



# Fit or misfit of culture in marketing communication? Development of the culture-ladenness fit index

Boris Bartikowski<sup>a,\*</sup>, Marie-Odile Richard<sup>b</sup>, Heribert Gierl<sup>c</sup>

<sup>a</sup> Kedge Business School, Domaine de Luminy, BP 921, 13288 Marseille Cedex 9, France

<sup>b</sup> State University of New York Polytechnic Institute, Donovan Hall 1264, 100 Seymour Road, Utica, NY 13502, USA

<sup>c</sup> University of Augsburg, Universitätsstrasse 16, 86159 Augsburg, Germany

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## ABSTRACT

We introduce culture-ladenness fit (CLF) in marketing communication as a new semantic memory concept and the CLF index as a new tool to measure the effectiveness of culture-laden marketing communication. Culture-ladenness is how much cultural representation consumers perceive in communication, and the CLF index measures how well culture-laden communication aligns with four mental categories against which consumers evaluate fit: (1) the product category, (2) target consumers, (3) the brand image, and (4) the image of the brand's strategic partners. We report three empirical studies that develop and validate the CLF index using twelve items for a long version (study 1 and 2) and four items for a short version (study 3) of the index measure. The CLF index is a viable tool that marketers can use as a key performance indicator (KPI) to measure and control the marketing effectiveness of culture-laden marketing communication.

## 1. Introduction

Marketers often seek to align cultural content in marketing communication with consumers' cultural values, habits and what else those consumers may know about the product and the brand. Cultural content includes signs, symbols, ethnic models, verbal statements, or any other type of cultural marker that may appear in any form of marketing communication such as advertising, sales promotions, or on websites. For example, Bertolli, a brand of Italian food products (e.g., pasta, olive oil, sauces), uses images on the web that emphasize fit of the Italian culture with the company's products (e.g., Tuscan landscapes, food scenes in Italy).<sup>1</sup> As another example, as part of their product seeding strategy in China, Maybelline New York (L'Oréal) provided popular Chinese social media influencers with a make-up kit containing the traditional Chinese strategy game mahjong, which fits the influencers' culture in terms of playing mahjong for the Chinese New Year. To assess the effectiveness of such culture-laden communication, marketers commonly rely on intuition, experience, content analyses, or experimental copy tests. However, broader strategic recommendations cannot be easily derived from these assessments. A comprehensive tool

to measure the effectiveness of cultural content in marketing communication from a marketing strategic perspective does not currently exist in the literature. This is a surprising gap because marketers need guidance in their efforts to use cultural content in communication and ensure reliable monitoring of the effectiveness of such communication. We therefore introduce the new concept of culture-ladenness fit (CLF) in marketing communication, and develop the Culture-Ladenness Fit index (CLF index) as an empirical measure of the effectiveness of culture-laden marketing communication. We thereby contribute to two important streams of literature.

First, we contribute to the debate on the effectiveness of standardization vs. localization (or cultural adaptation) of advertising, which has existed for more than half a century (Elinder, 1965). This debate has highlighted numerous benefits and perils of using cultural content in marketing communication, and has informed significant bodies of research into the role of culture from various perspectives, such as research on country-of-origin (COO) effects (Peterson & Jolibert, 1995), consumer culture brand positioning (Alden et al., 1999; Bartikowski et al., 2021), product/brand place associations (Batra et al., 2000; Papadopoulos et al., 2018), or ethnic targeting (Aaker et al., 2000;

\* Corresponding author.

E-mail addresses: [boris.bartikowski@kedgebs.com](mailto:boris.bartikowski@kedgebs.com) (B. Bartikowski), [richarm3@sunyit.edu](mailto:richarm3@sunyit.edu), [richarm3@sunyit.edu](mailto:richarm3@sunyit.edu) (M.-O. Richard), [heribert.gierl@wiwi.uni-augsburg.de](mailto:heribert.gierl@wiwi.uni-augsburg.de) (H. Gierl).

<sup>1</sup> Bertolli's olive oil business is actually owned by the Spanish food group Deoleo, against which a class action lawsuit has been filed for misleading consumers through claims such as "Imported from Italy" because the olives used in Bertolli olive oil are sourced and pressed outside of Italy (Siegener, 2018).

Bartikowski et al., 2016; 2020; Cleveland et al., 2016). Adding to this literature we introduce CLF as a new semantic memory concept for studying the effectiveness of culture-laden marketing communication. Culture-ladenness broadly signifies how much cultural representation consumers perceive in marketing communication. We define culture-ladenness fit (CLF) from the subjective perspective of the consumer; CLF measures how well culture-laden communication aligns with multiple mental categories against which consumers evaluate fit. Drawing on theories of mental categorizations (Rosch, 1978) and a historical review of the strategic marketing literature, we consider that four mental categories portray strategic fit dimensions and form the CLF index conceptually: product category fit, target consumer fit, brand image fit, and strategic partner fit, as we detail below.

Second, by introducing the new CLF index we contribute to the flourishing literature on the development of formative index measures. Index development is a growing area of research because marketers increasingly rely on Key Performance Indicators (KPIs) that measure the degree of some performance achievements, such as quarterly customer satisfaction scores (Fornell et al., 1996). Marketers typically use KPIs to set performance goals or use them as benchmarks for a better understanding and control of marketing effectiveness. Examples of KPI-type index measures are Homburg et al.'s (2002) index of a service-oriented business strategy, Cadogan et al.'s (2008) index of a firm's market-oriented behavior, Ruiz et al.'s (2008) service value index, Bruhn et al.'s (2008) index of customer equity management performance, and Dickinger and Stangl's (2013) website performance index. Despite the plethora of index measures that exist in the literature, and even though urgently needed, no index measure is available to assess the degree to which cultural content in communication is effective from a marketing perspective. The CLF index offers managers a new KPI-type measure to control the effectiveness of culture-laden marketing communication from a marketing strategic perspective.

The remainder is structured as follows. First, we provide a theoretical overview of the concept of cultural fit, based on which we introduce the new CLF concept. This is followed by a literature review of milestones in strategic marketing thinking, from which we derive four relevant CLF dimensions. We then report the results of three empirical studies that develop the CLF index formally. The studies demonstrate that the new CLF index is a viable and valid tool to measure the effectiveness of cultural content in marketing communication. We conclude with a discussion on the development of index measures in general, the CLF index in particular, considering theoretical ideas on logical positivism and the issue of theory-ladenness of observations. We also discuss the managerial implications of this research, and offer new research directions.

## 2. CLF concept and dimensions

### 2.1. Defining culture-ladenness fit

To learn about and understand the world that surrounds them, people mentally categorize new incoming information in terms of how well the new information fits with existing knowledge categories (Loken et al., 2008; Rosch, 1978). Knowledge categories have a “core meaning” which are the best examples or the clearest cases of a mental category, surrounded by other similar appearances, in combination making up the internal structure of the category. For example, when people see a new plant with leaves and a tall, thick trunk, they are likely to think of it as a tree, rather than another plant category such as a bush or a flower. Consumer researchers have studied mental categorizations in relation to various types of categories, such as personality traits that provide consumers self-expressive or symbolic benefits (i.e., personality traits as mental categories) (Aaker, 1999), product categories (e.g., soft drinks, fruit juice) (Herr, 1989), or brand categories (Barone & Miniard, 2002). Surprisingly little is known about multiple mental categorizations, or the idea that consumers may categorize one and the same stimulus (e.g., a culture-laden ad) into multiple mental categories simultaneously

(Bartikowski et al., 2022).

Central to mental categorizations is the idea of category fit, or the degree of “prototypicality of an object,” which is how good an example of a particular category individuals consider an object to be (Rosch, 1978). Focusing on the role of culture, authors have considered the idea of “cultural fit” from various perspectives of culture. For example, in social psychology Alter and Kwan (2009) found that cues that fit with a specific culture (e.g., the East Asian yin–yang symbol) cause people from other cultures to make “extracultural” judgments (e.g., considering foreign worldviews). In international business, cultural (mis-)fit is the extent to which one culture differs from another (Shenkar, 2012). Research into consumer-culture brand positioning (Alden et al., 1999; Bartikowski et al., 2019) suggests that managers may employ one of three types of cultural brand positioning (local, global, foreign) that fits best with country, consumer segment, and product category factors. For example, Budweiser as a brand is associated with small-town American culture and such an image positioning fits well with locally connected US consumers (Alden et al., 1999). Similarly, individualistic vs. collectivistic advertising appeals can trigger assimilation or contrast effects in consumers depending on the cultural fit of an ad with consumers' cultural values in terms of individualism/collectivism (Teng & Laroche, 2006).

It is clear that consumers are sensitive to cultural content in marketing communication. Moreover, mental categorizations of cultural content and category fit inform their behavior. Starting from here, we define culture-ladenness in marketing communication in terms of the semantic meaning of cultural content from the subjective perspective of consumers. Culture-ladenness is how much cultural representation consumers perceive in marketing communication. For example, on its US website the Mexican beer brand Casa Modelo claims to be the house of authentic Mexican beer, stating that Modelo Especial has been a part of the Mexican culture since the first bottle came off the assembly line in 1925. The website displays numerous markers of the Mexican culture (typical Mexican people, monuments, colors, symbols, and so forth) and therefore appears highly laden with the Mexican culture. In contrast, the international group website of the Mexican brand Bimbo displays little cultural content, and therefore appears not or only weakly culture-laden. We surmise that consumers experience feelings of fit or misfit of culture-ladenness in relation to four mental categories (i.e., the CLF dimensions) that we will introduce next. Multiple mental comparisons of culture-laden communication with some mental categories (cf., Bartikowski et al., 2022) result in individual perceptions of cultural fit, something that we call here culture-ladenness fit (CLF).

### 2.2. Four CLF content dimensions

To be relevant, index measures must cover aspects that marketers can manage or control in practice. Index measures must also be sufficiently broad and yet specific by mapping the construct domain on all relevant and actionable dimensions. Since our objective was to develop the CLF index as a marketing strategic tool, we decided to derive relevant CLF content dimensions from a review of historical developments in strategic marketing thinking. We do not mean to provide a comprehensive overview of how strategic marketing has evolved as a discipline. Rather, we propose that four milestones in strategic marketing thinking are most relevant to the CLF concept: product marketing, target marketing, brand marketing, and network partners. These four milestones represent four relevant and meaningful mental categories against which consumers can evaluate CLF (Fig. 1).

*Dimension 1: Product Category Fit.* Since the first stages of capitalism, marketers have considered that consumers are interested in product availability and low prices. Product-centric marketers focus on the products that they market, for example in terms of production cost or product quality. Early strategic tools such as Ansoff's (1957) product/market growth grid, Henderson's (1970) product portfolio model (BCG matrix), and later Porter's (1985) generic strategies all revolve around

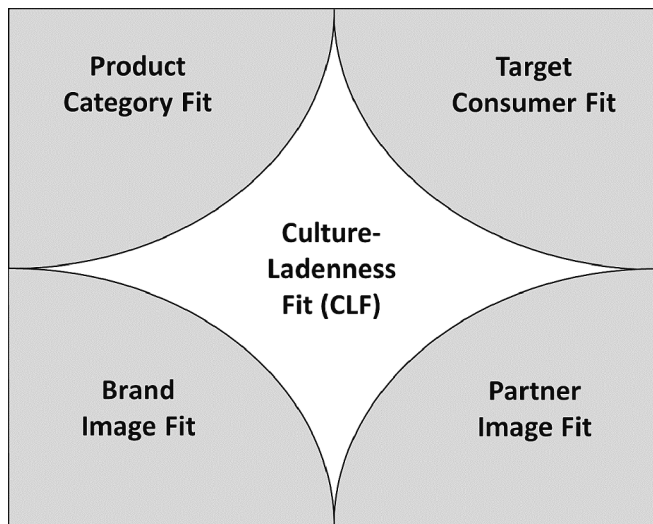


Fig. 1. Four dimensions of Culture-Ladenness Fit (CLF).

products, and help managers formulate product standardization (mass market, cost-leadership) or differentiation (niche) strategies. Researchers have frequently considered that consumers mentally categorize marketing information in relation to categories or types of products (Agarwal & Sikri, 1996). The first CLF dimension, *fit of culture-laden communication with the product category*, therefore represents product-centric marketing as one strategic marketing orientation. The introductory example of Bertolli using Italian cultural content to market typical Italian food products is an example of high CLF with the product category.

**Dimension 2: Target Consumer Fit.** While products are central to most firms, marketers' attention has quickly turned to differentiation strategies, recognizing that cost-leadership in product-centric marketing is strictly speaking not attainable for more than one competitor among many. Ideas on consumer segmentation and targeting therefore emerged early in the literature (Smith, 1956). Marketers may identify consumer segments based on demographic variables or psychological characteristics such as personality traits, values, or lifestyles (Novak & MacEvoy, 1990). Researchers have also emphasized the importance of considering the consumer's self-concept or identity (Belk, 1988; Sirgy, 1982). "Identity-based approaches" to targeting consumers enjoy until today great popularity in the literature (Bartikowski and Cleveland, 2017; Bartsch et al., 2016; Cleveland et al., 2016, 2023; Papadopoulos et al., 2018). Common to this line of research is the idea that people mentally categorize environmental stimuli (e.g., advertising) in relation to their own (cultural) identities, and tend to react positively to positive fit experiences (Luna et al., 2002; Steenkamp and Geyskens, 2006). The second CLF dimension, *fit of culture-laden communication with target consumers* represents the idea of target marketing as another relevant dimension of strategic marketing. For example, brands such as Coca-Cola or Mercedes Benz have aggressively targeted Chinese consumers using the Chinese national color red in advertising, which fits positively with Chinese cultural ideas of happiness and good luck. As another example, Japanese pop culture has inspired the famous role-playing game Genshin Impact, and billboard advertising for this game displays young women in miniskirts or sexy dominatrix outfits. While such ad content may be culturally acceptable to consumers in Japan (high CLF with the Japanese culture), it may not fit with consumer cultures in the Middle East where it may cause outrage.

**Brand Image Fit.** Deepened understanding about consumers has led researchers to consider imagery elements of the offering, and authors have developed concepts to explain consumer-brand relationships, such as brand image, brand personality, brand love, or brand hate (Aaker, 1997; Batra et al., 2012; Fournier, 1998; Zhang & Laroche, 2020). Brand

image is the set of memory associations that consumers have in mind when they think about the brand, and a positive and distinctive brand image is essential to brand equity (Keller, 1993). The third CLF dimension, *fit of culture-laden marketing communication with the brand image* portrays the idea of imagery in brand positioning as another dimension of strategic marketing. Consumers have numerous opportunities to associate brands with cultures, for example through brand story telling (the brand's history, the region from where it originates, etc.) on websites, or through country-of-origin (COO) information on packaging (made-in, designed-in, etc.). Such information loads the brand with rich symbolic cultural meaning, such as regional authenticity or exoticness (Bartikowski and Singh, 2014; Laroche et al., 2020; Verlegh & Steenkamp, 1999). CLF with the brand image increases when new incoming culture-laden information fits with the brand image that consumers have in mind. For example, part of the success that French luxury brands such as Dior, Louis Vuitton, or Hermès currently enjoy in China arguably relates to the French COO image as a culture-related source of luxury (elegance, craftsmanship, history, etc.). Executing a "French touch" in luxury advertising may enhance CLF with the brand image of luxury brands in general.

**Partner Image Fit.** Since the early 1990s, the strategic marketing literature has increasingly emphasized the relevance of strategic network partners and marketing alliances for marketing success (Anderson & Narus, 1990). Many firms are engaged in multiple interconnected vertical alliances (upstream suppliers or downstream buyers) or in horizontal alliances (partner firms or brands at a similar level of the value chain), all of which are strategic resources to the firm (Swaminathan & Moorman, 2009). The fourth CLF dimension, *fit of culture-laden marketing communication with the brand image of strategic partners*, portrays the idea of a network of partners to which culture-laden marketing communication must fit. For business-to-consumer (B2C) brands, celebrity endorsers (Agrawal & Kamakura, 1995), opinion leaders and influencers (Iyengar et al., 2011), and co-brands (Desai & Keller, 2002) are among the brand's most visible strategic partners. These partners come with their own brand image and unique cultural associations to which the focal brand's culture-laden marketing communication must fit. The introductory example of Maybelline cultivating partnerships with prominent Chinese social media influencers by providing them with culturally adapted product gifts (a make-up kit containing the traditional Chinese game mahjong) is an example of high CLF-fit with social media influencers as strategic partners.<sup>2</sup>

### 3. CLF index development

The literature offers rich discussions on the empirical development and proper use of psychometric index measures (Cadogan & Lee, 2013; Cadogan et al., 2008; Diamantopoulos et al., 2008; Diamantopoulos & Winklhofer, 2001; Jöreskog & Goldberger, 1975; Lee et al., 2013; Baumgartner and Weijters, 2019). For the CLF index development, we employed a three-step process (Table 1) following recommendations by Diamantopoulos and Winklhofer (2001) and Diamantopoulos et al. (2008).

Step 1 specified the CLF content in terms of the four discussed marketing strategic dimensions (Fig. 1). Formative indicators must cover a construct domain completely, or researchers must deal with measurement error (Bollen & Diamantopoulos, 2017; Diamantopoulos & Winklhofer, 2001). We have thus vetted the four strategic CLF dimensions and initial items (Appendix A) with six experts, who confirmed the relevance and conceptual distinctiveness of the dimensions of marketing strategy, as well as the idea that consumers can evaluate fit of culture-laden marketing communication against these dimensions. For

<sup>2</sup> The campaign was a resounding success, with hundreds of influencers talking about the brand on all major Chinese social media platforms (<https://ingdaily.com/mahjong-makeup-maybelline/>).

**Table 1**  
A three step process of psychometric index (CLF index) development.

Steps	Studies
Step 1:Content specification	Literature review • Four strategic CLF dimensions (Fig. 1)
Step 2:Item creation	Study 1 • Item creation • Exploration of the factor structure (EFA) • Item refinement
Step 3:Validity testing	Study 2 • MIMIC model testing • Predictive validity • Incremental validity Study 3 • External validity • Face validity

example, consumers may think that Bertolli’s Italian culture-laden website design fits well with pasta as a product category (i.e., high product category fit), or with Bertolli’s brand image (i.e., high brand image fit). Moreover, the experts revealed no other relevant CLF constituents that were not already broadly covered. We will discuss issues of domain completeness and measurement error in the theoretical conclusions, and offer ideas for CLF extensions in the future research section. To proceed, we submit that the four dimensions cover the CLF construct domain sufficiently completely to be practically relevant. Step 2 creates items that capture the four CLF dimensions and explores their factor structure (Study 1). Step 3 assesses the construct validity of the CLF index (Study 2 and Study 3).

3.1. Study 1: Item creation, factor structure, and item refinement

The objective of Study 1 was to create items to measure CLF from a consumer perspective. We formulated an initial set of 23 items with nuanced meanings that capture various aspects of the four CLF dimensions in relation to website design and vetted the items with experts (Appendix A). For example, to measure CLF with the brand image, one item was “the culture-laden website design is typical to [brand x].”

3.1.1. Study 1: Design and data collection

To test the initial set of items, we collected data from a sample of n = 151 MTurk respondents. Participants had to be from the US, be proficient in English and be at least 18 years old. Their task was to browse the website of a randomly assigned brand for five minutes and answering open- and close-ended questions about the site. They first read two relevant definitions:

- *Cultural markers* are design elements that reflect a specific national or ethnic culture, such as culture-related symbols or colors, images of ethnic people, buildings, or landscapes. Cultural markers can also appear as verbal statements in relation to products, news, events, or other things.
- *Culture-laden website design* is the use of cultural markers in website design (i.e., how much cultural representation the website displays)

The questionnaire then showed one randomly selected brand name and logo out of 20 brands (Table 2). We selected these brands because their US websites display observable variation in terms of culture-laden layout design<sup>3</sup> that we aimed to capture. We next asked the respondents to search the Internet for the homepage of the assigned brand, paste the URL into the questionnaire, and browse that website for at least five

<sup>3</sup> For example, the French brand Evian (soft drinks) emphasizes that the product is “Made by the French Alps,” and the US brand Tabasco (food) uses various cultural markers indicative of South-American cultures (colors, text, people).

**Table 2**  
Brands used in Study 1 and Study 2.

Brands (n = 20)	Categories (n = 9)	Brand COO (n = 6)
Evian	Soft Drinks	France
Louis Vuitton	Apparel	
Michelin	Travel guides, Tires	
Adidas	Apparel	Germany
BMW	Cars	
Schwarzkopf	Beauty	
Alfa Romeo	Cars	Italy
Pirelli	Tires	
Versace	Apparel	
Bimbo	Food	Mexico
Casa Modelo	Beer	
Jumex	Soft Drinks	
H&M	Apparel	Sweden
IKEA	Retail	
Volvo	Cars	
Coca Cola	Soft Drinks	USA
Starbucks	Fast Food	
Chipotle	Fast Food	
Tabasco	Food	
Taco Bell	Fast Food	

minutes while thinking about the website’s cultural content. A five-minute time counter was shown, and the questionnaire only moved forward after that amount of time elapsed. We expected that the participants would use the allotted time to complete the browsing task. We then asked them to write short statements about the cultural content that they had seen (if any). They next evaluated the website using the 23 CLF items and 5-point Likert scales (1 = strongly disagree; 5 = strongly agree). We randomized the display of the four dimensions and the display of the items within the dimensions.

Crowd-sourced questionnaire data frequently suffers from severe quality problems that researchers must mitigate through appropriate screening procedures (Chmielewski & Kucker, 2020). We used the written responses to the open-ended questions as a qualitative screener and excluded n = 64 respondents who provided either no valid website link, or provided meaningless answers, leaving a usable sample of n = 87 respondents who demonstrated meaningful participation and high data quality.

3.1.2. Factor structure and item refinement

We ran an exploratory factor analysis (EFA) with the 23 items using PROMAX rotation and an imposed 4-factor solution. The total variance extracted was 68.8%, and the Kaiser-Meyer-Olkin measure of sampling adequacy suggested a good model fit (KMO = 0.881). Most items load most strongly on their respective target factor, and only a few items show significant cross-loadings. We ran another EFA with those three items per dimension that showed the highest loadings per dimension. KMO was 0.789, and the total variance extracted was 75.5%. More detailed EFA results appear in Appendix A. We slightly rephrased some of the items to make them more inclusive, re-considering items that we excluded before despite high loadings on their target factor. For example, the item “... shows images that reflect my own culture” became “... shows images or colors that reflect my own culture”. Table 3 shows the refined set of twelve CLF items.

3.2. Study 2: Validity testing

The main objectives of Study 2 were to test the construct validity of the CLF index with respect to a MIMIC (Multiple Indicators Multiple Causes) model, as well as assessing the CLF index’s predictive- and incremental-validity (Table 1).

3.2.1. Data collection

Using the same brands as in Study 1 and the set of twelve refined items (Table 3), we collected data from another n = 335 MTurk

**Table 3**  
CLF items.

CFL dimension	The cultural content on [brand x]'s website ...
<b>Product category fit</b>	... is typical of the product category ... corresponds to what I know about the product category ... matches well with the product category
<b>Target consumer fit</b>	... is designed to target people of my own culture ... shows images or colors that are typical to my own culture ... shows symbols or written information that remind me of my own culture
<b>Brand image fit</b>	... fits well with the brand image of [brand x] ... is typical to [brand x] ... is coherent with what [brand x] stands for
<b>Partner image fit</b>	... fits well with partners of [brand x] (e.g., celebrities or other brands) ... is typical of the celebrities or partner brands of [brand x] ... corresponds to what I know about [brand x]'s celebrity partners or other partners

respondents, leaving a usable sample of  $n = 170$  respondents after data screening.<sup>4</sup> In the beginning, the online questionnaire additionally measured brand familiarity using the item “How familiar are you with [brand x]?” ( $1 = \text{never seen before}$ ;  $5 = \text{very familiar}$ ). Respondents then followed the same procedures as in Study 1. We also measured respondents’ brand trust (not trustworthy/trustworthy; not credible/credible) and brand liking (bad/good; unfavorable/favorable; unlikeable/likeable) using 7-point semantic differential scales.

### 3.2.2. MIMIC model testing

Assessments of convergent or discriminant validity are relevant to reflective measures, but are meaningless to formative indices (Bagozzi, 1994; Diamantopoulos et al., 2008). Researchers sometimes recommend assessing MIMIC models as part of formative measurement validation (Diamantopoulos & Winklhofer, 2001). A MIMIC model causally links all indicators to the same latent variable, including two reflective indicators that are required for statistical identification (Diamantopoulos & Winklhofer, 2001). The MIMIC model thus assesses the items as a combined set, considering interrelations between them. An overall good model fit may be taken as initial supporting evidence for the set of indicators to form an index (Diamantopoulos & Winklhofer, 2001). It is out of the scope of this article to discuss advantages, problems or remedies related to interpreting MIMIC models in psychometric research.<sup>5</sup> For the present study, the objectives were twofold.

*First*, we aimed to reach initial support for empirical model fit, considering theoretically that consumers’ brand trust (two reflective items) and the 12 formative CLF items belong to the same construct domain. Balance theory (Heider, 2013) suggests that people strive for harmony or psychological balance in their thoughts. Moreover, people tend to trust and like things better when they cause cognitive consistencies instead of inconsistencies or dissonances (Meyers-Levy & Tybout, 1989). High scores on any of the four CLF dimensions indicate cultural fit from the perspective of the observer, which we interpret as a form of cognitive consistency or harmony, whereas low CLF scores indicate cultural misfit or cognitive dissonance. We thus consider that CLF and brand trust belong broadly to the same construct domain (i.e., the psychological goal of achieving harmony or balance in thoughts), and it is therefore theoretically sound to expect that CLF scores and brand trust are positively interrelated. *Second*, we considered that many negative loadings, or strong negative loadings, of the items on the common latent variable indicate measurement problems (Diamantopoulos & Winklhofer, 2001). We thus expected that most of the twelve CLF indicators would load positively on the latent CLF variable.

We estimated the MIMIC model in AMOS, finding a good model fit ( $\chi^2 = 19.23$ , d.f. = 11,  $p > .05$ ; root mean square error of approximation [RMSEA] = 0.067; comparative fit index [CFI] = 0.992), and no significant negative loadings. We estimated additional MIMIC models using brand liking items as reflective indicators, finding similar model fit and parameter estimates as before. This encouraged us to keep the twelve CLF items in the next validation steps.

### 3.2.3. Measurement model and predictive validity

We aimed to test the CLF index measurement model and test aspects of its predictive validity. Predictive validity means that the new CLF index accurately predicts what it is expected to predict, notably the marketing effectiveness of culture-laden communication. Diamantopoulos and Winklhofer (2001) recommended that index validation should include nomological aspects and researchers must therefore gather information for at least one additional reflective construct for which it is possible to postulate the existence of a theoretical relationship between the new index and the additional construct (Diamantopoulos & Winklhofer, 2001). Authors have long since considered brand liking as a measure of marketing effectiveness (Yoo & MacInnis, 2005). We conceive that higher CLF scores indicate cognitive consistencies in consumers and consequently expect that CLF index scores are positively associated with brand liking in line with postulates from balance theory (Heider, 2013). Moreover, following stimulus-organism-response (SOR) ideas (Bigne et al., 2020), we consider that culture-laden website design is a stimulus to which consumers respond in terms of (a) CLF evaluations and (b) brand liking, as well as suggest that CLF causes brand liking (Fig. 2). We shall emphasize that the cross-sectional design in study 2 is problematic relative to assumptions about the causality between CLF and brand liking. Study 3 will therefore test ideas about the causality also experimentally.

To proceed, it is first necessary to specify the 4-dimensional formative CLF measurement model. While reflective constructs represent something that cannot be observed, index measures capture something that can be observed and that can, therefore, be interpreted in a causal sense (Bollen & Lennox, 1991; Bollen & Diamantopoulos, 2017). In this sense, the CLF index is a linear combination of its four dimensions (Fig. 2). While CLF is conceptually best represented as a formative second-order composite of its four dimensions, the four first-order dimensions are best represented as reflective constructs, meaning that the item measures constitute consequences of each (latent) dimension. Hence, we expect that changes in a CLF dimension will cause variation in the item measures, and that the item measures within each dimension are positively correlated. We thus specify the empirical CLF measurement model as a “Reflective First-Order, Formative Second-Order Model” and integrate brand liking as a causal consequence of CLF (Diamantopoulos et al., 2008: model Type II, p. 1207).<sup>6</sup> We scaled the latent constructs by fixing one of their indicator paths to 1.0, and set the error variance of CLF to zero. Estimation of the model produced a good model fit ( $\chi^2 = 110.3$ , d.f. = 81,  $p < .05$ ; root mean square error of approximation [RMSEA] = 0.046; comparative fit index [CFI] = 0.978). Given that the  $\chi^2$  test was significant, we additionally computed PCLOSE, which was  $p = .595$ , indicating only marginal specification errors or a very close-fitting model. The four CLF dimensions are positively related to the formative CLF index construct. The beta-weights are similar for the four dimensions, which likely results from the fact that we used a comprehensive cross-section of 20 brands that vary in terms of culture-ladenness. Moreover, the effect of CLF on brand liking was  $\beta = 0.65$  ( $p < .05$ ), providing initial supporting evidence that the CLF index is effective in predicting brand liking.

<sup>4</sup> Earlier index development studies used similar sample sizes (Bruhn et al., 2008; Diamantopoulos & Winklhofer, 2001; Homburg et al., 2002).

<sup>5</sup> Readers are referred to Diamantopoulos et al. (2008) or Lee et al. (2013).

<sup>6</sup> Readers are referred to Diamantopoulos et al. (2008) for a discussion of the empirical identification of models that violate (as ours does) the “2+ omitted paths rule.”

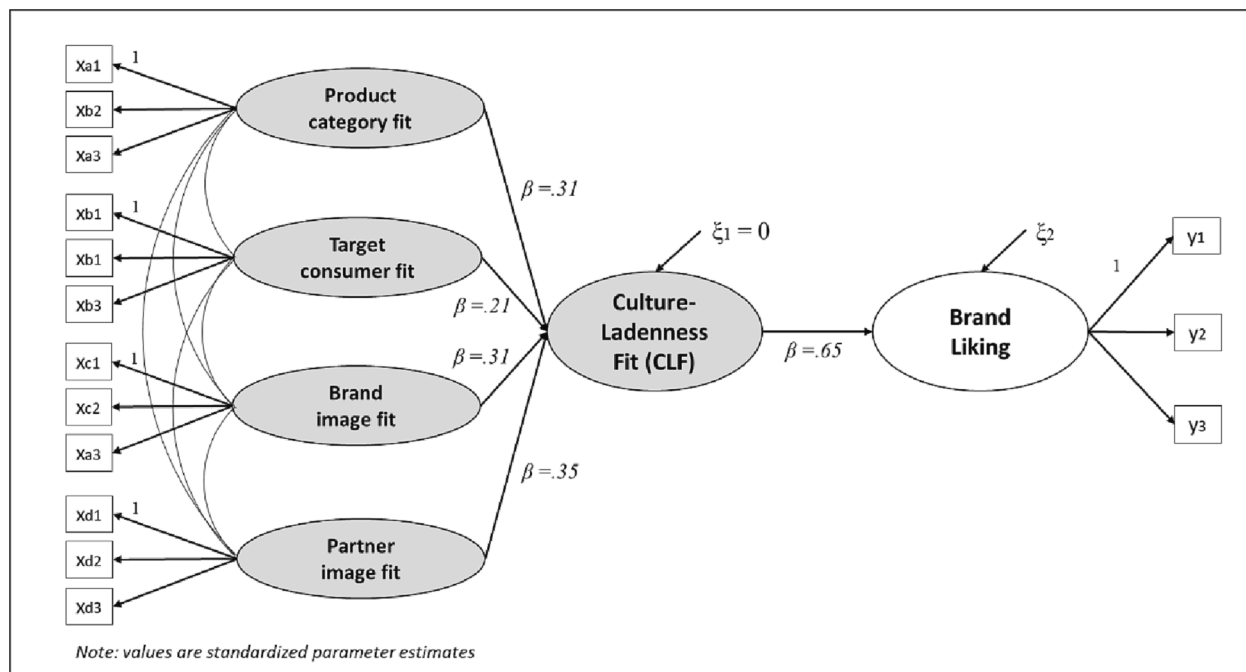


Fig. 2. Reflective first-order, formative second-order CLF measurement model with brand liking as a consequence.

### 3.2.4. Incremental validity

Incremental validity is the degree to which a new measure explains or predicts a phenomenon of interest, relative to other known measures of the same phenomenon (Haynes & Lench, 2003). It is first necessary to consider a relevant and valid conceptual model against which we can test the incremental validity of the CLF index. We therefore rely on the “familiarity breeds liking” effect, which is well-known as one of the most basic and at the same time most powerful psychological drivers of human behavior. Studies have shown that people tend to like well-known or more familiar brands better than lesser-known ones (e.g., Rindfleisch & Inman, 1998). To demonstrate the CLF index’s incremental validity, we expect that CLF index scores provide unique additional information<sup>7</sup> about brand liking, beyond the theoretically predictable effect of mere brand familiarity. In particular, if CLF index scores could not explain variance in brand liking beyond mere brand familiarity, the CLF index would be redundant, and we would have to conclude that researchers should resort to brand familiarity alone to predict brand liking. Brand familiarity may not only promote brand liking, but also affect individual CLF assessments. This is because people may correct new incoming information such that they accept more familiar information as more likely to be true, a type of continued-influence effect (Lewandowsky et al., 2012; Swire et al., 2017). This in combination suggests a conceptual model in which CLF partially mediates the effect of brand familiarity on brand liking (Fig. 3). If CLF scores contribute to explaining variance in brand liking beyond the well-known brand familiarity effect, then there is evidence for the incremental validity of the CLF index. We thus expect strong direct and indirect effects of brand familiarity on brand liking with CLF as a mediator variable.

To test the model, we computed the factor scores for the CLF index and brand liking from the parameter estimates obtained from the previous step. The squared correlation between the CLF index scores and brand familiarity was  $r^2 = 0.29$  clearly demonstrating that the two are separate constructs. The factor scores together with the brand familiarity scores next served as entry data for Hayes’ (2012) PROCESS tool. We used Hayes’ model #4, together with 95% bias-corrected bootstrap

<sup>7</sup> Variance in the criterion variable, over-and-above variance explained by alternative measures (Hunsley & Meyer, 2003).

confidence and 1,000 resamples to estimate the parameters of interest and confidence intervals. The results show, as expected, that brand familiarity is strongly positively related to both brand liking ( $\beta = 0.40$ ;  $p < .01$ ) and CLF ( $\beta = 0.91$ ;  $p < .01$ ), and that CLF is positively related to brand liking ( $\beta = 0.25$ ;  $p < .01$ ). Moreover, CLF mediates the relationship between brand familiarity and brand liking (indirect effect:  $\beta = 0.23$ ;  $CI_{low} = 0.14$ ;  $CI_{high} = 0.33$ ). CLF explains variance in brand liking beyond mere brand familiarity, suggesting the incremental validity of CLF as a measure of marketing effectiveness.

### 3.3. Study 3: External validity

External validity means that the outcome of a measurement can be generalized to different settings, contexts, or related measures. The cross-sectional setting in study 2 was problematic to test causal relationships. The main objective of Study 3 therefore was to test the CLF index’s predictive validity in a study that experimentally manipulated the culture-ladeness of marketing communication. Further, Study 2 focused on print advertising as a different context than website design, and considered consumers’ attitude toward the ad (Aad) as a different response variable. Aad is the consumer’s predisposition to respond to an ad stimulus in a favorable or unfavorable manner, and is a widely accepted measure of advertising effectiveness (MacKenzie et al., 1986).

#### 3.3.1. Study 3: Setting and rationale

We ran Study 3 in the context of cosmetic advertising in France. We thus created mock ads for French cosmetic brands that manipulated the French culture-ladeness of the ad (low vs. high). All ads displayed the same perfume bottle, the same French (Western) spokesperson, and one out of four logos of a French cosmetic brand. In the high French culture-ladeness condition, the ads displayed a product name written in French (“Rêverie”), and in the low French culture-ladeness condition, the ads displayed the same product name written in Chinese (遐想). Prior to running the experiment we discussed the stimuli with five French informants. They clearly identified Chinese letters in the ads as very salient cultural markers. Arguably, most French consumers are more familiar and more likely identify with French ads for French cosmetic brands that display French product names (as compared to Chinese ones that they may not be able to read and understand). We therefore

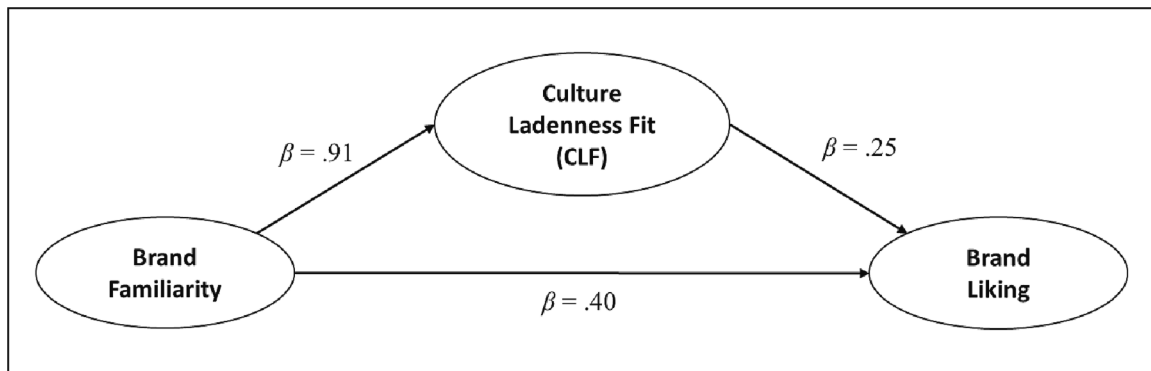


Fig. 3. Incremental validity of CLF in relation to mere brand familiarity.

conceived that the experimental manipulations of French culture-ladeness (as compared to the Chinese version) will cause globally higher levels of CLF within French consumers, which should in turn be positively associated with Aad. It is possible that culture-ladeness affects Aad directly and independently of consumers' CLF perceptions (for example because of past experiences with a certain cue such as a spokesperson). Since we cannot rule out such a possibility, we surmise that CLF partially mediates effects of culture-ladeness on Aad. However, we also conceive that culture-laden communication may affect Aad predominantly because of consumers' CLF perceptions (i.e., CLF causes Aad), and only secondarily for other reasons. We therefore expect the indirect effect of our experimental manipulations on Aad via CLF to be stronger than the direct effect. If confirmed empirically, this pattern of results would provide further evidence of the predictive and hence the external validity of the CLF index.

We collected data from  $n = 159$  French consumers who were randomly assigned to one of the two experimental conditions. After exposure to the mock ad, they evaluated the ad along the four CLF dimensions, using a short version of the CLF index measure with one item per dimension (four items in total) assessed on 5-point Likert scales (1 = strongly disagree; 5 = strongly agree). We measured brand familiarity as in study 2, and Aad using five-point semantic differential scales (unlikeable/likeable; not trustworthy/trustworthy; unappealing/appealing;  $\alpha = 0.91$ ). Participants who failed to pass the attention checks, or who indicated that they did not know the focal brand were excluded, leaving a usable sample of  $n = 124$  respondents.

### 3.3.2. Results

We first estimated the measurement model including four formative items to measure CLF, and three reflexive items to measure Aad, with Aad as a consequence of CLF (see Diamantopoulos & Winklhofer, 2001, p. 273 for empirical specifications of this model). The results show a good model fit ( $\chi^2 = 10.98$ , d.f. = 8,  $p > .05$ ; root mean square error of approximation [RMSEA] = 0.055; comparative fit index [CFI] = 0.994). The effect of CLF on Aad was  $\beta = 0.66$  ( $p < .05$ ), providing supporting evidence that the CLF index effectively predicts Aad.

Next, using the imputed factor scores from the measurement model we used Hayes' (2012) PROCESS tool to compute the direct and indirect effects of French culture-ladeness on Aad, with the CLF index as a mediator variable (Hayes' model 4). The results show that French culture-ladeness (manipulated: 0 = Chinese product name; 1 = French product name) is strongly positively related to CLF (measured) ( $\beta = 1.51$ ;  $p < .01$ ), but not directly to Aad ( $\beta = 0.24$ ;  $p > .1$ ), and that CLF is positively related to Aad ( $\beta = 0.35$ ;  $p < .01$ ). The indirect effect of culture-ladeness on Aad with CLF as a mediator is strong and significant (indirect effect:  $\beta = 0.53$ ;  $CI_{low} = 0.27$ ;  $CI_{high} = 0.84$ ). The total effect of French culture-ladeness on Aad is  $\beta = 0.78$  ( $p < .01$ ). The indirect effect of culture-ladeness on Aad with CLF as a mediator ( $\beta = 0.53$ ; SE = 0.139) is numerically higher than the direct effect of culture-

ladeness on Aad ( $\beta = 0.24$ ; SE = 0.171), and the difference between the two parameters is statistically significant ( $z = -0.132$ ;  $p < .1$ , one-sided). This suggests, as expected, that the experimental manipulation of culture-ladeness affects Aad predominantly because of consumers' CLF perceptions. The results therefore reinforce the validity of the new CLF index as a measure of the effectiveness of culture-laden marketing communication (see Fig. 4).

Equipped with the CLF index as a new valid measure, we can next explore the effects of the experimental manipulations on CLF and its formative dimensions. First, as stated before, the CLF scores clearly indicate that the culture-ladeness manipulation generated higher CLF (5.99 vs. 7.50;  $\beta = 0.66$ ;  $p < .01$ ), in line with expectations. Focusing on the CLF dimensions we find that the culture-ladeness manipulation led to (1) no increase in product category fit ( $\beta = 0.06$ ;  $p > .1$ ), (2) increased target consumer fit ( $\beta = 0.64$ ;  $p < .01$ ), increased brand image fit ( $\beta = 0.50$ ;  $p < .01$ ), and no increase in partner image fit ( $\beta = -0.62$ ;  $p > .1$ ). The findings of no variations on the product category and partner image dimensions resonate with the fact that the experimental procedures have indeed not manipulated either the product category or the spokesperson as a partner of the brand. This provides additional evidence for the face validity of the CLF index measure.

## 4. Conclusions

### 4.1. Research contributions

The main contributions of this research are introducing Culture-Ladeness fit (CLF) as a 4-dimensional concept and the CLF index as a measure of the effectiveness of culture-laden marketing communication. We defined CLF as a semantic memory concept in line with theories of mental categorizations. For its dimensions, we argued that four milestones in the historical development of marketing strategic thinking, namely product marketing, target marketing, brand marketing, and marketing alliances, represent four relevant mental categories against which consumers evaluate fit of culture-laden marketing communication: product category fit, target consumer fit, brand image fit, and partner image fit (Fig. 1). The new CLF concept adds to the debate on the effectiveness of standardization vs. cultural adaptation of advertising. Authors most frequently consider cultural fit of marketing communication in relation to target consumers, particularly the idea that consumers judge culture-laden communication based on how well the communication fits their own culture or cultural identity (Aaker et al., 2000; Cleveland & Bartsch, 2019; Cleveland et al., 2021; Forehand et al., 2002; Luna et al., 2002). However, the literature frequently neglects that consumers may engage in multiple mental categorizations, such that they evaluate cultural fit not only in relation to themselves as target consumers (i.e., in relation to their own cultural identity), but also in relation to other mental categories including the product category, the brand image or the image of the brand's partners (Bartikowski et al.,

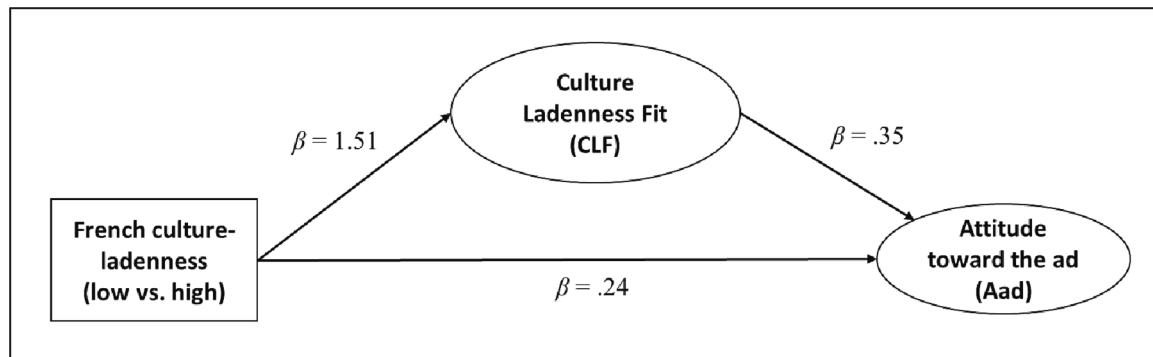


Fig. 4. Predictive validity of CLF with Aad as a consequence.

2022). These fit evaluations can interact one with another with combined effects on advertising effectiveness. Thus, while most marketers consider the truism that culture-laden communication should fit target consumers, no study has considered a comprehensive set of cultural fit dimensions to evaluate the effectiveness of culture-laden marketing communication. We demonstrate that four CLF dimensions are relevant as determinants of advertising effectiveness, giving new meaning to the broad idea of “cultural fit” from a marketing strategic perspective. Moreover, we add to the flourishing literature on index developments as we introduce and validate the CLF index as a new measure of the effectiveness of culture-laden marketing communication.

#### 4.2. Managerial implications

The new CLF index stands as a comprehensive tool to measure the effectiveness of culture-laden marketing communication. We recommend that marketers use the CLF index to create effectiveness barometers of culture-laden communication considering samples of brands and different contexts. In this sense, CLF index scores may serve as a KPI to benchmark, for example, brands’ multicultural internet presences (e.g., the websites of competing soft drink brands) or brands within a country (e.g., the image campaigns of the Top 20 UK brands), as well as track the evolution of these brands’ communication effectiveness in terms of CLF.

Marketers must be aware that culture is a particularly sensitive aspect of people’s lives, and cultural misfit in marketing communication can easily hurt marketing effectiveness. Marketers must ensure that culture-laden communication fits positively with each of the four CLF dimensions. Individual assessments of the four CLF dimensions can enable fine-granulated assessments of a brand’s culture-laden communication, and point marketers to areas where corrective actions are needed to enhance marketing effectiveness. CLF assessments can guide marketers in their efforts towards culturally adapting marketing communication, improve the monitoring of marketing effectiveness, and help avoid the danger of cultural misfit. One example of cultural misfit (low CLF) with negative consequences is the partnership between L’Oréal and Beyoncé to market skincare products. L’Oréal has suffered from an international backlash with the brand being accused of whitening Beyoncé’s skin color in an ad. This was seen as a disavowal of the star’s Black roots (Sweeney, 2008). CLF assessments of L’Oréal’s communication in relation to Beyoncé as a strategic partner could have helped identify and avoid the problem early on. Similarly, cultural misfit may become problematic when brands use radically localized or culturally adapted versions of central brand elements in different markets. An example of this is what became known as “Starbucks’ Saudi Sellout” (King, 2002). In order to cater for the conservative Saudi Arabian culture, Starbucks decided to remove the famous mermaid from the brand logo, retaining only her crown. The US home market reacted angrily, calling Starbucks ‘morally bankrupt’ and the brand found itself caught when trying to negotiate between conflicting cultural expectations of target consumers on the one side, and the brand’s values on the

other. Trying to enhance one CLF dimension (fit with Saudi Arabian target consumers), Starbucks has seemingly decreased CLF on another (fit with the brand identity) in a different market. Balancing such conflicting forces requires sensible effort and prioritization from marketers. CLF assessments may help marketers identify culturally critical brand elements that are so closely tied to the brand that they simply cannot transcend cultural barriers.

Another field of potential CLF application relates to the authenticity of culture-laden marketing communication as a driver of marketing effectiveness. For example, Zgadzaj (2019) notes that some product categories may benefit from “Frenchwashing,” which is making the product appear to be of French origin through misleading wordings (e.g., “French touch” or “à la française”) or symbols (displaying the Eiffel Tower or a rooster). Although such practice may not be illegal, consumers may feel betrayed if they think the communication is inauthentic. CLF assessments can help managers capture detailed insights into such consumer sentiment. Indeed, many products are intimately associated with countries or cultures, such as silk from China, tacos from Mexico, maple syrup from Canada, or wine from France and such products in particular require marketers’ attention in terms of CLF.

#### 4.3. Limitations and future research

There is much critical discussion in the literature about problems with formative measurement, such as the great potential for bias, or the unsuitability of some common validation procedures (Babin et al., 2016; Chang et al., 2016; Diamantopoulos & Siguaw, 2006; Wilcox et al., 2008). Some authors even consider that formative indicators are no measures at all (Howell et al., 2007; Lee et al., 2013). The present research demonstrates the validity of the CLF index considering various aspects of construct validity (Table 1). We are, therefore, confident that the CLF index measures what we expect it to measure, notably the marketing effectiveness of culture-laden communication. Babin et al. (2016, p. 1337) note that “formative indicators, from the perspective of objective measurement, present the unpleasant implication that the measure causes the phenomenon”. This characteristic of formative measures obviously limits the scope of CLF index applications. While CLF index scores cannot indicate objectively or absolutely how effective a brand’s culture-laden communication is, they can indicate how effective it is relative to alternatives in the same sample. We have, therefore, suggested in the managerial implications that marketers create CLF barometers to track and benchmark the effectiveness of brands’ culture-laden marketing communication.

Another limitation of this study, and formative constructs in general, relates to the prerequisite that index measures must cover a construct domain completely (Bollen, 1984; Bollen & Diamantopoulos, 2017; Diamantopoulos & Winklhofer, 2001). Notably, to identify the measurement model empirically, it was necessary to accept the assumption that there is no measurement error ( $\xi = 0$ ; cf. Fig. 2) meaning that there is no surplus meaning beyond the four theoretically derived CLF



dimensions. It is clear that only a census of indicators can theoretically justify the construct’s disturbance term being fixed to zero, but this is generally hard to achieve in psychometric research. By coincidence, the term “ladenness” appears in the philosophy of science under the term “thesis of theory-ladenness”. Theory-ladenness raises the theoretical problem that measurement outcomes or observations may be theory-laden and can thus not indicate the truth, because it is impossible to test theory without theory-neutral observations (Van Fraassen, 2010). We must therefore admit that the data acquired with CLF is theory-laden, because we cannot offer evidence that only the four proposed CLF dimensions exist and there are no others. The theoretical dictate from the thesis of theory-ladenness is consistent with the empirical dictate of specifying no measurement error in the formative measurement model. This creates a dilemma to all formative psychometric measures: unless a census of psychometric indicators is used to form an index, users must either accept that the index is theory-laden (as we do here), or accept remedies to the empirical identification problem that may, in turn, be hard to justify theoretically. However, if a measure is theory-laden (as ours is), and researchers do not specify measurement error, then they implicitly reject positivism and admit that the index score is to some unspecified degree mistaken, not certain, and thus potentially fallible.

We recognize that instances exist that we have not considered, but where culture-ladenness fit of marketing communication potentially plays a role to affect marketing effectiveness. One such relevant instance is the context in which consumers encounter culture-laden communication. Context is, for example, a culture-laden date (e.g., the Irish Saint Patrick’s Day on March 17th) or an event (e.g., the Bavarian Oktoberfest). Context has many facets, such as the particular place where the consumer is located (e.g., near a famous country monument, or in an ethnic restaurant), the people around, the time of the day, or even the meteorological conditions. Common to these is that marketers cannot easily control them. Meanwhile, recent advances in strategic fields of marketing such as customer relationship management (CRM), big data, geolocation technologies, or artificial intelligence (AI) point to the

importance of considering consumers’ immediate context as another CLF dimension (e.g., Bernritter et al., 2021). Contextual marketing, driven by automation technologies, appears to be another milestone that strategic marketing will evolve towards in years to come. We encourage researchers to conceptualize CLF in relation to context to deepen our understanding of how culture-laden marketing communication informs marketing effectiveness or consumer behavior. Other potentially meaningful context extensions are CLF with the current political situation, CLF with public opinions, or CLF with hot media topics.

Despite the theoretical problems with theory-ladenness highlighted in the preceding paragraph, we contend that the four-dimensional CLF index introduced here presents a valid and viable measure of the effectiveness of culture-ladenness of marketing communication, given that we employed widely accepted validation methods. Moreover, we contend that the four CLF dimensions cover the CLF construct sufficiently completely to be managed or controlled in marketing practice. We encourage researchers to develop extensions of the CLF index and apply the CLF concept with informants from various countries or cultures to detect cultural differences, as well as consider media other than websites or print advertising as we have done in this research.

*CRedit authorship contribution statement*

**Boris Bartikowski:** Writing – original draft, Software, Resources, Project administration, Methodology, Investigation, Formal analysis, Data curation, Conceptualization. **Marie-Odile Richard:** Writing – review & editing, Writing – original draft, Conceptualization. **Heribert Gierl:** Writing – review & editing, Writing – original draft, Methodology, Investigation, Formal analysis, Conceptualization.

**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. Study 1 - Initial items and factor loadings (pattern matrix)**

		CLF dimension (23 items)				CLF dimension (12 items)			
		Target	Brand	Category	Partner	Target	Brand	Category	Partner
<b>The cultural design of [brand x’s] website ...</b>									
<b>Category</b>	... fits well with the product category.	0.17	0.39	0.46	-0.13	-	-	-	-
	... is typical of the product category.	-0.03	0.01	<b>0.76</b>	0.14	-0.01	0.12	<b>0.72</b>	0.08
	... corresponds to what I know about the product category.	-0.02	0.09	<b>0.73</b>	-0.02	0.01	0.01	<b>0.83</b>	-0.06
	... is coherent with the product category.	0.15	0.65	0.23	-0.17	-	-	-	-
<b>Target</b>	... matches well with the product category	0.02	0.10	<b>0.74</b>	-0.04	0.02	-0.02	<b>0.81</b>	-0.03
	... displays typical aspects of my own culture	0.87	0.05	-0.10	0.02	-	-	-	-
	... is designed to target people of my own culture	<b>0.94</b>	0.11	-0.07	-0.12	<b>0.95</b>	0.07	-0.04	-0.08
	... shows images that reflect my own culture	<b>0.93</b>	0.12	-0.07	-0.05	<b>0.92</b>	0.00	-0.01	0.02
<b>Brand</b>	... has colors related to my own culture	0.77	-0.32	0.24	0.07	-	-	-	-
	... shows symbols that reflect my own culture	<b>0.91</b>	-0.06	0.05	0.02	<b>0.92</b>	-0.10	0.07	0.07
	... displays people that remind me of my own culture	0.86	-0.02	-0.03	0.07	-	-	-	-
	... contains written information related to my own culture	0.88	-0.10	0.05	0.06	-	-	-	-
<b>Partner</b>	... fits well with the brand image of [brand x]	0.06	<b>0.80</b>	0.02	0.01	0.08	<b>0.82</b>	0.07	-0.01
	... is typical to [brand x]	-0.10	<b>0.89</b>	-0.17	0.01	-0.07	<b>0.84</b>	-0.01	-0.05
	... corresponds to what I know about [brand x]	-0.14	0.60	0.20	0.16	-	-	-	-
	... is coherent with what [brand x] stands for.	-0.03	<b>0.74</b>	0.04	0.08	-0.02	<b>0.83</b>	0.03	0.06
<b>Partner</b>	... matches well with the brand identity of [Brand]	-0.15	0.61	0.29	-0.01	-	-	-	-
	... fits well with [brand x]’s celebrity partners	-0.03	0.04	-0.16	<b>0.87</b>	0.02	0.12	-0.18	<b>0.87</b>
	... is typical of the celebrity partners of [brand x]	0.02	-0.12	0.03	<b>0.88</b>	0.06	0.01	-0.05	<b>0.87</b>
	... corresponds to what I know about the celebrity partners of [brand x]	-0.13	-0.18	0.23	<b>0.89</b>	-0.09	-0.13	0.22	<b>0.85</b>
	... fits well with [brand x]’s partner brands	0.13	0.35	-0.18	0.59	-	-	-	-
	... is typical of the partner brands of [brand x]	0.20	0.13	0.01	0.62	-	-	-	-
	... corresponds to what I know about the partner brands of [brand x]	0.06	0.14	0.03	0.69	-	-	-	-
	Variance Explained (%)	<b>36.82</b>	<b>18.05</b>	<b>4.43</b>	<b>5.65</b>	<b>36.52</b>	<b>18.16</b>	<b>13.16</b>	<b>7.69</b>
Cronbach’s Alpha	<b>0.953</b>	<b>0.850</b>	<b>0.822</b>	<b>0.888</b>	<b>0.926</b>	<b>0.800</b>	<b>0.735</b>	<b>0.832</b>	

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**Boris Bartikowski** is Professor of Marketing at Kedge Business School, France. He received his PhD from the IAE d'Aix-en-Provence (France) and the University of Augsburg (Germany). His research emphasis is in the areas of cross-cultural consumer behavior and brand management. He serves as associate editor of the Canadian Journal of Administrative Science. His work has been published in journals such as Journal of Business Research, British Journal of Management, Journal of Business Ethics, Psychology and Marketing, and European Journal of Marketing.

**Marie-Odile Richard** is an Associate Professor of Marketing in the College of Business at the State University of New York Polytechnic Institute and the COB Research Chair. She received her M.Sc. (Marketing Option) from Concordia University and her Ph.D. (Marketing Option) from HEC-University of Montreal. Her main research interests are in the areas of marketing communications (including digital and social media marketing), services marketing, and cultural effects on individual responses. She published more than 42 articles in major journals, including the Journal of the Academy of Marketing Science, the Journal of Advertising Research, the Journal of Business Research, the International Journal of Information Management and the Journal of Social Psychology. She published more than 34 articles in proceedings, and 10 chapters in major encyclopaedias, specifically focusing on digital and social media marketing. She is serving on the Editorial Review Board of the Journal of Business Research.

**Heribert Gierl** is Professor of Marketing at the University of Augsburg, Germany. He received his doctoral degree at the University of Regensburg. His research is focused on consumer behavior research. He published articles in Journals such as International Journal of Research in Marketing, Psychology & Marketing, Marketing Letters, International Journal of Advertising, Journal of Business Ethics, and Journal of Business Research.