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Choice in Computer-Mediated Environments

RUSSELL S. WINER
School of Business, 350 Barrows Hall, University of California, Berkeley, CA 94720

JOHN DEIGHTON
Harvard University

SUNIL GUPTA
University of Michigan

ERIC J. JOHNSON
University of Pennsylvania

BARBARA MELLERS
Ohio State University

VICKI G. MORWITZ
New York University

THOMAS O'GUINN
University of Illinois

ARVIND RANGASWAMY
Penn State University

ALAN G. SAWYER
University of Florida

Abstract

In the last several years, the increased diffusion of computer and telecommunications technologies in businesses and homes has produced new ways for organizations to connect with their customers. These computer mediated environments (CMEs) such as the World Wide Web raise new research questions. In this paper, we examine the potential research issues associated with CMEs in five areas: (1) decision processes, (2) advertising and communications, (3) brand choice, (4) brand communities, and (5) pricing.

Key words: consumer choice, Internet

In the last several years, the world of marketing has changed dramatically with the rapid diffusion of computer and information technologies throughout businesses and homes. The two most notable changes that have increased potential of linking buyers and sellers

are the number of households owning personal computers (over 33% in the U.S.) and the exponential growth of applications of the Internet, most notably the World Wide Web (WWW).[1]

While the Internet has been around since the 1960s, only since the development of the WWW (Berners-Lee et. al. 1993) has its potential for electronic commerce become apparent. The WWW is essentially a network of "home pages" where companies (and other organizations and individuals) can place information about themselves, communicate with customers, receive communications from customers, make transactions, and deliver customized messages, products, and services to customers. Through the use of layers of information called hypertext, "hot links" that permit easy flow from one WWW site to another, web search engines that permit a user to search for information by simply typing in a keyword or phrase, and various methods of payment including credit cards and "E-cash," the WWW has become a hot area of marketing.

These technologies are examples of what we refer to as computer-mediated environments (CMEs).[2] In general, we define a CME as a link between a "sponsor" (e.g., a seller) and "users" (e.g., a customer) involving

- information technology
- feedback (i.e., interactivity)
- customization.

A CME may or may not allow open access and communications among the users. For example, AOL is a subscription-based service while, in most cases, the WWW permits open access. The WWW and AOL both allow for communications among users while Peapod does not.

In this paper, we focus on the research implications of CMEs for better understanding consumer choice. In particular, we examine the following different areas for research using CMEs: (1) decision processes, (2) advertising/communications, (3) brand choice, (4) "communities" around brands, and (5) pricing. An important question that we explore is whether or not the CMEs give rise to new research issues, i.e., are CMEs generating new theories, or are simply a different (albeit exciting) new laboratory for testing existing theories.

1. Decision processes

While CME environments permit users to perform many tasks such as accessing product-related information, many of the environments permit customers to search for and evaluate alternative products and brands by their attributes. Thus, the CME environment is a sophisticated version of the old information board or computer-based Mouselab (Johnson, Schkade, and Bettman 1988) experimental environments used to test decision processes and strategies in the 1970s and 1980s. The main differences between Mouselab and CMEs are that with CMEs, there are more attributes, there is more information available through

hypertext links, the purchasing situation is real rather than artificial, and there may be interactions between sellers and customers or customers and customers.

One area of research in consumer behavior that can be tested using CMEs is how sorting capabilities affects decision rules. First, does the use of CMEs affect the size of the consideration set? Second, different kinds of decision rules or data "combination" hypotheses such as compensatory, conjunctive, and lexicographic have been tested before on experimental data (cf. Wright 1973). It has not been previously possible to examine this topic in actual purchase situations; as a result, we have a good idea of the alternative processing strategies used in lab experiments, but we may not have a good understanding of the strategies that are used in practice. Given a large number of product attributes (calories, carbohydrates, cholesterol, fat, etc.) and the ability to sort brands easily on any of these attributes via a service like Peapod, we can examine whether decision makers use the capabilities, and if so, how. These new sorting capabilities may affect decision rules and ultimately brand choice (see §3 below). Different kinds of decision rules might result since the effort required relative to improvements in decision accuracy is low. Sorting can also affect accessibility of attitudes and/or past behavior which can lead to increases in purchase incidence and ultimate shifts in market share (Morwitz, Johnson, and Schmittlein 1993).

In the last 20 years, a large body of research has emerged on context effects, in particular, attraction (asymmetric dominance) and compromise effects (Mellers and Cooke 1996, Simonson 1989). This research has shown that, among other things, the inclusion of a dominated alternative (in terms of product attributes) in a choice set can materially affect the choice probabilities of extant brands. CMEs provide the opportunity to move this research from the lab into actual choice contexts. Given the availability of attributes including price, consumers now have the ability to form their own efficient frontiers, a spatial representation of brands in attribute space (or attribute per dollar). In theory, inefficient brands, i.e., those on the interior of the frontier, should have no buyers since they are dominated by other alternatives. In the conventional retail environment, it is very difficult to form such frontiers and make efficient choices. However, with CMEs (where such data manipulation could be performed by the software), the nature of the marketplace might change dramatically as inefficient brands are either driven out or re-manufactured to be on the frontier.

CMEs also provide the opportunity to study the dynamics of processing strategies, i.e. learning, forgetting, customization, etc. This can happen in two ways. First, the CME can be viewed as an intervention and we can explore differences in behavior before and after the intervention. Suppose we could observe a household's behavior prior to adopting a CME (e.g. using Nielsen or IRI scanner data in a packaged goods context) and then follow the household's behavior afterwards (e.g. using Peapod). Do consumers make fewer/more efficient choices? Do they change their decision strategies from, say, brand-based to attribute-based? Do they become less/more price/promotion sensitive? Is less/more variety sought? Do brand names have more or less effect on purchase decisions? Second, during the intervention, behavior could change. People might use different decision strategies immediately after vs. some time after the intervention. Consumers might not change their decision strategies at the early stages of adoption of the new technology, but as the

consumer learns and adapts to the CME, the decision strategies would differ greatly (Alba, Hutchinson, and Lynch 1991).

An interesting innovation in the WWW is the construction of so-called "smart agents." These are decision rules encoded by a user where future visits to a site make predictions about the user's preferences based on previous choices (see, for example, the WWW site Firefly, www.firefly.com, which can be used for music or movie choices) of the user and similar users. Methodological research issues which are apparent are how do we develop these predictions, i.e. how do we combine a user's data and other users' data? Can we construct different agents for different occasions, moods, etc.? How accurate are these predictions? Will these agents actually affect customer preferences and can their recommendations affect future product choices? (Morwitz and Pluzinski 1996, West 1996).

Many other research topics emerge on the topic of decision processes. For example, a topic relevant to public policy is if and how consumers use specific attributes such as nutrition and/or construct and use unit prices from the CMEs. Also, mediators such as product class knowledge (Brucks 1985) can be studied for their impact on information sought in Peapod or Shoppers' Advantage-like environments. Other dependent measures such as decision accuracy and customers' perceptions of the CME as a decision can be studied (Widing and Talarzyk 1993).

2. Advertising/communications

Perhaps the most important research issue in this area is in terms of communications theory. Marketing researchers have traditionally relied on *source-sending-message-to-receiver* models of communications dating back to Lasswell (1948), and popularized by Schramm (1954) an others in the 1950's. CMEs may bring a long overdue re-thinking of marketing communication specifically, and "mass communication" in general. Traditional mass communication models assume a one-to-many form where the sender (e.g., a firm with a TV or radio ad) sends messages to its audience with no little or no real interactions between audience and sender. The CME feedback loop from "receiver" to "sender" is much more direct, immediate, and much more likely to yield a significant response from the sender than with traditional mass media (e.g., television programming). In the case of CMEs, we see active communication between audience and sender, as well as the ability for audience members to communicate with one another, and to form important communication collectives which have their own voices as well.

In the new media it is not even always clear who is the sender and who is the receiver. Communication theories have always revealed a tension between the form and functions of interpersonal and mass communication (Anderson and Meyer 1988). CMEs exist at the border of the two: audience members may actually participate (to varying degrees) in the production of mediated content. There can be (and often is) significant mutual participation in "message" content, and in the construction of meaning. This makes the kind of communication that occurs in CMEs fundamentally different than that which occurs in traditional mass media environments.

What then are the most significant research implications of the new media? First, there is more work to be done in developing communications models which can adequately

account for this new form. How do we account for a communications network in which the distinction between sender and receiver is unclear as in interpersonal communications settings, yet also retains many of the aspects of mass communication as well? Second, what predictions come from models representing the ability of so many consumers to communicate with each other so rapidly? How will we account for and predict the actions of the CME groups or "communities" which now form around brands and their impact on brand equity, customer satisfaction, and overall brand performance? Third, will the dynamic nature of CMEs yield a more dynamic environment for advertising copy? If customers can virtually interact with advertising, a fixed campaign such as might be run on TV might become inappropriate, or on the other hand, might endure due to the unwillingness of audience members to consistently interact due to their essential passivity. The audience may not care to "interact" as much as the technology will allow. In a McLuhan sense, will the nature of the medium itself fundamentally alter the nature of the marketing message? What are the public policy implications of a more decentralized "information store" (Bordewijk and Van Kaam 1986) and a more active consumer?"

The most common framework for thinking about advertising objectives is the classic "hierarchy of effects" model, or AIDA, Awareness → Interest → Desire → Action. Are these appropriate objectives for Web-based advertising? How should a site visit be counted? Conventional measures of "eyeballs," i.e. exposure, are not really useful because users jump quickly from one "page" of hypertext to another as well as from one site to another. At the same time, better measures of "interest" can be obtained from "clickstream" data which record the flow of a user's mouse clicks through a site and between sites. A person who clicks on an ad at a site, moving to the site sponsored by the advertiser, and going through several pages of hypertext at the site produces a quantitative measure of interest.

In addition, there has been a considerable amount of econometric work in the area of evaluating advertising effectiveness and advertising carryover effects. These models have tended to focus on sales or market share as the dependent variable. In the context of CMEs, new dependent variables emerge, such as time spent at a Web site, customer responses via e-mail, the number of hypertext pages accessed, etc.

One general comment about the Web is that it levels the "playing field" for large and small companies. Due to low barriers to entry, a small company site (or advertisement) can look as good as a large company site. Research in the marketing literature has focused almost exclusively on large companies with concomitant large advertising budgets. An interesting research question is whether Web-based advertising is differentially effective (i.e., is the playing field really level?) and how both large and small companies maintain unique identities.

3. Brand choice

The ability of consumers to sort on attributes and make reasoned decisions at home about which brands to choose via a Peapod-like interface has the potential to change decision processes and ultimately brand choice. Similarly, many of the CMEs allow customers to customize the information they see; for example, with CUC, consumers can type in

threshold levels for price and specify attribute levels on one or more attributes to select products that satisfy the chosen criteria.

If sorting and customization affect brand choice, then CMEs with those features may impact important constructs, such as loyalty. For example, what does the ability to sort via Peapod do to brand switching? A concern of marketing managers is that brand loyalty has been eroding due to the proliferation of price-oriented promotions and the growth of private labels (although both have slowed somewhat recently). With CMEs, brand loyalty may be enhanced with the ability of households to press a button with the mouse and simply reorder from the previous set of choices. One study comparing realistic, laboratory simulated choices to actual supermarket choices by the same people found the latter behavior to be more zero order than the former (Burke, et. al. 1992). In addition, less exposure to in-store promotions and communications should enhance loyalty. Alternatively, with more product information available, promotions more salient, and fewer distractions, brand choices could become less routinized and therefore exhibit more switching.

Changes in brand loyalty have important implications for brand equity. A powerful brand name is one that survives the kind of information onslaught characterized by a Peapod or Shopper's Advantage environment. In fact, with CMEs, we can reexamine the whole area of brand equity. An important motivator for the construction of Web sites is to enhance brand equity. Are they working? What do customers learn about brand names from Web sites? Are brand names less important in a CME environment? This latter topic relates to the research on memory versus stimulus-based decision-making (Lynch and Srull 1982); clearly, a customer using a CME is at least exposing him or herself to more stimuli in terms of advertisements and attributes and potentially increasing the weight given to those stimuli relative to short or long-term memory components.

The predictive accuracy of choice models is greatly improved when the set of brands is reduced from the total set in the category to those in the household's consideration set (Roberts and Lattin 1991). Using Peapod or Shopper's Advantage, it is easier to construct consideration sets by noting which brand attributes were examined. The use of "personal lists" in Peapod allows consumers to construct and customize shopping lists that only contain products and brands of interest (interestingly, brands which are purchased but not added to the "personal list" can also be identified). Useful research topics would be how the sets change over time, what factors affect brands in the sets, and predicting brand choice conditioned on brands in the set. Lower decision costs implied by the use of at-home CMEs like Peapod suggest that consideration sets would be larger (Hauser and Wernerfelt 1990) and, relevant to our discussion above about loyalty, would provide more opportunity for brand switching.

There are a variety of other research topics related to brand choice. For example, satisfaction with and confidence in purchases made using CMEs, variables relevant to their long-term commercial potential; can be studied. CMEs tend to separate choice from purchase, especially in high-involvement categories such as cars, where consumers obtain comparative information from a CME (e.g., www.edmunds.com) and then purchase from a dealer offering the lowest price. In this environment, will consumers attribute poor brand choices to their own poor judgment in incorrectly utilizing available information rather

than to persuasion or manipulation by a dealer? In addition, while conventional wisdom suggests that the use of CMEs would decrease impulse purchases, the opposite could occur when a consumer sorts a product category on a selected attribute or pursues a set of hypertext links.

4. Brand communities

In the discussion of communication theory, we noted that a characteristic of the CME environment is the way customers can form groups or communities around brands (Muniz and O'Guinn 1996). For example, Saab owners are notorious for their fierce loyalty to the brand and their high degree of interest in new product offerings and other matters related to the company. Saab owners have their own "chat rooms" where they discuss the cars with each other and communicate their feelings to the company via e-mail. Muniz (1997) has reported several similar CME brand communities, each with different interests but very similar communal characteristics. Clearly, this hybrid form of interpersonal and mass communication afforded by CMEs increases the probability that communities will form around brands.

One important research question is how communities affect member attitudes toward the target brand and their purchasing behavior. Since communications among communities are largely outside of the control of the marketing manager, the size and interconnectedness of these communities shifts power from the marketer to the consumer. How should a marketer's communications be targeted to brand communities as well as to individual consumers? While it is important for a manager to monitor community communications, traditional advertising may have a decreasing impact on member attitudes and behavior. Particularly influential and knowledgeable users may have a much more profound effect than when interested consumers were more geographically and temporally isolated from one another, and thus less powerful. Whyte's (1954) "web of word of mouth" takes on a whole new meaning. CMEs may actually enable the field to revisit the essential but ultimately frustrating work on mass opinion leadership (Katz and Lazarsfeld 1955). That is, we may now have the technology to study the interplay between word-of-mouth and marketer produced information in diverse contexts and in near real time.

Another question is: around which products are communities more or less likely to form? There is a CME brand community for Saab, but there is unlikely to be one for Crest toothpaste. Controlling for price and frequency of purchase, what are the factors leading to community creation? What kinds of people are likely to be members of communities for different kinds of products?

A potentially exciting way to view a community is as a market segment. This kind of segment has common interests but may cut widely across demographic and socioeconomic lines. How does this kind of segmentation fit with more traditional approaches to forming market segments? Do community-defined segments respond similarly to marketing mix variables? How can marketers influence these segments? Does this change our definition of target marketing?

5. Pricing

Unlike the prominent role it takes at point-of-purchase, price is simply another attribute in a list of attributes (much like in a conjoint analysis experiment). Therefore, its role in the choice process could be diminished. Thus, an interesting question relates to price sensitivity in a CME environment.

The area of reference price (Kalyanaram and Winer 1996) has been extensively studied over the last 10 years. Some researchers have categorized references prices as being temporal, formed on the basis of past prices, and contextual, formed at point of purchase based on other observed prices. The empirical evidence so far is mixed on which kind seem to most influence brand choice. In a Peapod or Shopper's Advantage kind of environment, a reasonable hypothesis would be that contextual prices would dominate. However, in the price recall domain (e.g., Dickson and Sawyer 1990), it would be interesting to study if prices are remembered any better or worse based on computer transactions versus conventional store transactions.

Different pricing mechanisms can be easily used with CMEs. For example, occasionally, Cathay Pacific airline holds auctions of available business class seats on the Internet. Lands End sells closeouts in a special "room" at its Web site where the prices steadily decrease until the merchandise is cleared. Another possibility is that multiple types of prices can be offered including financing; for example, in purchasing a car, the CME can suggest prices for a 3-year fixed loan, 5-year adjustable loan, 5-year lease, etc. A potential area of research is when and where different mechanisms can be most profitably applied and if new approaches to pricing can be developed.

6. Conclusion

The diffusion of computer-mediated environments is occurring rapidly. While forecasts of the dollar amounts of sales that will occur through CMEs are wildly different, it is safe to say that the next 5 years will see a significant increase in sales made through these channels. At the same time, marketers will spend an increasing amount of money on customer communications to improve their relationships with customers, increase brand equity, and to simply provide information to current or prospective customers.

It is important for marketing researchers to examine these emerging technologies. At the very minimum, we view CMEs as an exciting new laboratory for testing existing theories. Such a laboratory is relevant to research on decision processes, brand choice, and marketing mix variables such as advertising and price. However, we also believe that some new research areas will emerge from CMEs. Clearly, CMEs point to new questions for communications theory and ideas about community. We believe that new theories are needed to handle the unique environment. Thus, we see the CME environment as providing both a new context in which to study existing theories *and* an entirely new phenomenon, both of which merit research by marketing academics and other social scientists.

In sum, the key areas of choice research we feel will be most impacted by the development of CME technology are:

1. Decision processes, in particular, how the ability to sort on attributes affects decision rules and how they may change over time.
2. Response to advertising and other communications
3. Brand choice, in terms of loyalty, brand equity, and consideration set formation.
4. Brand communities, the social structure that can build up around brands.
5. Psychological response to price and how customers will respond to new pricing mechanisms that can be employed.

Notes

1. In 1995, the Web search engine Lycos documented 8.5 million URLs, WWW addresses. In April, 1996, this was up to 22 million and in July, 1996, 30 million.
2. A recent paper by Donna L. Hoffman and Thomas P. Novak, "Marketing in Hypermedia Computer-Mediated Environments: Conceptual Foundations," *Journal of Marketing* 60 (July), pp. 50–68, uses "hypermedia" to refer to networked links, largely the WWW. Our coverage is intended to be broader to include CD-ROMs, kiosks, and other approaches to electronic marketing.

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