The Science of Creating Brand Associations: A Continuous Trinity Model Linking Brand Associations to Learning Processes

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The continuous trinity model (CTM) of brand associations integrates 50 years of consumer learning research with recent conceptualizations of consciousness. Three types of brand associations are proposed at the representational level (expectations, meaning, and affect), corresponding to three types of learning at the process level (predictive learning, referential learning, and direct affect transfer). A core proposition derived from research on automaticity holds that the operating conditions of the learning processes vary on a continuum from mostly System 2 for predictive learning to mostly System 1 for direct affect transfer, with referential learning as a mix of the two. The CTM aims to bring clarity and structure to a complex literature by highlighting the web of interrelations between operating principles ("what" brand associations are learned), operating processes ("how" brand associations are learned), and operating conditions ("when" brand associations are learned). For consumer and learning researchers, the CTM outlines an agenda for future research and guidelines to improve conceptual and methodological clarity. For brand managers, the CTM provides tactical recommendations (a "toolkit") for structuring advertising campaigns to create desired brand associations and strategic recommendations for managing brand partnerships. For policymakers, the CTM offers guidance on types of advertisements requiring closer scrutiny.

Keywords: Consumer learning, brand associations, attitudes, automaticity, theory building

Brands are the most valuable symbols in the world. They constitute billions of dollars of firm value, often accounting for 20–30% of total company market capitalization (Interbrand 2023). Yet, these intangible assets exist only in consumers' minds as a network of interconnected associations. Brand associations can include the

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benefits of consuming the brand (Keller 1993), the brand's personality (Aaker 1997), and the feelings evoked by the brand (Batra 2019). Because small changes in these associations can have multi-billion-dollar consequences (e.g., the brands sponsoring Tiger Woods lost between $5 and $12 billion in the wake of his extramarital affairs; Knittel and Stango 2014), brands are the most actively managed and closely scrutinized associative networks in the world. Brand managers and marketing scholars alike are keenly interested in uncovering how brand associations are formed, shaped, and maintained.

Although researchers have attempted to explain how brand associations form (Keller 1993; McCracken 1989; van Osselaer and Janiszewski 2001), an integrative account remains elusive (Batra 2019) and the role of automatically operating processes in the learning of such associations continues to be debated (Corneille and Stahl 2019). These conflicting perspectives can partly be explained by a lack of conceptual clarity in the literature, as researchers have insufficiently distinguished between *operating principles* at the representational level ("what" gets learned), *operating processes* ("how" learning occurs), and *operating conditions* ("when" the processes operate). These problems have been compounded by the fact that the distinctions proposed at the principle level by leading conceptual models (e.g., between "associations" and "propositions"; Gawronski and Bodenhausen 2006, 2014) are increasingly regarded as problematic and unfalsifiable (Hütter 2022). In response, we propose a new conceptualization, the continuous trinity model (CTM) of brand associations (figure 1).

Rather than starting with an associative-propositional duality, the core tenet of the CTM is that a trinity of operating principles—corresponding to qualitatively different kinds of brand associations—needs to be distinguished at the representational level. The model then posits that a trinity of processes preferentially drive the formation of these brand associations: *predictive learning* drives the formation of brand *expectation* associations, *referential learning* drives the formation of brand *meaning* associations, and *direct affect transfer* drives the formation of brand *affect* associations. The model also proposes higher-order learning at the principle level and interactions at the process level. Finally, the model holds that the operating conditions of the processes vary on a continuum from mostly system 2 (predictive learning) to mostly system 1 (direct affect transfer), with referential learning in between. Table 1 summarizes the characteristics of the three operating processes and uses different possible Coca-Cola® brand associations to illustrate the operating principles. As illustrated in table 1, the CTM may guide brand managers' tactical and strategic decisions because it clarifies the "what," "when," and "how" of each brand association type.

THREE WAYS OF LEARNING BRAND ASSOCIATIONS

The CTM is a bottom-up (learning-focused) model of brand associations that differs from previous models by proposing a new distinction at the *operating principle* level. The operating principles of a learning model specify the

FIGURE 1

THE CONTINUOUS TRINITY MODEL OF BRAND ASSOCIATIONS

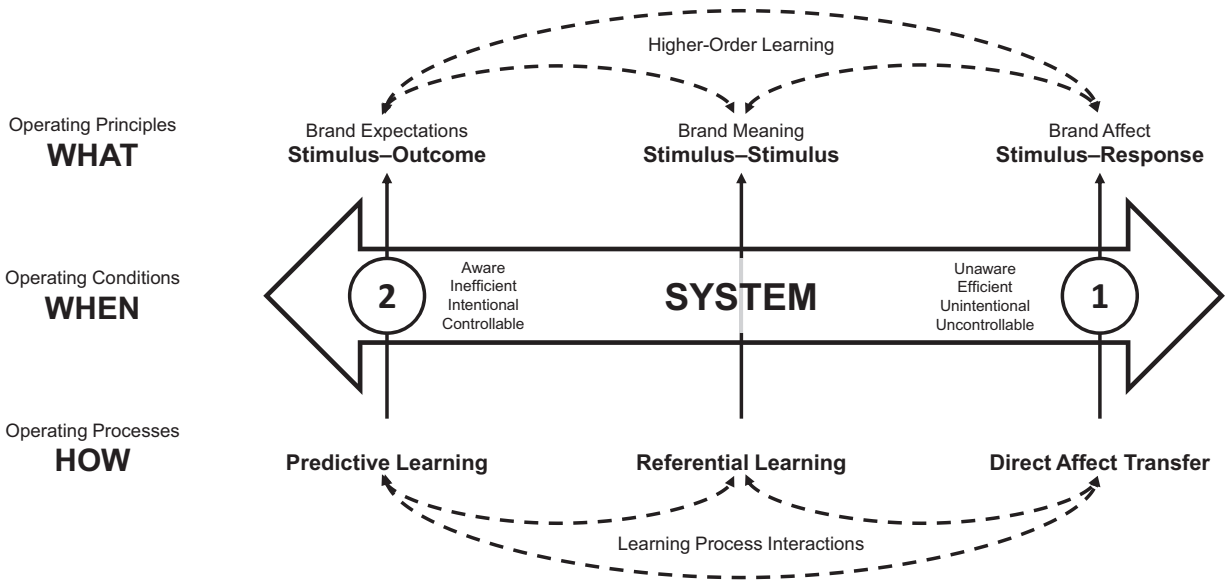

TABLE 1

THREE WAYS OF LEARNING BRAND ASSOCIATIONS

Operating process	Operating principle	Brand association type	Tactical managerial implications	Illustrative example
Predictive learning	Stimulus–outcome (S–O)	Brand expectations: The consumer "expects" an outcome to occur when exposed to the brand.	When the aim is to form an association between the brand (e.g., Coca-Cola) and a particular outcome expectation (e.g., sweet, refreshing): • Present/expose the brand to consumers before the outcome (i.e., use forward-pairing conditioning procedures). • Consistently pair the brand with the same outcome (i.e., brand–outcome pairings should be homogeneous). Quality control and product standardization are essential. • Ensure that the brand is a unique and best predictor of the outcome (i.e., statistical contingency between the brand and outcome is important). Other cues (e.g., partner brands, ingredient brands, sub-brands) will compete with the brand for association strength with the outcome. Be wary of overshadowing (e.g., when the ingredient brand is more salient) and blocking (e.g., when the ingredient brand is encountered first) effects. • Once formed, the association still needs to be actively maintained and often repeated. If the brand stops predicting the outcome, the association fades quickly.	
Referential learning	Stimulus–stimulus (S–S)	Brand meaning: The consumer "thinks of" another stimulus or concept when exposed to the brand, without expecting that stimulus to occur.	When the aim is to form an association between the brand (e.g., Coca-Cola) and another concept or stimulus (e.g., Christmas): • Present the brand before, after, or simultaneously with the stimulus (i.e., use forward-, backward-, or simultaneous-pairing conditioning procedures). • Pair the brand repeatedly with the same stimulus (i.e., brand–stimulus pairings should be homogeneous). • Focus on the frequency with which the brand and stimulus are presented or experienced together. The brand does not need to be a unique predictor of the stimulus (i.e., statistical contingency is not required), but the frequency of co-occurrence (i.e., statistical contiguity) matters.	

(*CONTINUED*)

TABLE 1 (*CONTINUED*)

Operating process	Operating principle	Brand association type	Tactical managerial implications	Illustrative example
			• Once formed, the association is stable for a long time (limited extinction). Whether this is desirable depends on if the association is positively valued by the consumer.	
Direct affect transfer	Stimulus–response (S–R)	Brand affect: The brand triggers an affective response originally evoked by a paired affectively laden stimulus.	When the aim is to form an association between the brand (e.g., Coca-Cola) and an affective response (e.g., positive affect, arousal) originally evoked by an affectively laden stimulus (e.g., a celebrity): • Present the brand and affectively laden stimulus simultaneously in advertising campaigns or on product packaging (i.e., use simultaneous-pairing conditioning procedures). • Present the brand and affectively laden stimulus close in time and space (i.e., close spatio-temporal contiguity is necessary). • Pair the brand with different affectively laden stimuli such as a variety of celebrities (i.e., use heterogeneous pairings). This reduces the risk of revaluation effects (e.g., when the celebrity becomes embroiled in a scandal). • Feature the brand prominently in advertising. This increases affect misattribution likelihood. • Once formed, the association is stable for a long time (limited extinction).	

NOTE.—The associative learning literature is characterized by jargon which we aim to minimize in this table. However, when referring to the underlying literature, the following terms are important to know: in associative learning, the learning target is referred to as the *conditioned stimulus* (CS; in a marketing context, the brand would take this role). The source of the learning is referred to as the *unconditioned stimulus* [US; in a marketing context, one can think of the outcome (e.g., sweet taste) or another stimulus (e.g., Christmas, a liked celebrity) as the US]. Other terms refer to important distinctions in how a CS and a US are presented together. In *forward* (vs. *backward*) *pairings*, the CS is presented/perceived/experienced before (vs. after) the US. In *simultaneous pairings*, the CS and US are presented/perceived/experienced simultaneously. In *homogeneous pairing* conditioning procedures, the CS is consistently paired with the same US. In *heterogeneous pairing* conditioning procedures, the CS is presented with a variety of USs that share a characteristic that one desires to transfer to the CS.

fundamentals of "what" is being learned, that is, which kind of representations are being formed in memory. Where previous learning models distinguished between the learning of (unqualifiable) *associations* versus (qualifiable) *propositions* (Gawronski 2022; Gawronski and Bodenhausen 2006, 2014; see also Contribution to Bottom-Up Models of Associative Learning), the CTM starts by distinguishing between three qualitatively different types of associations: *expectations*, *meaning* and *affective responses*. Drawing on this principle-level distinction, the CTM brings structure to the literature by clarifying and systematically specifying the operating processes (predictive learning, referential learning, direct affect transfer) and conditions (awareness, efficiency, intentionality, controllability) underlying each type of brand association.

Brand Expectations and Predictive Learning

Operating Principle. Brand expectation associations are formed when consumers learn to associate a particular outcome or experience with the brand. For example, consumers learn to expect that they will be refreshed and energized after consuming Coke and that the drink will taste sweet (table 1). Both functional (e.g., tangible and useful advantages of consuming the brand) and experiential (e.g., sensory pleasure or cognitive stimulation derived from consumption) benefits are *outcomes* that consumers come to expect from a brand after a number of observed co-occurrences or experiences. Essentially, what consumers learn is an association between a *stimulus* (e.g., the brand cue) and an *outcome* (S–O).

Operating Process. Consumers can learn how utilitarian product dimensions (e.g., the energy derived from consuming a beverage) as well as hedonic product experiences (e.g., beverage sweetness) are predicted by various product and brand cues (van Osselaer and Alba 2000; van Osselaer and Janiszewski 2001). Here, consumers learn to predict the likelihood that a particular outcome (i.e., a functional or experiential benefit) will occur when another stimulus or cue (e.g., a product feature or brand, aka the conditioned stimulus or CS) is present. This learning process has been referred to as "cue-outcome learning," "adaptive network models," "causal learning," or "predictive learning"—the term we retain (van Osselaer 2008).

Research has shown that the predictive learning process is unidirectional and forward-looking: consumers make a prediction about an outcome (e.g., sweetness) when made by a particular brand (e.g., Coke), receive feedback by experiencing the outcome (i.e., actual sweetness), and update the association strength based on the feedback. The process is adaptive: the prediction–feedback–update process continues until the predictions are accurate. Predictive learning is facilitated when the consumer encounters the CS (e.g., brand) *before* the outcome, rather than simultaneously or after the outcome. The S–O pairing needs to occur repeatedly and consistently, the CS needs to be the best predicter of the outcome (i.e., *statistical contingency* is required), and—once established—this contingency needs to be maintained and repeated to prevent extinction of the conditioned response (van Osselaer 2008). If multiple cues (e.g., the brand name and product attribute information) co-predict an outcome, one cue may be overshadowed (by the more salient cue) or blocked (by the first-encountered cue). Marketers should thus be careful of cue competition effects (van Osselaer and Alba 2000).

Brand Meaning and Referential Learning

Operating Principle. Brand meaning associations are formed when a brand is associated with stimuli that give it meaning, personality, or identity. These associations include symbols associated with the brand (e.g., colors, celebrities, reference groups), the brand's identity-reflecting symbolic value (Batra 2019), and inferences about the virtues of the brand (e.g., its green credentials) that stem from the brand's association with specific symbols (e.g., the word earth). Essentially, what consumers learn is a mere association between a stimulus (e.g., the brand cue) and another concept or stimulus (S–S) as a kind of mental reference. Crucially, this mental reference does not contain a prediction component or an actual expectation of occurrence of the other stimulus. For example, the Coke brand might evoke thoughts of Christmas (table 1), but consumers do not expect Christmas to occur when they open a can of Coke.

Operating Process. Various researchers have investigated consumer learning of brand associations with emotional or meaningful concepts that do not have a prediction or an expectation component. Different names have been used to describe the learning process involved, such as "exemplar-based learning" (van Osselaer 2008), "Human Associative Memory" or "HAM-learning" (van Osselaer and Janiszewski 2001), "indirect affect transfer" (Sweldens, Van Osselaer, and Janiszewski 2010), "inferential belief formation" (Kim, Allen, and Kardes 1996), "attribute conditioning" (Förderer and Unkelbach 2015), and "referential learning" (De Houwer, Thomas, and Baeyens 2001)—the term we retain.

Referential learning creates a bidirectional stimulus–stimulus (S–S) association in memory such that thoughts of one stimulus (e.g., a brand like Coca-Cola) activate thoughts of another stimulus (e.g., Christmas), which can trigger the activation of further associations (e.g., family and happiness). S–S associations form in memory when the two stimuli repeatedly co-occur. Like in predictive learning, the pairing needs to be homogeneous. For example, Coke will have a strong brand meaning association with Christmas only to the extent that the brand is linked repeatedly with Christmas (Sweldens et al. 2010). Unlike in predictive learning, the pairing can be forward,

backward, or simultaneous (Kim, Sweldens, and Hütter 2015). Importantly, the formation of a referential association does not depend on statistical contingency and is less sensitive to extinction while the association grows stronger every time two nodes are co-activated (De Houwer et al. 2001). Referential learning does not entail competition between cues for predictive power (i.e., brands can share associations like celebrity endorsers without competing for associative strength; Förderer and Unkelbach 2015; van Osselaer 2008).

Brand Affect and Direct Affect Transfer

Operating Principle. Brand affect associations are formed when consumers associate a particular affective response with the brand. Extant research shows that affective responses can transfer to brands from ads (Gorn 1982) and that ad-evoked feelings directly impact brand evaluations after controlling for attitudes toward the ad and brand beliefs (Burke and Edell 1989). In the CTM, brand affect associations are not limited to unidimensional positive or negative affect but may vary on multiple appraisal dimensions. For instance, Gawronski and Mitchell (2014) found a transfer of arousal alongside the transfer of valence in conditioning studies. The CTM suggests that a brand like Coca-Cola can be associated with both positive affect and arousal (table 1) to create a rich mixture of affective responses, a characteristic of strong brands (Batra 2019). Essentially, consumers learn an association between a brand and a physiological response (the unconditioned response, UR) generated by a paired, unconditioned stimulus (the US), denoted as an S–R association (Sweldens et al. 2010). Importantly, the CS and the representation of the US itself do not need to be linked in memory (as in referential learning), and the US does not need to evoke an outcome expectation (as in predictive learning).

Operating Process. One mechanism that has been proposed to underlie the direct transfer of affect is the implicit misattribution account, according to which transfer occurs when an affect-rich US causes the consumer to experience a rapid affective response that is diffuse enough to be misattributed—specifically, to the co-occurring CS (Jones, Fazio, and Olson 2009). For example, the co-occurrence of the Coke brand (the CS) with Penelope Cruz (the affective US) leads consumers to attribute the positive feelings evoked by the celebrity (the UR) to the brand (the CS). Affect is diffuse enough to be misattributed only at the time of exposure to the US, so the CS must occur *simultaneously* for direct affect transfer to occur (Hütter and Sweldens 2013; Sweldens et al. 2010). Factors that increase the likelihood that the CS is mis-interpreted as the source of the affective response (e.g., close spatio-temporal contiguity or a greater relative CS salience) will promote direct affect transfer (Jones et al. 2009). Unlike in predictive and referential learning, the CS–US pairing does not have to be homogeneous—direct affect transfer can occur as long as the varied USs (unconditioned stimuli) (e.g., Penelope Cruz, Muhammad Ali, Courtney Cox, Lance Armstrong) evoke similar affective responses (Sweldens et al. 2010). Creating S–R associations can help firms circumvent a common issue with S–S associations where a later drop in the symbolic value of the US (e.g., a celebrity) negatively impacts the CS (i.e., the brand), which can be costly for firms (e.g., the Lance Armstrong doping scandal).

Direct affect transfer depends on *spatio-temporal contiguity* rather than statistical contingency—the CS (e.g., brand) and US (e.g., celebrity) must be encountered together, but consumers do not need to be aware that the two stimuli tend to co-occur (Hütter and Sweldens 2013). Because direct affect transfer depends on simultaneous co-occurrences (rather than the statistical contingency and predictive value of the CS), extinction is expected to be limited and brand affect associations should be resilient to cue competition.

The Continuity of Operating Conditions

The CTM provides insight into *when* each learning process will operate. It specifies the extent to which each process is reliant on *awareness* (i.e., of the CS–US pairing), and is *efficient* (i.e., reliant on cognitive resources), *intentional* (i.e., dependent on the learning goal), and *controllable* (i.e., can be stopped or altered by the consumer). A substantial portion of research conducted in the last 50 years explores the bewildering complexity of associative learning's sensitivity to these operating conditions. As conflicting findings have proliferated for most automaticity features applied to associative learning (Corneille and Stahl 2019), we believe that the CTM can offer a much-needed fresh perspective. The CTM's primary claim that the analysis needs to start at the principle level, along with its specification of the three types of associations, allows a reconceptualization of this debate centered around the notion that the learning process operating conditions vary on a *continuum* of automaticity, in line with the conceptualization of consciousness introduced by Williams and Poehlman (2017). In this article's web appendix A (summarized in table 2), we make a substantiated case for why this continuum is thought to vary with the type of association being formed, from mostly system 2 (brand expectation associations) to mostly system 1 (brand affect associations), with brand meaning associations in between. There we outline the theoretical and empirical reasons for the CTM specification that the learning mechanisms underlying the different brand associations vary on this automaticity continuum. Next, we present a brief, high-level summary only.

TABLE 2

CONCEPTUAL AND EMPIRICAL ARGUMENTS LINKING OPERATING CONDITIONS TO LEARNING PROCESSES

Operating condition	Predictive learning	Referential learning	Direct affect transfer	CTM proposition
Awareness[a]	Predictive learning is more dependent on awareness than referential learning and direct affect transfer because: • Attention to predictor, outcome, and temporal order is needed. • Storage of causal relation between CS and US is required. • Error-related events and unexpected outcomes drive process.	Referential learning is less dependent on awareness than predictive learning because: • Awareness of temporal/causal relation between CS and US is not needed. • Statistical contingency is not necessary. • Some empirical evidence that meaning transfer can occur when CS is presented subliminally. Referential learning is more dependent on awareness than direct affect transfer because: • Awareness of US identity conducive to meaning transfer.	Direct affect transfer is less dependent on awareness than predictive learning and referential learning because: • Origin of affective responses can be diffuse and therefore misattributed. • Affect transfer can be caused by different, same valence USs. Thus, awareness of US identity is not necessary, though awareness of US valence (a lower level of awareness) may be conducive/necessary. • EC effects[e] appear less dependent on awareness of affective response source under conditions facilitating direct affect transfer (vs. referential learning).	Proposition 1: Formation of brand expectation associations is more reliant on awareness than the formation of brand meaning associations. Formation of brand affect associations is least dependent on awareness.
Efficiency[b]	Predictive learning is less efficient than referential learning and direct affect transfer because: • Process involves comprehension of propositional information. • Learning impaired by high processing demands. Attention to stimulus-outcome relation is needed.	Referential learning is more efficient than predictive learning because: • Encoding of causal relations is not needed. • Updating of stimulus–outcome predictive relations is not needed. Referential learning is less efficient than direct affect transfer because: • Encoding of stimulus–stimulus relations requires some processing resources. • EC effects are eliminated by concurrent tasks posing high demands on the attentional system (e.g., digit monitoring in two back tasks), but minimally affected by lower demands on working memory (e.g., remembering a four-digit number) that interfere only with controllable part of effect. • EC effect is attenuated by retroactive interference after conditioning procedures aiding referential learning (i.e., when CS–US pairings are sequential and homogeneous).	Direct affect transfer is more efficient than predictive learning and referential learning because[f]: • Attention to and identification of precise source of affective response (US identity) are not necessary and may even disrupt direct affect transfer. • EC effect is not attenuated by retroactive interference after conditioning procedure aiding direct affect transfer (i.e., when CS-US pairings are simultaneous and heterogeneous).	Proposition 2: Formation of brand expectation associations requires more processing resources than formation of brand meaning associations. Formation of brand affect associations is least reliant on processing resources.

(*CONTINUED*)

TABLE 2 (*CONTINUED*)

Operating condition	Predictive learning	Referential learning	Direct affect transfer	CTM proposition
Intentionality[c]	Predictive learning is more intentional than referential learning and direct affect transfer because: • Motivation to improve prediction accuracy drives the learning process.	Referential learning is less intentional than predictive learning because: • Process drives learning in the absence of prediction goal. • Process drives choice in the absence of product evaluation goal.[g] • Process may have intentional antecedents but unintentional consequences. • Processing goals may influence what is learned via the allocation of attention.	Direct affect transfer is less intentional than predictive learning because: • Limited empirical research discriminates intentionality of referential learning and direct affect transfer. Findings listed under referential learning apply equally to direct affect transfer. Direct affect transfer is less intentional than referential learning because: • If direct affect transfer requires lower levels of awareness and less processing resources than referential learning, and is less controllable than referential learning, then process may also be less intentional if automaticity features are not completely orthogonal.	Proposition 3: Formation of brand expectation associations is more intentional than formation of brand meaning associations. Formation of brand affect associations is least intentional.
Controllability[d]	Predictive learning is more controllable than referential learning and direct affect transfer because: • Externally provided/self-generated propositions can be invalidated through motivated reasoning. • Process sensitive to occasion setting and causal inference.	Referential learning is less controllable than predictive learning, but more controllable than direct affect transfer because: • EC effects partially reversed if consumer believes that CS has "negative" relation to US (e.g., when a celebrity turns against a brand). • Process-dissociation studies find evidence of controllable and uncontrollable meaning transfer.[h] • Persuasion knowledge attenuates EC effects when conditioning procedures aid referential learning (i.e., when CS–US pairings are sequential and homogeneous).	Direct affect transfer is less controllable than predictive learning and referential learning because: • Process-dissociation studies find evidence of controllable and uncontrollable affect transfer.[h] • MPT[i] modelling studies show that US valence directly impacts CS attitudes even when the conceptual relation between CS and US implies opposite effect on attitude. • EC effects are not attenuated by persuasion knowledge when conditioning procedures aid direct affect transfer (i.e., when CS–US pairings are simultaneous and heterogeneous).	Proposition 4: Formation of brand expectation associations is more controllable than formation of brand meaning associations. Formation of brand affect associations is least controllable.

NOTE.—See web appendix A for references supporting table 2 claims.

[a]Introspective access to mental processes or mental components.

[b]Extent to which process requires processing resources and interferes with other ongoing mental tasks.

[c]Degree to which process requires intention to start. Unintentional processes are stimulus driven.

[d]Extent to which process can be altered or stopped. Uncontrollable processes continue despite intention to alter or terminate them.

[e]Evaluative conditioning (EC) is an effect where the valence of a stimulus (a CS such as the brand) changes because of pairing it with another stimulus (a US such as Christmas or a liked celebrity). EC effects are driven by both referential learning and direct affect transfer (Kim et al. 1996; Sweldens et al. 2010).

[f]Findings do not imply that direct affect transfer is resource independent. Attention to either US (for affective reaction to occur) or CS (for affect misattribution to occur) required.

[g]Unclear if EC effects in these studies are driven by direct affect transfer or referential learning. Thus, findings considered evidence that *both* processes are less intentional than predictive learning.

[h]Research does not compare conditioning procedures aiding direct affect transfer versus referential learning.

[i]Multinomial processing tree (MPT) models are statistical models that can be applied to categorical data. They are often used as data analysis tools capable of disentangling and measuring the separate contribution of different cognitive processes to observed data.

We argue that predictive learning is governed mostly by system 2 operating conditions to encode a causal relation between the CS (brand) and an outcome (e.g., a great quality experience). Consumers must be aware of the CS–US pairing to minimize prediction error (van Osselaer 2008), must attend closely to stimuli to encode their causal relation (van Osselaer 2008), should be motivated to learn to predict an outcome (van Osselaer and Janiszewski 2001), and may exert control over the established associations (Gawronski and Bodenhausen 2006, 2014). Direct affect transfer, on the other end of the spectrum, relies mostly on system 1 operating conditions because the misattribution of an affective response to the CS (brand) might be *least dependent* on awareness (Hütter and Sweldens 2013; Sweldens et al. 2010). Furthermore, direct affect transfer may drive decision-making when preference formation is unintentional (Gorn 1982), and it cannot be controlled by consumers even when they are incentivized to resist its influence (Hütter and Sweldens 2018). Finally, the CTM characterizes referential learning as a mix of system 2 and system 1 operating conditions: it requires awareness of and attention to the CS–US association (Kim et al. 1996; Sweldens et al. 2010) but not a prediction goal (van Osselaer 2008). Referential learning can be partially controlled (Förderer and Unkelbach 2012).

GENERAL DISCUSSION

Contribution to Top-Down Models of Brand Equity

Consumer research has long studied how to build, measure, and manage brand equity. To date, a variety of top-down models of brand associations exist. Some of these models provide a conceptual overview of brand equity (Keller 1993) while others hone in on a specific brand association to elucidate its role in consumer–brand relationships (Aaker 1997; McCracken 1989). Conceptually, different kinds of associations are often grouped indiscriminately. Take, for example, the concept of brand image (Keller 1993) which can refer to associations including celebrity endorser-derived brand meaning (McCracken 1989), brand personality (Aaker 1997), and brand affect (Gorn 1982). Similarly, brand meaning associations have ranged from cultural meanings, to values, to emotions (Batra 2019). Established models, like the customer-based brand equity (CBBE) model (Keller 1993) or the brand knowledge model (Keller 2003), have so far insufficiently considered which associations are similar or different in terms of how they are acquired and which behavioral effects they have. The CBBE model, for example, views the formation and representation of all brand associations from the perspective of a general associative network memory model (Keller 1993), in which all connections are strengthened each time two events co-occur. The CTM demonstrates that this assumption needs to be revisited.

Leading scholars in this domain have recognized the need for greater refinement of brand equity models. Keller (2003) highlights eight sources of brand knowledge (awareness, attributes, benefits, images, thoughts, feelings, attitudes, and experiences) that are transferred from other stimuli, but notes that a better understanding of their "transferability" is "especially critical" (599) and that research on their "interactions" is of "paramount importance" (597). Because the learning process driving each association remains opaque, the model, though informative, does not clarify how researchers or practitioners should distinguish between different association types or how the formation of one association may influence the acquisition of other associations. Here, the CTM can provide guidance as a parsimonious framework that synthesizes the plethora of brand associations into three overarching classes with different fundamentals. By considering whether associations are of the S–O, S–S, or S–R type, future brand equity models can make clearer and more grounded predictions regarding the transferability and longevity of different sources of brand equity (see Implications for Brand Managers and Policymakers) and potential interactions among different brand associations (see Directions for Future Research).

Contribution to Bottom-Up Models of Associative Learning

Contemporary theoretical perspectives on learning can be divided into two broad classes: dual-process theories and single-process theories. Briefly, dual-process theories such as the APE model (Gawronski and Bodenhausen 2006, 2014) posit an associative and a propositional learning process mechanism. In contrast, single-process theories propose that purely non-automatic propositional reasoning processes drive learning. Yet, the validity of both classes of theories continues to be heavily debated (Corneille and Stahl 2019). It is also increasingly clear that associative and propositional process theories cannot be empirically distinguished based on their operating conditions as both classes of theories can accommodate mere co-occurrence effects and conditioning effects under suboptimal learning conditions. Instead, researchers increasingly recognize that the proper way to distinguish between learning processes is based on the operating principles (i.e., "what" is learned; Hütter 2022).

Recent theory updates have therefore introduced the associative versus propositional duality at the principle level (rather than just the process level as before; Gawronski 2022): when validity or relational information about the CS–US association can be incorporated (i.e., when people can qualify the association with meaning or endorse its validity), it is considered a *propositional*

representation; when it cannot, it is considered an *associative representation*. Yet, at the empirical level, this approach confounds the levels of analysis of the operating principle and operating conditions because the same criterion is used to describe both what kind of association is formed (associative versus propositional representations: an operating principle) and the conditions under which it is formed (controllability: an operating condition).

The CTM thus contributes to bottom-up theories by proposing a novel trichotomy of operating principles based on *what* stimulus characteristics are linked in memory (i.e., S–O, S–S, or S–R) to differentiate learning processes. The CTM thereby provides a method for distinguishing between processes; this method does not rely on differentiating their operating conditions. Instead, the operating conditions are allowed to vary on a continuous basis between the processes while researchers are encouraged to refine their measures of *what* is learned—expectations, meaning, or affect—to gain more insight into *how* and *when* brand associations are formed.

Directions for Future Research

By identifying and characterizing brand associations into different types (i.e., S–O, S–S, or S–R associations), the CTM highlights important considerations and opportunities for future research. Three research priorities stand out.

Priority 1: Better Differentiate "What" Is Learned and Embrace the Continuity of the Operating Conditions. We believe that many of the conflicting findings plaguing associative learning research (Corneille and Stahl 2019; Hütter 2022) are caused by a combination of two underlying problems. First, researchers have insufficiently discriminated between "what" is being learned at the principle level, often relying on *overall* explicit or implicit evaluation measures that conflate changes over the different association types (Hasford, Kidwell, and Hardesty 2018; Sweldens et al. 2010). As outlined by the CTM, this could lead to conflicting findings as the operating conditions of each association type are characterized by a unique mix of automaticity features. More fine-grained measures and analyses at the principle level are therefore needed to make progress. Yet, just like measures and manipulations are never process pure (Hütter et al. 2012), they are likely not representation pure either (e.g., affective responses toward brands are likely influenced by brand performance expectations and vice versa). Though this poses a challenge, progress may still be possible if researchers more explicitly target the operating principle being studied. For example, a measure like the IAT can be tailored to measure associations of a brand with a specific concept (i.e., to investigate the development of specific S–S brand associations) while other measures are better suited to study affective responses (e.g., affective priming measures or physiological measures). Mediation analyses could further clarify the extent to which responses on one level of representation (e.g., brand liking) are driven by changes at another level (e.g., brand meaning; Kim et al. 1996).

A second problem characterizing past research is that it has insufficiently embraced the *continuity* of operating conditions. Instead, research often took a dichotomized, all-or-nothing approach, investigating, for example, if a particular conditioning procedure can change brand attitudes in the complete absence of contingency awareness, with the scholarly debate focusing on how awareness should then be defined and measured (Sweldens, Corneille, and Yzerbyt 2014). Such approaches are likely self-defeating as they are ultimately empirically unattainable (e.g., observations of learning without awareness could always be criticized for not being rigorous enough in measuring awareness) and therefore theoretically not the most generative. As specified by the CTM, mental process awareness is assumed to vary in intensity and scope between the various types of brand associations, but even processes operating at the lowest levels of awareness could still be characterized by some level of awareness (e.g., awareness of stimulus valence). Therefore, in keeping with recent conceptualizations of consciousness (Williams and Poehlman 2017) and earlier recommendations for its study (Sweldens, Tuk, and Hütter 2017), the key CTM propositions to be tested (table 2) are all expressed in continuous terms. The greatest challenge will be to see whether recent methodological innovations in the study of operating conditions (Béna, Mauclet, and Corneille 2023; Hütter and Sweldens 2018; Hütter et al. 2012) could be tailored to allow a continuous analysis across the principle levels. See web appendix B for additional considerations on how to test the key CTM propositions.

Priority 2: Investigate the Behavioral Consequences of the Different Association Types. Strong brands consist of multiple synergistic association types. Consider, for example, an endorsement of a brand like Nike® by Michael Jordan. To the extent that Jordan triggers affective responses and that the pairings are simultaneous, S–R associations (e.g., positive affect) are created. If the pairing is consistent and repeated over time, S–S meaning associations that link the brand with the endorser (and related concepts, e.g., athleticism) are created. Finally, if the pairing triggers performance expectations (e.g., by seeing Jordan dunk or naming the product Nike Dunk®), S–O associations might be created. Currently, little is known about the relative impact of each association type on consumer behavior. This relative impact is likely contingent on the consumer's stage in the decision-making process (e.g., brand expectations could be crucial in consideration set formation, while brand meaning and brand affect could prove decisive when formulating a purchase intention), on

individual differences (e.g., a consumer's sense of self-efficacy could determine the effectiveness of brand expectation associations), on the product category (e.g., brand affect and brand meaning associations may influence hedonic choices more than utilitarian choices), and other variables (e.g., S–O associations could be a particularly powerful source of brand placebo effects).

Priority 3: Investigate Higher-Order Learning and Interactions between Operating Processes. Brand association learning never takes place in a vacuum. As visualized in figure 1, higher-order learning and interactions between the operating processes may complicate brand association formation. Every US or concept that can be associated with a CS (brand) is itself characterized by its own network of associations. These secondary associations can become associated with the brand through what is known as higher-order learning (Honey and Dwyer 2022). For example, associating Nike with the concept of Michael Jordan (an S–S association) can result in Nike also being linked with other Michael Jordan associations such as the concept of basketball (another S–S association) or positive feelings (S–R associations; Sweldens et al. 2010). Since parts of Michael Jordan's own associative network may transfer too, these secondary associations could potentially reinforce other association types attached to Nike (e.g., the expectation of improved sports performance, an S–O association). The learning processes may also interact. For example, a relatively automatic learning process (e.g., direct affect transfer) could pave the way for a relatively less automatic learning process (e.g., predictive learning), if the presence of positive emotional responses to a brand increases the attention it receives (e.g., a liked brand may receive more attention in cue-interaction contexts where the brand competes with other cues, such as ingredient brands, in predicting outcomes; van Osselaer and Alba 2000). The possible process interactions and higher-order learning effects illustrate the complexity inherent in the empirical study of brand association formation. Recognizing these layers of complexity is a crucial first step in advancing empirical research and interpreting complex (or even conflicting) data patterns.

Implications for Brand Managers and Policymakers

The CTM has both tactical and strategic implications for managers and highlights areas of special attention for policymakers and regulators. Tactically, the CTM's principles should play a major role in designing marketing campaigns. Because the CTM proposes a link between types of brand associations and learning processes, marketers and advertisers can identify the parameters that will aid or impede learning of the brand association they strive to form (table 1). When designing a marketing campaign, it is therefore essential that brand managers first clearly identify the type of brand association they want to create (expectations, meaning, or affect) as this will determine the necessary campaign characteristics for the desired association. Consider, for example, the design of the next Kleenex® ad campaign. Kleenex's brand manager should first consider which brand association they desire to create or reinforce in Kleenex's network of associations. Imagine they decide on puppies, a stimulus Kleenex has used often in the past which gives rise to numerous desirable secondary associations (e.g., friendliness, playfulness, and softness). Since this is a brand meaning (S–S) association, copywriters can be given relatively free reign in how the Kleenex brand and puppy stimuli are presented in the ad, while the brand manager can be confident that the consistent co-occurrence of the brand with puppies is all that is required for the desired brand meaning association to be formed. As detailed in table 1, copywriters do not need to stick to a certain temporal order between the brand and the puppy appearances in the commercial, nor do they need to worry about potential interference from sub-brands or ingredient brands as cue-interaction effects (e.g., blocking) are minimal in referential learning. This implies that if the campaign is centered on Kleenex Tissues, the resulting association with puppies should also positively impact brand perceptions in other product categories (e.g., toilet paper). As summarized in table 1, other association types (S–R and S–O) require much tighter control of the creative process.

The CTM also implies important strategic considerations for brand managers, most notably in the domain of brand alliances and partnerships. The CTM indicates when brands can partner with other brands and for which kind of associations brands need to compete for exclusivity. Brand expectation associations (e.g., the performance expectations of a watch brand such as Audemars Piquet) are proposed to be more sensitive to cue-interaction effects (e.g., blocking and overshadowing) than brand meaning and brand affect associations and thus cannot be shared. When it is necessary to include an ingredient brand name (e.g., an automatic movement originally created by Jaeger-LeCoultre), the CTM suggests that marketers must be extremely cautious as the ingredient brand may capture much of the association strength if it is seen as a better predictor of the outcome. The CTM also suggests ways to prevent this from happening. For example, Audemars Piguet could present its brand name first or, as the company did, purchase the movement license from Jaeger-LeCoultre. In contrast, cue-interaction effects are not characteristic of referential learning or direct affect transfer. Thus, the CTM predicts that brand meaning associations and brand affect associations can be shared by multiple brands. For example, because referential learning is not subject to blocking, numerous brands (e.g., Audemars Piguet and Wilson) can partner with the same celebrity endorser (e.g., Serena

Williams) and become successfully associated with the same prototypical characteristics of that endorser (e.g., winning and excellence).

Finally, the CTM also gives guidance to policymakers and regulators about the type of advertisements and brand associations that need special care. The CTM proposes that consumers may lack control over whether they can stop, override, or otherwise influence the learning of certain brand associations, implying serious repercussions for consumer autonomy and free will. Consider direct-to-consumer advertising of pharmaceutical products. The elements in these advertisements closely mimic those in evaluative conditioning studies: there is liberal use of positive images comparable to those used in conditioning studies, and the brand logo is often presented simultaneously with these images (Biegler and Vargas 2016). The targets of these advertisements are often distracted and under cognitive load because they are in pain or distress, suggesting that direct affect transfer might drive brand association formation. The CTM proposes that, because direct affect transfer is most uncontrollable and unintentional, consumers will be less able to stop, override, or prevent the formation of positive brand affect associations based on these ads. Thus, informing consumers about the risks of a drug or telling them to consult with their physician will likely be ineffective. Instead, censorship may be a better solution.

These threats to consumer autonomy likely extend to other domains with significant implications for consumer welfare such as financial investments, health insurance, alcohol, and fast food. Given these potentially wide-ranging implications and the sparsity of research on the controllability and intentionality of different learning processes (web appendix A), further research is both timely and essential.

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