Consumer Brand Knowledge: a Multiple Memory Systems Model

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Consumer memory processes relate to internal mental representations that are not directly observable. We used functional neuroimaging to uncover the memory representations of brand knowledge. We found that, far from a unitary construct, consumer brand knowledge can be decomposed into distinct components corresponding to episodic, semantic, and habit systems.

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EXTENDED ABSTRACT

Consumer research studies focusing on memory processes have traditionally conceptualized consumer memory in terms of a single unitary process (Alba, Hutchinson, and Lynch, Jr. 1991). Based on connectionist models of associative memory, consumer knowledge is typically thought of as a network of nodes and connecting links, where nodes represent stored information or concepts and links represent the strength of association between nodes.

These models, derived from cognitive psychology, have proven extremely useful for consumer researchers by providing a powerful way to explain a variety of experimental and observational data. Associative memory, for example, has been used to explain and relate a diverse set of marketing phenomena, including how consumers use brand names and product attributes as retrieval cues for information about product performance, why brands can extend to some categories but not others, and conditions under which brand alliances can benefit or hurt firms (van Ossem and Janiszewski 2001).

Each feature-benefit association will develop independently. During adaptive learning, features will compete to predict benefits and, thus, feature-benefit associations will develop interdependently. We find adaptive learning of feature-benefit associations when consumers are motivated to learn to predict a benefit (e.g., because it is perceived to have hedonic relevance.

Despite the influential and parsimonious nature of a single process account of memory, it has been appreciated for some time in cognitive psychology that, far from a unitary entity, human memory is comprised of multiple systems with distinct neural substrates that have evolved to serve different cognitive functions. That is, memory is not a monolithic faculty but rather a collection of relatively independent systems, which are characterized by different patterns of learning, unlearning, and biases.

Episodic memory, for example, is fast forming and organized around context, but is relatively easy to bias and distort, whereas semantic memory is organized around concept, and is more resilient to distortions. In contrast to both episodic and semantic systems, Pavlovian habit systems, likely underpinned by reinforcement mechanisms, are largely implicit, and slow in acquisition as well as extinction. Finally, these systems are known to interact, alternatively compensating and competing under different conditions. For example, habit memory is known to be triggered by context rather than goals, which in turn depends on the integrity of episodic systems.

Although prominent in psychology and cognitive neuroscience, the idea of multiple memory systems is rarely explicitly incorporated into conceptualization of consumer memory. Consequently, existing work invoking the idea of different forms of memory (typically between implicit and explicit processes, or goals and habits) have largely evolved independently without reference to each other. In this study, we describe a new approach to understanding dimensions of consumer memory by drawing on recent advances in cognitive neuroscience of learning and memory. Because memory processes relate to internal mental representations that are not directly observable, one must simultaneously consider both the memory representation and the processes that act upon it to draw inferences about memory structure from behavioral data (Alba et al. 1991). For this reason, neuroscientific methods that are capable of probing these representations at the neural level have been instrumental in testing and refining psychological theories of memory (Schacter 1999).

Specifically, we tested the hypothesis that consumer memory for brands is comprised of distinct forms of memory traces that rely on different memory systems. A total of 18 participants underwent functional magnetic resonance imaging (fMRI) while being shown a set of 45 of logos of well-known brands in a passive viewing task. Next, we sought to relate brain activity to three distinct dimensions of brand knowledge. Participants were asked to complete (i) the brand personality scale (Aaker 1997) identify the "Big Five" dimensions, and explore the meaning of each dimension, no parallel research has been conducted in consumer behavior on brand personality. Consequently, an understanding of the symbolic use of brands has been limited in the consumer behavior literature. In this research, the author develops a theoretical framework of the brand personality construct by determining the number and nature of dimensions of brand personality (Sincerity, Excitement, Competence, Sophistication, and Ruggedness) to capture brand knowledge of a set of traits that consumers project onto brands, (ii) the brand experience scale (Brakus, Schmitt, and Zarantonello 2009) to capture the experiences, feelings, and sensations that result from interactions with brands, and (iii) brand preference scale to capture consumer value for the brands.

To address how these components of brand knowledge are stored in the brain, we applied newly developed machine learning tools to functional neuroimaging data that allows us to ask whether a brain regions contains the different forms of memory as captured by our scales. This is different from traditional approaches that focus on how brain activity in a single region differs across two or more conditions, our approach, referred to as model-based decoding, focuses on whether brain activity across multiple regions or networks contains information about a particular cognitive construct (Poldrack 2011).

First, we found that information about brand personality was contained in areas of the medial and lateral prefrontal cortex (permutation test p<0.01). This is consistent with known roles of these regions in semantic memory retrieval and the notion that the brand personality construct largely consists of semantic associations that consumers associate with brands (e.g., whether a brand is down to earth). In contrast, we found that brand experience was contained in the insular cortex as well as the hippocampal formation (permutation p<0.01). This is striking given the known role of the insula in affective processing and the hippocampal formation in episodic retrieval and vivid recall of past experiences, and is consistent with the notion that, unlike brand personality, brand experience captures episodic and affective experiences consumers have with the brand. Finally, we found that brand preference is represented in the striatal regions (permutation p<0.01), which is consistent with substantial neuroeconomic literature implicating this habit system in value representation.

Taken together, our results provide strong support for the notion that distinct types of memory traces are activated simultaneously and in parallel during brand evaluation, and that they relate to notions of semantic, episodic, and habit memory systems that are among the most well studied divisions in human memory. More broadly, a multiple memory systems view can change how managers design brand strategy efforts aimed to increase recognition and recall rates by targeting each system and maximizing complementarities between these systems.
REFERENCES