

## New Directions in the Use of Virtual Reality for Food Shopping: Marketing and Education Perspectives

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### Abstract

Virtual reality is used in marketing research to shape food selection and purchase decisions. Could it be used to counteract the marketing of less-nutritious foods and teach healthier food selection? This article presents interviews with Raymond Burke, Ph.D., of Indiana University Bloomington, and Rachel Jones, M.P.H., of the University of Utah College of Health. Topics covered include new marketing research technologies, including virtual reality simulations; retailing and shopper behavior; and the use of virtual grocery stores to help students explore quality of diet and food/nutrient relationships. The interviewees discuss how the technologies they have developed fit into research and behavior change related to obesity and diabetes.

*J Diabetes Sci Technol 2011;5(2):315-318*

### Introduction

Virtual reality is used in marketing research to shape food selection and purchase decisions. Could it be used to counteract the marketing of less-nutritious foods and teach healthier food selection? Raymond Burke, Ph.D., of Indiana University Bloomington, and Rachel Jones, M.P.H., of the University of Utah College of Health, each addressed this topic at the National Institutes of Health Department of Defense Workshop on Virtual Reality Technologies for Research and Education in Obesity and Diabetes, July 15–16, 2010 (<http://www.nhlbi.nih.gov/meetings/workshops/vr.htm>). Dr. Burke is chair of the marketing department and directs the Customer Interface Laboratory at Indiana's Kelley School of Business. He has developed several new marketing research technologies, including virtual reality simulations, and published extensively on retailing and shopper behavior. Ms. Jones has created effective public health campaigns to address cancer, diabetes, and heart disease. She instructs nearly 1000 college students each year in nutrition and has created a virtual grocery

store to help students explore quality of diet and food/nutrient relationships. Barb Ruppert, Telemedicine and Advanced Technology Research Center science and technology writer, asked both presenters to discuss how the technologies they have developed fit into research and behavior change related to obesity and diabetes.

### Interview

#### *Ruppert:*

Dr. Burke, please tell us about your work<sup>1</sup> with virtual reality shopping simulations and the benefits of this research method related to food shopping.

#### *Burke:*

While traditional research methods such as consumer surveys, concept tests, and focus groups can provide rich feedback from shoppers, they do not measure behavior in a realistic, competitive context and are therefore unable

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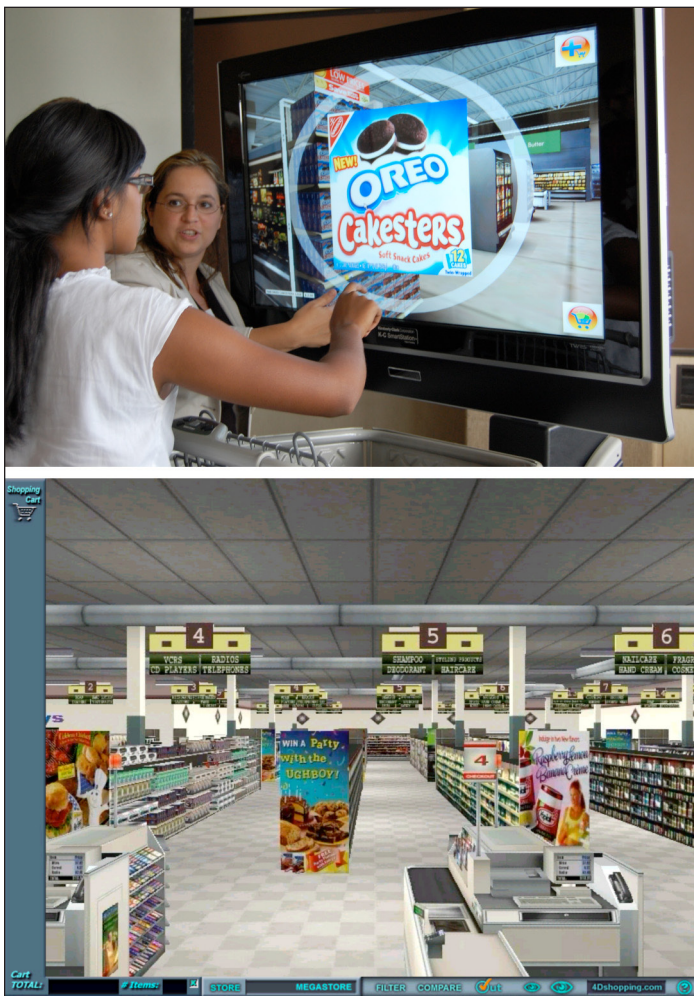
**Keywords:** food selection, food shopping, nutrition education, shopper behavior, virtual grocery store, virtual reality, virtual reality simulations

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to identify what will capture the shopper's attention in an actual store. A typical supermarket will have between 30,000 and 40,000 different types of products—different combinations of the brand, the flavor, the package size, the type of packaging; there is a tremendous amount of complexity and clutter in the store environment. You could spend millions of dollars developing a new product and put it on store shelves, and the consumer might not even see it.

The simulated environment allows the shopper to navigate through a virtual store, pick a product from a set of alternatives, and put it in the virtual shopping cart, which is closer to what people do in a physical store (**Figure 1**). We measure which aisles they go down, where they stop, which packages they pick up, and which sides of the package they view. We can test a variety of factors, including changes in a product's attributes,



**Figure 1.** Computer graphic simulations are used at Indiana University's Kelley School of Business to test shopper reactions to new products and store environments. Images courtesy of the Kelley School of Business.

packaging, shelf position, and merchandising. This would be difficult to do in a physical store because of the time and cost involved.

We have also integrated eye tracking into our simulations, using an infrared camera to track where subjects look and for how long. We find that people only spend a few seconds scanning the aisles and product displays before deciding to move on to another product category. If something catches their attention, they will stop and process that information, and maybe spend 20 to 30 seconds in a category.

The other tool that researchers are now combining with virtual shopping is electroencephalography to measure brain activity. One can detect three patterns of response using electroencephalography: a surprise response, an emotional response (positive or negative), and a memory-coding response. As subjects navigate through a store, researchers can see which elements of the store environment evoke a strong cognitive or affective response and which items are being encoded in memory.

**Ruppert:**

How do you see virtual reality simulations supporting efforts to address obesity and diabetes?

**Burke:**

Let's say we want to see what grocery items people with diabetes are buying or what factors might encourage people to choose healthier foods. If we have people fill out a survey about whether they would like to eat healthy, they will say, "Of course," because people often tell you what is socially desirable. But in a simulation, people are actually going through the shopping process, and their behavior is similar to what we see in the actual store.

In addition, because we are testing new ideas in a competitive environment, we can see what stands out from the clutter. If you make an innovation to improve the nutritional value of a product, the simulation allows you to explore the best way to communicate that information to the consumer, whether it is through the product packaging, on-shelf signage, a display case, or something else. There is a tremendous opportunity for this kind of research program.

**Ruppert:**

What are some findings from your research that might apply to the goal of helping shoppers make healthy food choices?

**Burke:**

The focus of my research<sup>1</sup> is on “retail shoppability,” which is the capacity of the retail store to convert consumer demand into purchase. A variety of aspects of the shopping environment can influence a store’s shoppability, including the presence of signs and other navigational aids, how items are organized on the shelves, and how convenient and enjoyable it is to shop in that store.

We have observed that many high calorie items, such as snack foods, soft drinks, baked goods, and candy, attract a considerable amount of consumer attention. These products are often heavily advertised and prominently featured in the store, and their sensory characteristics can stimulate an emotional response in shoppers. This can distract people from other products that may be more nutritious.

You could apply what we have learned about shoppability to redirect shopper attention and encourage individuals to purchase healthier foods. Simple changes in product presentation can have a dramatic impact on shoppers. An example is the produce section of H-E-B’s Central Market stores in Texas, where they create an enticing display to highlight the produce in a local market setting. The presentation is so compelling that sales from their produce department are 50% higher than competitors’ sales in that area.

When people are shopping for groceries, they usually have a limited amount of time available, so it is important that nutritional items are easy to find and buy. People scan the shelves for relevant products, and what stands out depends on the stimulus characteristics—the color, contrast, orientation, positioning and size of the object—as well as the person’s needs and desires. As consumers walk through the store, they have in mind a set of products that address their needs. They notice those things that are familiar to them, that connect with some knowledge or experience they already have.

If there is a close match between the shopper’s mental representation of his or her needs and what is physically on the shelf, then he or she can find a product very quickly. But if there is no match, perhaps because those desires are vague or confused, then it is very difficult for the consumer to shop.

**Ruppert:**

Shaping consumers’ needs and desires is the focus of Ms. Jones’s work. Ms. Jones, please tell us about the virtual

grocery store you have developed and the benefits of using it with your college students.

**Jones:**

I developed my virtual grocery store (**Figure 2**) based on the lesson of object fixation that I learned in skydiving: whatever you are focusing on—or trying *not* to focus on—is what you will hit. If you tell your brain, “Don’t hit that, don’t hit that,” you are going to hit it. Nobody hears the word “don’t.” So the approach I took was to focus only on “real” food, rather than on the many items that resemble food but have little nutritional value.

In the course I teach based on the virtual store, students learn about different aspects of food related to nutrition. Over the semester, they complete 10 corresponding trip objectives in the store. They log in to the store Web site, choose an objective, and “go shopping.” They can select from among 100 items, all of which have great nutritional value. I did not include any poor choices.

For instance, the goal of trip 1 is to find 10 items with a water content above 75%. Students surmise that they would probably find such foods in the fruit and vegetable aisles, so they navigate their cart to those aisles and choose the foods to put in their cart. At checkout, they see a list of their items’ nutrient values for each of the nutrients we study in class. The object of the game is repetition.

Each week, after students select their foods, they then shop for those foods at a real grocery store. The virtual store is like a flight simulator; students become comfortable in



**Figure 2.** Ms. Jones uses a virtual grocery store to prepare students at the University of Utah to make nutritious food choices on real shopping trips. Images courtesy of Great River Technologies.

the shopping environment and identify the foods they will actually purchase. They use online trip reports to give my teaching assistants weekly feedback.

As these students go into the virtual grocery store more often, they begin to understand that nutrients and foods are connected, and they can identify specific nutrients in specific foods. They start shopping with quality in mind. I do not take a quantitative approach in the virtual store; you will not see calories or number of servings; you see the quality of real foods.

**Ruppert:**

What have you found as a result of using the virtual grocery store?

**Jones:**

Nearly 2000 students have used this tool since I put it into play a year ago. I am gaining rich qualitative data and a huge window into consumer behavior: what motivates the students, how their food selections relate to their lives, and how eating different food makes them feel.

Responses in the trip reports indicate the virtual grocery store is accomplishing its goal of behavior change. Students consistently note that the way they view food has changed. They say they now explore food in terms of its value and not in terms of its calorie content. Many report that, as a result of this class, they are no longer anorexic or, on the opposite end of the spectrum, they and their families have lost weight.

This approach has been wildly successful in getting students to change not only their own behavior, but their surrounding environment. For example, our on-campus farmers' market has experienced extreme growth in the last year, and the downtown Salt Lake City farmers' market is now inundated with students because of the social networking and social marketing springing from this class. Students have successfully lobbied to change on-campus menu items and have approached university administrators to request green space to grow produce. Use of the virtual store is translating into tangible behavior changes because students are learning at their own pace, they are developing confidence within a social network with positive peer pressure, and they are accountable on a weekly basis.

The course has grown from 25 students to 650 students every semester. We are seeing that we can take large groups and use the virtual store and its feedback mechanisms to create that sense of individual accountability that is so motivating.

**Ruppert:**

How do you see this teaching tool addressing diabetes and obesity in the general population?

**Jones:**

There is a level of anxiety associated with going to the grocery store because of the number of choices. Therefore, when you help people focus on specific items to accomplish specific objectives, you are still allowing them choices but narrowing the decisions in a helpful way.

I would love to see the virtual grocery store become a model for how nutrition is taught from kindergarten through college. We have to switch the emphasis from quantity and economics to quality when choosing foods. Nutrition is about quality of life as opposed to saving money. My method does not approach cost-effectiveness at all, because the truth is, it is time-consuming and costly to eat right.

That is why my long-term goal is to get my students so fired up about what food really is that they change food policy—so we do not have to pay more for fresh fruit than a fast-food hamburger. We have a million food-like choices in this country but an absence of quality, of what food needs to be. Our current food system is based on commodities and economics. Nutrition does not fit into this schema. As a culture, we need a different approach.

**Acknowledgement:**

The author would like to thank Dr. Abby Ershow and Dr. Charles M. Peterson for their editorial assistance in the preparation of this article.

**Reference:**

1. Burke R. Virtual Shopping: Breakthrough in Marketing Research. *Harvard Business Review*, 1996;74:120–31.