A behavioral window on the mind of the market: An application of the response time paradigm

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Abstract

This article focuses on the role of implicit knowledge consumers have about particular brands, products or names. The major findings of several studies, conducted at the Mind of the Market Laboratory at Harvard Business School, are presented with specific emphasis on studies in which response time measurements were the core method. The results revealed that implicit measures provide a rich understanding of the meaning conveyed by a product or brand. Moreover, there is also considerable evidence that implicit measures may be better than traditional explicit measures as predictors of consumer behavior. We discuss the implications for the study of consumer behavior and the importance of combining several methods including neuroimaging, which has received recent attention by marketers, economists and social scientists.

Keywords: Association; Consumer behavior; Implicit cognition; Marketing; Neuroeconomics; Priming

1. Introduction

Researchers in consumer behavior address several important and interesting questions. For example, how do we know whether a new product will appeal to consumers and whether they will in fact purchase it? How do we know which brand name, logo or package design best fits the intended image of a brand? How do we know if and how a particular brand is perceived differently from a competing brand? How do we know whether a brand name is appropriate for a given product? Answering these questions seems easy. Just go and ask consumers directly what their purchase intentions are, what they like and do not like about a package design and how strongly they feel about these attributes or whether they like or even remember a proposed name. Consumers will indeed provide answers that they believe reflects their thinking. In fact, this way of answering such questions is common practice in marketing and generally involves the use of several questionnaires administered in writing or by telephone interview and by focus groups where 8–10 consumers under the guidance of a group moderator will discuss a topic and provide their opinions. Face-to-face interviews are also used to explore conscious thoughts and feelings among consumers. These same methods are used frequently in other domains of inquiry. Job candidates are asked about the strengths they will bring to a company and are asked to complete various kinds of personality tests, patients describe their symptoms when asked by the physician and journalists interview politicians and ask them about their plans for the future.

Verbal reports, whether written or spoken, are widely accepted as an important source of information. Moreover, they are easy to administer, can be implemented in any location and in a variety of ways and they are often inexpensive and quick. However, as widely used as verbal reports are, their utility in actually predicting behavior has become increasingly unclear. For example, verbal self-reports are widely accepted as an important source of information. Moreover, they are easy to administer, can be implemented in any location and in a variety of ways and they are often inexpensive and quick. However, as widely used as verbal reports are, their utility in actually predicting behavior has not been suggested [1]. However, researchers who have investigated this link empirically have failed to demonstrate it [23]. Often, when actual behavior is observed, it does not correspond to the earlier expressed attitude.

There is mounting evidence that verbal reports, while useful in some instances, are much less reliable than previously...
thought [16]. One reason they are unreliable as predictors of consumer behavior is that they do not uncover or address the actual consumer cognitions which drive behavior. Simply because people can express apparent preferences when asked does not mean these are accurate reflections of their thoughts and feelings or that they are the most relevant thoughts and feelings for the topic being investigated [10,22]. Numerous studies in psychology have revealed that self-report measures correlate poorly with more implicit measures of the same construct [7,8,18,20].

Still, in 2002, an estimated US$ 6.8 billion was spent on conventional marketing research tools in the United States alone. This is an enormous amount of money considering that there is little scientific evidence to support the widespread use of focus groups and growing concerns about the accuracy of other verbal report techniques. There are several reasons why conventional methods and in particular, verbal reports obtained from consumers may be inaccurate. Some reasons, often noted in the psychological literature, are that participants in a research project try to please the interviewer, have hypotheses about the goals of the research they are participating in which, in turn, shapes their responses and try to convey a certain image of themselves. Another reason is that people may not have complete or ready access to their own thoughts and feelings and, even when they do, they may not be able to articulate them well. Often, too, people are responding to what the researcher thinks that study participants think is important. These assumptions may not correspond to what participants actually do think about with regard to the topic being investigated. So, the results of market research may simply reflect researcher thinking more than consumer thinking [2,24]. In fact, there is evidence that as much as 80% of all market research is confirmatory, that is, it is intended to demonstrate a particular point of view held by those doing the research and as a result does not allow for unexpected findings to surface. It is no surprise, then, that despite all the money spent on new product research that as much as 80% of all new products are judged a commercial failure during their first year in the market.

Compelling evidence suggesting caution about the usefulness of explicit information for marketing research is illustrated by a study on purchase intentions for new products [15]. Indeed, there was no correlation between stated purchase intentions for new products and their actual purchases. Similarly, purchase intentions provided verbally based on the viewing of advertisements does not predict well actual purchase behavior.

But if questionnaires, verbal reports and interviews all fail to predict behavior, what other methods are there we could use instead? Perhaps, we are overestimating the role of language to convey hidden knowledge or unconscious thoughts and feelings. Why should literal human language used in surveys be the tool to describe how mental operations work? Indeed, early experimental psychologists have assumed that introspection is a tool to study mental processing. The insights remained moderate and it became clear that verbal protocols miss much information, which is absolutely essential for understanding how the mind works. But how can we tap into these implicit processes if language does not do it? What is the key to the hidden motives? Do we now need to bring in Freudian psychoanalysts to better understand consumers’ thoughts? Freud’s merit is his conceptually pioneering work on introducing the unconscious and the idea that many of our motives are out of reach of conscious control can be captured by projective measures. The idea behind the use of projective measures is to present an ambiguous stimulus or situation to a participant and to let him or her interpret the stimulus. It is assumed that the hidden motives or intentions of the individual are projected onto the stimulus. Although projective measures are appealing, they are time-consuming to administer and most of the tests are non-standardized.

2. Response latency

Cognitive psychology has started to use response times to study how the mind works. This approach is called mental chronometry and is strictly experimental. Based on how long it takes the participants to perform a particular task, we can draw important inferences about the nature of the underlying mechanisms. Response times are measured in milliseconds and therefore have a high temporal resolution, in any case better than most techniques that image the activation of the human brain at work (e.g. functional magnetic resonance imaging). Response time measures are quantitative, and therefore, enable us to analyze the data with powerful statistical tools such as analyses of variance. A particular type of response time measure is the paradigm of priming. Consumers do not take in and process information in a neutral and unbiased fashion [24]. Instead, prior knowledge serves as an organizing framework that is used to interpret new information. The prime being the input stimulus brings conceptually related items into a state of heightened accessibility. The response latency to certain stimuli therefore reveals whether and to what degree conceptually related items are preactivated by a particular prime stimulus. The prime stimuli are varied systematically thus allowing for an experimental manipulation of the context information. For example, it has been shown that participants are faster at detecting the letters “doctor” as a real word (as opposed to a random configuration of letters) when they just saw the word “nurse” compared to when they just saw the word “bread” [14]. “Nurse” and “doctor” are conceptually related whereas “bread” and “doctor” are not. The relation between “nurse” and “doctor” is evident but the potential of the priming paradigm in marketing is to reveal relations we do not know might exist. The question is what gets primed by what kind of input. To better illustrate the use of priming, we now describe in more detail an experiment we conducted in the Mind of the Market Laboratory at the Harvard Business School.
3. Using priming to study brand associations

The goal of this study was to investigate consumers’ associations related to “coke” and compare these associations with those related to “water” (a local brand familiar to all consumers tested was used in the study). The study was purely exploratory in nature and not financed by a private corporation. Forty consumers (20 females and 20 males, aged between 19 and 33 years) volunteered to take part in this study. They were either students from Harvard University or professionals from Boston area.

Prior to the study, we defined a set of concepts, which we thought would differentially distinguish between “coke” and “water”. We expected the concepts “enjoy”, “mystery”, “fresh taste” and “energy” to show stronger associations with “coke” and likewise, we expected the concepts “satisfy”, “nature”, “clean taste” and “vitality” to show stronger associations with water. Each of these concepts was represented by 20 different words defined prior to the study. These 20 words were preselected from a list of 40 words provided to an independent group of consumers similar to those involved in the response latency part of the study. They were asked to rate to what extent each of these 40 words represented the concept (e.g. how much does the word “delight” represent the concept of “enjoy”) on a scale from one to five. For each concept, we selected those 20 words, which best represented the concept.

The words were then presented in a lexical decision task, which required consumers to distinguish between words and non-words. Consumers sit in front of a computer and words or non-words appear in the center of a computer screen. Consumers had to decide as quickly as possible whether the configuration of letters represented a word or a non-word. In 50% of the cases, the consumers saw a word and in 50% of the cases, the consumers saw a non-word. Prior to the words or non-words, the prime stimuli appeared for 150 ms on the computer screen. This duration is above the threshold of detection but too short for elaborated cognitive processes.

The primes were either pictures of “coke” or “water” (e.g. a picture of a “coke” bottle or of the brand of bottled water). All words and non-words were combined with both types of primes. For each word, we subtracted the response times when primed with “coke” from the response times when primed with “water”. Had there been no difference, the primes were inefficient. However, this was not the case. The primes had differential effects on the concepts “mystery” and “nature”, which were more strongly associated with “coke”. This means that the participants responded faster to “mystery” and “nature” when they were primed with “coke” in comparison to when they were primed with “water”. Surprisingly, other concepts, such as “enjoy” and “fresh” showed no difference between the two primes. We then analyzed the data separately by gender. The results showed a clear difference. The strong connection between “mystery” and “coke” was found only for female consumers. For the men only group, the “mystery” words were not differentially primed. The reverse pattern was revealed for the “nature” words. Only the male consumers show the priming effect for “coke” on the “nature” words.

4. Behavioral relevance of priming studies

Clearly, the lab is not the store where many factors may be operating. However, the artificial setting of the laboratory provides a special advantage: we can isolate variables, which may be crucially involved in a particular marketing problem. Whether the evidence revealed in the lab holds up in a real world context is of course very important in marketing and other settings. That is, are the effects we find in a response time task behaviorally relevant? With reference to the example above, will female consumers buy “coke” more often when it is presented in a “mystery” context? What about the “nature-coke” relation we revealed for the men? Do male consumers prefer “coke” when they are outside, for example, in a ballpark attending a game? Likewise, it could make sense to present “coke” in magazines for sport and outdoor recreation, which are read more frequently by men.

Until now, only few studies have addressed the relationship between implicit measures and actual purchase behavior. For example, Maisen et al. [11] report that implicit associations with juice and soda brands predict actual product usage better than explicit self-reports. Even though there is only limited evidence in the domain of consumer behavior since this is a new approach, there is a wealth of knowledge in psychology showing that priming affects subsequent behavior. For instance, in a study in which participants were primed with words belonging to the concept of “aggression”, these participants interrupted others more often in a subsequent conversation [3]. Similar research in this vein finds that covert primes for helpfulness make people help more [13] while intelligence primes (i.e. that activate a stereotype of a college professor) temporarily improve people’s performance at Trivial Pursuit [6]. Thus, the implicit associations individuals hold and the degree to which a given context might activate them play an important role in guiding behavior. Therefore, priming not only helps uncover relevant thoughts but also helps predict actual behavior. Can we extend these priming effects to the domain of purchase behavior? The answer is certainly yes. It is entirely possible to design field experiments using the methods described above. For example, instead of prime stimuli on the computer, it is possible to present the information at the entrance to the store or as point of purchase stimuli where a product is located within a store and measure the actual purchases when the information is present compared to when it is absent.

In this context, the “mere exposure effect” is of interest. It describes the phenomenon whereby people have a greater preference for objects they have previously seen compared to new objects being viewed. This preference holds even...
when the objects were only polygons presented for a duration which was too brief to consciously encode the stimuli [4]. The participants were later shown those polygons interspersed with new ones and they preferred the ones they were exposed to before. Using the “mere exposure” technique, it has been shown that fictitious brands can become “famous overnight” [9]. In this study, the consumers recognized those brands as famous, which they saw on the day before. Again, they had no conscious recollection of having been exposed to those names. Moreover, the “mere exposure” effect can also account for the results reported by Shapiro et al. [17]. The consumers read a magazine article delivered on a computer screen. The article was flanked by target ads designed to receive minimal reader attention. Later, the consumers were engaged in a buying scenario and they named eight products considered for later purchase. No reference was made to the ads they viewed before. In addition, the consumers performed a recognition task, in which they had to identify the ads they saw from a list of four alternatives. Their conscious recognition did not differ from the control group, in which none of the consumers actually saw the ads. Interestingly, the buying scenario revealed that those consumers who had viewed the ads in the periphery of their visual field were more likely to include the corresponding products in their consideration set.

Importantly, response time techniques are not at all static but rather flexible and easily adapted to the specific context in which the study will be conducted. For example, it is possible to measure the affective connotation of products by measuring positive-negative judgments to neutral target stimuli (meaningless strings of letters, such as $\hat{Y}v$Z!). Again, we would present as primes pictures of different brands prior to the target stimuli. The faster the consumers will hit the positive response button, the more positive an affective connotation is associated with the product. The results could complement product positioning research. In this context, another study form the Mind of the Market Laboratory at Harvard Business School is of interest. We conducted a priming study for a major auto manufacturer. The aim of the study was to reveal the attributes consumers associate with particular automotive designs. The experimental design was similar to the study with beverages described above with the extension of the specific comparisons with the attributes consumers associate with the competitor’s designs. The consumers who participated in this study were all experienced drivers and car owners. The prime stimuli were different pictures of cars, which preceded words like daring, fast and supple, which revealed significant differences between different manufacturers.

Priming is not the only possible effect we can measure with response time latency. In 1935, Stroop [21] published his landmark article on attention and interference and since then, numerous studies have been done replicating and extending his initial results. In the classic Stroop test, participants view words written in different colors of ink. Their task is to identify the color of the ink. It is usually found that the time required to name the color ink of the colored words takes longer when the information is incongruent (e.g. the word “red” written in blue ink) than when the ink and word are congruent (e.g. the word “red” written in red ink). Therefore, the task to name the color of the ink interferes with the intention to automatically read the color word.

How can we apply the Stroop paradigm in the context of marketing research? For example, it could be used to select a name for a new product or service. Imagine you have a product (represented by different pictures) and alternative names. The idea is to figure out whether there is an existing affinity between the product and one of the alternative names. Consumers would see pictures of the product on the screen followed immediately by one of those potential names printed in color. The consumer has to read aloud the color in which the ink is printed. An existing connection between any of the names and the product would enhance response times when naming the color. The implicit connection between the product and its potential name would make it harder to ignore the meaning of the word and thus it will take the consumers longer to solve the actual task, which is to name the color of letters [5] (unpublished data).

We suggest that when comparing the results from the response time latency measures to explicit judgments based on questionnaires or rating scales, the former will be more accurate predictors of the most successful name. Recently, we tested potential names for a new resource center on smoking. This priming study revealed that consumers (smokers and non-smokers) responded differently to names like “try to stop” or “make smoking history”. The latencies revealed with priming differed from the subjective ratings we collected with questionnaires, and most interestingly, only the response time data revealed significant differences between smokers and non-smokers. The explicit survey failed to discriminate between smokers and non-smokers. This is yet another demonstration that the results from priming studies are behaviorally relevant.

5. From response times to the brain

Even though the response time techniques have many advantages when compared to conventional tools, it is not always possible to draw conclusive evidence from the response time data. Recently, marketers have become interested in the advances in the brain sciences and have discovered that technologies such as functional magnetic resonance imaging can provide potentially useful data about brain activation patterns in response to marketing stimuli [24]. Researchers in both marketing and neuroscience have begun using neuroimaging to study brain activations while consumers are involved in a marketing related task. For example, an fMRI study involving two popular beverages, Coca Cola and Pepsi Cola, provides a number of interesting insights that might not be as readily obtained using traditional...
methods [12]. One such finding was that brand knowledge for Coca Cola has a stronger impact on behavioral preference than did brand knowledge for Pepsi Cola.

Unlike, for example, questionnaire data, neuroimaging data are much less susceptible to demand characteristics or social desirability. We are not able to voluntarily control activation within a given brain area. However, as increasingly available these techniques have become, the more we need to be able to design tasks that are meaningful to consumers. The importance of this point is often underestimated. The rapid rise of cognitive neuroscience was possible only because a wealth of knowledge was already available from decades of research in the neurosciences and cognitive psychology. In order to make neuroimaging a useful method for marketing research, one needs to be aware that the starting conditions for its use in marketing are totally different than those of cognitive neuroscience. Going from focus groups and opinion polls to the use of neuroimaging tools is a much bigger leap than was necessary going from cognitive psychology to cognitive neuroscience.

The use of neuroimaging techniques in marketing contexts is very much in its infancy. Although very promising, a great deal of experimental work is required to determine what set of problems are best addressed using this approach and how neuroimaging techniques might best supplement existing methods. Neuroimaging does not generate hypotheses and to formulate interesting hypotheses, it is necessary existing methods. Neuroimaging does not generate hypotheses and how neuroimaging techniques might best supplement what set of problems are best addressed using this approach and the role of brand image and cultural meaning. There is also promise in using neuroimaging to help to learn more about how marketing information is consolidated in memory or how the activation patterns change over the course of multiple exposures to a particular advertisement. Moreover, it might reveal more about the affective components associated with a product or about the anticipated reward promised by the purchase of a product. A very interesting area of application involves the basic dynamics of choice making. One neuroimaging study, potentially very important because of application involves the basic dynamics of choice making.

In sum, we think that converging evidence using several research methods in combination is key to better understand how consumers think. Considerable evidence suggests that in many circumstances, an implicit measure may be a better predictor of actual consumer behavior. In the future, market research that combines explicit, implicit and behavioral variables will be necessary to further reveal the interrelation between conscious and unconscious information and its impact on consumer behavior. While explicit and implicit knowledge may sometimes correspond, the exciting opportunity for marketers is that often there is a discrepancy, i.e. what a consumer reports explicitly, their espoused attitudes and beliefs, may have no bearing on their actual behavior. The use of implicit measures will provide more reliable predictions and may also help us learn how to improve the design and use of explicit measures.

References