



# Institute for Behavioral Economics and Consumer Choice (IBECC)

## A Report on IBECC Roundtable 3

May 9, 2019, New York, NY

Mastering the Marketing Stack  
Using Technology and Behavioral Science to Drive  
Growth in Today's Digital Age



Dyson  
Cornell  
SC Johnson College of Business

Cornell **CALS**  
College of Agriculture and Life Sciences

# Introduction

In the pre-digital world of marketing, companies focused on finding the optimal message, location, and timing to promote their products to consumers they hoped would be in the right mindset to make a purchase. But as retail has increasingly migrated online, marketing has shifted to targeting consumers on their personal devices at any location and any time of day.

Digital marketing relies on the use of personal information about potential consumers — their location, their preferences, their activities, and the triggers that may lead them to purchase. While mining personal data to market products to consumers can drive sales, the practice has led to growing concerns about the potential misuse of customer data and the invasion of personal privacy.

The Institute for Behavioral Economics and Consumer Choice (IBECC) at Cornell University held a roundtable on May 9 to analyze the opportunities and challenges companies



Executives from PepsiCo, Nestle Starbuck Alliance US and Canada, Waze, Roku, Cheetah Digital, The NPD Group, Kantar (Americas), ZX Ventures an ABInBev company, RevTrax, TVision and Fors Marsh Group participated in IBECC's 3rd Roundtable.



From bottom left corner clockwise: Colombe Bommelaer, Raman Sehgal, Erik Lund, Adam Brumberg, Yung Ching (Yoshi) Yang, Stephan Gans, Stephen Kaiser, Geoff Fisher, Clarence Lee and Heath Nielsen

## The Shift from TV to Digital Advertising

While a growing number of digital platforms are competing for consumers' attention, television is still the most popular medium adults access on a daily basis. American adults spent 4 hours and 10 minutes a day watching live television in the last quarter of 2018, compared to 2 hours and



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face in the digital marketing landscape. A group of 26 industry executives, consumer behavior researchers, scholars, and graduate students attended IBECC's third roundtable at Cornell University's Industrial and Labor Relations Center in New York City.

The roundtable opened with a discussion of the transition from television to digital advertising and strategies for attracting consumer attention. The presentations then assessed the expanding range of platforms for individualized consumer targeting and explored the issues of privacy and trust. The roundtable concluded with a discussion among three breakout groups that focused on how academic research and potential policy changes could improve the efficiency of digital marketing, whether a central repository for consumer data should be created, and how industry leaders could improve trust among consumers while addressing concerns about privacy.

22 minutes using a smartphone, and 1 hour and 46 minutes listening to the radio, according to a study conducted by TVision, a TV marketing technology firm.

Since television commands much of our time, it remains an effective platform for advertisers to reach consumers. Yet what type of TV advertising is the most effective, and how can we measure that?

To determine how consumers react to TV ads, TVision implemented a groundbreaking technology that places web cameras and facial recognition technology in homes to gauge which ads garner the most attention of viewers. This data contains information not just on what is on the television, but also whether the viewers are in the room and whether they have their eyes on the screen. Researchers Matt McGranaghan, Jura Liaukonyte, both at Cornell, and Ken Wilbur, at the University of California, San Diego, analyzed this data to try to answer these advertising effectiveness questions.

"This is the first time we actually are able to observe whether people are in the room while they are watching TV, and on top of that, we are also able to observe if they are actually paying attention to the TV," said Jura Liaukonyte, a professor in the Dyson School of Applied Economics and Management at Cornell.



From left top row clockwise: Zou (Zoey) Yang, Khaled Boughanmi, Lea Masatsugu, Emily Berg, Jacob Davis, Sandra Cuéllar-Healey, René Lammers and Robert Hill

The study shows that broadcast networks command higher viewer engagement than other channels. Viewers who watch during prime time are more selective of which channels they watch, and once they are watching, they pay more attention than at other times. Among types of shows, news and live TV programming command the highest attention, Liukonyte said.

Using an ad engagement index, the brands that perform the best are technology companies and movie trailers, while organizations targeting animals and the environment had the least viewer engagement. “People don’t want to hear these uncomfortable messages,” Liukonyte said. “They tune out, and they tune out really fast.”

Another category that underperforms in television advertising is pharmaceutical companies. In this category, ads related to the severest health conditions tend to generate the least attention from viewers. Ads about cancer drugs, for example, perform the worst, according to the study.

“Pharma brands for specific medical conditions should be smarter with mass media, otherwise they will reach people who may not pay attention because the brand or ad is not relevant,” said Raman Sehgal, TVision’s vice president of marketing. Sehgal also noted that viewer engagement with pharma ads varies, because they are often longer than most other ads — 60 seconds for pharma ads versus the industry



From left to right: Jackie Stine, Ceren Karacasu, Seth Sarelson and Guilherme Lebelson

norm of 15 and 30-second ads) — as they also have to include federally regulated information, which makes it difficult to retain viewers’ attention.

Negative ads not only reduce attention span for the products they are promoting, but they also lower interest in any subsequent ads, the study shows. The impact of negative ads

causes broadcast networks to lose between 4 and 9 percent of their revenue, Liukonyte said. Yet she said networks can avoid those losses by targeting ads to specific demographic groups and by offering differential pricing to advertisers.

## Using Different Platforms for Individualized Targeting

The burgeoning digital economy paved the way for the development of targeted advertising that relies on vast amounts of data collected about consumers. Personalized digital ads grew out of customer relationship management (CRM) platforms that emerged in the 1990s to extract data about consumers, such as email addresses and shopping habits, and to use that information to predict future behavior.

A game-changer in the process was the development of data management platforms (DMP), which enabled companies to synchronize email addresses with a website cookie, said Seth Sarelson, a 2004 Cornell alumnus and co-founder and COO of RevTrax, a promotional marketing technology company. These platforms enabled marketers to transfer their CRM file online and use it to create targeted display ads. It also led companies to start buying third-party data to target customers, based on their attributes and interests.



“A newer phase in the evolution of targeted marketing is the customer data platform (CDP), which folds all customer data into a single profile,” Seth Sarelson

A newer phase in the evolution of targeted marketing is the customer data platform (CDP), which folds all customer data into a single profile. Such platforms automatically create segments that are sent to outside companies, which leverage the data for targeted marketing.

“What’s effectively happening is the marketers are able to ingest data from different sources, whether it’s their own database, behavior that’s happening on their own website, sales data, other conversational data, or smart watches,” Sarelson said. “The platform actually pulls all this information together into one unified profile. You can run rules against it, you can segment, and you can get a good sense of who is a lapsed customer and who is a high loyal and then you can actually do something with it.”

The ability to harness personal information from customer data platforms has become a make-or-break difference in whether retailers survive or fail in the competitive e-commerce environment.

“If you just look at the retail industry and how fragmentation and consolidation are happening, the consolidators are the ones that have a handle on this, while a lot of the smaller

players that don't have the ability to invest in infrastructure on an individual level — they face major challenges," said Robert Hill, a 1991 Cornell alumnus and executive vice president of The NPD Group's U.S. Retail Business Group.

The retailers that are declining are those that are over-leveraged, financially troubled, or unable to use personalized digital marketing. "Saying that retail is dead is not the case," Sarelson said. "It's the ones who understand how to do digital marketing that will ultimately be successful."

## Using Adaptive Customization

**Y**et another way for companies to track the preferences of consumers is by analyzing their behavior on their retail website. As customers search for products on a website, the process of sequential elimination they use presents an opportunity for companies to use adaptive customization by analyzing clickstream information on how they interact with the platform and applying the data to customize the website, said Khaled Boughanmi, an assistant professor in the Johnson Graduate School of Management at Cornell.

The first step in the process is to identify segments of customers, each of which may use different screening rules to eliminate products in an online search. The next phase is to observe the customers' click choices, use that information to predict the customer's next move, and then adjust the website, Boughanmi said.

In their experiment, Boughanmi and two other researchers identified three segments of customers who were searching for a tablet online: those who were more concerned about brand, those who were more interested in technical features, and those who were driven by price.



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The researchers created a model based on adaptive customization that was able to predict customers' second click 80 percent of the time in a simulation of 10,000 online shoppers, a rate that was at least 30 percent better than other methodologies, Boughanmi said. The reason the model could predict the customers' behavior is because the first click revealed whether they were more concerned about brand, technical features, or price.

"If customers first click on an 8-hour battery or a price of less than \$199 for a tablet, then I know with a probability of 99 percent that they are in the segment that is price sensi-



**From left top clockwise: Gail Fink, David Just, Jackie Stine, Ceren Karacasu, Seth Sarelson, Guilherme Lebelson and Sherrie Negrea**

tive," Boughanmi said. "Or if they click on an iPad or a 7-inch screen, I would know they are Apple customers. And if they click on 2 gigabytes of Ram or 64 gigabytes of hard drive, then I know with a high probability that these are techie customers."

Analyzing this type of information could enable companies to determine the probability the customer will make a purchase, the expected revenue, and the value of a promotion that would induce a purchase. Each prediction could then be leveraged to customize the platform, recommend products, and target customers, Boughanmi said.

The model could be used to predict behavior on a variety of media platforms, such as Netflix and Spotify. In addition, Boughanmi said it could be applied across category settings, for example linking a customer's search for a particular type of television to future purchases of other products.

In a follow-up study, Boughanmi and his colleagues will focus on consumers who exit an online search without buying anything. That research could create a model to try to predict why customers leave the search and how retailers could entice them back to their websites to make a purchase.

## The Science of Consumer Decision Making

**A**nother way to unravel how consumers make choices is by studying decision-making behavior in a laboratory. Research on consumer neuroscience conducted at Cornell shows that when given a choice of two objects shown on a computer screen, people tend to select the first and last object they look at and the object that they spend the most time looking at, said Geoff Fisher, a 2010 Cornell alumnus and an assistant professor of marketing in the Dyson School.

As people focus on a particular item, they overweigh its value by 5 percent, while discounting the item to which they pay the least amount of attention. This pattern creates an attentional bias as people accumulate information and decide which object to choose in the laboratory trial, said Fisher, who uses an eye tracker to monitor people's responses.

In another study, Fisher measured how patient people are in decision making by giving them a monetary choice: Do they want to get \$20 in three days, or \$26 in 21 days? The more time people spend looking at the \$26 option on the computer screen, the more patient they are. And the more time they spend looking at the earlier date listed on the screen, the



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more impatient they are, Fisher said.

Fisher further explored the effect of time on consumers' decision making in a study that posed a hypothetical purchasing choice: Would people rather buy a laptop today for \$2,000, or wait six months when the price dropped to \$1,800?

"In a purchasing environment like that, attention matters as well," Fisher said. "So when you spend more time looking at those monetary amounts, then you become more patient because you want to spend less money. When you spend more time looking at the delays, then you're willing to spend more money and you're more impatient because you want to buy it."

In another laboratory study, Fisher used a cursor to monitor people's decisions in choosing between two food items from different brands: a chicken burrito from Chipotle or a turkey sub from Subway. Based on the participant's use of the cursor, the study showed that products played a more important role than brands in making a choice in the trial, Fisher said.

"One reason is that the product is this simpler thing that's easier to think about," Fisher said. "Brands are typically thought of as more complex and made up of lots of products. You typically use more abstract language to talk about brands than to talk about products."

## Data Usage and Privacy Protection

If consumers give priority to products over brands, marketers are building on that tendency by using customer data to offer targeted promotions on products they want to purchase. While some companies buy consumer data from third parties, other retailers, such as Amazon, have the capacity to analyze the data internally and leverage it to influence consumer behavior by offering targeted promotions.



From left to right: Colombe Bommelaer, Ceren Karacasu, Dan Robbins, Heath Nielsen, Adam Brumberg, Seth Sarelson, Jura Liaukonyte and Sandra Cuéllar-Healey

"Amazon can use all this data, from the marketing mix to point of sale, to map out the entire customer journey, online and offline," said Clarence Lee, an assistant professor at the Johnson Graduate School of Management at Cornell. Lee calls this practice "the holy grail in marketing."

Although most companies want to access consumer data, the process of obtaining that information is cumbersome and outdated, Lee said. Most retailers sign agreements before sharing data with third-party marketing companies that analyze it and send it back to the retailer.

Lee said there are three challenges this model presents: the possibility that the data may be hacked when it is released to third-party companies; the small size of the data sample that makes it difficult to generalize to actual customers; and the lengthy process of transferring the data to outside firms.

One way to overcome these challenges is by using a collection of methods called the data free transfer paradigm, in which the actual customer data is not transferred. This collection consists of three general methods: (1) synthetic data transfer, (2) data generating process (DGP) transfer, and (3) federated learning. In the first two methods, what is



**"One way to overcome the challenges posed by the current methods used by retailers to obtain consumer data is to instead use a collection of methods called the Data Free Transfer Paradigm where the actual customer data is not transferred," Clarence Lee**

being exchanged are either synthetic data or computer codes created using machine learning and artificial intelligence that captures the DGP.

The synthetic data "has such high fidelity you can run typical business analytics, such as regressions or machine learning models on it and still protect the privacy of the customers as well," Lee said.

Another way to preserve customers' control over their own the data would be to flip the model, and instead of pushing the data to a third-party, bring the analysis to the original data generator. This model, known as federated learning, pushes the analysis to the metadata available on customers' smart phones, which is created whenever they log onto a website such as Amazon. The results of the analysis are then transferred back to Amazon's servers but the data would be ultimately kept on consumers' personal devices, Lee said.

## The Privacy and Trust Threshold

Customers' trust grows as convenience improves through the development of better apps. Yet even though consumers are willing to trade their personal data to gain convenience, they often do so grudgingly and believe that they have



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no choice in complying in order to access the technology, said Emily Berg, head of consumer insights at Waze.

A study by Google, which purchased Waze in 2013, shows that 32 percent of consumers describe this tradeoff as “mostly” or “totally fair,” Berg said. Those results show that companies competing in the digital marketplace need to build trust with customers by offering clear explanations about how they are collecting and using consumer data.

One way to build trust is through privacy reform, Berg said. When people sign up for an app or service, they need to understand how the platform is using their data, what the benefits are for consumers, and how to set up controls on how their data is shared. Explaining the purpose of targeted marketing will allow the public to understand the benefits for both consumers and retailers. “Economic models tell us that all of the targeting is an economic benefit for the consumer,” said David Just, the Susan Eckert Lynch Professor in Science and Business at the Dyson School and director of IBECC. “It’s going to make more products available to people at prices they can afford. From that perspective, the only risk is nefarious use by people gaining access to data that they didn’t have.”



David Just, Roundtable Chair and Director of IBECC

## Challenges and Research Needs

The roundtable concluded with a discussion session in which three breakout groups explored a range of topics: the challenges digital marketing faces now into the future, the need to build trust among consumers, potential policy changes that

could help digital marketing run more efficiently, academic research needs, and potential roles for IBECC.

The discussion groups concluded that one of the challenges the industry faces as digital marketing continues to evolve and mine personalized data to drive growth is that consumers don’t seem to perceive the benefits of sharing their personal data and instead have stigmatized the practice. In turn, their negative perception has affected the level of trust they have with brands in the digital marketplace.

If new policies are enacted to safeguard consumer data, roundtable participants suggested that researchers examine how such legislation would impact the industry. Researchers, for example, could analyze the benefits and risks of various policy proposals and develop models to project whether the industry would decline as a result of limiting the use of consumer data.

Another challenge in the industry is determining how to provide accurate information about consumers and their digital footprint, Sarelson said. That problem could be resolved by creating a central consumer data repository and offer



Pre-Roundtable Reception, May 8th 2019

monetary incentives for people to correct their information. Researchers and academic groups such as IBECC could play a role in this process by gaining access to the data and maintaining the repository as neutral gatekeepers.

Yet another issue the industry faces, according to roundtable participants, is how to keep digital marketers from creating an echo chamber that repeatedly delivers the same messages or the same products to consumers. Participants also concluded that more research is needed on how to motivate consumers to try new products and encourage impulse buying on e-commerce platforms in order to simulate the experience of shopping in brick-and-mortar stores.

IBECC can play a role in addressing these challenges by bringing together companies that compete in the same space to help formulate solutions that will move the industry forward. The institute could also be instrumental in exploring the potential impact of policy proposals designed to safeguard consumer data in the United States.

To bridge the gap between industry and academic research, IBECC continues to work with industry partners on collaborative research projects. This applied research will help develop solutions that will not only benefit consumers by enabling them to make healthier and more sustainable choices, but will also allow companies to make smarter and more profitable decisions based on the tools of behavioral science.

# PARTICIPANTS

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