cogent psychology

*Corresponding author: Steffen Schmidt, Institute of Marketing and Management, Leibniz University of Hannover, Koenigsworther Platz 1, 30167 Hannover, Lower Saxony, Germany
E-mail: schmidt@m2.uni-hannover.de

APPLIED PSYCHOLOGY | RESEARCH ARTICLE

The green brand: Explicit and implicit framing effects of ecolabelling on brand knowledge

Steffen Schmidt[1]*, Sascha Langner[1], Nadine Hennigs[1], Klaus-Peter Wiedmann[1], Evmorfia Karampournioti[1] and Gesa Lischka[2]

Abstract: An increasing number of brands rely on ecolabelling as associative branding strategy for communicating their sustainability performance. Specifically, associative branding aims to link a brand to an ecolabel to embed sustainability into brand knowledge to provide an added value for consumers. In this regard, the present study applies a combined measurement approach that examines both implicit and explicit information processing to assess consumers' brand associations related to sustainability. Specifically, a pre/post-testing is conducted to evaluate the framing effect of ecolabel exposure in a brand advertisement on the enhancement of brand knowledge. The results of the current study provide evidence that in particular implicit brand sustainability is a favorable brand association that positively affects consumers' decision-making and preferences. Furthermore, the results reveal a relevant framing effect of ecolabelling on the enhancement of brand knowledge, on both implicit and explicit levels. In addition, the study results indicate the existence of three efficacy parameters that influence brand knowledge transfer: adequate ecolabel-brand fit, early ecolabel recognition time, and distinct implicit-explicit knowledge acquisition.

Subjects: Consumer Psychology; Marketing Research; Brand Management; Consumer Behaviour; Marketing Communications

Keywords: brand knowledge; framing effect; brand leveraging; sustainability advertising; ecolabelling; implicit measures; reaction time measurement; universal structure modeling

ABOUT THE AUTHORS

The study was conducted as a joint research of the Center for Neuroeconomic Marketing Management (CNEMM) at the Institute of Marketing and Management, Leibniz University of Hannover and Kochstrasse™ – Agentur für Marken GmbH. CNEMM (www.cnemm.net) is dedicated to enhancing the understanding of people's decision making processes for marketing purposes. Their research motivation is to help to shape positive exchange relationships among citizens, customers, nonprofit organizations, business companies and politics by analyzing and informing all parties involved through applied transdisciplinary research. Kochstrasse™ (www.kochstrasse.de/en) is a marketing agency, working for national and international clients. They apply various neuromarketing methods including fMRI for evaluating marketing activities such as packaging, advertising and brand positioning.

PUBLIC INTEREST STATEMENT

In today's business world, marketers have to address a massive consumer disorientation related to social and environmental issues. Specifically, many consumers have begun to rethink the way they consume and the way companies should produce their products and services. As a consequence of this development, an increasing number of companies are focusing on sustainability. This enhanced corporate sustainability comes with an increasing number of ecolabels that brand companies use for marketing purposes to record, evaluate, and communicate their sustainability performance. With that said, the findings of the current study provide further evidence that corporate sustainability performance positively affects consumers' decision-making and preferences, and that ecolabelling in brand communication is an efficient branding strategy for embedding sustainability into brand knowledge.

1. Introduction

Almost six decades ago, the environmental revolution started after a series of serious ecological problems that became highly visible to the public, such as the declaration of Lake Erie as being "dead" and the discovery of Minamata disease, caused by methylmercury poisoning (Hart, 1997). The emerging environmental pollution was accompanied by severe societal consequences, and along with a growing general environmental awareness in society, created the motivation in the early 1970s for marketing science to systematically address and examine the negative outcomes of economic activities on the natural environment (Kilbourne, 2004). This phase of increasing sensitivities to social and environmental issues was also the cradle of the socially conscious consumer (Anderson & Cunningham, 1972). Soon afterward, by the late 70s, the issue of sustainability, which embodies an individual's environmental concerns, had become a global social movement (e.g. Peet & Watts, 1996; Tokar, 2008). Currently, a significant number of consumers are concerned about and aware of a broad spectrum of environmental and ethical issues that range from industrial pollution to violations of human rights and animal welfare (e.g. Freestone & McGoldrick, 2008; Laroche, Bergeron, & Barbaro-Forleo, 2001; Smith, 1995).

Along with the rising public awareness of ecological issues and a greater demand for eco-friendly products, governmental actions have strengthened environmental regulations (e.g. United Nations Conference on Environment & Development, 1997; World Summit on Sustainable Development, 2002). In today's post-cold war era, it can be stated that the concept of "sustainable development is the dominant paradigm of development at the regional and local levels in the countries of the periphery as well as the center" (Castro, 2004, p. 195). As a direct consequence of this progress, the implementation of sustainability reporting is becoming a common practice of global companies to inform their stakeholders about the social and environmental impacts of their business activities (Boiral, 2013). However, corporate social and environmental reporting must be not only a nice gesture but also a set of actions that are actually implemented, following the business principle "show me" rather than "trust me" (Zairi & Peters, 2002). Indeed, recent studies provide empirical evidence that the sustainability performance of a company is increasingly becoming key factor in a company's long-term success (e.g. Eccles, Ioannou, & Serafeim, 2014; Gidwani, 2013).

Enhanced corporate sustainability comes with an increasing number of ecolabels that brand companies use as marketing instruments for recording, evaluating, and communicating their sustainability performance (e.g. Andrea Blengini & Shields, 2010; Proto, Malandrino, & Supino, 2007). In fact, according to the Ecolabel Index, their database identifies more than 465 ecolabels as of September 2016 (Ecolabel Index, 2016). Therefore, today's consumers are challenged by a confusing number of ecolabels (Atkinson, 2014), thus further enhancing the amount of brand- and product-related information an average consumer is exposed to on a daily basis (Bougherara & Grolleau, 2005; Vermeer et al., 2010). In light of such an intensive communication environment, a crucial role in consumers' judgments and decisions is performed by long-term memory processes (Lynch & Srull, 1982). With reference to activation models of memory, each incoming piece of information, such as a brand advertisement or point-of-sale display, is processed and stored in an associative network that contains organized systems of mental concepts such as brands, products, or places (Solomon, Bamossy, Askegaard, & Hogg, 2006). From a marketer's perspective, these associative networks are an efficient way to build and claim significance in a consumer's mind (Till, Baack, & Waterman, 2011). Actually, brand associative networks not only determine a meaning or image about a brand but also constitute a consumer's brand knowledge, which is defined as "the essence of what a brand represents, how it can achieve competitive advantage and ultimately significant value to a business" (Richards, Foster, & Morgan, 1998, p. 48).

In this regard, a considerable number of consumers in the developed and Western world are frequently motivated to behave sustainably (Grunert, Hieke, & Wills, 2014). Against this background, linking a brand or product to an ecolabel through associative branding is an appropriate approach for embedding sustainability into brand knowledge that provides an added value for consumer and thus increases a brand's strength in a competitive market (Gupta, Czinkota, & Melewar, 2013).

2. Research objective

Similar to Park, McCarthy, and Milberg (1993) and their understanding of branding related to brand extension strategies, associative branding in the present work is understood as the targeted transfer of specific associations (e.g. novel attributes, benefits, brand category) from a selected entity (e.g. testimonials, events, symbols) to an existing brand to set up an refined brand positioning. It is a vital marketing approach for strengthening the brand with meaningful associations to establish and foster brand knowledge in consumers' (long-term) memory. Specifically, brand associations are a critical component of brand knowledge, and marketing managers need to understand the nature and structure of consumers' associations with a brand (Henderson, Iacobucci, & Calder, 1998). In addition, an evidence-based enhancement of brand knowledge requires marketers to evaluate the favorability of single brand associations that influence consumers' decision-making and preferences (Schnittka, Sattler, & Zenker, 2012). Thus, a systematic brand building process needs a three-step analysis in which marketers need to (1) explore what consumers know about the brand, (2) identify strong and weak associations that affect the valence of a brand, and (3) assess how the associative structure of brand knowledge in consumers' memory is affected by brand communication, such as linking the brand with an entity in a print advertisement (Keller, 2003; Krishnan, 1996).

That being said, marketing science and marketing practice often apply only explicit measures, such as self-report or face-to-face interview, that focus on brand awareness and brand image as preferred performance indicators for assessing the effectiveness of brand-related marketing actions, e.g. sport sponsorship and print advertising (Esch, Langner, Schmitt, & Geus, 2006). However, that conventional evaluation of brand knowledge provides a limited depth of understanding by measuring verbalized knowledge that consumers are aware of only on a conscious level (Koll, von Wallpach, & Kreuzer, 2010). Indeed, the capacity of conscious processing is constrained to a performance between 10 and 60 bits per second, which equates to merely a short sentence, meaning that essentially all of the estimated 11,200,000 bits per second that the human system is receiving are processed on an unconscious level (Dijksterhuis & Nordgren, 2006). Consequently, a consumer's brand knowledge is mainly processed in the unconscious mind as deep-rooted knowledge and predominantly stored in and retrieved from implicit (and primarily episodic) memory (Koll et al., 2010). In point of fact, recent studies in the field of neuroeconomics provide clear evidence that consumer information processing is automatically activated by implicit brain processes with no (or only little) conscious awareness (e.g. Deppe, Schwindt, Kugel, Plaßmann, & Kenning, 2005; Knutson, Rick, Wimmer, Prelec, & Loewenstein, 2007; Reimann, Zaichkowsky, Neuhaus, Bender, & Weber, 2010; Weber, Rangel, Wibral, & Falk, 2009).

Yet, established models of brand knowledge are missing implicit processes completely. For example, the review of Keller and Lehmann (2006) exploring influential work in branding and brand equity in the past identified no research on implicit information processing. With that said, an advanced measurement of brand knowledge needs to assess both the explicit and implicit processing of brand-related information. To address this research issue, the present article uses an evaluation approach that relies on a combined implicit-explicit measurement of consumers' brand knowledge and leveraging effects when message framing is applied as an advertising strategy for brand communication. More precisely, this study investigates the effectiveness of a leveraging process that aims to embed sustainability as an advantageous benefit into brand knowledge by linking the brand to an ecolabel in a print advertisement.

3. Theoretical background

3.1. Brand knowledge transfer and added brand value

Brand knowledge relates to the (schematic) mental representation of a brand and "is conceptualized as consisting of a brand node in memory to which a variety of associations are linked" (Keller, 1993; p. 3). Specifically, brand knowledge is composed of procedural (e.g. brand usage) and declarative brand-related information (e.g. brand meaning) that are stored in consumer's memory (e.g. Ambler, 1997; Brucks, 1986). Fundamentally, brand information is a cue that creates a context

(Samu & Krishnan, 2009) that again influences consumers' tendency to show an approach or avoidance response (Jain, Mathur, & Maheswaran, 2009). The level of brand information processing of an advertisement and the effectiveness of brand communication are determined by consumer's motivation, ability, and opportunity to process brand messages during or directly after a consumer-brand contact (MacInnis, Moorman, & Jaworski, 1991). Generally speaking, consumers develop knowledge of a brand in resonance to a marketing program, but especially in the context of a brand communication exposure (Yang & Ha, 2014). With that said, the transfer of brand knowledge via brand communication is the process of linking the brand to an entity exposed in the communication contact, such as another brand, person, place, event, or thing, in order to create new brand knowledge or to affect existing brand knowledge (Keller, 2003).

The process by which brand information is stored in long-term memory and the ease with which that information is retrieved from long-term memory play an essential role in shaping brand knowledge, which can be understood as a network of associations that influence decision-making and preferences (Walvis, 2008). Eventually, an advantageous processing of brand information creates powerful brand associations, which are stored in and retrieved from long-term memory and affect consumer's choice to prefer one brand over alternative brands. Therefore, the building of a strong brand with unique and favorable associations in consumer's mind by means of brand knowledge transfer can be regarded as "a host of possible benefits to a firm, including greater customer loyalty and less vulnerability to competitive marketing actions and marketing crises, larger margins as well as more favorable customer response to price increases and decreases, greater trade or intermediary cooperation and support, increased marketing communication effectiveness, and licensing and brand-extension opportunities" (Keller, 2001, p. 3). In other words: Leveraging brand knowledge by associating the brand to another entity to establish salient associations in a consumer's brand associative network ideally results in a greater brand-added value (e.g. Valette-Florence, Guizani, & Merunka, 2011; Vieceli & Shaw, 2010), both for consumer (e.g. better need satisfaction) and for brand management (e.g. higher revenue stream).

3.2. Effect and nature of message framing

Marketing communication (e.g. public relations) and more particularly brand advertising (e.g. TV commercials) widely apply brand-related message framing that affect consumers' evaluations of past, present, or future consumption experiences (Tsai, 2007). Specifically, this kind of brand communication strategy creates an interpretation context of circular and continuously updated brand judgments (Mehta, Chen, & Narasimhan, 2008). Within this reciprocal evaluation process, consumers' brand experiences are influenced by advertisement-evoked brand expectations and vice versa. Hence, framing is an essential branding strategy as it "is a critical activity in the construction of social reality because it helps shape the perspectives through which people see the world" (Hallahan, 1999, p. 207). In the academic literature, several types of framing are examined (see for an overview Wright & Lutz, 1993; Hallahan, 1999). For example, attribute framing is used as a branding approach to enhance brand knowledge that again influences consumer's subsequent brand experience (Levin & Gaeth, 1988). This kind of framing is incorporated in the advertising concept of "transformational advertising" (Puto & Wells, 1984). Originally developed by Wells (1980), transformational advertising "posits that some advertising works not by changing beliefs and attitudes through providing information, but by helping to develop associations with the use experience into something different than it otherwise would have been" (Aaker & Stayman, 1992, p. 238). In this regard, advertising retrieval cues such as brand claims or other types of content codes such as ecolabels or safety signs have a particularly strong impact due to their inherent potential to transform consumer's brand memory through associative meaning transfer and therefore affect brand choices (Keller, 1987).

3.3. Sustainability advertising and ecolabels

Several frameworks for environmental marketing communication, such as green advertising (Kilbourne, 1995) and sustainable communication (McDonagh, 1998), were developed in order to

examine the complex relationships between advertising and ecological issues. The frameworks differ in various aspects, for example their views on the role of stakeholders. From a customer-centric perspective, the communication activity of sustainability advertising addresses the triple bottom line of sustainability: Planet (e.g. the use of natural resources), people (e.g. societal welfare), and profit (e.g. financial performance) (e.g. Chabowski, Mena, & Gonzalez-Padron, 2011; Sheth, Sethia, & Srinivas, 2011). However, to avoid the common accusation of "greenwashing", which is the use of false or misleading claims about supposedly environmentally friendly business practices, major brand companies are making commitments to sustainability, but their green credentials are not always sufficient to ward off criticism from a concerned and skeptical public (Berrone, 2016; Watson, 2016). In this regard, brand companies rely on ecolabelling to record and communicate their environmentally oriented efforts and actions (Gulbrandsen, 2006). When a brand meets the respective environmental criteria or standards that are reviewed by an independent third party, it receives an ecolabel as a seal-of-approval (Roheim, 2008). These ecolabelling schemes, such as Fairtrade or UTZ Certified, provide consumers with an informed choice about the environmental quality of a product or service (Thøgersen, Haugaard, & Olesen, 2010). As a consequence, ecolabels provide transparency and trust related to the promoted brand and product (Thøgersen, 2002) without limiting a consumer's freedom of choice but reducing information search costs (Grunert & Wills, 2007). Therefore, in an attempt to signal sincerity and credibility in the context of sustainability advertising, ecolabels (e.g. Fairtrade, UTZ Certified, Rainforest Alliance) in their function as environmentally related attribute cues, are widely used to advertise sustainable brands and products and guide consumers' decision-making and brand choice (Leire & Thidell, 2005).

4. Conceptual background

4.1. Dual nature of brand information processing

According to well-established dual-process theories of reasoning and decision-making, two systems account for human information processing (e.g. Epstein, Pacini, Denes-Raj, & Heier, 1996; Evans, 2003; Fazio, 1990; Shiffrin & Schneider, 1977; Sloman, 1996; Stanovich & West, 2000): An implicit system that is associative and automatic, and an explicit system that is rule-based and controlled (Evans & Stanovich, 2013). The two distinct systems have different functions and thus, being complementary, both determine human behavior (e.g. Kahneman, 2003). However, both systems "can be active concurrently, that automatic and controlled cognitive operations compete for the control of overt responses" (Kahneman & Frederick, 2005, p. 268). Concerning this matter, explicit processes are consciously experienced and often involve logical reasoning. Furthermore, the explicit system operates in a serial and slow mode, which limits its processing capacity. The explicit system is responsible for reflected judgments (e.g. fractional arithmetic) and controlled behavior. Based on their inherent consciousness, explicit processes are accessible to introspection, which can be measured through verbalization techniques such as self-reported questionnaires. In contrast, the implicit system operates unconsciously and often comprises intuitive action. Specifically, a vast amount of information is continuously and quickly processed in a parallel mode by the implicit system through its nearly unlimited processing capacity. Specifically, implicit processes account for automatic evaluation (e.g. visual identification) and spontaneous behavior. Individuals are not aware of this causation or the causes of the automatic evaluation. For that reason, several implicit measures have been developed in the past that "are intended to assess relatively automatic mental associations that are difficult to gauge with explicit self-report measures" (Hofmann, Gawronski, Gschwendner, Le, & Schmitt, 2005, p. 1369). Specifically, neuromarketing methods such as response latency-based measures (e.g. Implicit Association Test) and other advanced techniques for capturing physiological responses (e.g. facial electromyography) and brain activity (e.g. near-infrared spectroscopy) are able to assess implicit processes (Wittenbrink & Schwarz, 2007).

Given the dual nature of human information processing, Figure 1 illustrates the conceptual model for a combined implicit-explicit measurement of consumers' brand knowledge and the impact of ecolabelling on embedding sustainability into brand knowledge when message framing is applied as an advertising strategy for sustainability communication. Specifically, an ecolabel is used as an

cogent ·· psychology

Figure 1. Conceptual framework.
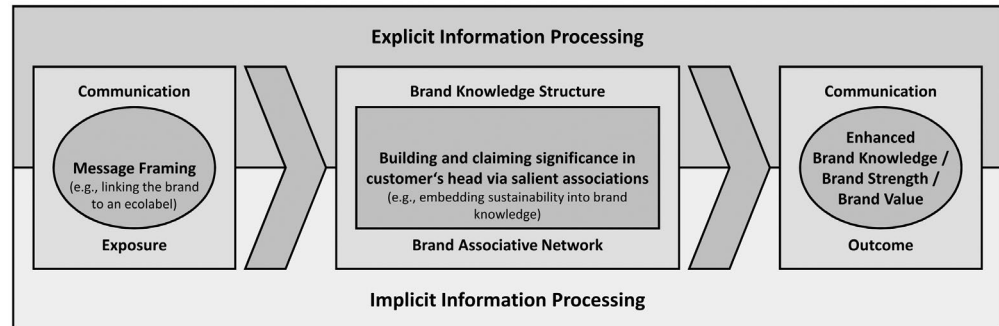
advertising retrieval cue to establish salient associations related to sustainability and to strengthen a brand-sustainability linkage, respectively. To consider an evidence-based marketing management, the relevance of providing sustainability as an added value for consumer is determined by assessing the cause-effect relationship between brand sustainability and brand strength (H_{1a} and H_{1b}). In light of this assessment, the use of ecolabelling in brand advertising is assumed to evoke a framing effect that enhances consumer's brand knowledge related to brand sustainability (H_{2a} and H_{2b}). In addition, the associative fit between the advertised brand and the ecolabel used in the communication is expected to affect the efficiency and outcome of the brand knowledge transfer (H_{3a} and H_{3b}). Finally, two further efficacy parameters are expected to influence consumer information processing regarding the impact of an ecolabel presented in a brand advertisement to embed sustainability into brand knowledge: Time to first contact, indicating the time elapsed from the initial contact with the advert until the ecolabel was recognized for the first time in the advertisement (H_{4a} and H_{4b}), and the transfer of accumulated implicit knowledge to explicit knowledge enhancement (H_5).

4.2. Impact of perceived brand sustainability on brand strength

For a successful brand presence in the market, relevance is required to create a strong brand preference in consumer's mind (Campbell, 2002). Therefore, brand-related associations without any meaning are just trivial facts and irrelevant pieces of information, respectively, that are unnecessarily stored in and retrieved from consumers' memory about brands. Regarding the (added) value to consumers, a brand must be linked to salient choice cues to gain a promoted cortical representation probability that also relates to an enhanced automatic evaluation as being an appropriate choice at the moment of the decision (Walvis, 2008). Indeed, an advantageous brand benefit, such as offering the consumption of sustainable products and services, enhances the cognitive (intelligence), affective (emotion) and intentional brand strength (behavior), and helps differentiate a brand from the competition (Vukasovič, 2009). It also improves brand saliency and thus increases a brand's market potential by being considered a valuable brand from a consumer's perspective (Ehrenberg, Barnard, & Scriven, 1997).

> H_{1a}: The implicit brand sustainability has a positive impact on cognitive, affective and intentional brand strength.

> H_{1a}: The explicit brand sustainability has a positive impact on cognitive, affective and intentional brand strength.

4.3. Framing effects of ecolabelling on perceived brand sustainability

The use of positively framed ad messages, such as the exposure of a popular celebrity or familiar label in an advertisement, is expected to generate a positive individual response and to bias viewers' evaluations of an advertised product or brand in a favorable direction (e.g. Burke & Edell, 1989; Chang, 2007). Similar to a consumer's evaluation of brand extensions (e.g. Aaker & Keller, 1990), by linking a brand to an ecolabel presented in an advertisement, potentially relevant knowledge is transferred from the ecolabel to the brand. Specifically, salient ecolabel associations such as

cogent • psychology

environmental wellbeing and care are embedded into brand knowledge, which establishes and fosters a brand-sustainability linkage.

H_{2a}: The exposure to an ecolabel in a brand advertisement enhances the implicit brand sustainability.

H_{2b}: The exposure to an ecolabel in a brand advertisement enhances the explicit brand sustainability.

4.4. Ecolabel-brand fit

In general, advertising retrieval cues influence a consumer's memory performance and thus affect the communication performance by framing ad and brand judgments (Keller, 1991). From a more technical perspective, leveraging brand knowledge through "linking a brand to another person, place, thing, or brand" (Keller, 2003, p. 595) in an advertisement elicits a knowledge transfer when the match between the brand and the entity is strong (Gwinner & Eaton, 1999). Therefore, the associative relation between an entity and a brand regarding a specific attribute (association) is supposedly correlated with the magnitude of the framing effect. In this respect, the more the ecolabel exceeds the brand in terms of perceived sustainability (ecolabel-brand fit), the greater the probability that the brand sustainability will be increased after exposure to an ecolabel in a brand advertisement.

H_{3a}: The ecolabel-brand fit is positively related to the enhancement of implicit brand sustainability.

H_{3b}: The ecolabel-brand fit is positively related to the enhancement of explicit brand sustainability.

4.5. Ecolabel recognition time

According to the Hebbian theory of learning (Hebb, 1949), neurons that are simultaneously active are strengthened by growth processes or metabolic changes in the brain, which is summarized in the popular phrase "neurons wire together if they fire together" (Lowel & Singer, 1992, p. 211). More precisely, the strength of the connections between neurons is adjusted through the neural mechanism of spike timing-dependent plasticity, which in short refers to the causation in which a particular neuron has to fire first at an earlier phase to be the associative input for another neuron that fires shortly afterward (e.g. Feldman, 2012; Markram, Gerstner, & Sjöström, 2011). This kind of temporal pairing stresses the relevance of the speed of acquisition; therefore, associative learning "depends on perceiving and encoding temporal regularities rather than stimulus contiguities" (Balsam, Drew, & Gallistel, 2010, p. 1). Furthermore, cue competition phenomena indicate that exposure to multiple cues during the learning phase limits the associative strength of the connections between the various cues (Rescorla & Wagner, 1972). Hence, from a brand communication perspective, a meaningful advertising retrieval cue (e.g. an ecolabel) should to be perceived before any other salient brand information (e.g. a brand logo) and before other less important advertising retrieval cues are recognized in the advertisement (e.g. an ad claim) to be efficient as possible in enabling a brand knowledge transfer. That means, the lower (faster) the time to first contact, the higher the probability of being perceived as the first salient cue. For that this reason, the recognition time for an ecolabel displayed in an advertisement affects the enhancement of brand sustainability.

H_{4a}: The lower the time to first contact related to the ecolabel in an advertisement, the greater the enhancement of implicit brand sustainability.

H_{4b}: The lower the time to first contact related to the ecolabel in an advertisement, the greater the enhancement of explicit brand sustainability.

4.6. Implicit-explicit knowledge acquisition

From an information processing perspective, the average exposure to a brand communication mainly includes visual (pictorial) codes but fewer verbal (textual) codes, a fact that is particularly valid for print advertisement for obvious reasons (e.g. Mitchell, 1980). Specifically, the processing of pictorial advertisement occurs primarily on a peripheral route rather than via a central information route (e.g. Miniard, Dickson, & Lord, 1988). In particular, when consumers lack the motivation, ability, and opportunity to process brand information in an advertisement, a lower level of information processing is expected, but sufficient capacity is still available to encode salient properties such as advertising retrieval cues in terms of a global meaning analysis (e.g. MacInnis & Jaworski, 1989). Moreover, currently, media multitasking is literally consuming situational awareness available and most media content receives only superficial attention (Schmidt, Thoelke, Langner, & Schiessl, 2015). In light of this, the implicit system is primarily in charge of acquiring and processing knowledge of the world (e.g. Chaffin, 1979; Herbig & Müller, 2014). The associative machine of the implicit system, with its enormous processing capacity, continuously generates a stream of interpretations and suggestions for the explicit system that cannot be turned off at will (Dijksterhuis & Nordgren, 2006; Kahneman, 2011). In this regard, as past research has shown, the accumulation of knowledge through implicit learning also positively affects the enhancement of explicit knowing (e.g. Fischer, Drosopoulos, Tsen, & Born, 2006; Lola, Tzetzis, & Zetou, 2012). Hence, the automatic acquisition (implicit learning) of information related to brand sustainability by linking a brand to an ecolabel in an advertisement influences the reflected representation (explicit knowing) of explicit brand sustainability.

> H_5: The enhancement of implicit brand sustainability has a positive effect on the enhancement of explicit brand sustainability.

5. Methodology

5.1. Study design

An exploratory web study was conducted to evaluate the performance of using ecolabelling in brand communications as an associative branding strategy to embed implicit and explicit sustainability into brand knowledge. Specifically, a within-subject design was used to measure the perceived brand sustainability before and after exposure to a print advertisement. As cues of interest, the cookie brands *Leibniz* and *Oreo* and the ecolabels *Fairtrade* and *UTZ Certified* were chosen. To gain deeper insights, the ecolabel quality referring to the association strength of the ecolabel was taken into account. Therefore, familiarity with the ecolabel was assessed (five-point ordinal scale: "1 = I know this ecolabel but would recognize the label logo not at all" to "5 = I know this ecolabel very well and would recognize the label logo immediately") as an indicator of past experiences with the ecolabel to indicate weak to strong associations (e.g. Krishnan, 1996). In the present study, *Fairtrade* was found to be a strong ecolabel, with a mean familiarity score of 4.46 (*SD* = 1.07). In contrast, *UTZ Certified* was found to be a weak ecolabel, with a mean familiarity score of 1.68 (*SD* = 1.15).

Against that background, three advertising conditions were further examined: (i) a cookie brand advertisement was labeled with a *Fairtrade* logo (experimental condition I: strong ecolabel), (ii) a cookie brand advertisement was labeled with an *UTZ Certified* logo (experimental condition II: weak ecolabel), and (iii) a cookie brand advertisement was shown in its original layout without any ecolabel exposure (control condition). Furthermore, each participant was randomly assigned to evaluate either the cookie brand *Leibniz* or *Oreo*. Thus, a final research design of six subject groups was employed. In the experimental conditions, the respective ecolabel was placed in the upper right corner of the original cookie brand advertisements. In addition to the cookie brand advertisements selected for this study, participants were exposed to four additional brand advertisements from the fast-moving consumer goods (FMCG) industry to simulate a competitive advertising environment and diversion of attention.

cogent ·· psychology

5.2. Measurement instruments

The explicit brand sustainability was measured on a five-point Likert scale (1 = strongly disagree to 5 = strongly agree) to ensure a reflected brand judgment. In contrast, the implicit brand sustainability was assessed by applying a response latency-based measure to detect automatically activated associations in order to capture a spontaneous brand evaluation. Specifically, an advanced response competition procedure was used. Both measures of perceived brand sustainability used the same set of items (*cf.* Table 1) that have been derived from qualitative interviews with marketing experts from science (*n* = 3) and business (*n* = 3). Additionally, three global items were used to measure the overall perceived sustainability (three seven-point semantic differentials: 0 = not at all fair trade oriented/not at all careful/not at all environmentally oriented to 7 = extremely fair trade-oriented/ extremely careful/extremely environmentally oriented). The assessment of the overall perceived sustainability represents an alternative measurement of the focal construct to evaluate external (convergent) validity (e.g. Henseler, Ringle, & Sinkovics, 2009).

The single facets of the perceived cognitive (popularity, quality, uniqueness), affective (identification, trust, liking), and intentional brand strength (loyalty, recommendation, willingness-to-pay, buying intention) were evaluated using the key performance measurement scale as proposed by Wiedmann, Hennigs, Schmidt, and Wuestefeld (2011). In this regard, the use of single-item measures referring to those brand strength facets is appropriate due to their unambiguous meaning and in order to avoid the appliance of a lengthy, time-consuming questionnaire (e.g. Drolet & Morrison, 2001). Also, Bergkvist and Rossiter (2007) indicated no significant differences in the predictive validity between multiple item and single-item measures when the corresponding construct of interest is constituted by a clear and concrete characteristic, as in the current research. In addition, a Restricted Focus Viewer (RFV) was used as preferred attention tracking tool for measuring a participant's visual attention toward the exposed advertisements (e.g. Bednarik & Tukiainen, 2007; Jansen, Blackwell, & Marriott, 2003). All measures were specified to the corresponding ecolabels and cookie brands that were used as cues of interest in the current research. Table 1 presents the manifest variables for of all the measures used.

5.3. Sample and procedure

The web study participants were recruited by applying an opportunity sampling in Germany. Specifically, the subjects were recruited via links on selected web pages (e.g. social media networks) with an invitation to actively participate in the study. By clicking on a consent button at the beginning, participants were able to gain access to the online questionnaire. Furthermore, they were told

Table 1. Manifest variables of the sustainability and brand strength measures	
Construct	**Item(s)**
Explicit sustainability	Antipollution, nature-minded, green-minded, ecological, environmentally aware, ecosensitive
Implicit sustainability	Antipollution, nature-minded, green-minded, ecological, environmentally aware, ecosensitive
Cognitive brand strength: popularity	The brand is very famous
Cognitive brand strength: quality	In my opinion the quality of the brand is very high
Cognitive brand strength: uniqueness	The brand is very distinctive
Affective brand strength: identification	The brand suits me completely
Affective brand strength: trust	The brand keeps to its promise
Affective brand strength: liking	I find the brand very pleasant
Intentional brand strength: loyalty	I am very faithful to the brand
Intentional brand strength: recommendation	I would recommend the brand to my friends
Intentional brand strength: willingness-to-pay	The products of the brand are worth a higher price compared to similar products of other brands
Intentional brand strength: buying intention	I intend to buy the brand in the future

they could leave the online survey at any time. In addition, only subjects who knew at least the name of the examined ecolabels and cookie brands were allowed to participate in the present study. In total, 141 complete questionnaires were received. Participants were mostly female (69.5%), single (87.9%) and on average 26.57 years old (*SD* = 7.17). The higher percentage of young and female participants may be indicative of the fact that many consumers within this social group are particularly interested in sustainable consumption.

Participants evaluated the implicit and explicit brand sustainability of the cookie brand (*Leibniz* or *Oreo*) before and after the contact with a print advertisement (pre-post testing). The measurement of the implicit and explicit ecolabel sustainability (*Fairtrade* or *UTZ Certified*) was conducted only in the pre-testing. Participants were randomly assigned to one of the six subject groups (*cf.* study design). Within each subject group, participants received the same sequence of measures and amount of advertisement stimulus. First, various introductory questions (e.g. individual's decision style) were answered by the subjects to get them comfortable with the survey. Then, the implicit and explicit measurements of ecolabel sustainability, and subsequently the implicit and explicit measurements of brand sustainability, were conducted. Next, participants were exposed to five brand advertisements (target advertisement plus four additional advertisements) in a random sequence, whereby each advertisement was presented on the screen for 10 s followed by a blank screen with a black background for 0.5 s. During the randomized advertisement presentation, the visual attention of each subject was measured by means of a RFV. Then, in the post-testing, the implicit and explicit measurements of brand sustainability were repeated. Finally, participants completed the survey by evaluating the cognitive, affective, and intentional brand strengths.

5.4. Implicit measurement and value calculation

As an appropriate measure for assessing the strength and direction of automatically activated associations related to a cue such as a brand or ecolabel, a response competition procedure was employed (e.g. Wittenbrink & Schwarz, 2007). Similar to Craddock, Molet, and Miller (2012), the employed response latency-based measure assessed the associative network of interest (here, consumer's knowledge of brand and ecolabel sustainability) by incorporating both the reaction time and the nature of the response given (e.g. approval vs. non-approval). Specifically, the reaction time software tool BrandReact by eye square (2017) was employed to execute this implicit measurement, whereby the performance of this implicit measure having been demonstrated in implicit brand evaluations in past research (e.g. Schmidt, Hennigs, Langner, & Limbach, 2013; Schmidt, Wiedmann, Reiter, & Kurlbaum, 2016).

Specifically, the implicit measurement approach employed here is similar to the Single Category Implicit Association Test (SC-IAT) that was introduced by Karpinski and Steinman (2006). Due to an adapted measurement procedure, subjects need less time to perform the task (on average, approximately 30 s per brand evaluation, compared to 3 min or more needed in the SC-IAT), which also enhances the application value for marketing practice (shorter survey time decreases the costs per subject and increases the probability of participation). In more detail, the underlying response competition procedure forces the subjects to decide quickly whether the displayed attribute item on the screen fits to the investigated cue of interest (here: ecolabel and cookie brand) (key: "A" for yes and "L" for no). In the current study, each implicit measurement comprised 24 decision trials: 6 sustainability-related items, and 18 supplementary motive items. The motive items were included in the reaction time measurement to receive a continuum of implicit responses that range from a clear manifestation of strong associations to a clear manifestation of no associations. Similar to the conventional Implicit Association Test (Greenwald, McGhee, & Schwartz, 1998), response times outside of lower 350 ms and upper 2500 ms boundaries were deleted and treated as missing values. This data preparation was undertaken to ensure that only spontaneous responses related to automatically activated associations were used in the final data analysis.

With regard to the implicit value calculation for each subject, the captured reaction time (RT) and response given (RG) for each attribute were first transformed into one single implicit score (IS_{att}). The

basic idea behind the data transformation is "to place quick responses at each extremity of the continuum according to the nature of the response (i.e. quick 'yes' responses have the opposite meaning to quick 'no' responses)" (Craddock et al., 2012, p. 191). In the present study, the IS_{att} values range from −1 ("no") to 1 ("yes") by taking into account the maximum RT (RT_{max}) and minimum RT (RT_{min}) as well as the RG ("no" = −1; "yes" = 1) using the following formula: $IS_{att} = RG \times (RT - RT_{max})/(RT_{min} - RT_{max})$. In short, "yes" responses are translated into increasing positive scores (indicating a certain level of approval), while "no" responses are translated into increasing negative scores (indicating a certain level of non-approval). The shorter the response time, the closer the score is to the extreme ends of the continuum according to its response interpretation (approval or non-approval).
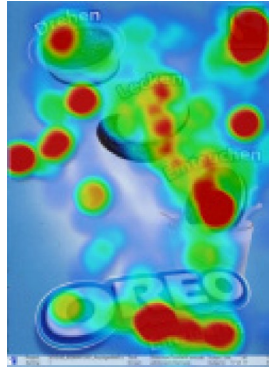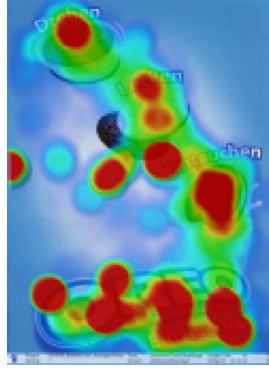
Finally, an average value over all corresponding scores and items, respectively, for each implicit and explicit measurement was calculated to obtain the construct estimates. In addition, each implicit and explicit value was normalized on a scale ranging from 0 to 100 using the following minimum-maximum adjustment: $100 \times$ (value − minimum value possible)/(maximum value possible − minimum value possible). Specifically, no information is lost by this transformation, while clarity and comparability of the implicit and explicit measurement outcomes are enhanced. Furthermore, the subjects' visual attention was assessed using a RFV technique. The compiled heat maps shown in Table 2 reveal that the ecolabels, which are placed in the upper right corner, were extensively recognized by the subjects, suggesting a successful manipulation of the advertisement. In the present study, the time to first contact was captured as indicator of interest. This key visual performance indicator indicates when the ecolabel in the (manipulated) advertisement was first recognized by the subject. Hence, the shorter the time to first contact, the faster the recognition of the ecolabel.

5.5. Data analysis

A structural equation model (SEM) was used to investigate the proposed research hypotheses H_1, H_4, and H_5. In this regard, covariance-based SEM (CB-SEM) and partial least squares SEM (PLS-SEM) path modeling are probably the most widely used SEM techniques (e.g. Haenlein & Kaplan, 2004; Hair, Sarstedt, Pieper, & Ringle, 2012). However, both approaches are limited in their ability to assess and estimate nonlinear relationships among the observed variables in a model. In light of this analytical limitation, Deppe et al. (2005) showed that implicit measures are able to capture nonlinear responses. Furthermore, Frydman and Camerer (2016) recently suggested to systematically establish the psychological mechanisms of nonlinear responses into the analysis when investigating decision-making. For that reason, in the present research, universal structure modeling (USM) was applied as an appropriate SEM technique that overcomes the limitations mentioned above. Specifically, USM relies on a Bayesian neural network that enables the quantification of nonlinear and interactive effects among model constructs (Buckler & Hennig-Thurau, 2008). The neural network approach is especially valuable in exploratory analysis with a focus on theory-building, rather than theory-testing (Henseler et al., 2009), as in the current research, and has been successfully applied in past research (e.g. Turkyilmaz, Oztekin, Zaim, & Fahrettin Demirel, 2013; Wiedmann, Hennigs, Schmidt, & Wuestefeld, 2013). The software package Neusrel was used to estimate the proposed construct relationships (Neusrel, 2017).

In the present study, a less stringent cutoff of $p < 0.1$ is used to report statistical significance against the background of a relatively small sample size (e.g. Lieber, 1990) and with the remark that simply focusing on p-values easily leads to improper conclusions (e.g. Biau, Jolles, & Porcher, 2010; Johansson, 2011; Sawyer & Peter, 1983). Or, as Rosnow and Rosenthal (1989) explain: "surely, God loves the 0.06 nearly as much as the 0.05" (Rosnow & Rosenthal, 1989, p. 1277). For this reason, to evaluate the outcomes with repeated measures and a within-subject design in view of H_2 (enhancement of implicit and explicit brand sustainability), in the current research not only the statistical significance but also the practical (clinical) significance (importance) are examined to avoid the potential peril of flawed interpretations concerning the obtained p-values (Ranstam, 2012). As an appropriate statistical technique for evaluating the effectiveness of a treatment or intervention in behavioral science, such as a brand communication contact, the effect size statistic Cohen's d was used for evaluation (Rosenthal, 1994). Cohen's d is dimensionless and provides a

cogent · psychology

Table 2. Attention heat maps

Investigation brand	Cookie brand *Leibniz*	Cookie brand *Oreo*
Investigation condition		
Experimental condition I (strong label): *Fairtrade* Sustainability Label	*n* = 20	*n* = 17
Experimental condition II (weak label): *UTZ Certified* sustainability label	*n* = 35	*n* = 15
Control condition: No sustainability label	*n* = 32	*n* = 22

Note: The ecolabels were place on the upper right corner of the original brand advertisements in the experimental conditions.

standardized mean difference (Nakagawa & Cuthill, 2007). In detail, the formula (3) as proposed by Dunlap, Cortina, Vaslow, and Burke (1996) was applied to calculate Cohen's *d*. Additionally, the effect sizes f^2 (*f-square*) for examining the relationship between a dependent variable and an independent variable in a causal model and the product-moment *r* for investigating the simple relationship between two variables were used (Cohen, 1977). With that said, the following absolute thresholds were employed as benchmarks for interpreting Cohen's *d*/f^2/*r*: small effect = 0.20/0.02/0.10; medium effect = 0.50/0.15/0.30; large effect = 0.80/0.35/0.50 (Cohen, 1992).

cogent ·· psychology

Table 3. Evaluation of the implicit and explicit sustainability measures						
	Factor loadings	**Average variance extracted**	**Cronbach's alpha**	**Split-half reliability[1]**	**External validity[2]**	**Discriminant validity[3]**
Ecolabel Fairtrade: explicit sustainability	>0.876	84%	0.962	n/a	0.386**	0.513**
Ecolabel Fairtrade: implicit sustainability	n/a	n/a	n/a	0.878	0.363**	
Ecolabel UTZ Certified: explicit sustainability	>0.972	97%	0.993	n/a	0.671**	0.519**
Ecolabel UTZ Certified: implicit sustainability	n/a	n/a	n/a	0.904	0.564**	
Brand Leibniz before: explicit sustainability	>0.948	94%	0.985	n/a	0.686**	0.498**
Brand Leibniz before: implicit sustainability	n/a	n/a	n/a	0.897	0.456**	
Brand Leibniz after: explicit sustainability	>0.934	92%	0.977	n/a	0.713**	0.584**
Brand Leibniz after: implicit sustainability	n/a	n/a	n/a	0.680	0.512**	
Brand Oreo before: explicit sustainability	>0.950	93%	0.985	n/a	0.512**	0.231*
Brand Oreo before: implicit sustainability	n/a	n/a	n/a	0.894	0.310**	
Brand Oreo after: explicit sustainability	>0.905	89%	0.985	n/a	0.793**	0.663**
Brand Oreo after: implicit sustainability	n/a	n/a	n/a	0.930	0.532**	

Note: n/a = not applicable.

*$p < 0.05$

**$p < 0.01$

[1]Similar to the standard procedure for calculating internal consistencies of IAT measures (e.g. Schnabel et al., 2008), first, the implicit scores were randomly divided into two sets, second, the total value for each half was calculated, third, the Spearman–Brown correlation coefficient between these two total values was estimated.

[2]Spearman's rank correlation analysis between the sustainability measure and a global external factor that summarizes the essence of sustainability for the respective brand and ecolabel.

[3]Spearman's rank correlation analysis between the corresponding explicit and implicit sustainability measure.

6. Results

6.1. Evaluation of the implicit and explicit measures
All explicit and implicit measures of sustainability showed satisfactory values in terms of item reliability (factor loadings and average variance extracted), internal consistency (Cronbach's alpha and split-half reliability), and construct validity (discriminant and external validity), as summarized in Table 3.

The achievement of substantial internal consistency for implicit measures is a critical challenge, in particular for response latency-based measures with frequently low internal consistency estimates (Nosek, Greenwald, & Banaji, 2007). In the present study, all implicit measures of sustainability displayed satisfactory values with internal consistency estimates (split-half reliability) ranging from 0.68 to 0.93, which is in accordance with what IAT measures typically reveal (see Schnabel, Asendorpf, & Greenwald, 2008). Furthermore, in support of external (convergent) validity, each implicit and explicit measure correlates with a global factor that summarizes the essence of sustainability for the corresponding brand and ecolabel, respectively. In addition, the correlation between an implicit measure and its explicit counterpart is moderate to high but still satisfactory and supportive of discriminant validity. Hence, the implicit and explicit measures capture correlated but distinct constructs. Taken together, the empirical results are in line with the results from other areas of implicit research (e.g. Nosek & Smyth, 2007).

6.2. Testing the hypotheses
To test the five sets of hypotheses, SEM, dependent sample t-tests and correlation analyses were conducted. The empirical investigation for each set of hypotheses is separately presented in the following paragraphs.

6.2.1. Impact of brand sustainability on brand strength

To check the first set of hypotheses, USM was applied to estimate the proposed impact of brand sustainability on brand strength. Specifically, the data-sets of the control conditions were used to establish a neutral baseline for the model estimation. In more detail, the associative network of those subjects was not affected (manipulated) by an exposure to an ecolabel in a brand advertisement that otherwise might have evoked an uncontrolled bias in the subject's perception. The empirical results are presented in Table 4. Regarding the coefficient of determination, the values of R^2 (*R-square*) range from 0.35 (uniqueness) to 0.55 (popularity). On average, R^2 values are 0.46, which can be deemed to be moderate in accordance to Chin (1998). In summary, the predictive accuracy of the investigated causal model is established.

H_{1a} is confirmed, and H_{1b} is partially confirmed. As discussed, a positive impact of both implicit and explicit brand sustainability on brand strength was assumed. As shown in Table 4, the empirical results reveal significant and positive effects of implicit brand sustainability on each facet of brand strength, with linear path coefficients ranging from 0.22 (loyalty, $p = 0.011$) to 0.42 (identification, $p = 0.000$). Furthermore, the estimated relationships indicate medium (uniqueness, $f^2 = 0.21$) to large effect sizes (popularity, $f^2 = 0.39$). Concerning the impact of explicit brand sustainability on brand strength, only partially significant and positive relationships with medium to large effects are indicated. Concretely, the empirical results suggest a relevant impact of explicit brand sustainability on trust ($\beta = 0.35$, $p = 0.018$, $f^2 = 0.36$), liking ($\beta = 0.20$, $p = 0.009$, $f^2 = 0.17$), loyalty ($\beta = 0.19$, $p = 0.012$, $f^2 = 0.27$), and willingness-to-pay ($\beta = 0.19$, $p = 0.096$, $f^2 = 0.28$). Thus, the empirical results provide full support for H_{1a}, whereby H_{1b} is only partially supported.

Table 4. Results of the Universal Structure Modeling path analysis

Dependent variable	Independent variable	f-square[1]	LPC[2]	t	p[3]	R-square
Cognitive brand strength (*n* = 54): popularity	Implicit brand sustainability	0.39	0.24	2.17	0.018	0.55
	Explicit brand sustainability	0.33	0.05	0.82	0.209	
Cognitive brand strength (*n* = 54): quality	Implicit brand sustainability	0.28	0.38	3.44	0.001	0.39
	Explicit brand sustainability	0.22	0.10	0.97	0.169	
Cognitive brand strength (*n* = 54): uniqueness	Implicit brand sustainability	0.21	0.28	2.47	0.009	0.35
	Explicit brand sustainability	0.21	0.00	1.01	0.159	
Affective brand strength (*n* = 54): identification	Implicit brand sustainability	0.39	0.41	4.55	0.000	0.47
	Explicit brand sustainability	0.29	0.14	0.86	0.197	
Affective brand strength (*n* = 54): trust	Implicit brand sustainability	0.36	0.27	2.29	0.014	0.51
	Explicit brand sustainability	0.36	0.35	2.16	0.018	
Affective brand strength (*n* = 54): liking	Implicit brand sustainability	0.29	0.38	4.20	0.000	0.43
	Explicit brand sustainability	0.17	0.20	2.45	0.009	
Intentional brand strength (*n* = 54): loyalty	Implicit brand sustainability	0.29	0.22	2.38	0.011	0.50
	Explicit brand sustainability	0.27	0.19	2.34	0.012	
Intentional brand strength (*n* = 54): recommendation	Implicit brand sustainability	0.37	0.42	4.30	0.000	0.46
	Explicit brand sustainability	0.39	0.09	0.86	0.198	
Intentional brand strength (*n* = 54): willingness-to-pay	Implicit brand sustainability	0.27	0.23	1.46	0.076	0.41
	Explicit brand sustainability	0.28	0.19	1.33	0.096	
Intentional brand strength (*n* = 54): buying intention	Implicit brand sustainability	0.31	0.27	3.58	0.001	0.43
	Explicit brand sustainability	0.26	0.00	0.84	0.317	

[1]Regarding the estimated USM model, the overall explained deviation described as "a more general criterion for the strength of construct interrelations" (Buckler & Hennig-Thurau, 2008, p. 52) and which is calculated by default in the used software package Neusrel (2017) was applied as proxy for f^2.

[2]LPC = standardized linear path coefficients (β).

[3]One-tailed test.

cogent ·· psychology

Table 5. Summary statistics for the before–after measurement											
	Before		After		Difference		t	p^1	d	d 95% CI	
	M	*SD*	*M*	*SD*	*M*	*SD*				Lower	Upper
Experimental condition I (strong label): Fairtrade ecolabel explicit sustainability (*n* = 37)	35.47	21.61	46.29	23.45	10.82	21.04	3.128	0.003	0.479	0.017	0.941
Experimental condition I (strong label): Fairtrade ecolabel implicit sustainability (*n* = 37)	27.64	21.69	41.15	29.55	13.51	26.01	3.160	0.003	0.509	0.046	0.972
Experimental condition II (weak label): UTZ certified ecolabel explicit sustainability (*n* = 50)	35.92	24.21	46.00	25.01	10.08	24.08	2.959	0.005	0.409	0.013	0.805
Experimental condition II (weak label): UTZ certified ecolabel implicit sustainability (*n* = 50)	27.82	22.12	39.09	31.31	11.27	29.51	2.701	0.009	0.407	0.011	0.803
Control condition (no label): explicit sustainability (*n* = 54)	33.87	23.26	33.63	22.71	−0.24	16.61	−0.104	0.917	0.010	−0.367	0.387
Experimental condition (no label): implicit sustainability (*n* = 54)	23.71	20.55	22.73	23.71	−0.98	16.90	−0.427	0.671	0.044	−0.333	0.421

Notes: *M* = mean, *SD* = standard deviation; scale range (rescaled): 0–100, higher (lower) numbers indicate an increasing level of approval (non-approval) related to perceived sustainability.
[1]Two-tailed test.

6.2.2. Framing effects of ecolabel exposure on perceived brand sustainability

Referring to the second set of hypotheses, Student's *t*-tests (two-tailed paired sample tests) were conducted. In particular, a positive effect of the exposure to an ecolabel in a brand advertisement that increases the implicit and explicit brand sustainability was postulated. Specifically, the analysis considered the ecolabel quality in terms of the strength of association with sustainability. In the present study, *Fairtrade* was determined to be a strong ecolabel and *UTZ Certified* was weak ecolabel based on the subjects' average familiarity with those ecolabels (*cf.* study design). Indeed, the results indicate a relatively strong association strength for *Fairtrade* with a mean of 73.96 (*SD* = 24.49) for implicit ecolabel sustainability and a mean of 66.32 (*SD* = 24.89) for explicit ecolabel sustainability. In contrast, *UTZ Certified* received a mean sustainability value of 48.72 (*SD* = 32.39) on an implicit level and of 44.08 (*SD* = 28.59) on an explicit level, suggesting a weaker (low) association strength. Thus, the initial classification of the ecolabel is justified. Table 5 presents the results of the before-after measurement.

H$_{2a}$ and H$_{2b}$ are confirmed. In both experimental conditions, the results indicate a positive impact of ecolabel exposure on perceived brand sustainability. Specifically, a significant and medium increase of implicit brand sustainability in the strong label experimental condition (*ΔM* = 13.51, *p* = 0.003, *d* = 0.509) and a small increase of implicit brand sustainability in the weak label experimental condition are revealed (*ΔM* = 11.27, *p* = .009; *d* = 0.407). Furthermore, the results suggest a significant enhancement of explicit brand sustainability with a small-medium effect in the strong label experimental condition (*ΔM* = 10.82, *p* = 0.003, *d* = 0.470) and a small effect in the weak label experimental condition (*ΔM* = 10.08, *p* = 0.005, *d* = 0.409). By comparison, in the control condition, no significant and essential association shift is identified for perceived brand sustainability, either on an implicit level (*ΔM* = −0.98, *p* = 0.671, *d* = 0.044) or on an explicit level (*ΔM* = −0.24, *p* = 0.917, *d* = 0.010). Thus, these findings are supportive of hypotheses H$_{2a}$ und H$_{2b}$.

6.2.3. Ecolabel-brand fit

With regard to the third set of hypotheses, Pearson's moment correlation analysis (two-tailed) was used to examine the relationship between ecolabel-brand fit and the enhancement of perceived sustainability.

H$_{3a}$ and H$_{3b}$ are confirmed. The mean differences in the pre-post-measurements regarding perceived brand sustainability and the ecolabel-brand fit were used as the variables of interest. The ecolabel-brand fit was calculated using the data from the before measurement (pre-testing) in order

cogent · psychology

**Figure 2. Ecolabel-brand fit and brand knowledge transfer.**
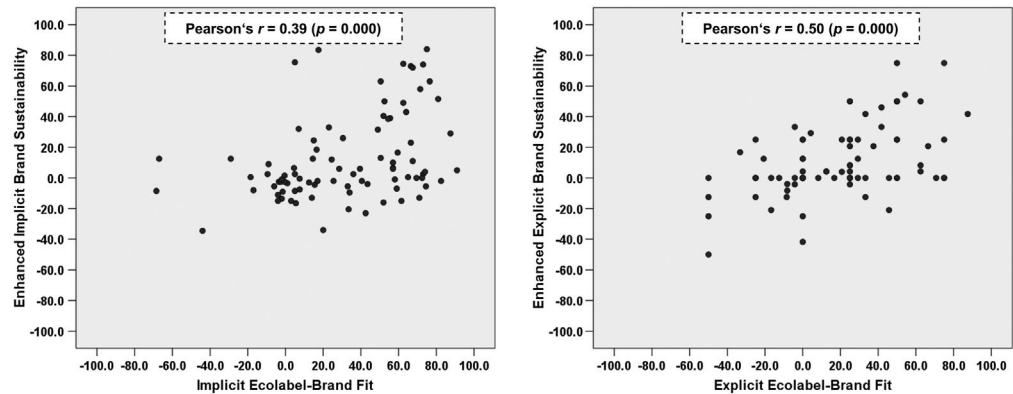
to subtract the brand sustainability value from the perceived ecolabel sustainability value. As illustrated in Figure 2, the product-moment r reveals a significant medium effect on an implicit level ($r = 0.39$, $p = 0.000$) and a significant large effect on an explicit level ($r = 0.50$, $p = 0.001$). Therefore, H_{3a} and H_{3b} receive full support.

6.2.4. Ecolabel recognition time

Considering the fourth set of hypotheses, the time to first contact, indicating the elapsed time until the ecolabel was recognized for the first time after the initial exposure to the brand advertisement, was assumed to be another efficacy parameter that affects the implicit and explicit information processing with regard to the enhancement of brand sustainability. For that reason, USM was applied for estimating separated causal models related to the enhancement of implicit and explicit brand sustainability.

H_{4a} is confirmed, while H_{4b} is rejected. The time to first contact was used as the independent variable, and the mean difference between the pre-post-measurements of brand sustainability was defined as the dependent variable. Specifically, a significant negative and small-medium effect of time to first contact on the enhancement of implicit brand sustainability is revealed ($R^2 = 0.12$, $\beta = -0.32$, $p = 0.019$, $f^2 = 0.141$), though the R^2 is low but still within an acceptable range. However, on an explicit level, the results suggest no significant and relevant relationship between time to first contact and brand-related sustainability enhancement ($R^2 = 0.01$, $\beta = 0.02$, $p = 0.416$, $f^2 = 0.01$). Specifically, the impact of the time to first contact on the enhancement of implicit brand sustainability is nonlinear and decreasing, as illustrated in Figure 3, which shows that a low recognition time related to the ecolabel exposed in the advertisement increases the implicit brand sustainability. In summary, the results are supportive of H_{4a}, but not H_{4b}.

Figure 3. Ecolabel recognition time and implicit–explicit knowledge acquisition.
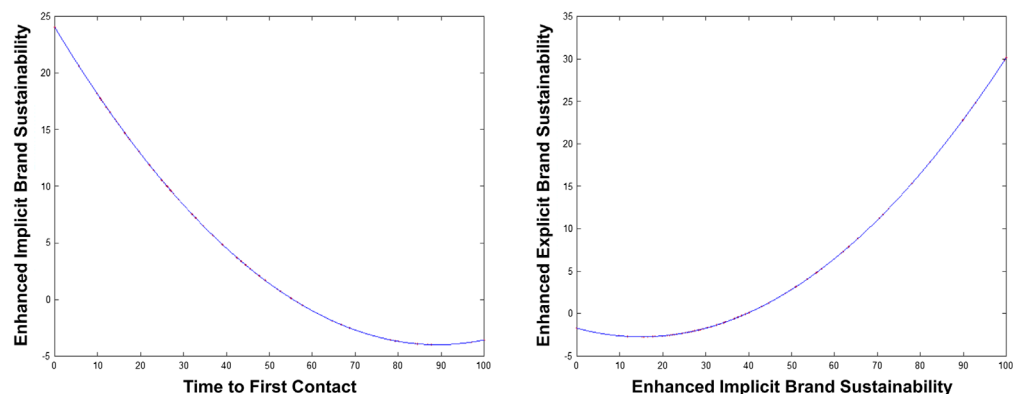
6.2.5. Implicit-explicit knowledge acquisition

With regard to the fifth and final hypothesis, it was expected that the enhancement of implicit brand sustainability positively affects the enhancement of explicit brand sustainability. Once again, USM was applied to examine the proposed relationship.

H_5 is confirmed. The empirical results reveal a positive and medium effect of the enhancement of implicit brand sustainability on the enhancement of explicit brand sustainability ($R^2 = 0.21$, $\beta = 0.44$, $p = 0.000$, $f^2 = 0.268$). Hence, H_5 is supported by the results. As shown in Figure 3, the relationship between both variables is nonlinear and increasing.

6.3. Conclusion and interpretation

First, the empirical findings show that brand sustainability, especially on an implicit level, is a favorable and meaningful brand information stored in consumer's brand knowledge that influences brand attractiveness and brand choice, and thus increases brand's strength in the market. Second, the usage of ecolabelling in print advertising seems to be an efficient branding strategy to embed implicit and explicit sustainability into brand knowledge. In the present study, even a short exposure to an ecolabel in a brand advertisement was powerful enough to increase the brand sustainability from, on average, a relatively low to a more neutral sustainability level. In this regard, the ecolabel quality turned out to be less important to enhancing the brand sustainability. That is, even a low familiarity with and less developed knowledge of an ecolabel appears to positively increase the perceived brand sustainability. However, to strengthen the brand associations related to sustainability, the ecolabel should exhibit a higher level of perceived sustainability than the advertised brand. This means that the higher the sustainability of an ecolabel, and the lower the sustainability of a brand, the greater the knowledge transfer will be from the ecolabel to the brand. Although this finding is derived from a simple correlation, and hence does not imply causation, it is reasonable to assume that the ecolabel-brand fit manifests as a sort of necessary precondition for a positive knowledge transfer. Furthermore, it seems to be beneficial when the ecolabel exposed in a brand advertisement is recognized as early as possible to ensure a positive acquisition of brand information referring to sustainability, but in this case, the acquisition is reasonably effective only on an implicit level and not on an explicit level. However, considering the brand associative network in its entirety, a distinct gain in explicit brand knowledge is generated when a certain level of implicit knowledge enhancement is reached. In summary, these findings emphasize the superior role of implicit information processing in strengthening brand knowledge that provides an added value for consumers, such as sustainable production and consumption.

7. Discussion

7.1. Contribution and implications

The current study aimed to examine the performance of message framing as an advertising strategy that relies on ecolabelling as a branding approach to create and foster consumer's brand knowledge related to brand sustainability. Past research has already investigated the relationship between consumer's brand knowledge related to sustainability performance and decision-making (Bartels & Hoogendam, 2011), the effectiveness of branding to embed sustainability into brand knowledge in general (Gupta et al., 2013) and the communication performance of ecolabelling to strengthen brand perception (D'Souza, 2000). With that said, the present study specifically contributes to the existing sustainability literature not only by considering explicit processes by means of conventional measures such as self-reported questionnaires, but also by accounting for implicit processes that were captured in the present study using a response latency-based measure as an advanced market research method.

First, an advanced framework of brand knowledge transfer that incorporates a dual process model of sustainability perception was derived to examine the implicit and explicit information processing of salient brand information related to sustainability and to explain the respective enhancement of brand knowledge in consumer's mind after contact with a marketing communication. Second, a combined implicit-explicit measurement approach was developed to evaluate consumer's brand

knowledge with regard to sustainability performance. Third, all implicit and explicit measures were successfully applied and examined in terms of measurement quality. Fourth, to the best of the author's knowledge, the exploratory approach of the present study investigated and revealed for the first time the impact of brand sustainability as brand-added value on brand strength and the effectiveness of ecolabelling in brand communication not only on an explicit level but also on an implicit level. Fifth, the findings of the current study provide evidence of three efficacy parameters that affect the brand knowledge transfer related to sustainability: adequate ecolabel-brand fit (on both the implicit and explicit levels), early ecolabel recognition time (only on the implicit level) and distinct implicit-explicit knowledge acquisition.

In today's business world, marketers have to address massive consumer disorientation related to social and environmental issues. A large number of consumers have begun to rethink the way they consume and the way companies should produce their products and services. Indeed, according to the 2015 Global CSR study by Cone Communications/Ebiquity (2015) approximately 9 in 10 consumers expect companies to operate more responsibly. With that said, the findings of the current study provide further support that (a) corporate sustainability performance positively affects consumers' decision-making and preferences, and that (b) ecolabelling in brand communication is an efficient branding strategy for embedding sustainability into brand knowledge. As a result of these findings, the following implications can be derived and generalized from a marketing management perspective:

- Marketing managers must examine the status quo of consumers' implicit and explicit brand knowledge related to brand values, and they must also examine the relationship between the brand values and key performance indicators (e.g. affective, cognitive, and intentional brand strength).
- To evoke a successful brand knowledge transfer by means of linking a brand to a value-related object or person, marketers should use only cues (e.g. ecolabel, celebrity) with at least the same level of association strength referring to the specific brand value.
- Furthermore, marketing managers need to apply a combined implicit-explicit measurement of brand knowledge to evaluate the performance of brand communications in general and of associative branding in particular.

7.2. Limitations and next research steps

Due to the exploratory nature of the present research, several study limitations require further research to replicate and review the findings. Above all, the reliability and validity of the developed implicit and explicit measures related to brand sustainability must be retested. Second, this study's sample was dominated by young females, likely with an increased interest in sustainability and a high environmental awareness. Hence, a more representative sample is required in future research, as is the detailed investigation of subjects with a different level of interest in sustainable consumption and varying levels of awareness of environmental issues. Third, another important limitation is that the present study covered cookie brands only from the FMCG. Therefore, investigations of other brands and products from the FMCG and from outside the FMCG industry are needed. Fourth, the introduced measurement approach should be applied to other brand communications (e.g. TV commercial, social media advertising). Fifth, the application of additional neuromarketing methods (e.g. electroencephalography, facial recognition) should extend the explaining power of the developed brand knowledge model. Overall, the measurement approaches introduced here and the findings of the present study are encouraging for ongoing research that incorporates the insights of consumer psychology, neuroscience, and marketing management into a neuromarketing research framework.

Competing Interests
The authors declare no competing interest.

Author details
Steffen Schmidt[1]
E-mail: schmidt@m2.uni-hannover.de
Sascha Langner[1]
E-mail: langner@m2.uni-hannover.de

cogent •• psychology

Nadine Hennigs[1]
E-mail: hennigs@m2.uni-hannover.de
Klaus-Peter Wiedmann[1]
E-mail: wiedmann@m2.uni-hannover.de
Evmorfia Karampournioti[1]
E-mail: karampournioti@m2.uni-hannover.de
Gesa Lischka[2]
E-mail: lischka@kochstrasse.de

[1] Institute of Marketing and Management, Leibniz University of Hannover, Koenigsworther Platz 1, 30167 Hannover, Lower Saxony, Germany.

[2] Kochstrasse™ – Agentur für Marken GmbH, Plaza de Rosalia 3, 30449 Hannover, Lower Saxony, Germany.

Citation information

Cite this article as: The green brand: Explicit and implicit framing effects of ecolabelling on brand knowledge, Steffen Schmidt, Sascha Langner, Nadine Hennigs, Klaus-Peter Wiedmann, Evmorfia Karampournioti & Gesa Lischka, *Cogent Psychology* (2017), 4: 1329191.

References

Aaker, D. A., & Keller, K. L. (1990). Consumer evaluations of brand extensions. *Journal of Marketing, 54*, 27–41. doi:10.2307/1252171

Aaker, D. A., & Stayman, D. M. (1992). Implementing the concept of transformational advertising. *Psychology and Marketing, 9*, 237–253. doi:10.1002/mar.4220090306

Ambler, T. (1997). How much of brand equity is explained by trust? *Management Decision, 35*, 283–292. doi:10.1108/00251749710169666

Anderson, W. T., & Cunningham, W. H. (1972). The socially conscious consumer. *Journal of Marketing, 36*, 23–31. doi:10.2307/1251036

Andrea Blengini, G., & Shields, D. J. (2010). Green labels and sustainability reporting. *Management of Environmental Quality: An International Journal, 21*, 477–493. doi:10.1108/14777831011049115

Atkinson, L. (2014, July 4). "Wild west" of eco-labels: Sustainability claims are confusing consumers. *The Guardian*. Retrieved from https://www.theguardian.com

Balsam, P., Drew, M., & Gallistel, C. (2010). Time and associative learning. *Comparative Cognition & Behavior Reviews, 5*, 1–22. doi:10.3819/ccbr.2010.50001

Bartels, J., & Hoogendam, K. (2011). The role of social identity and attitudes toward sustainability brands in buying behaviors for organic products. *Journal of Brand Management, 18*, 697–708. doi:10.1057/bm.2011.3

Bednarik, R., & Tukiainen, M. (2007). Validating the restricted focus viewer: A study using eye-movement tracking. *Behavior Research Methods, 39*, 274–282. doi:10.3758/bf03193158

Bergkvist, L., & Rossiter, J. R. (2007). The predictive validity of multiple-item versus single-item measures of the same constructs. *Journal of Marketing Research, 44*, 175–184. doi:10.1509/jmkr.44.2.175

Berrone, P. (2016, September 15). How to succeed at sustainability (and why greenwashing doesn't work). *Forbes*. Retrieved from https://www.forbes.com

Biau, D. J., Jolles, B. M., & Porcher, R. (2010). *P* value and the theory of hypothesis testing: An explanation for new researchers. *Clinical Orthopaedics and Related Research®, 468*, 885–892. doi:10.1007/s11999-009-1164-4

Boiral, O. (2013). Sustainability reports as simulacra? A counter-account of A and A GRI reports. *Accounting, Auditing & Accountability Journal, 26*, 1036–1071. doi:10.1108/aaaj-04-2012-00998

Bougherara, D., & Grolleau, G. (2005). Designing ecolabels in order to mitigate market failures an application to agrofood products. *Journal of Interdisciplinary Economics, 16*, 411–430. doi:10.1177/02601079X05001600403.

Brucks, M. (1986). A typology of consumer knowledge content. In R. J. Lutz (Ed.), *NA–Advances in consumer research*, (Vol. 13, pp. 58–63). Provo, UT: Association for Consumer Research.

Buckler, F., & Hennig-Thurau, T. (2008). Identifying hidden structures in marketing's structural models through universal structure modeling. *Marketing ZFP, 30* (JRM 2), 47–66. doi:10.15358/0344-1369-2008-jrm-2-47

Burke, M. C., & Edell, J. A. (1989). The impact of feelings on Ad-based affect and cognition. *Journal of Marketing Research, 26*, 69. doi:10.2307/3172670

Campbell, M. C. (2002). Building brand equity. *Journal of Medical Marketing, 2*, 208–218. doi:10.1057/palgrave.jmm.5040078

Castro, C. J. (2004). Sustainable development: Mainstream and critical perspectives. *Organization & Environment, 17*, 195–225. doi:10.1177/1086026604264910

Chabowski, B. R., Mena, J. A., & Gonzalez-Padron, T. L. (2011). The structure of sustainability research in marketing, 1958–2008: A basis for future research opportunities. *Journal of the Academy of Marketing Science, 39*, 55–70. doi:10.1007/s11747-010-0212-7

Chaffin, R. (1979). Knowledge of language and knowledge about the world: A reaction time study of invited and necessary inferences. *Cognitive Science, 3*, 311–328. doi:10.1207/s15516709cog0304_2

Chang, C. (2007). Ad framing effects for consumption products: An affect priming process. *Psychology and Marketing, 25*, 24–46. doi:10.1002/mar.20199

Chin, W. W. (1998). The Partial Least Squares Approach for Structural Equation Modelling. In G. A. Marcoulides (Ed.), *Modern Methods for Business Research* (pp. 295–336). Mahwah, NJ: Lawrence Erlbaum.

Cohen, J. (1977). *Statistical power analysis for the behavioral sciences*. New York, NY: Academic Press.

Cohen, J. (1992). A power primer. *Psychological Bulletin, 112*, 155–159. doi:10.1037//0033-2909.112.1.155.

Cone Communications/Ebiquity. (2015). *2015 Cone Communications/Ebiquity–Global CSR study*. Retrieved from http://www.conecomm.com/2015-cone-communications-ebiquity-global-csr-study-pdf

Craddock, P., Molet, M., & Miller, R. R. (2012). Reaction time as a measure of human associative learning. *Behavioural Processes, 90*, 189–197. https://doi.org/10.1016/j.beproc.2012.01.006

D'Souza, C. (2000). Bridging the communication gap: Dolphin-safe "ecolabels". *Corporate Communications: An International Journal, 5*, 185–190. doi:10.1108/13563280010379129

Deppe, M., Schwindt, W., Kugel, H., Plaßmann, H., & Kenning, P. (2005). Nonlinear responses within the medial prefrontal cortex reveal when specific implicit information influences economic decision making. *Journal of Neuroimaging, 15*, 171–182. doi:10.1111/j.1552-6569.2005.tb00303.x.

Dijksterhuis, A., & Nordgren, L. F. (2006). A theory of unconscious thought. *Perspectives on Psychological Science, 1*, 95–109. doi:10.1111/j.1745-6916.2006.00007.x

Drolet, A. L., & Morrison, D. G. (2001). Do we really need multiple-item measures in service research? *Journal of Service Research, 3*, 196–204. doi:10.1177/109467050133001

Dunlap, W. P., Cortina, J. M., Vaslow, J. B., & Burke, M. J. (1996). Meta-analysis of experiments with matched groups or repeated measures designs. *Psychological Methods, 1*, 170–177. doi:10.1037/1082-989x.1.2.170

Eccles, R. G., Ioannou, I., & Serafeim, G. (2014). The impact of corporate sustainability on organizational processes and performance. *Management Science, 60*, 2835–2857. doi:10.1287/mnsc.2014.1984

Ecolabel Index. (2016). *All ecolabels*. Retrieved from http://www.ecolabelindex.com/ecolabels

cogent ·· psychology

Ehrenberg, A., Barnard, N., & Scriven, J. (1997). Differentiation or salience. *Journal of Advertising Research, 37*, 7–14.

Epstein, S., Pacini, R., Denes-Raj, V., & Heier, H. (1996). Individual differences in intuitive-experiential and analytical-rational thinking styles. *Journal of Personality and Social Psychology, 71*, 390–405. doi:10.1037/0022-3514.71.2.390

Esch, F., Langner, T., Schmitt, B. H., & Geus, P. (2006). Are brands forever? How brand knowledge and relationships affect current and future purchases. *Journal of Product & Brand Management, 15*, 98–105. doi:10.1108/10610420610658938.

Evans, J. St. B. T. (2003). In two minds: Dual-process accounts of reasoning. *Trends in Cognitive Sciences, 7*, 454–459. doi:10.1016/j.tics.2003.08.012.

Evans, J. St. B. T., & Stanovich, K. E. (2013). Dual-process theories of higher cognition. *Perspectives on Psychological Science, 8*, 223–241. doi:10.1177/1745691612460685

eye square. (2017). *Reaction time measurement e²*. BrandREACT. Retrieved from http://www.eye-square.com/reaction-time

Fazio, R. H. (1990). Multiple processes by which attitudes guide behavior: The mode model as an integrative framework. *Advances in Experimental Social Psychology, 23*, 75–109. doi:10.1016/s0065-2601(08)60318-4

Feldman, D. (2012). The spike-timing dependence of plasticity. *Neuron, 75*, 556–571. doi:10.1016/j.neuron.2012.08.001

Fischer, S., Drosopoulos, S., Tsen, J., & Born, J. (2006). Implicit learning–Explicit knowing: A role for sleep in memory system interaction. *Journal of Cognitive Neuroscience, 18*, 311–319. doi:10.1162/jocn.2006.18.3.311

Freestone, O. M., & McGoldrick, P. J. (2008). Motivations of the ethical consumer. *Journal of Business Ethics, 79*, 445–467. doi:10.1007/s10551-007-9409-1

Frydman, C., & Camerer, C. F. (2016). The psychology and neuroscience of financial decision making. *Trends in Cognitive Sciences, 20*, 661–675. doi:10.1016/j.tics.2016.07.003

Gidwani, B. (2013). The link between brand value and sustainability. *Director Notes, 5*(21), 1–14. Retrieved from http://brandfinance.com/images/upload/the_link_between_brand_value_and_sustainability.pdf

Greenwald, A. G., McGhee, D. E., & Schwartz, J. L. (1998). Measuring individual differences in implicit cognition: The implicit association test. *Journal of Personality and Social Psychology, 74*, 1464–1480. doi:10.1037/0022-3514.74.6.1464

Grunert, K. G., Hieke, S., & Wills, J. (2014). Sustainability labels on food products: Consumer motivation, understanding and use. *Food Policy, 44*, 177–189. doi:10.1016/j.foodpol.2013.12.001

Grunert, K. G., & Wills, J. M. (2007). A review of European research on consumer response to nutrition information on food labels. *Journal of Public Health, 15*, 385–399. doi:10.1007/s10389-007-0101-9

Gulbrandsen, L. H. (2006). Creating markets for eco-labelling: Are consumers insignificant? *International Journal of Consumer Studies, 30*, 477–489. doi:10.1111/j.1470-6431.2006.00534.x

Gupta, S., Czinkota, M., & Melewar, T. (2013). Embedding knowledge and value of a brand into sustainability for differentiation. *Journal of World Business, 48*, 287–296. doi:10.1016/j.jwb.2012.07.013

Gwinner, K. P., & Eaton, J. (1999). Building brand image through event sponsorship: The role of image transfer. *Journal of Advertising, 28*, 47–57. doi:10.1080/00913367.1999.10673595

Haenlein, M., & Kaplan, A. M. (2004). A beginner's guide to partial least squares analysis. *Understanding Statistics, 3*, 283–297. doi:10.1207/s15328031us0304_4

Hair, J. F., Sarstedt, M., Pieper, T. M., & Ringle, C. M. (2012). The use of partial least squares structural equation modeling in strategic management research: A review of past practices and recommendations for future applications. *Long Range Planning, 45*, 320–340. doi:10.1016/j.lrp.2012.09.008

Hallahan, K. (1999). Seven models of framing: Implications for public relations. *Journal of Public Relations Research, 11*, 205–242. doi:10.1207/s1532754xjprr1103_02

Hart, S. L. (1997). Beyond greening: Strategies for a sustainable world. *Harvard Business Review, 75*, 66–76

Hebb, D. O. (1949). *The organization of behavior: A neuropsychological theory*. New York, NY: Wiley & Sons.

Henderson, G. R., Iacobucci, D., & Calder, B. J. (1998). Brand diagnostics: Mapping branding effects using consumer associative networks. *European Journal of Operational Research, 111*, 306–327. doi:10.1016/s0377-2217(98)00151-9

Henseler, J., Ringle, C. M., & Sinkovics, R. R. (2009). The use of partial least squares path modeling in international marketing. In R. R. Sinkovics & P. N. Ghauri (Eds.), *New challenges to international marketing–Advances in International Marketing Volume 20* (pp. 277–319). Bingley: Emerald Group Publishing Limited. doi:10.1108/S1474-7979(2009)0000020014

Herbig, B., & Müller, A. (2014). Implicit knowledge and work performance. In S. Billet, C. Harteis, & H. Gruber (Eds.), *International handbook of research in professional and practice-based learning Part IV* (pp. 781–780). Dordrecht, Netherlands: Springer.

Hofmann, W., Gawronski, B., Gschwendner, T., Le, H., & Schmitt, M. (2005). A meta-analysis on the correlation between the implicit association test and explicit self-report measures. *Personality and Social Psychology Bulletin, 31*, 1369–1385. doi:10.1177/0146167205275613

Jain, S. P., Mathur, P., & Maheswaran, D. (2009). The influence of consumers' lay theories on approach/avoidance motivation. *Journal of Marketing Research, 46*, 56–65. doi:10.1509/jmkr.46.1.56

Jansen, A. R., Blackwell, A. F., & Marriott, K. (2003). A tool for tracking visual attention: The restricted focus viewer. *Behavior Research Methods, Instruments, & Computers, 35*, 57–69. doi:10.3758/bf03195497

Johansson, T. (2011). Hail the impossible: p-values, evidence, and likelihood. *Scandinavian Journal of Psychology, 52*, 113–125. doi:10.1111/j.1467-9450.2010.00852.x

Kahneman, D. (2003). Maps of bounded rationality: Psychology for behavioral economics. *American Economic Review, 93*, 1449–1475. doi:10.1257/000282803322655392

Kahneman, D. (2011). *Thinking, fast and slow*. London: Penguin Books.

Kahneman, D., & Frederick, S. (2005). A model of heuristic judgment. In K. Holyoak & B. Morrison (Eds.), *The Cambridge handbook of thinking and reasoning* (pp. 267–293). Cambridge: Cambridge University Press.

Karpinski, A., & Steinman, R. B. (2006). The Single category implicit association test as a measure of implicit social cognition. *Journal of Personality and Social Psychology, 91*, 16–32. doi:10.1037/0022-3514.91.1.16

Keller, K. L. (1987). Memory factors in advertising: The effect of advertising retrieval cues on brand evaluations. *Journal of Consumer Research, 14*, 316–333. doi:10.1086/209116

Keller, K. L. (1991). Cue compatibility and framing in advertising. *Journal of Marketing Research, 28*, 42–57. doi:10.2307/3172725

Keller, K. L. (1993). Conceptualizing, measuring, and managing customer-based brand equity. *Journal of Marketing, 57*, 1–22. doi:10.2307/1252054

Keller, K. L. (2001). *Building customer-based brand equity: A blueprint for creating strong brands*. Cambridge, MA: Marketing Science Institute.

Keller, K. L. (2003). Brand synthesis: The multidimensionality of brand knowledge. *Journal of Consumer Research, 29*, 595–600. doi:10.1086/346254

Keller, K. L., & Lehmann, D. R. (2006). Brands and branding: Research findings and future priorities. *Marketing Science, 25*, 740–759. doi:10.1287/mksc.1050.0153

Kilbourne, W. E. (1995). Green advertising: salvation or oxymoron? *Journal of Advertising, 24*, 7–20. doi:10.1080/00913367.1995.10673472

Kilbourne, W. E. (2004). Sustainable communication and the dominant social paradigm: Can they be integrated? *Marketing Theory, 4*, 187–208. doi:10.1177/1470593104045536.

Knutson, B., Rick, S., Wimmer, G. E., Prelec, D., & Loewenstein, G. (2007). Neural predictors of purchases. *Neuron, 53*, 147–156. doi:10.1016/j.neuron.2006.11.010

Koll, O., von Wallpach, S. V., & Kreuzer, M. (2010). Multi-method research on consumer-brand associations: Comparing free associations, storytelling, and collages. *Psychology and Marketing, 27*, 584–602. doi:10.1002/mar.20346

Krishnan, H. (1996). Characteristics of memory associations: A consumer-based brand equity perspective. *International Journal of Research in Marketing, 13*, 389–405. doi:10.1016/s0167-8116(96)00021-3

Laroche, M., Bergeron, J., & Barbaro-Forleo, G. (2001). Targeting consumers who are willing to pay more for environmentally friendly products. *Journal of Consumer Marketing, 18*, 503–520. doi:10.1108/eum0000000006155

Leire, C., & Thidell, Å. (2005). Product-related environmental information to guide consumer purchases–A review and analysis of research on perceptions, understanding and use among Nordic consumers. *Journal of Cleaner Production, 13*, 1061–1070. doi:10.1016/j.jclepro.2004.12.004

Levin, I. P., & Gaeth, G. J. (1988). How consumers are affected by the framing of attribute information before and after consuming the product. *Journal of Consumer Research, 15*, 374–378. doi:10.1086/209174

Lieber, R. L. (1990). Statistical significance and statistical power in hypothesis testing. *Journal of Orthopaedic Research, 8*, 304–309. doi:10.1002/jor.1100080221

Lola, A. C., Tzetzis, G. C., & Zetou, H. (2012). The effect of implicit and explicit practice in the development of decision making in volleyball serving. *Perceptual and Motor Skills, 114*, 665–678. doi:10.2466/05.23.25.pms.114.2.665-678

Lowel, S., & Singer, W. (1992). Selection of intrinsic horizontal connections in the visual cortex by correlated neuronal activity. *Science, 255*, 209–212. doi:10.1126/science.1372754

Lynch, Jr., J. J., & Srull, T. K. (1982). Memory and attentional factors in consumer choice: Concepts and research methods. *Journal of Consumer Research, 9*, 18–37. doi:10.1086/208893

MacInnis, D. J., & Jaworski, B. J. (1989). Information processing from advertisements: Toward an integrative framework. *Journal of Marketing, 53*, 1–23. doi:10.2307/1251376

MacInnis, D. J., Moorman, C., & Jaworski, B. J. (1991). Enhancing and measuring consumers' motivation, opportunity, and ability to process brand information from ads. *Journal of Marketing, 55*, 32–53. doi:10.2307/1251955

Markram, H., Gerstner, W., & Sjöström, P. J. (2011). A history of spike-timing-dependent plasticity. *Frontiers in Synaptic Neuroscience, 3*. doi:10.3389/fnsyn.2011.00004

McDonagh, P. (1998). Towards a theory of sustainable communication in risk society: Relating issues of sustainability to marketing communications. *Journal of Marketing Management, 14*, 591–622. doi:10.1362/026725798784867699

Mehta, N., Chen, X., & Narasimhan, O. (2008). Informing, transforming, and persuading: Disentangling the multiple effects of advertising on brand choice decisions. *Marketing Science, 27*, 334–355. doi:10.1287/mksc.1070.0310

Miniard, P. W., Dickson, P. R., & Lord, K. R. (1988). Some central and peripheral thoughts on the routes to persuasion. In M. J. Houston (Ed.), *NA–Advances in consumer research Volume15* (pp. 204–209). Provo, UT: Association for Consumer Research.

Mitchell, A. A. (1980). The use of an information processing approach to understand advertising effects. In J. C. Olson (Ed.), *NA–Advances in consumer research Volume7* (pp. 171–177). Ann Abor, MI: Association for Consumer Research.

Nakagawa, S., & Cuthill, I. C. (2007). Effect size, confidence interval and statistical significance: a practical guide for biologists. *Biological Reviews, 82*, 591–605. doi:10.1111/j.1469-185x.2007.00027.x

Neusrel. (2017). *Causal analytics*. Retrieved from http://www.neusrel.com/causal-analytics

Nosek, B. A., Greenwald, A. G., & Banaji, M. R. (2007). The Implicit Association Test at age 7: A methodological and conceptual review. In J. A. Bargh (Ed.), *Automatic processes in social thinking and behavior* (pp. 265–292). New York, NY: Psychology Press.

Nosek, B. A., & Smyth, F. L. (2007). A Multitrait-multimethod validation of the implicit association test. *Experimental Psychology, 54*, 14–29. doi:10.1027/1618-3169.54.1.14

Park, C. W., McCarthy, M. S., & Milberg, S. J. (1993). The effects of direct and associative brand extension strategies on consumer response to brand extensions. In L. McAlister & M. K. Rothshild (Eds.), *NA–Advances in consumer research*, (Vol. 20, pp. 28–33). Provo, UT: Association for Consumer Research.

Peet, R., & Watts, M. (1996). Liberation ecology: Development, sustainability, and environment in an age of market triumphalism. In R. Peet & M. Watts (Eds.), *Liberation ecologies: Environment, development, social movements* (pp. 1–45). London: Routledge. https://doi.org/10.4324/9780203286784

Proto, M., Malandrino, O., & Supino, S. (2007). Eco-labels: A sustainability performance in benchmarking? *Management of Environmental Quality: An International Journal, 18*, 669–683. doi:10.1108/14777830710826702

Puto, C. P., & Wells, W. D. (1984). Informational and transformational advertising: the differential effects of time. In T. C. Kinnear (Ed.), *NA - Advances in consumer research*, (Vol. 11, pp. 638–643). Provo, UT: Association for Consumer Research.

Ranstam, J. (2012). Why the *p*-value culture is bad and confidence intervals a better alternative. *Osteoarthritis and Cartilage, 20*, 805–808. doi:10.1016/j.joca.2012.04.001

Reimann, M., Zaichkowsky, J., Neuhaus, C., Bender, T., & Weber, B. (2010). Aesthetic package design: A behavioral, neural, and psychological investigation. *Journal of Consumer Psychology, 20*, 431–441. doi:10.1016/j.jcps.2010.06.009

Rescorla, R. A., & Wagner, A. R. (1972). A theory of Pavlovian conditioning: Variations in the effectiveness of reinforcement and nonreinforcement. In A. H. Black & W. F. Prokasy (Eds.), *Classical conditioning II: Current research and theory* (pp. 64–99). New York, NY: Appleton-Century-Crofts.

Richards, I., Foster, D., & Morgan, R. (1998). Brand knowledge management: Growing brand equity. *Journal of Knowledge Management, 2*, 47–54. doi:10.1108/13673279810800762

Roheim, C. A. (2008). The economics of ecolabelling. In T. Ward & B. Phillips (Eds.), *Seafood ecolabelling: Principles and practice* (pp. 38–57). Oxford: Wiley-Blackwell. https://doi.org/10.1002/9781444301380

Rosenthal, R. (1994). Parametric measures of effect size. In H. Cooper & L. V. Hedges (Eds.), *Handbook of research synthesis* (pp. 231–244). New York, NY: Russell Sage Foundation.

Rosnow, R. L., & Rosenthal, R. (1989). Statistical procedures and the justification of knowledge in psychological science. *American Psychologist, 44*, 1276–1284. doi:10.1037//0003-066x.44.10.1276

Samu, S., & Krishnan, H. S. (2009). Brand related information as context: Rhe impact of brand name characteristics on memory and choice. *Journal of the Academy of Marketing Science, 38*, 456–470. doi:10.1007/s11747-009-0175-8

Sawyer, A. G., & Peter, J. P. (1983). The significance of statistical significance tests in marketing research. *Journal of Marketing Research, 20*, 122–133. doi:10.2307/3151679

Schmidt, St, Hennigs, N., Langner, S., & Limbach, M. (2013). The explicit and implicit impact of sport sponsorship. *Marketing Review St. Gallen, 30*, 58–70. doi:10.1365/s11621-013-0189-y

Schmidt, St., Thoelke, A., Langner, S., & Schiessl, M. (2015). Communication research in a digitized world–The necessity of an integrative visual and affective measurement 3.0 diagnosis. *Planung & Analyse, 6*, 34–36.

Schmidt, St, Wiedmann, K.-P., Reiter, P., & Kurlbaum, C. (2016). Anticipating the effects of marketing communication: A neuroeconomic framework for marketing purposes. In T. Langner, F.-R. Esch, & M. Bruhn (Eds.), *Handbuch Sozialtechniken der Kommunikation*, Vol. 3 (pp. 1–23). Wiesbaden: Springer. https://doi.org/10.1007/978-3-658-05262-1

Schnabel, K., Asendorpf, J. B., & Greenwald, A. G. (2008). Assessment of individual differences in implicit cognition. *European Journal of Psychological Assessment, 24*, 210–217. doi:10.1027/1015-5759.24.4.210

Schnittka, O., Sattler, H., & Zenker, S. (2012). Advanced brand concept maps: A new approach for evaluating the favorability of brand association networks. *International Journal of Research in Marketing, 29*, 265–274. doi:10.1016/j.ijresmar.2012.04.002

Sheth, J. N., Sethia, N. K., & Srinivas, S. (2011). Mindful consumption: A customer-centric approach to sustainability. *Journal of the Academy of Marketing Science, 39*, 21–39. doi:10.1007/s11747-010-0216-3

Shiffrin, R. M., & Schneider, W. (1977). Controlled and automatic human information processing: II. Perceptual learning, automatic attending and a general theory. *Psychological Review, 84*, 127–190. doi:10.1037//0033-295x.84.2.127

Sloman, S. A. (1996). The empirical case for two systems of reasoning. *Psychological Bulletin, 119*, 3–22. doi:10.1037//0033-2909.119.1.3

Smith, C. S. (1995). Marketing strategies for the ethics era. *Sloan Management Review, 36*, 85–97.

Solomon, M., Bamossy, G. J., Askegaard, S., & Hogg, M. K. (2006). *Consumer behaviour: A European perspective* (3rd ed.). London, England: Prentice Hall.

Stanovich, K. E., & West, R. F. (2000). Individual differences in reasoning: Implications for the rationality debate? *Behavioral and Brain Sciences, 23*, 645–665. doi:10.1017/s0140525x00003435

Thøgersen, J. (2002). Promoting green consumer behavior with eco-labels. In T. Dietz & P. Stern (Eds.), *New tools for environmental protection: education, information, and voluntary measures* (pp. 83–104). Washington, DC: National Academy Press.

Thøgersen, J., Haugaard, P., & Olesen, A. (2010). Consumer responses to ecolabels. *European Journal of Marketing, 44*, 1787–1810. doi:10.1108/03090561011079882

Till, B. D., Baack, D., & Waterman, B. (2011). Strategic brand association maps: Developing brand insight. *Journal of Product & Brand Management, 20*, 92–100. doi:10.1108/10610421111121080

Tokar, B. (2008). On bookchin's social ecology and its contributions to social movements. *Capitalism Nature Socialism, 19*, 51–66. doi:10.1080/10455750701859430

Tsai, S. (2007). Message framing strategy for brand communication. *Journal of Advertising Research, 47*, 364–377. doi:10.2501/s0021849907070377

Turkyilmaz, A., Oztekin, A., Zaim, S., & Fahrettin Demirel, O. F. (2013). Universal structure modeling approach to customer satisfaction index. *Industrial Management & Data Systems, 113*, 932–949. doi:10.1108/imds-12-2012-0444

United Nations Conference on Environment and Development. (1997). *United Nations Conference on Environment and Development (1992)*. Retrieved from http://www.un.org/geninfo/bp/enviro.html

Valette-Florence, P., Guizani, H., & Merunka, D. (2011). The impact of brand personality and sales promotions on brand equity. *Journal of Business Research, 64*, 24–28. doi:10.1016/j.jbusres.2009.09.015

Vermeer, D., Clemen, B., Michalko, A., Nguyen, D., Noyes, C., Akella, A., & Bunting, J. (2010). An overview of ecolabels and sustainability certifications in the global marketplace. In J. S. Golden (Ed.), *Corporate sustainability initiative (Interim Report Document #2010-10-1)*. Durham: Nicholas Institute for Environmental Policy Solutions, Duke University.

Vieceli, J., & Shaw, R. N. (2010). Brand salience for fast-moving consumer goods: An empirically based model. *Journal of Marketing Management, 26*, 1218–1238. doi:10.1080/0267257x.2010.523009

Vukasovič, T. (2009). Searching for competitive advantage with the aid of the brand potential index. *Journal of Product & Brand Management, 18*, 165–176. doi:10.1108/10610420910957799

Walvis, T. H. (2008). Three laws of branding: Neuroscientific foundations of effective brand building. *Journal of Brand Management, 16*, 176–194. doi:10.1057/palgrave.bm.2550139

Watson, B. (2016, August 20). The troubling evolution of corporate greenwashing. *The Guardian*. Retrieved from https://www.theguardian.com

Weber, B., Rangel, A., Wibral, M., & Falk, A. (2009). The medial prefrontal cortex exhibits money illusion. *Proceedings of the National Academy of Sciences, 106*, 5025–5028. doi:10.1073/pnas.0901490106

Wells, W. D. (1980). *How advertising works*. Chicago, IL: Needham, Harper and Steers Advertising.

Wiedmann, K., Hennigs, N., Schmidt, S., & Wuestefeld, T. (2011). The importance of brand heritage as a key performance driver in marketing management. *Journal of Brand Management, 19*, 182–194. doi:10.1057/bm.2011.36

Wiedmann, K., Hennigs, N., Schmidt, S., & Wuestefeld, T. (2013). Brand heritage and its impact on corporate reputation: corporate roots as a vision for the future. *Corporate Reputation Review, 16*, 187–205. doi:10.1057/crr.2013.10

Wittenbrink, B., & Schwarz, N. (2007). Introduction. In B. Wittenbrink & N. Schwarz (Eds.), *Implicit measures of attitudes* (pp. 1–13). New York, NY: The Guilford Press.

World Summit on Sustainable Development. (2002). *World Summit on Sustainable Development... Live*. Retrieved from http://www.un.org/events/wssd

Wright, A. A., & Lutz, R. J. (1993). Effects of advertising and experience on brand judgments: a rose by any other frame. In L. McAlister & M. L. Rothschild (Eds.), *NA - Advances in consumer research*, (Vol. 20, pp. 165–169). Provo, UT: Association for Consumer Research.

Yang, S., & Ha, S. (2014). Brand knowledge transfer via sponsorship in the financial services industry. *Journal of Services Marketing, 28*, 452–459. doi:10.1108/jsm-11-2013-0313

Zairi, M., & Peters, J. (2002). The impact of social responsibility on business performance. *Managerial Auditing Journal, 17*, 174–178. doi:10.1108/02686900210424312

cogent •• psychology

Cogent Psychology **(ISSN: 2331-1908) is published by Cogent OA, part of Taylor & Francis Group.**

Publishing with Cogent OA ensures:

- Immediate, universal access to your article on publication
- High visibility and discoverability via the Cogent OA website as well as Taylor & Francis Online
- Download and citation statistics for your article
- Rapid online publication
- Input from, and dialog with, expert editors and editorial boards
- Retention of full copyright of your article
- Guaranteed legacy preservation of your article
- Discounts and waivers for authors in developing regions

Submit your manuscript to a Cogent OA journal at www.CogentOA.com