levels. These diminishing returns, however, are less pronounced, the greater the variety of brand-related activities that consumer perform. In other words, engagement variety in terms of brand engagement spread across different social media activities (e.g., liking, commenting, and posting) attenuates the diminishing marginal utility. Our results hence demonstrate that volume and variety are two important dimensions of social media brand engagement behavior that interact to shape brand outcomes.

## 2. Consumers' social media brand engagement behavior

Engagement has emerged as a core concept for understanding value co-creation within networks of different actors, such as customers, employees, brands, or platforms (Storbacka, Brodie, Böhmman, Maglio, & Nenonen, 2016). The broad concept of actor engagement can be defined as "a dynamic and iterative process, reflecting actors' dispositions to invest resources in their interactions with other connected actors in a service system" (Brodie, Fehrer, Jaakkola, & Conduit, 2019, p. 183), or as "both the disposition of actors to engage, and the activity of engaging in an interactive process of resource integration within the institutional context provided by a service ecosystem" (Storbacka et al., 2016, p. 3009). Key aspects of engagement are thus its iterative nature (e.g., continuous and cross-referencing social media activities), the integration of resources (e.g., time and effort invested by consumers), and the interactions occurring among actors within a given system (e.g., extent and variety of activities performed on a social media platform). It is

important to note, however, that while our investigation builds on the broad foundation of actor engagement, we focus on one specific area of engagement, namely that by consumers, occurring via social media in a brand-related setting.

### 2.1. Definition

As a specific area of actor engagement, social media brand engagement is defined as "a consumer's positively valenced brand-related cognitive, emotional and behavioral activity during or related to focal consumer/brand interactions" (Hollebeek et al., 2014, p. 154). It represents a key driver of establishing and managing consumer-brand relationships via social media (Malthouse, Haenlein, Skiera, Wege, & Zhang, 2013), as it adds value to a company, either directly via purchases and/or indirectly via social media conversations customers have about a brand (e.g., Chevalier & Mayzlin, 2006; Dessart & Pitardi, 2019; Dessart, Veloutsou, & Morgan-Thomas, 2015).

It is important to note that engagement can generally occur at the cognitive, emotional, and behavioral level (Alexander, Jaakkola, & Hollebeek, 2018; Brodie, Hollebeek, Jurić, & Ilić, 2011). However, while the psychological states related to engagement are important precursors, the behavioral manifestation of engagement is what ultimately affects other actors and thus leads to economic consequences (Alexander et al., 2018; Jaakkola & Alexander, 2014; van Doorn et al., 2010). Therefore, literature on consumer engagement is increasingly adopting a 'behavioral stance', acknowledging the key role of engagement behavior (e.g., Groeger, Moroko, & Hollebeek, 2016; Harmeling, Moffett, Arnold, & Carlson, 2017; Jaakkola & Alexander, 2014; Pansari & Kumar, 2017). This focus on engagement behavior is already evident in the early definition by van Doorn et al. (2010, p. 254), who conjecture that engagement "may be specifically defined as customer's behavioral manifestations that have a brand or firm focus, beyond purchase, resulting from motivational drivers". Nevertheless, as engagement behaviors result from a motivational state to act, research has also agreed on the importance of cognitive and affective elements of engagement for capturing the conceptual domain of the construct (Brodie et al., 2011; Vivek, Beatty, & Morgan, 2012).

The resulting, and widely accepted multi-dimensional nature of customer engagement notwithstanding, our research joins the rank of work highlighting the behavioral aspects of consumer engagement (e.g., Groeger et al., 2016; Hollebeek, Juric, & Tang, 2017; Jaakkola & Alexander, 2014; Morgan-Thomas, Dessart, & Veloutsou, 2020). More precisely, we argue that a behavioral focus does not preclude the importance of the cognitive and emotional dimensions, but rather focuses on the 'tangible' part of engagement that seems more actionable, better observable, and easier to approach from a managerial perspective. Correspondingly, consumers' social media brand engagement behavior represents a widespread social media metric (Sprout Social, 2019) that is commonly used for managerial decision-making (Moro, Rita, & Vala, 2016; Peters, Chen, Kaplan, Ognibeni, & Pauwels, 2013).

In line with Obilo, Chefor, and Saleh (2021), we capture the behavioral component of social media brand engagement as social bookmarking (e.g., Liking), sharing of, or commenting on brand-related content, or as creating brand-related content. Similar to offline interactions with a brand (e.g., frontline employees), all of these activities are considered to influence brand outcomes, such as consumers' perceptions of their brand relationship, their brand-related attitudes, and their purchase behavior (Pansari & Kumar, 2017).

The consequences of consumers' social media brand engagement behavior can be captured with various outcome measures, such as the relationship between consumer reviews and online sales (Chevalier & Mayzlin, 2006); between user-generated content and firm performance (Tirunillai & Tellis, 2012); or between social media participation and purchase behavior (Manchanda et al., 2015; Mochoch, Johnson, Schwartz, & Ariely, 2017). Managing brands in a social media environment thus requires measures that shift the focus from the firm to

consumers (Gensler et al., 2013), and that capture engagement beyond transactional behavior (Kumar et al., 2010). We intend to add to the extant literature by investigating how consumers' brand engagement behavior affects relational, attitudinal, and behavioral brand outcomes. More specifically, we examine the ramifications of engagement volume and variety and empirically show that these are two important aspects of engagement behavior that together determine its effectiveness.

## 2.2. Volume and variety of social media brand engagement behavior

We operationalize consumers' social media brand engagement behavior along two structural dimensions that capture the pattern of brand-related activities. Specifically, we consider the quantity of activities, which we call engagement volume, and the range of different types of activities, which we denote as engagement variety.

On a social media platform, let  $s = 1, \dots, S$  index the different engagement behavior types that consumers can perform, such as posting content, sharing, commenting, or social bookmarking (e.g., Like). Furthermore, we define  $a_{it}^s$  as the number of activities of engagement type  $s$  that consumer  $i$  performed in a given period  $t$ . Then, we operationalize volume and variety of engagement as follows. For a consumer  $i$  for a given period  $t$ , *VOLUME* measures the total number of performed activities across all engagement behavior types. Thus, engagement volume measures the extent of a consumer's engagement behavior with a brand via social media:

$$VOLUME_{it} = \sum_{s=1}^S a_{it}^s \quad (1)$$

We measure *VARIETY* by calculating entropy (Godes and Mayzlin, 2004) for each consumer  $i$  across all  $s$  engagement types that exhibit more than zero activities in a given period of time  $t$ . Entropy is superior over other measures that may capture the variety of a consumer's engagement, such as variance, because, as Godes and Mayzlin (2004) explain, it is independent of the total volume of activities.

$$VARIETY_{it} = \begin{cases} - \sum_{s=1}^S \frac{a_{it}^s}{VOLUME_{it}} \times \log\left(\frac{a_{it}^s}{VOLUME_{it}}\right) & \text{if } VOLUME_{it} > 0 \\ 0 & \text{if } VOLUME_{it} = 0 \end{cases} \quad (2)$$

Thus, engagement variety reflects the dispersion of a user's activity across different types of engagement behavior. The higher the measure, the more evenly dispersed are a user's activities. The measure is minimized, when all activities are concentrated on one engagement type.

## 3. Hypotheses development

### 3.1. Outcomes of social media brand engagement volume

Companies strive for higher volumes of engagement behavior in order to positively influence brand outcomes, such as consumers' perceived relationship with a brand, their attitude toward the brand, and, ultimately, their brand-related behavior (Gensler et al., 2013; Jahn & Kunz, 2014). On a conceptual level, the link between engagement volume and brand outcomes can be explained by the extent to which consumers are willing to invest resources in their interaction with other actors, such as brands (Alexander et al., 2018; Brodie et al., 2019), which is assumed to enhance commitment and consumer-brand relationships (Brodie, Ilic, Juric, & Hollebeek, 2013; Hollebeek et al., 2014; Vivek et al., 2012).

However, the effectiveness of this linear focus may be called into question (Beukeboom et al., 2015). For instance, despite a strong focus of marketers on maximizing engagement (Eckstein, 2021; McLachlan, 2020), trade journals frequently report that companies' social media activities often fail to achieve the intended increase in consumers'

responses (e.g., Forbes, 2015; Fortune, 2015). Therefore, the relationship between engagement volume and brand outcomes may not be monotonically increasing but rather exhibit a diminishing marginal utility. Extant research provides first evidence for such nonlinear effects of engagement behavior, as firm-initiated interactions were found to exhibit diminishing returns to consumers' positive reactions (Homburg, Ehm, & Artz, 2015).

The power law of practice (Newell & Rosenbloom, 1981) provides theoretical support for the a diminishing marginal utility of engagement volume. It proposes a nonlinear learning curve which describes that task repetition increases experience and thus leads to performance improvements, but at a diminishing rate. The theory, which is well-established in cognitive science, has also been transferred to the marketing context. For instance, Lakshmanan and Krishnan (2011) reveal that the process of learning how to use a product follows a power law curve. In the context of electronic environments, Johnson, Bellman, and Lohse (2003) find learning curve effects for web site visitors. Specifically, the authors show that the cognitive costs of using a site decrease with repeated visits. Users learn to be more efficient at using a web site the more often they visit it; however, the improvements gradually decline.

We consider consumers' brand engagement behavior as performing tasks that contribute to positive brand outcomes. Specifically, we focus on a set of three outcome variables, which have been highlighted as important brand performance measures (e.g., Gensler et al., 2013; VanMeter, Syrdal, Powell-Mantel, Grisaffe, & Nesson, 2018): consumers' brand attachment, defined as "the strength of the bond connecting the brand with the self" (Park, MacInnis, Priester, Eisingerich, & Iacobucci, 2010, p. 2) to capture consumer-brand relationship perceptions; consumers' attitude toward the brand; and consumers' purchase intent. We thus consider greater engagement volume to resemble task repetition, which should lead to improved brand outcomes, as reflected in brand attachment, brand attitudes, and purchase intent. Additionally, we consider social media brand engagement behavior to exhibit learning curve effects. Consumers' ability to navigate brand-related social media environments is likely to show effects similar to the learning curve found for general web site visitors (Johnson et al., 2003). For example, the more often a consumer likes or comments on brand-related content, the more internalized and routinized these activities may become, which may diminish their effects on brand outcomes. This notion is also in line with the view that learning about a focal entity is a key sub-process and motivational driver of social media engagement (e.g., Brodie et al., 2013; Dessart, Veloutsou, & Morgan-Thomas, 2016; Kumar, 2020). Therefore, as the specific tasks (i.e., engagement behaviors) are repeated, learning curve effects are likely to occur. The more often consumers perform a task, the less the impact of each additional task. In sum, we propose that at higher levels of engagement volume, the improvement in brand outcomes from additional activities is smaller than the improvements that occur at lower levels of engagement volume.

**H1.** The positive impact of social media brand engagement volume on (a) brand attachment, (b) attitude toward the brand, and (c) intent to purchase the brand diminishes as engagement volume increases.

### 3.2. Outcomes of social media brand engagement variety

In addition to the number of brand-related activities performed by consumers (i.e., brand engagement volume), we propose that it is important to also consider the variety of engagement behaviors. Across various disciplines, multiple studies have demonstrated that task variation leads to better outcomes than specialization on particular tasks. For example Graydon and Griffin (1996) found that subjects practicing a sports task in various settings performed better than subjects practicing only the specific designated setting. Paas and Van Merriënboer (1994) show that greater variability improves performance in solving geometry

problems. Thus, increasing the variety of performed activities within a set of possible activities, such as five different sports settings (Graydon and Griffin, 1996) or two different problem-solving tasks (Schilling, Vidal, Ployhart, & Marangoni, 2003), exerted a positive influence on task-related performance. Similarly, Hopp and Van Oyen (2004) found greater job variety to be associated with higher employee motivation and productivity. The theoretical arguments underlying these findings are that task variety allows individuals to develop a more complete schema of relevant knowledge and that it triggers implicit learning, which leads to improved understanding and recall of a focal entity or topic (Schilling et al., 2003).

Although, to the best of our knowledge, no study has examined variety across consumer engagement behaviors, research on employee engagement found that “increasing job variety is one of the most powerful ways to leverage greater engagement in organizations” (Crawford et al., 2013, p. 60). For instance, Ramaswami, Agarwal, and Bhargava (1993) show that higher levels of task variety increase marketing employees’ organizational commitment and reduce their work alienation. Additionally, we can draw from marketing-related studies on the effects of variety in marketing channels. Research indicates that multichannel customers, who have a greater variety in touchpoints than single-channel customers, represent more committed and more valuable customers (e.g., Kushwaha and Shankar, 2013; Venkatesan, Kumar, & Ravishanker, 2007).

Conceptually, engagement variety can be linked to the general notion of engagement representing the integration of actors’ resources (Brodie et al., 2019; Storbacka et al., 2016). As such, an increasing variety of tasks (e.g., liking and posting) is likely to correspond with different resources invested by consumers. In this iterative process of engagement, it can thus be assumed that the higher investment resulting from task variety leads to a more positive disposition towards continuing such investments (e.g., purchasing from a brand). Based on this idea and transferring the outlined empirical findings to social media brand engagement, where consumers encounter a set of possible engagement behaviors (e.g., liking, commenting, posting), we expect a greater engagement variety to be beneficial for brand outcomes.<sup>1</sup>

**H2.** Social media brand engagement variety positively impacts (a) brand attachment, (b) attitude toward the brand, and (c) intent to purchase the brand.

### 3.3. Interaction effect between brand engagement volume and variety

Furthermore, we propose that the two dimensions of brand engagement behavior interact in their effects on brand outcomes, such that performing a greater variety of different, but related tasks enhances the positive effect of engagement volume on brand outcomes. More specifically, combining the findings regarding the task repetition and those related to the variety of tasks, when engagement occurs in a greater variety, the diminishing marginal utility of engagement volume should not be as pronounced as when there is a stronger focus on one particular activity type. Thus, the returns on engagement volume should

<sup>1</sup> We acknowledge that some prior studies found the effect of task variety on learning outcome to follow an inverted U-shape in contexts of a large number of different possible activities (Narayanan, Balasubramanian, & Swaminathan, 2009; Staats & Gino, 2012). However, these studies captured variety across a much greater number of different instances (e.g., various maintenance tasks across 50 different software modules; Narayanan et al., 2009) or measure the number of changes between different tasks (e.g., the number of changes between different tasks across 17 work process stages; Staats & Gino, 2012). Thus, the reason for us not hypothesizing such a diminishing marginal utility of engagement variety is that, in contrast to engagement volume, consumers have a limited set of possible engagement behaviors, constrained by the social media platforms. In such settings, prior studies observed positive linear effects (Graydon and Griffin, 1996; Paas & Van Merriënboer, 1994).

not diminish as quickly as when consumers’ engagement occurs across a smaller variety of activities. This assumption is in line with prior findings, such as those by Schilling et al. (2003), who found that when subjects practiced alternating, but related problem-solving tasks, the learning effect of repeated tasks was enhanced. Similarly, Staats and Gino (2012) revealed that employees working on different tasks enhances productivity gains obtained from task repetition. As Staats and Gino (2012, p. 1145) explain: “the returns from specialization likely decrease at a faster rate than do the returns from varied experience.”

Additionally, when considering engagement volume and variety as consumers’ resource investment (Brodie et al., 2019; Storbacka et al., 2016), the idea of an enhancing effect between these two dimensions can also be derived from the general conceptualization of engagement. Equal levels of engagement volume should thus have a stronger effect when consumers perform a greater variety of activities as compared to only performing one particular activity, and the marginal utility of additional engagement should be greater when it entails a broader variety.

**H3.** Social media brand engagement variety moderates the effect of engagement volume on (a) brand attachment, (b) attitude toward the brand, and (c) intent to purchase the brand, such that a greater variety increases the effects of engagement volume and leads to greater marginal utility than a lower variety.

### 3.4. Mediating effects of brand attachment and brand attitudes

The three focal brand outcome variables capture relational (i.e., brand attachment), attitudinal (i.e., attitude toward the brand), and behavioral (i.e., purchase intent) aspects of brand performance and should thus be related. Brand attachment is frequently considered to be a direct result of consumers’ interactions with brands (e.g., Brodie et al., 2013; Park & MacInnis, 2006), such as those occurring via social media. According to Bhattacharya and Sen (2003, p. 83), engaging in company-related rituals and routines “causes people to become psychologically attached to (...) the organization”. The feeling of attachment is suggested to increase “when consumers network with other company stakeholders through on- and offline communities” (Bhattacharya and Sen, 2003, p. 82). This notion is in line with the general finding that engaging customers in brand-related activities builds their relationship with a brand (e.g., McAlexander, Schouten, & Koenig, 2002; Palmatier, Dant, Grewal, & Evans, 2006).

On a conceptual level, social networks are viewed as an important determinant of relationship building, with the resultant relational characteristics as mediators in value co-creation (Akaka, Vargo, & L., & Lusch, R., F., 2012). Thus, as a consequence of brand engagement, brand attachment represents a determinant of brand-related attitudes and behavior (Thomson, MacInnis, & Whan Park, 2005). Prior studies support the idea of brand attachment mediating attitudinal effects on brand-related outcome variables (e.g., Jahn & Kunz, 2014; Japutra, Ekinci, & Simkin, 2018; Zhou, Zhang, Su, & Zhou, 2012). We intend to examine these relationships on a behavioral level, and therefore propose that consumers’ feeling of attachment to a brand represents an underlying process variable that explains the hypothesized effects of social media brand engagement volume and variety on the more general measures of brand attitudes and purchase intent. Furthermore, we account for the established link between attitudes and intentions (Ajzen, 1991), leading us to the following two hypotheses:

**H4.** Brand attachment mediates the effects of social media brand engagement volume and variety on (a) attitude toward the brand, and (b) purchase intent.

**H5.** Attitude toward the brand mediates the effects of brand attachment on purchase intent.

Fig. 1 summarizes and illustrates the hypothesized model. We expect brand engagement volume to exhibit a diminishing marginal utility

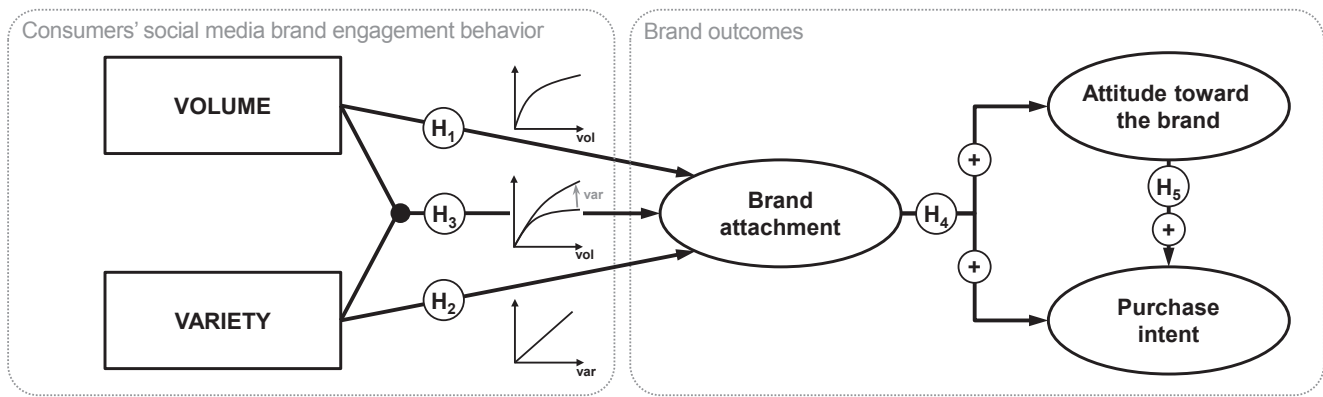


Fig. 1. Conceptual Model.

regarding brand outcomes ( $H_1$ ). Furthermore, we assume that greater engagement variety leads to positive brand outcomes ( $H_2$ ) and that it attenuates the diminishing marginal utility of engagement volume ( $H_3$ ), such that the slope becomes steeper. Finally, the different brand outcome measures are expected to be interrelated, with brand attachment ( $H_4$ ) and attitude toward the brand ( $H_5$ ) acting as mediators.

#### 4. Overview of studies

The level of consumers' brand engagement varies across product categories (Li, Abbasi, Cheema, & Abraham, 2020). Therefore, to generalize our results, we test our hypotheses across two different studies in two distinct product categories. Study 1 uses a unique dataset which combines survey responses and three months of aggregated observational data capturing three types of social media brand engagement behavior (i.e., Likes, comments, and posts) on a car brand's Facebook page. It tests the postulated nonlinear relationship between brand engagement volume and brand outcomes ( $H_1$ ) as well as the mediating effects of brand attachment ( $H_4$ ) and attitude toward the brand ( $H_5$ ). Study 2 comprises a combination of survey responses and twelve months of observed social media engagement behavior in the context of an independent workshop and retail chain.<sup>2</sup> In addition to the effect of engagement volume, the study tests the postulated effect of engagement variety ( $H_2$ ) and its interaction with engagement volume ( $H_3$ ). Compared to Study 1, the second study allowed us to observe engagement behavior over a longer time period, to capture a more comprehensive array of behaviors (i.e., Likes, comments, posts, and shares), and to calculate and model the effects of engagement variety.

#### 5. Study 1: Diminishing marginal utility of engagement volume

##### 5.1. Research setting and data collection

We cooperated with a top 100 global automotive brand to recruit study participants amongst its Facebook fans. An automotive brand was judged to represent an adequate product category, since cars are high-involvement, emotional, and service-intensive products that consumers interact with on different occasions. Invitations to participate in an online survey were posted on the brand's German Facebook page for a period of two weeks. The survey asked for participants' consent to combine their responses and the activities they had performed on the brand's Facebook page. A total of 1,743 participants clicked on the

survey link, out of which 1,171 (67.2%) completed the survey. Respondents who were younger than 18 years old or who were speeding through the questionnaire were excluded from the data set, leaving 922 responses. In order to have a sufficiently long period to evaluate engagement behavior, the survey included a question on how long respondents had been Facebook fans of the focal brand; we excluded individuals who had been fans less than three months, finally leaving 688 responses for which the car brand provided us with social media engagement data, as described below. With regards to brand ownership, 271 respondents (39.4%) reported to currently own a vehicle of the focal brand, while 417 were non-owners. The sample consisted of 41.7% females; respondents were on average 36.9 years old ( $SD = 10.74$ ).

As our data comprise only respondents who voluntarily participated in the survey, we assessed possible self-selection of respondents by examining non-response bias (Armstrong and Overton, 1977). Specifically, we compared all variables in the model (i.e., brand engagement volume, brand attachment, brand attitudes, purchase intent) as well as the covariates (i.e., age, gender, and brand ownership) between the first quartile and the fourth quartile of respondents related to their point in time of participation. These comparisons reveal no significant differences in any of the assessed variables, providing evidence that non-response did not bias our findings.

##### 5.2. Measures

Data on engagement behavior per respondent were provided to us by the brand. Specifically, we received the aggregate volume of each respondent's activities in terms of the number of likes, comments, and posts related to the focal brand that occurred during a period of three months prior to conducting the survey. Of the 688 respondents, 64.7% exhibited some form of activity during the analyzed period; on average, these active respondents performed 5.13 activities ( $SD = 6.49$ ). Comparing brand owners and non-owners, the former on average exhibited higher engagement volumes ( $M_{\text{owners}} = 5.39$ ,  $M_{\text{non-owners}} = 1.97$ ,  $p < .001$ ), supporting our notion of including brand ownership as a covariate.

In the survey, established scales were used to assess brand outcomes. Brand attachment was measured with the two-dimensional, four-item scale developed by Park et al. (2010). Attitude toward the brand was captured with six five-point items (Maheswaran and Sternthal, 1990; Stayman & Batra, 1991). Purchase intent was measured with the three-

<sup>2</sup> Independent workshops offer repair and maintenance services for cars, independent of the car manufacturer, and perform retail activities in selling spare parts, accessories, and consumables. Examples of larger chains are Bosch Car Service in multiple countries across the world, Jiffy Lube in the U.S., or Euro-master in multiple European countries.

item scale used by Coyle and Thorson (2001).<sup>3</sup> The individual items are shown in Appendix A.

To assess the psychometric properties of the applied scales, we first conducted a principal component analysis with Varimax rotation. The four brand attachment items, the six attitude toward the brand items, and the three purchase intent items load on separate components with rotated factor loadings above 0.69 and cross-loadings below 0.32, indicating convergent and discriminant validity of the scales. Furthermore, we conducted a confirmatory factor analysis (CFA) in Mplus 8.2 (Muthén and Muthén, 1998–2017). The results, provided in Appendix A, reveal an adequate model fit and satisfactory psychometric properties for the scales. Moreover, a discriminant validity assessment according to Fornell and Larcker (1981) revealed that the average variances extracted (AVEs) of the latent construct exceeds their squared correlations.

### 5.3. Results

For hypotheses testing, we used structural equation modeling (SEM) with Mplus 8.2 (Muthén and Muthén, 1998–2017). To estimate the diminishing marginal utility of engagement volume, we followed prior studies and modeled a square root function (Albrecht, Schaefers, Walsh, & Beatty, 2019; Homburg, Müller, & Klarmann, 2011). Thus, the square root of engagement volume is used as the predictor variable in the model. Moreover, to control for potential alternative explanations, we included ownership of the focal brand, age, and gender as predictors of brand attachment, attitude toward the brand, and purchase intent. As shown in Fig. 2, estimation of the full model revealed a good fit to the data and provides evidence for the proposed diminishing marginal utility of engagement volume (volume<sup>0.5</sup> → attachment:  $\gamma = 0.57, p < .001$ ).<sup>4</sup> Of the three control variables, age does not exert any influence ( $p > .58$ ), while gender and brand ownership influence the three focal constructs. Specifically, female respondents exhibit greater brand attachment (gender → attachment:  $\gamma = 0.09, p < .01$ ) and more favorable attitude toward the brand (gender → brand attitudes:  $\gamma = 0.19, p < .001$ ), but lower purchase intent (gender → purchase intent:  $\gamma = -0.11, p < .001$ ); compared to non-owners, owners score higher in attachment (ownership → attachment:  $\gamma = 0.28, p < .001$ ), brand attitudes (ownership → attachment:  $\gamma = 0.19, p < .001$ ), and purchase intent (ownership → purchase intent:  $\gamma = 0.38, p < .001$ ).

In addition to the direct nonlinear effect of engagement volume on brand attachment, the latter positively influences the two other brand outcome variables—attitude toward the brand and purchase intent. Furthermore, a direct nonlinear effect of engagement volume on attitude toward the brand is evident, indicating a partial mediation via brand

<sup>3</sup> Although capturing purchase intent instead of actual purchase behavior is a limitation with regards to external validity, it represents a common approach in the automotive industry. Due to the dominance of indirect distribution via independent dealers, it is almost impossible for car manufacturers to gain insights into actual purchases of their Facebook fans. Instead, market research studies predominantly rely on self-reported measures.

<sup>4</sup> As a robustness check, we additionally estimated the model for a subsample consisting of only those respondents who exhibited some engagement behavior during the three month period ( $n = 445$ ). The model fits the data equally well:  $\chi^2(96) = 178.96$ , CFI = 0.980, TLI = 0.973, RMSEA = 0.044 [90% C.I.: 0.034/0.054], SRMR = 0.040. The explanatory power of the model remains almost unchanged, with 30.8% of the variance in brand attachment being explained, 30.1% in attitude toward the brand, and 54.1% in purchase intent. Moreover, all structural paths remain significant, with the exception of the engagement volume-attitude toward the brand path ( $\gamma = -0.002, p = .98$ ). A magnitude increase is evident for the paths from attachment to attitude toward the brand ( $\beta = 0.49, p < .001$ ) and to purchase intent ( $\beta = 0.27, p < .001$ ).

attachment, while the influence of engagement volume on purchase intent is fully mediated via brand attachment and attitude toward the brand (Zhao, Lynch, & Chen, 2010).<sup>5</sup> Following the recommendations by Zhao et al. (2010), we used bootstrapping with 5,000 bootstrap samples to estimate the indirect effects. All indirect paths are significant: the nonlinear effect of engagement volume on attitude toward the brand via brand attachment ( $\beta = 0.22$ , 99% C.I.: 0.139/0.328), of engagement volume on purchase intent via brand attachment ( $\beta = 0.10$ , 99% C.I.: 0.026/0.178), via attitudes ( $\beta = 0.06$ , 95% C.I.: 0.005/0.123), and via brand attachment and attitudes ( $\beta = 0.09$ , 99% C.I.: 0.055/0.147).

We assessed the robustness of the mediation by comparing the hypothesized model to a competing model, in which the paths from brand attachment to attitude toward the brand and purchase intent are constrained to zero and thus no mediation via brand attachment is present. All fit indices point to a reduced model fit ( $\chi^2(97) = 277.79$ ,  $\chi^2/df = 2.86$ , CFI = 0.973, TLI = 0.964, RMSEA = 0.052 [90% C.I.: 0.045/0.059], SRMR = 0.070, BIC = 17,750.96). A chi-square difference test ( $\Delta\chi^2(1) = 61.54, p < .001$ ) indicates that the fit reduction is significant, thus lending support to the hypothesized mediating role of brand attachment.

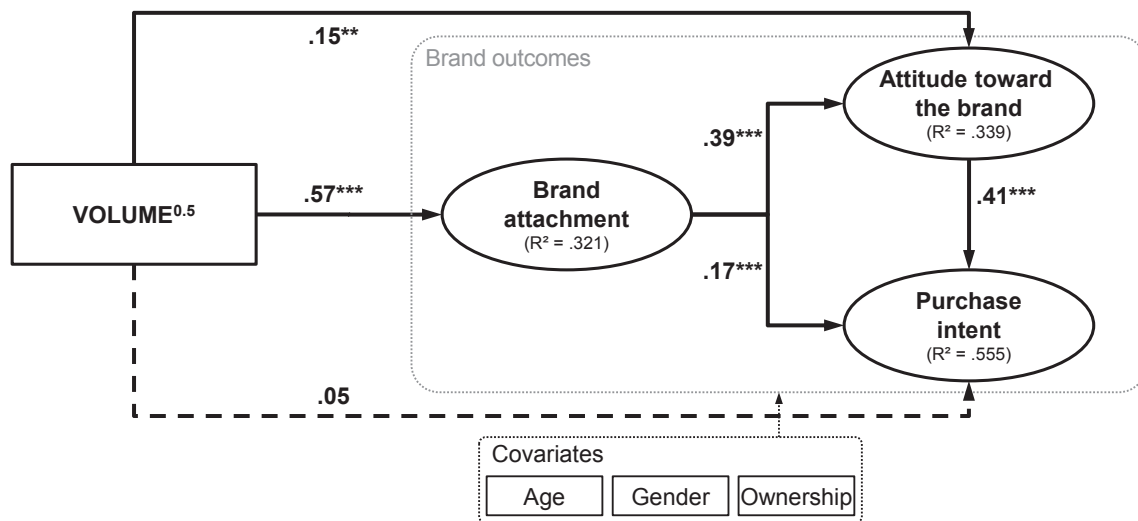
To examine the viability of the diminishing marginal utility, we compared our model to a linear model, in which brand attachment is regressed on engagement volume and the covariates, based on Bayesian Information Criterion (BIC).<sup>6</sup> Although the linear model also exhibits an acceptable fit ( $\chi^2(96) = 204.21$ ,  $\chi^2/df = 2.13$ , CFI = 0.983, TLI = 0.978, RMSEA = 0.040 [90% C.I.: 0.033/0.048], SRMR = 0.032) and a significant effect of engagement volume on brand attachment ( $\gamma = 0.49, p < .001$ ), the BIC is greater (BIC = 17,780.17,  $\Delta BIC = 84.22$ ) and the explained variance in attachment is substantially smaller ( $R^2 = 0.235$ ). According to Raftery (1995), the BIC difference greater than 10 indicates very strong evidence (i.e., posterior probability > 99%) for the square root model's superiority in model fit. We additionally estimated a squared model, in which attachment was regressed on engagement volume, engagement volume<sup>2</sup>, and the covariates. The model fit is acceptable ( $\chi^2(106) = 227.93$ ,  $\chi^2/df = 2.15$ , CFI = 0.982, TLI = 0.975, RMSEA = 0.041 [90% C.I.: 0.034/0.048], SRMR = 0.031, BIC = 17,716.20) and the positive coefficient for the path from engagement volume to attachment ( $\gamma = 0.95, p < .001$ ) and the negative coefficient for engagement volume<sup>2</sup> ( $\gamma = -0.53, p < .001$ ) together point at an inverted u-shape relationship, which resembles the hypothesized diminishing marginal utility. However, the difference in BIC of 20.24 provides very strong evidence (i.e., probability of greater than 99%, Raftery, 1995) that the square root model fits the data better. Overall, we thus interpret the results as support for the hypothesized diminishing marginal utility of engagement volume.

### 5.4. Discussion

In support of H<sub>1</sub>, Study 1 revealed a diminishing marginal utility of engagement volume. Consumers who were more active also exhibited greater attachment to the brand, more favorable attitudes, and higher purchase intentions. At the same time, each increase in engagement behavior resulted in a smaller increase in the three brand outcome measures. Moreover, consumers' brand attachment mediated the nonlinear effects of engagement volume on attitude and purchase intent. Thus, in line with H<sub>4</sub> and H<sub>5</sub>, engagement volume creates attachment,

<sup>5</sup> Prior to estimating the mediation model, we analyzed the direct effects on attitudes and intentions in two separate models. The hypothesized diminishing marginal utility of engagement volume is evident for attitudes ( $\gamma = 0.38, SE = 0.036, p < .001$ ) and intentions ( $\gamma = 0.30, SE = 0.033, p < .001$ ).

<sup>6</sup> Smaller BIC values represent better model fit. We use BIC because we compare non-nested models. Thus, common fit indices (e.g., chi-square difference test) cannot be used for meaningful comparisons between the linear and the diminishing marginal utility models (Raftery, 1995).



**Fig. 2.** Study 1: Results. **Notes:** Standardized path coefficients. Model fit:  $\chi^2(96) = 216.25$ ,  $\chi^2/df = 2.25$ , CFI = 0.982, TLI = 0.975, RMSEA = 0.043 [90% C.I.: 0.035/0.050], SRMR = 0.032, BIC = 17,695.95. \*\*\*  $p < .001$ , \*\*  $p < .01$ .

which explains the effects on the attitudinal and behavioral brand outcomes.

## 6. Study 2: Interaction of engagement volume and variety

### 6.1. Research setting and data collection

In this study, we cooperated with a workshop brand that operates a network of car service and repair shops across Germany and in several other European countries. The brand posted an invitation to participate in an online survey on its German Facebook page. Over a period of four weeks, 2,044 participants clicked on the survey link, out of which 848 (41.49%) completed the survey. Based on an attention check item (“This is a quality check question. Please answer with ‘totally agree’”) and survey duration, 189 participants were excluded, leaving a total of 659 analyzable responses, with 23.7% females and a mean age of 41.7 years ( $SD = 13.53$ ).

### 6.2. Measures

We captured respondents’ engagement behavior by using Facebook’s Graph application to extract all activities on the brand’s Facebook page that occurred in the twelve months prior to the survey.<sup>7</sup> This allowed for a more comprehensive measure than in Study 1, as we were able to include information on users’ social bookmarking (e.g., Likes), comments, posts, and shares. Upon starting the survey, respondents

<sup>7</sup> See <https://developers.facebook.com/docs/graph-api/>; the interface allows for reading and extracting information on activities performed on Facebook, such as the activities that occurred on a brand’s Facebook page.

consented to having the activity they had performed in relation to the brands’ Facebook page analyzed as part of our study. We measured engagement volume by counting the sum of all activities per user during the focal period.<sup>8</sup> Overall, the 659 respondents in our sample performed 2,740 activities. Among all respondents, 53.9% exhibited some level of activity in the analyzed period and active respondents on average performed 7.72 activities ( $SD = 15.55$ ). Based on the extracted engagement data, we calculated engagement volume and variety, as previously explained. For the latter, we considered the dispersion across four different kinds of activities, namely posts, comments, shares, and social bookmarking.

In the survey, we used the same scales as in Study 1 to capture respondents’ brand attachment, attitude toward the brand, and purchase intent. Moreover, we controlled for alternative explanations by capturing two covariates that are likely to influence the three constructs, namely perceived quality of the focal brand (Grewal, Monroe, & Krishnan, 1998) and the need to belong (Leary, Kelly, Cottrell, & Schreindorfer, 2013). Reliability as well as convergent and discriminant validity assessments for these latent constructs again yielded satisfactory results (see Appendix A). We again captured respondents’ gender and age to be used as controls. Additionally, we accounted for store patronage, as purchase experience may also affect brand attachment, by asking respondents how often they had purchased something from the brand (never/once/2–4 times/5–10 times/more than 10 times).<sup>9</sup>

<sup>8</sup> In contrast to Study 1, the more detailed data captured in Study 2 allowed us to interpret the valence of engagement behavior (i.e., positive, such as advocating a brand, negative, such as complaining about service failures, or neutral, such as posting a question about product availability), which we had initially intended to examine in more detail, following the conceptualization of engagement proposed by Obilo et al. (2021). We thus content coded all posts and comments as being positive, negative, or neutral. However, among all activities that occurred on the brand’s Facebook page there were very small incidences of negative engagement (6.0%) and neutral activities (0.2%). This incidence was similar among survey respondents (2.0% negative, 0.3% neutral). There were thus too few negative and neutral activities to warrant individual analyses. Therefore, to prevent any distortions that may arise from negative activities, we focused on positive and neutral activities, combining these to measure brand engagement behavior.

<sup>9</sup> Across the levels of store patronage, there were no differences in engagement volume ( $p > .126$ ) or engagement variety ( $p > .718$ ).

### 6.3. Results

We estimated an SEM model with the square root of engagement volume, engagement variety, both mean-centered, and their interaction term as independent variables. Age, gender, store patronage, perceived quality of the brand, and respondents' need to belong were included as covariates. The results, illustrated in Fig. 3, reveal a good model fit and support the hypothesized diminishing marginal utility of engagement volume, the positive effect of engagement variety, and the interaction between engagement volume and variety.<sup>10</sup> Of the covariates, perceived quality influences brand attachment ( $\gamma = 0.29, p < .001$ ), attitudes ( $\gamma = 0.54, p < .001$ ), and purchase intent ( $\gamma = 0.41, p < .001$ ); age ( $\gamma = 0.08, p < .05$ ) and need to belong ( $\gamma = 0.34, p < .001$ ) influence attachment; store patronage influences attachment ( $\gamma = 0.10, p < .01$ ) and purchase intent ( $\gamma = 0.10, p < .01$ ).

A mediation analysis with 5,000 bootstrap samples reveals indirect-only effects via brand attachment for all three predictor variables (Zhao et al., 2010). The square root of engagement volume indirectly influences attitudes ( $\beta = 0.14, 99\% \text{ C.I.: } 0.076/0.224$ ) and purchase intent (*total indirect effect* = 0.14, 99% C.I.: 0.068/0.222) via attachment. Such indirect effects are also evident for engagement variety (attitudes:  $\beta = 0.03, 95\% \text{ C.I.: } 0.006/0.072$ ; purchase intent: *total indirect effect* = 0.03, 95% C.I.: 0.006/0.069) and the volume<sup>0.5</sup> × variety interaction (attitudes:  $\beta = 0.04, 95\% \text{ C.I.: } 0.003/0.090$ ; purchase intent: *total indirect effect* = 0.04, 99% C.I.: 0.004/0.086).<sup>11</sup>

To assess the viability of the hypothesized diminishing marginal utility, we again compared the designated model to two competing models. The square root model fits the data better than both a linear model ( $\Delta\text{BIC} = 49.33$ ) and a quadratic model ( $\Delta\text{BIC} = 28.42$ ).

Overall, Study 2 thus also supports the assumption that the effects of engagement behavior diminishes as its volume increases. Additionally, more variety in consumers' engagement behavior leads to greater attachment and, in turn, more favorable attitudes and higher purchase intent. The positive interaction coefficient reveals that, as variety increases, the coefficient of the square root function is increased as well. This indicates that with greater variety, engagement volume has a stronger effect on brand attachment and greater marginal utility. Fig. 4 plots the estimated relationship between engagement volume and variety and brand attachment. It is evident that equal levels of engagement volume lead to greater attachment when consumers perform a broader variety of activities. Moreover, the marginal utility of engagement volume is higher at greater levels of engagement variety.

### 6.4. Discussion

In line with the findings from Study 1, engagement volume was found to exhibit a diminishing marginal utility for brand outcomes. Brand attachment again explained the relationship between engagement behavior and attitudes as well as behavioral intentions. Based on a

<sup>10</sup> We again checked the robustness of the model by also estimating it for only those respondents who exhibited some kind of engagement behavior during the observed period ( $n = 355$ ). The model still fits the data well:  $\chi^2(234) = 425.53$ ,  $\chi^2/\text{df} = 1.82$ , CFI = 0.964, TLI = 0.956, RMSEA = 0.048 [90% C.I.: 0.041/0.055], SRMR = 0.055. The explained variance is almost unchanged, with 49.1% for brand attachment, 49.3% for attitude toward the brand, and 54.5% for purchase intent. The only notable differences in the path coefficients are slightly larger effects of engagement variety on attachment ( $\gamma = 0.18, p < .05$ ) and the engagement volume<sup>0.5</sup> × variety interaction on attachment ( $\gamma = 0.15, p < .05$ ).

<sup>11</sup> To assess the robustness of the mediation, we again compared the hypothesized model to a competing model that omitted the paths from brand attachment to attitude toward the brand and purchase intent. The model fit ( $\chi^2(2) = 520.48$ ,  $\chi^2/\text{df} = 2.22$ , CFI = 0.973, TLI = 0.967, RMSEA = 0.043 [90% C.I.: 0.038/0.048], SRMR = 0.057, BIC = 28,643.82) is significantly worse than that of the hypothesized model ( $\Delta\chi^2(1) = 39.68, p < .001$ ;  $\Delta\text{BIC} = 33.19$ ).

different context than Study 1 and using a more comprehensive measurement of social media brand engagement behavior, these results thus lend further support to H<sub>1</sub>, H<sub>4</sub>, and H<sub>5</sub>.

In addition to the effects of engagement volume, Study 2 assessed the proposed moderating influence of engagement variety. The results show that greater engagement variety is beneficial for brand outcomes (H<sub>2</sub>) and that among consumers who engage in a greater variety of behaviors, the effect of engagement volume and its marginal utility are enhanced (H<sub>3</sub>). These findings support the notion that task variety leads to improved outcomes.

## 7. Conclusion

Consumer engagement has become a core objective for many brands (Harmeling et al., 2017). To this end, social media are increasingly used for interactions between companies and consumers (Malthouse et al., 2013; Trainor, Andzulis, Rapp, & Agnihotri, 2014). Predominantly, firms appear to aim at increasing the volume of engagement behavior, assuming direct and linear impacts on brand outcomes (Chang et al., 2019). In contrast to this widespread belief, our investigation reveals diminishing marginal utility of engagement volume. Moreover, we show that engagement variety can counter this effect, as the nonlinear influence is less pronounced when consumers' engagement comprises a greater variety of behaviors.

### 7.1. Contributions to theory

From a theoretical perspective, we expand existing views of engagement effects by distinguishing between volume and variety, by identifying diminishing returns on engagement volume, and by providing evidence for the beneficial effects of engagement variety. This also includes the contribution of transferring the power law of practice to a social media context. At the same time, while most of the extant studies investigated a linear link between engagement behavior and brand outcomes (e.g., Rishika et al., 2013), the power law of practice allows for a differentiated examination. By providing evidence for the existence of a learning curve for engagement volume, this work contributes to an enhanced understanding of the effects of brand-related social media behaviors performed by consumers, while extant studies predominantly focused on companies' social media activities (e.g., Hewett et al., 2016; Kumar et al., 2016). Additionally, by considering social media brand engagement as tasks that are characterized by learning effects, we offer a novel conceptual perspective to the social media marketing literature.

Considering the variety of engagement behavior contributes to research on social media marketing that has previously paid little attention to the effects of the diverse activities consumers can perform (Lamberton and Stephen, 2016). The evidence presented in Study 2 implies that research in this domain should not only consider if and how much consumers engage with brands, but also across how broad of a variety of behaviors.

Additionally, our investigation makes a contribution to the literature on actor engagement (Alexander et al., 2018; Storbicka et al., 2016). By distinguishing between engagement volume and variety and by demonstrating the differentiated effects of these dimensions on brand-related outcomes, our findings provide a more nuanced view of the ramifications of an individual's resource investments. Thus, our findings suggest that, in addition to accounting for engagement intensity that may differ over time (Brodie et al., 2019), the variety of activities should also be considered.

Finally, our work contributes to the broader brand community literature that defines brand communities to "represent a network of relationships between consumers and the brand, product, fellow consumers, and the marketer" (McAlexander et al., 2002, p. 39; see also Brodie et al., 2019). In line with, for instance, Rodríguez-López and Diz-Comesaña (2016), we view a Facebook brand page as a company-

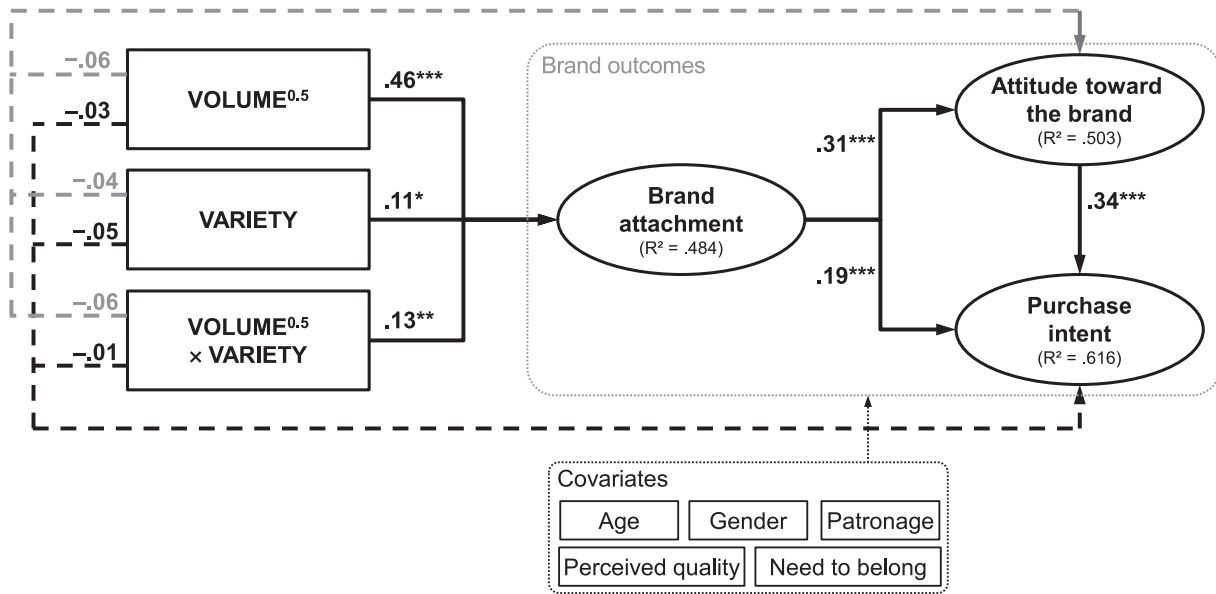


Fig. 3. Study 2: Results. **Notes:** Standardized path coefficients. Model fit:  $\chi^2(234) = 480.80$ ,  $\chi^2/df = 2.06$ , CFI = 0.977, TLI = 0.971, RMSEA = 0.040 [90% C.I.: 0.035/0.045], SRMR = 0.044, BIC = 28,610.63. \*\*\*  $p < .001$ , \*\*  $p < .01$ , \*  $p < .05$ .

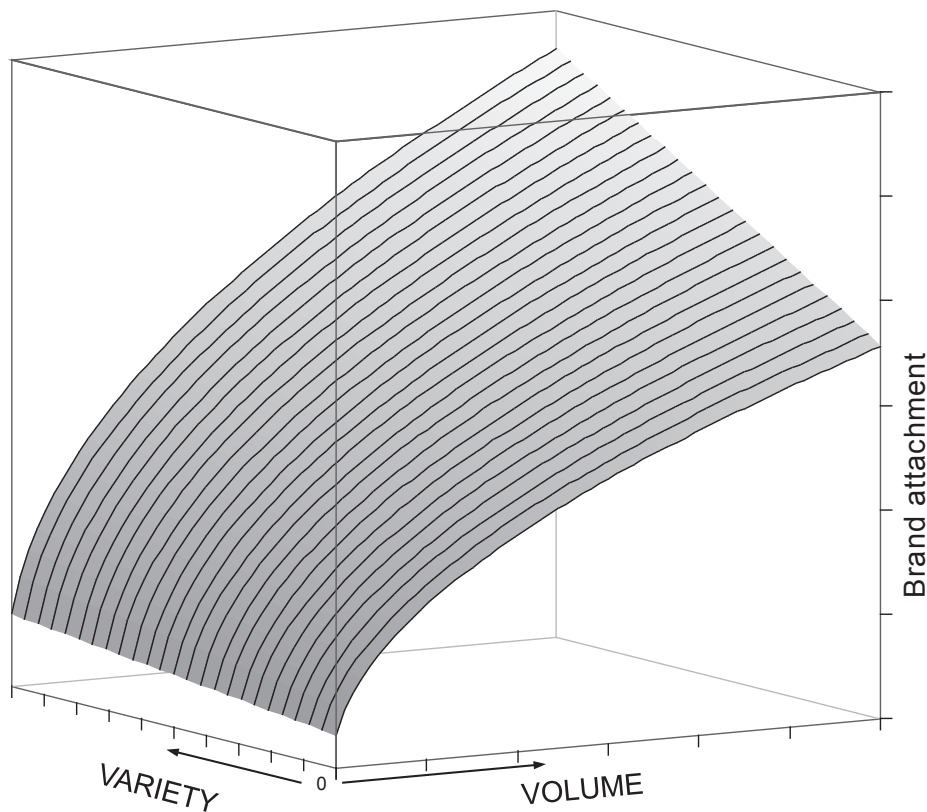


Fig. 4. Study 2: Nonlinear Effects of Brand Engagement Volume on Brand Attachment by Engagement Variety.

managed brand community. While [McAlexander et al. \(2002\)](#) found indication of boundary conditions of brand community engagement effectiveness, we provide a quantification of diminishing returns and its moderation. Moreover, our study indicates that for the specific context of online brand communities, a risk of habituation might exist. Specifically, although higher levels of engagement volume create positive effects, consumers appear to be less affected by additional activities they perform in the community context. In a broader perspective, this finding

could be preliminary evidence for the existence of a life cycle of online brand communities ([Karniouchina, Uslay, & Erenburg, 2011](#)). At the same time, the finding that engagement variety acts as a moderator indicates the importance of engaging consumers in various ways to maximize the effects of a community.

### 7.2. Managerial implications

For companies using social media in marketing activities it is important to understand how engagement behavior influences consumer-brand relationship quality. Our findings can thus be used to develop, evaluate, and further refine social media marketing activities.

The diminishing marginal utility of engagement volume sheds light on potential pitfalls of continuously trying to engage consumers via social media. Instead of merely maximizing engagement behavior (Eckstein, 2021; McLachlan, 2020), companies should try to broaden and diversify their social media fan base, as among consumers with low engagement, additional activities yield higher returns than among consumers who are already highly engaged. What is more, such a low vs high behavioral engagement segmentation would also allow companies to incentivize already highly engaged consumers to venture into new social media channels or environments in order to prevent from the ‘volume trap’ (Malthouse et al., 2013). This suggestion also corresponds with recent studies on actor engagement, suggesting that providing and guiding consumers to different technological platforms might enrich the engagement setting (e.g., Brodie et al., 2019; Jaakkola & Alexander, 2014; Storbacka et al., 2016).

Following seminal work on customer engagement marketing initiatives (Harmeling et al., 2017), we further differentiate between **task-based and experiential-based engagement initiatives** to counter the declining effect of engagement volume. Task-based initiatives could explicitly ask consumers to perform previously not or rarely performed activities by formulating rather specific and structured tasks, such as, for example, Apple’s #ShotOniPhone challenge that invited iPhone users to post their best shots on Instagram or Twitter (Apple, 2019). Apart from that, more proactive consumers seem to be prone for experiential-based initiatives, given their already strong identification with the target brand (McAlexander et al., 2002). For example, German luxury car manufacturer Porsche had unveiled a multi-sensory pop up store in New York City, where it allowed visitors to draw what the sound of Porsche meant to them and then uploaded these drawings to social media via the hashtag #soundofporsche (Rodrigues, 2018).

Taken together, our findings on the role of engagement variety show that unidimensional approaches to social media engagement, such as announcing a raffle among all consumers who post the answer to a quiz question on Facebook, are short-sighted. Instead, companies should encourage consumers to perform various brand-related activities to increase effectiveness. This may be achieved by conducting multi-dimensional campaigns that incentivize consumers to post, comment on, and share brand-related content.

### 7.3. Limitations and research opportunities

Limitations of our research concern the research design, as cross-sectional survey responses were analyzed in combination with aggregated data on prior engagement. However, the effects of volume and variety may also be influenced by temporal aspects, such as the time

window in which a specific volume and variety of engagement occur or the customer lifecycle. Future studies should therefore examine temporal dynamics by using longitudinal data, which would also allow for validating the interdependencies which we examined based on cross-sectional data. Moreover, such a research design would also allow for examining possible feedback loops and reverse dynamics. For instance, it is reasonable to assume that engagement behavior not only influences brand outcomes, but that more positive attitudes in turn lead to higher engagement.

Second, our studies only measured purchase intentions instead of actual purchase behavior. Although this is very much in line with the limitations that many companies face in linking social media engagement behavior to purchase data, future studies should examine the links between social media brand engagement behavior and consumers’ actual purchase patterns. Similarly, future studies could apply more comprehensive measures for assessing social media brand engagement that also count for the cognitive and emotional elements of engagement in addition to its behavioral component.

Third, although we controlled for customer-level covariates in our empirical analyses, firm-level variables may also affect brand outcomes. Future studies should hence account for aspects such as advertising and firm-initiated marketing communication, and a potential influence of the network the focal brand is embedded in (e.g., frontline representatives, suppliers, dealers, or competitors; Jaakkola & Alexander, 2014).

Fourth, our examination of engagement variety was based on a limited set of three (Study 1) or four (Study 2) different types of behavior. This led us to only examine linear effects of engagement variety on brand outcomes. However, as ever more diverse social media platforms and types of activities become available, it may be worthwhile and feasible to also examine a possible diminishing marginal utility of engagement variety.

Fifth, our investigation takes a dyadic perspective, as we examined the relationship between consumers and specific brands. This allowed us to capture the consequences of consumers’ social media brand engagement behavior and, specifically, its nonlinear effects. Recently, however, researchers have advocated to ‘zoom out’ in order to capture the broader, networked effects of engagement (e.g., Alexander et al., 2018; Brodie et al., 2019; Hollebeek, Kumar, & Srivastava, 2020; Verleye, Gemmel, & Rangarajan, 2013). Future studies should thus examine volume and variety effects from a stakeholder perspective, beyond the consumer-brand dyad.

Finally, we encourage future research to also account for the brand content of engagement (e.g. storytelling) in addition to the volume and variety of activities (Dessart & Pitardi, 2019).

### Declaration of Competing Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

### Appendix A. Items and Reliability Measures (Study 1/Study 2)

	Cronbach’s alpha	Composite reliability	AVE	Factor loadings	Indicator reliability
Brand attachment – second-order (Park et al., 2010)	–	0.86/0.95	0.76/0.91		
1. Dimension 1: brand-self connection				0.91/0.97	0.84/0.95
2. Dimension 2: brand prominence				0.82/0.93	0.68/0.86
Dimension 1: brand-self connection	.85a/.86a	0.92/0.92	0.85/0.86		
1. [Brand] is part of me and who I am.				0.92/0.93	0.85/0.87
2. I feel personally attached to [brand].				0.92/0.92	0.85/0.84
Dimension 2: brand prominence	.73a/.86a	0.85/0.92	0.73/0.86		
1. My thoughts about [brand] are often automatic, coming to mind seemingly on their own.				0.86/0.95	0.74/0.89
2. I think about [brand] naturally and instantly.				0.85/0.91	0.72/0.82

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	Cronbach's alpha	Composite reliability	AVE	Factor loadings	Indicator reliability
Attitude toward the brand (Maheswaran and Sternthal 1990; Stayman et al. 1991)	0.90/0.94	0.90/0.94	0.60/0.73		
1. bad/good				0.80/0.90	0.64/0.81
2. outmoded/advanced				0.72/0.82	0.52/0.68
3. inferior/superior				0.81/0.88	0.65/0.78
4. worse than competing brands/better than competing brands				0.73/0.83	0.54/0.68
5. not beneficial/beneficial				0.79/0.86	0.63/0.73
6. worthless/valuable				0.79/0.85	0.62/0.72
Purchase intent (Coyle and Thorson 2001)	0.90/0.90	0.91/0.91	0.77/0.76		
1. It is very likely that I will buy [brand] (again).				0.95/0.89	0.90/0.65
2. I will purchase a [brand] (again) the next time I need a car.				0.92/0.89	0.85/0.80
3. I will definitely test drive a [brand] (again).				0.75/0.92	0.56/0.84
Perceived quality (Grewal et al., 1998)	-/0.89	-/0.88	-/0.70		
1. The products and services of [brand] are of good quality.				-/0.83	-/0.68
2. [Brand] sells products that are durable.				-/0.78	-/0.61
3. [Brand] sells products that are reliable.				-/0.90	-/0.82
Need to belong (Leary et al., 2013)	-/0.77	-/0.77	-/0.53		
1. I want other people to accept me.				-/0.74	-/0.54
2. I do not like being alone.				-/0.65	-/0.42
3. I have a strong "need to belong".				-/0.79	-/0.63
CFA model fit Study 1: $\chi^2$ (59) = 118.67; $\chi^2/df$ = 2.01; RMSEA = 0.038 [90% C.I.: 0.028, 0.048]; SRMR = 0.029; CFI = 0.990; TLI = 0.987					
CFA model fit Study 2: $\chi^2$ (138) = 300.75; $\chi^2/df$ = 2.18; RMSEA = 0.042 [90% C.I.: 0.036, 0.049]; SRMR = 0.028; CFI = 0.984; TLI = 0.980					
Note: a For two-item constructs, bivariate correlations ( $p < .001$ ) are reported instead of Cronbach's alpha.					

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