



Evaluation and associations: A neural-network model of advertising and consumer choice

Meghana A. Bhatt*

Beckman Research Institute, City of Hope, 1500 E. Duarte Rd., Duarte, CA 91010, United States

ARTICLE INFO

Article history:

Received 21 September 2009

Received in revised form 18 January 2012

Accepted 1 February 2012

Available online 11 February 2012

JEL classification:

D8

M31

Keywords:

Advertising and marketing

Neuroeconomics

ABSTRACT

We propose a neurally motivated network model of advertising where advertisements create complementarities among the directly observable attributes of a product, allowing a brand to obtain social value. The formalization of this process allows us to examine the indirect effects of advertising in addition to how ads might affect the decision utility of a product. We focus mainly on the externalities, both positive (spillovers) and negative (dilution), predicted by this model.

© 2012 Elsevier B.V. All rights reserved.

1. Introduction

The existence of advertising is one of the major open problems in economics. It presents difficulties in traditional economic models because advertisements are meant to change the decisions of consumers. The only way this should be possible in a model with stable preferences is if (a) advertisements change the information available to the consumer, or (b) consumption of the advertisements acts as a complement to the product. We propose a model in which an advertisement indirectly acts as a complement to a product by creating complementarities among the product's characteristics.

This model is based on the standard hedonic pricing model, which decomposes the utility of goods into the utilities of their characteristics (Lancaster, 1966; Rosen, 1974; Maclennan, 1982). We modify the hedonic pricing model by asserting that (a) a decision maker's experiences change the associations he has among characteristics and (b) the characteristics attributed to a product, its "perceived characteristics", are a function of both its objective characteristics and these associations (see Fig. 1). Specifically, associations can generate complementarities among characteristics, affecting the consumer's utility for a product. For example, in any given year, advertisers will help determine what makes a skirt fashionable, including its length, fabric and pattern. So advertisements create complementarities among sets of physical attributes, allowing the combination to be "attractive," or "fashionable."

In the model, each node in a network represents a possible characteristic for a product. The connections between these nodes represent the associations between characteristics. The strengths of these associations are determined by the experience of the consumer *including advertisements*. Note that while this is a neurally inspired network model, it is not meant to be a literal interpretation of what is going on in the brain. This model is about fast automated processing (System I in the language of Kahneman, 2003), and is most appropriately applied to low-involvement situation or those where rational inferences about characteristics are difficult or impossible to make (for example: when is a skirt fashionable?).

* Tel.: +1 617 217 6580.

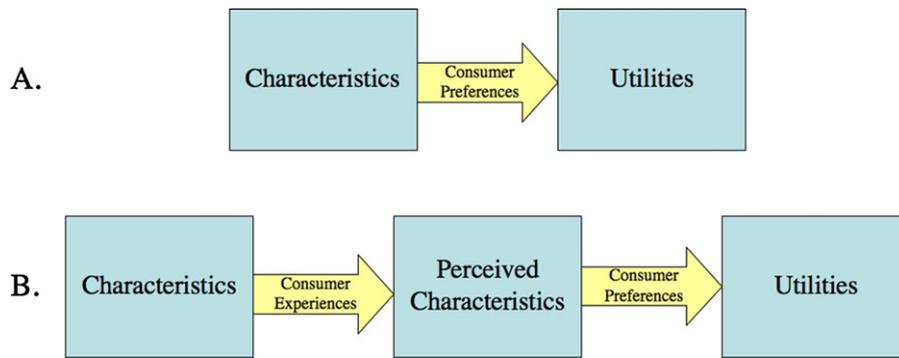


Fig. 1. (A) Standard hedonic pricing models use a function to take sets of attributes directly to utilities. (B) In this model we add an extra level of processing. First the initial set of characteristics is transformed to a “perceived” set of characteristics based on the experiences of the consumer. Then we use a utility function to take the perceived attributes to utilities.

In Section 2 we review the relevant literature from economics, marketing, psychology and computational neuroscience. In Section 3 we formally develop a neural-network model of product perception and incorporate it into a decision utility framework. In Section 4 we explore the implications of this model. We first apply it to the example of a simple oligopoly and showing that it is comparable to existing economic models in simple situations. We then explore two classes of advertising externalities, “dilution” and “spillover” effects where the model is able to describe commonly observed phenomena that are not explained by existing economic models.

2. Background

2.1. Economic models of advertising

Informative models

As the name suggests, informative models focus on the role of advertising as a means to convey information. Advertisements first and foremost inform consumers of the existence of the product and its basic features. Some models consider not only the informative content of the advertisement, but also how this might interact with the information contained in the media containing the advertisement (Ellman and Germano, 2009). But informative models also hold that advertising is, in itself, a signal of quality. Nelson (1974) writes about the function of advertising as “money-burning”: a costly signal for producers to show that they are efficient, since otherwise they would not have the money to advertise.

One particularly useful distinction Nelson makes is between “search” products, products that can be evaluated before purchase, and “experience” products, which must actually be used to be evaluated. Since consumers need to actually use an experience product in order to evaluate its quality, advertising signals are relevant to these products.

While the function of advertising to inform customers of a product’s existence is indisputable, the other “money-burning” function of advertising is problematic. There is an entire industry based around manipulating the *content* of ads, but money-burning does not allow for differences in skill at creating advertisements. According to this view an ad shown during the Super Bowl would be more effective than any large scale viral marketing campaign¹ regardless of content. These models also imply that firms should actually report the costs of expensive ads, which is almost never done.

Persuasive models

Persuasive models of advertising focus on how advertising generates brand-loyalty (Bain, 1956; Kaldor, 1950). Unlike informative models, persuasive models implicitly assume that the uninformative content of an advertisement is important. In 1933, Joan Robinson stated that “the customer will be influenced by advertisement, which plays upon his mind with studied skill, and makes him prefer the goods of one producer to those of another because they are brought to his notice in a more pleasing and forceful manner” (Robinson, 1933). Her reference to the “studied skill” of the advertiser implies that there are hidden mechanisms exploited by advertisers to persuade consumers to buy one product over the other, even if those mechanisms are poorly understood.

Another difference between informative and persuasive models are the effects of the frequency of advertising.² Comanor and Wilson (1974) assert that advertisements “reinforce the experience that consumers have with established products”. This implicitly assumes that there are cognitive processes that are somehow effected by repeated exposure. The major

¹ A viral marketing campaign is one where consumers themselves do the advertising. These campaigns encourage consumers to pass along advertisements in the form of amusing video clips, images and a variety of other forms.

² Frequency effects may be captured indirectly in Nelson’s money burning model since more frequent ads imply greater advertising expenditure to first time users. But the persuasive view asserts that frequency will have an effect even if advertising is free.

متن کامل مقاله

دریافت فوری ←

ISIArticles

مرجع مقالات تخصصی ایران

- ✓ امکان دانلود نسخه تمام متن مقالات انگلیسی
- ✓ امکان دانلود نسخه ترجمه شده مقالات
- ✓ پذیرش سفارش ترجمه تخصصی
- ✓ امکان جستجو در آرشیو جامعی از صدها موضوع و هزاران مقاله
- ✓ امکان دانلود رایگان ۲ صفحه اول هر مقاله
- ✓ امکان پرداخت اینترنتی با کلیه کارت های عضو شتاب
- ✓ دانلود فوری مقاله پس از پرداخت آنلاین
- ✓ پشتیبانی کامل خرید با بهره مندی از سیستم هوشمند رهگیری سفارشات