

**Programmatic Advertising:
Shaping Consumer Behavior or Invading Consumer Privacy?**

UNDERGRADUATE DISTINCTION THESIS

Presented in Fulfillment of the Requirements
For the Degree with Distinction in Marketing in the
Fisher College of Business at The Ohio State University

By

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The Ohio State University

April 2016

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ABSTRACT

Digital advertising is experiencing a disruptive, industry-transforming shift. Everything – from how companies and brands target consumers, record their preferences and behavior, persuade them, and intervene in the consumer decision process – has dramatically changed. Big Data, particularly from consumers’ online behavior, has fueled opportunities for marketers to create optimized campaigns, cost efficiently, and with great precision, through the phenomenon of *Programmatic Advertising*. Over half of digital media expenditures in 2015 were on programmatic advertising. It is estimated that \$17B will be spent on programmatic advertising next year.

Despite its current popularity and exponential growth, there has been a lack of systematic research on programmatic advertising. The goals of this research project are to develop a 360-degree understanding of programmatic advertising, its effect on consumer perceptions and behavior, current industry best practices, and, its projected future. Consequently, this project involves multiple phases and research methods – literature review and analysis (phase 1), qualitative research with managers (phase 2), and a field experiment with consumers (phase 3).

I have developed four hypotheses. I tested two hypotheses with results from in-depth interviews with industry executives, and two consumer-behavior related hypotheses with data from a field experiment with consumers. Results from the qualitative research validate the enhanced efficiency and accountability of marketing expenditures (H1), and the growing abuse of consumer privacy (H2), due to programmatic advertising. Results from the field experiment indicate that programmatic advertising positively affects purchase intentions of online shoppers to a greater extent compared to other forms of online advertising (H3), and builds more positive

attitudes towards brands (H4). Novel findings from this research have broad implications for consumer behavior researchers, advertising and media executives, and policy makers.

ACKNOWLEDGEMENTS

The completion of this thesis is a culmination of many generous and knowledgeable individuals' time and energy. Most notably, I would like to thank Dr. Shashi Matta, whose support, expertise, and guidance has had an enormous impact on this thesis, and it would not have been possible without him.

I would also like to thank Professor Dale Anne Davidson and Dr. Patricia West for serving on my thesis review board.

An Undergraduate Research Award scholarship awarded by the Undergraduate Research Office supported this research. I am very thankful to The Ohio State University for awarding these funds, as their contribution has afforded me the resources to complete my research.

Last but not least, I would like to thank my fellow students for their overwhelming support, throughout this project and through my entire college career.

I. INTRODUCTION

At an eye-opening \$66B in projected revenue in 2016, aggregate digital advertising revenue will surpass television revenue this year. A report by Business Insider reveals that 60% of non-search advertising in 2016 will be attributed to programmatic means, up 8% from 2015. This shift is forcing companies to refocus their marketing practices, improve their digital presence, and become educated on the transformation within the industry. However, a deficit exists amongst marketers when it comes to understanding the phenomenon of programmatic advertising. According to a study done by the Interactive Advertising Bureau, 47% of surveyed respondents claim to “not know or are unsure of what programmatic media buying even is” (IAB, 2015). Not surprisingly, the rapid onset of programmatic has led to researchers and marketers alike to study the issue, hoping to narrow the education deficit and find areas of opportunity for business growth.

Substantial growth in the industry provides evidence that programmatic advertising may have a positive effect on the consumer decision-making process. Systematic research on the effects of programmatic advertising on consumer behavior, however, is an area that lacks research depth. Previous research indicates that targeted advertisements, an important facet of programmatic advertising, enhance click-through rates by as much as 670% relative to conventional online advertisements (Beales, 2010). Further studies show that behaviorally targeted advertisements, those related to consumers’ past behavior online, can act as implied social labels (Rescek, Smith, Summers, 2016). Another aspect of online consumer behavior, purchase intention, has been studied to predict online purchase intentions based on the

psychological state of flow (Korzaan, 2003). In sum, there is some evidence that online advertisements have an impact on the consumer decision-making process. However, these findings are mainly related to other forms of online advertising or were conducted prior to the onset of programmatic advertising. It is important to note the difference between programmatic advertising and other forms of digital advertising. ‘Programmatic’ advertising is an umbrella term that is used to describe the advertising buying process, and it encompasses tactics such as behavioral targeting, Real-Time Bidding, and retargeting. The term covers a wide range of technologies that have begun automating the buying, placement and optimization of advertising, replacing human-based methods.

The growth of programmatic advertising can be attributed to developed technological capability, efficient systems, and stronger methods of consumers’ personal data collection and analysis. Furthermore, ‘Big Data’ allow marketers to utilize programmatic advertising to reach the right person, at the right time, and in the right context. Such data collection has placed emphasis on consumers’ privacy online, particularly the abuse of consumers’ personal online behavioral data. A study commissioned by Yahoo! reveals that Americans demonstrate a “willingness” to share information as they recognize the value of allowing advertisers to use their data “the right way” (Yahoo, 2014). Consequently, researchers in diverse fields, including those in consumer behavior, have continued to challenge this notion. As the amount of consumers’ personal online data expands daily, greater emphasis has been placed on the issue of security.

In this research thesis, I conducted three studies to examine the shifting landscape in digital marketing that is activated by Programmatic Advertising, and to study the effects this phenomenon has on the consumer decision-making process. Findings indicate that programmatic advertising is causing a disruption in the industry, and that it has a positive impact on consumers’

perceptions of brands and online purchase intentions. Similarly, this research provides insight to the growing abuse of consumers' personal data, which is fueling growth within the industry.

II. SITUATION ANALYSIS AND LITERATURE REVIEW

In this phase of the research, I conducted secondary research and industry analysis to arrive at hypotheses on efficiency of marketing expenditures attributed to programmatic advertising, and concerns about consumer privacy, also attributed to programmatic advertising.

Programmatic Advertising and Marketing Expenditures

Programmatic Advertising effects on Efficiency

Programmatic advertising allows companies to serve one specific ad to the right person, at the right time, and in the right context. Contrasted with traditional segment-based buying where advertisers are limited to serving one generic ad to a large, potentially diverse segment of consumers across a variety of contexts, programmatic buying executes campaigns with fine-grained control on a true one-to-one marketing scale (Stillman and Letang, 2015). Today, approximately 20% of all digital advertising is sold by one machine talking to another machine (IAB, 2015). The advertising buying process, one that historically took weeks to complete, has been consolidated to minutes due to advanced automation technologies and precise consumer data profiles. As a result, marketers are witnessing stronger yields from their expenditures. 87% of marketers are seeing greater return through programmatic ads compared to traditional media buying. Such efficiency fueled 32% of marketers to allocate over 50% of their expenditures to programmatic in 2015, up from 14% in 2014 (AdRoll, 2016).

Programmatic Advertising effects on Accountability

Centralized profile databases, global access to 1st and 3rd party data, minimal information

loss, and semantic statistical twinning are the driving force behind the success of digital advertisements (Busch, 2014). Marketers have developed confidence in the precision of their targeting efforts, however viewability continues to be an area of focus to maintain accountability of the programmatic process. “Recent accreditation of verification tools by industry bodies has facilitated adoption by practitioners, and allowed advertisers and publishers to report and transact on verified impressions instead of overall impression delivery” (IAB, 2015). Developments in process security, paired with improving attribution, place control in the hands of marketers, creating greater accountability for campaign success (or failure).

In sum, I hypothesize that,

H1: Programmatic advertising leads to enhanced efficiency and accountability of marketing expenditures compared to non-programmatic advertising.

Programmatic Advertising and Consumer Privacy

Data Collection

Programmatic advertising is made possible through the creation of Big Data, particularly data on consumers’ personal online behavior. Data management platforms (DMPs) help produce a single, coherent set of metrics that can be used to intelligently describe, target, and track a consumer audience across all channels and devices. DMPs work hand-in-glove with demand-side platforms (DSPs) to precisely deliver advertisements to the right consumer, at the right time, and in the right context. Within the programmatic process, data serves three functions: to *identify, target, and deliver*. Identification data is used to figure out which consumer corresponds with which impression, regardless of how they’re accessing content. Targeting data is used to decide whether that consumer is worth bidding on, and if so, what the price should be. Once a user is

identified, and an exchange is made for that impression, delivery data is used to serve the appropriate creative content (Magna Global, 2015). Data that is used in the programmatic advertising process includes, but is not limited to: social data, email, subscriptions, device information, telecom data, and online shopping data.

Big Data and Consumer Privacy

The advancement of data collection serves marketers a very clear purpose: greater efficiency, enhanced targeting, and optimized campaigns. However, this research indicates that there is a paradox among consumers. This paradox, termed by some as the *privacy paradox*, says that people have inconsistent and contradictory impulses when it comes to safeguarding their own personal information” (Turow, Hennessy, Draper, 2015). According to a 2014 Yahoo Advertising report, “roughly two-thirds of consumers find it acceptable or are neutral to marketers using online behavior or information to craft better ads...” The programmatic advertising industry continuously seeks transparency in its processes. That is, marketers must be able to understand where and how their media dollars are being spent. However, this paradox indicates a need for greater transparency in personal data collection and usage, as well. This research shows that consumers’ have either neutral or positive attitudes towards relinquishing data to increase personalization online, but believe that their data will still be misused. Turow, Hennessy, and Draper support the explanation that “a majority of Americans are resigned to giving up their data – and that is why many appear to be engaged in tradeoffs”. This explanation serves as a basis for the second study in this research.

Given consumers’ attitudes towards data collection, this research examined why Big Data has the power to cause detriment. Behind the ‘Big Data’ that fuels efficient and lucrative marketing opportunities, are the dangers of data brokers. Consumer data ranging from online

behavior to medical history, sexual and political orientation, and even psychiatric problems, is available for purchase. Tim Sparani, Facebook's first director of public policy notes on a 60 Minutes special, "It's not about what we know we're sharing, it's about what we don't know is being collected and sold about us" (Kroft, 2014). Aforementioned personal data collection is a consumer threat that results in marketers' ability to more precisely find the right consumer, in the right context. The Federal Trade Commission sets current regulation for data usage in advertising, while companies such as AboutTheData.com attempt to educate and protect consumers from personal data abuse within the digital marketing space. Therefore, I hypothesize that,

H2: Programmatic advertising contributes to a growing abuse of consumer privacy.

III. STUDY 1: QUALITATIVE RESEARCH WITH INDUSTRY INSIDERS

Study 1 builds upon the situation analysis and literature review to examine trends in the programmatic advertising space that will impact the future of the industry. In this study, I conducted three personal interviews with experts in the industry and extracted insight regarding the outlook of digital advertising, with an emphasis on the effects programmatic will create.

Shifting Campaign Objectives

Programmatic advertising utilizes the strength of 'Big Data' to sharpen targeting efforts of digital campaigns. This tool provides marketers the unique opportunity to surpass several key steps in the consumer decision making process, and simply focus on reaching consumers in the final stages of their decision making process. The desire for performance-based campaigns is

largely responsible for marketers' shift to programmatic. Diego Rodriguez, sales executive at Pandora, a music streaming service that now sells its advertising inventory strictly programmatically, believes there will be a renewed focus on campaign objectives. He says, "Data is a double-edged sword. Everybody wants: 'right consumer, right time'. It's overdone on the targeting front. A big trend will be replacing the top of the funnel – branding, awareness, and prospecting". Other experts strongly believe that the industry is creating a "filter bubble", adding further value to replacing the aforementioned metrics of focus.

Advanced Attribution and Methodologies

Research reveals that advertisement attribution is a continuous focus within the industry. 84% of marketers believe attribution is critical to marketing success in 2015, compared to just 35% of marketers indicating it as critical in 2014 (AdRoll, 2016). Laura Loveless, associate director at Rise Interactive, an interactive digital marketing and analytics firm, stresses the importance of progressing attribution methods going forward. She says, "Click attribution is old school. Display 'last click' is flawed. Both attribution models are elementary. Advanced attribution will be necessary to improving the industry standard". Furthermore, 48% percent of marketers indicate 'viewability tracking' as the future of attribution, while 36% believe 'better multi-touch attribution tracking' is the future (AdRoll, 2016). Consensuses among experts in this study echo the views of Loveless, noting advertising fraud as a major concern relating to current attribution models.

Programmatic Television

In 2015, 26% of marketers bought programmatically on television (AdRoll, 2016). A report from Magna Global predicts that by 2019, roughly two-thirds of total digital video spend in the U.S. will be spent on programmatic TV (Magna Global, 2015). Nikhil Hunshikatti, VP of

marketing at the Dispatch Media Group, a leading online news publication, sees programmatic TV as a monumental opportunity. He says, "From a content standpoint, the systems are intelligent enough to gather that data – once somebody figures out how to augment the TV advertising programmatically, the industry could blow up". Research defends Nikhil's insight. Magna Global indicates that programmatic TV is the next platform that marketers' will indulge into, however it is likely to experience road bumps, as television will be going through a systematic shift in the near future. Further insight from this study reveals that experts are dipping their feet into programmatic TV, while keeping a keen eye on its progression.

Summary from Secondary Research

Programmatic advertising growth shows no signs of slowing and is being adopted by an increasing number of marketers. The industry is enamored by the enhanced efficiency and marketing ROI that programmatic advertising is able to achieve. Experts propose that programmatic advertising positively impacts consumers' attitudes towards the brand being advertised and increases consumers' purchase intentions compared to non-programmatic advertising. I explore these assertions in a consumer study. Specifically, study 2 tests the effects of programmatic advertising on consumers' online purchase intentions and attitudes towards brands.

I propose two hypotheses based on my qualitative research with industry experts -

H3: Programmatic Advertising positively affects purchase intentions of online shoppers to a greater extent compared to other forms of online advertising; and

H4: Consumers exhibit more positive attitudes towards brands that target them using programmatic advertising than towards brands that target them with non-programmatic advertising.

IV. STUDY 2: CONSUMER PERCEPTION AND BRAND LOYALTY

Overview

Study 2 was conducted to investigate the relationship between programmatic advertisements and consumers' attitudes towards a brand and their online purchase intention. Study 2 was designed to test H3 and H4. This study collected data from respondents through an online survey tool.

Method

Respondents were given a questionnaire using an online survey platform, Qualtrics (N=60). All participants were asked to provide information relating to online browsing behaviors, such as likelihood of visiting online news publications, e-commerce websites, and social networks. Additionally, participants were asked to provide demographic data including age and gender. Half (N=30) of the participants were given a questionnaire that resembled a makeshift programmatic process, serving advertisements that were tailored to previous behavior. Remaining participants (N=30) were given an identical questionnaire, however advertisements presented to them were unaffiliated with previous behavior. Respondents evaluated their attitudes towards the brand and their online purchase intention on a scale from 1-5 (1=strongly disagree and 5=strongly agree). Following each served advertisement, respondents were asked to what extent they agreed or disagreed with a series of statements.

The dependent variable, Attitudes Towards a Brand, was measured using the following items:

- This advertisement is relevant to me
- I would recommend this brand to friends and family
- This advertisement reflects my online behavior
- I associate myself with this brand

The dependent variable, Online Purchase Intention, was measured using the following items:

- I want to learn more about the product or service being advertised
- The product or service being advertised reflects a direct need or desire of mine
- I am intrigued to click on this advertisement
- I am interested in the product or service being advertised

Results and Discussion

Results showed that respondents carry more positive attitudes towards a brand and exhibit greater online purchase intention when delivered a programmatically served advertisement. When measuring consumers' attitudes towards a brand, programmatically served advertisements were rated significantly different when compared to non-programmatic advertisements. When presented with programmatic ads, respondents reported greater personal relevance ($t(30)=4.14, p < .001$), stronger attitudes towards recommending the brand to friends and family ($t(30)=4.89, p < .001$), a greater reflection of the respondents' online behavior ($t(30)=4.79, p < .001$), and a stronger association with the brand ($t(30)=4.65, p < .001$), when compared to non-programmatic ads.

Similar results were found for measures of purchase intention. Study participants reported that, when compared to non-programmatic ads, programmatically served advertisements reflected greater need or desire ($t(30)=1.89, p < .05$), intrigued them more to click on the advertisement ($t(30)=3.61, p < .05$), and interested them more in the product being advertised ($t(30)=2.9, p < .05$). (Refer to Figures 1 and 2)

These results provide evidence that programmatically served advertisements positively affect purchase intentions of online shoppers to a greater extent compared to other forms of online advertising (H3), and build more positive attitudes towards brands (H4). Additionally, this study supported the *privacy paradox*, strengthening the dissonance that is created among consumers. This research revealed that consumers, on average, react positively towards programmatically served advertisements. However, the majority of respondents (56%) revealed that they believe websites use their personal data to “sell and make a profit from it”, while only one in five respondents (20%) believe that websites use their data to “enhance their online experience”. This data supports H2.

Figure 1

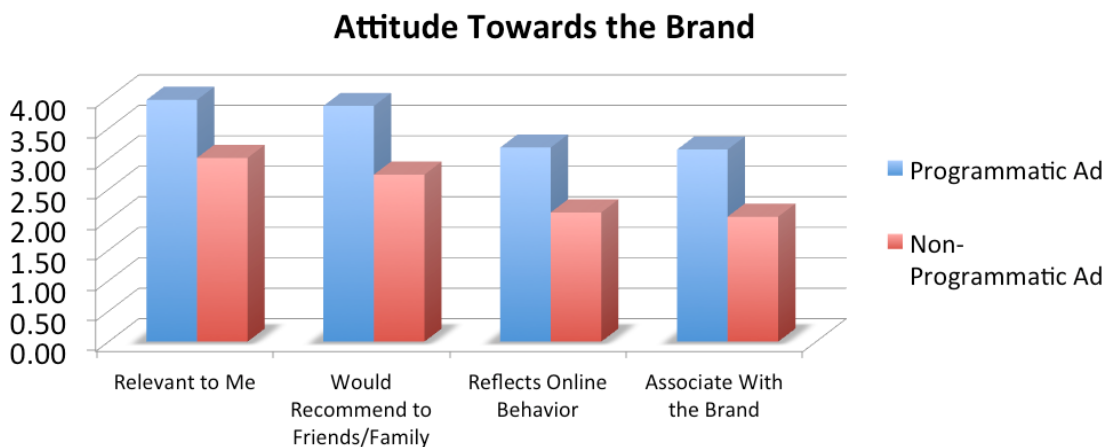
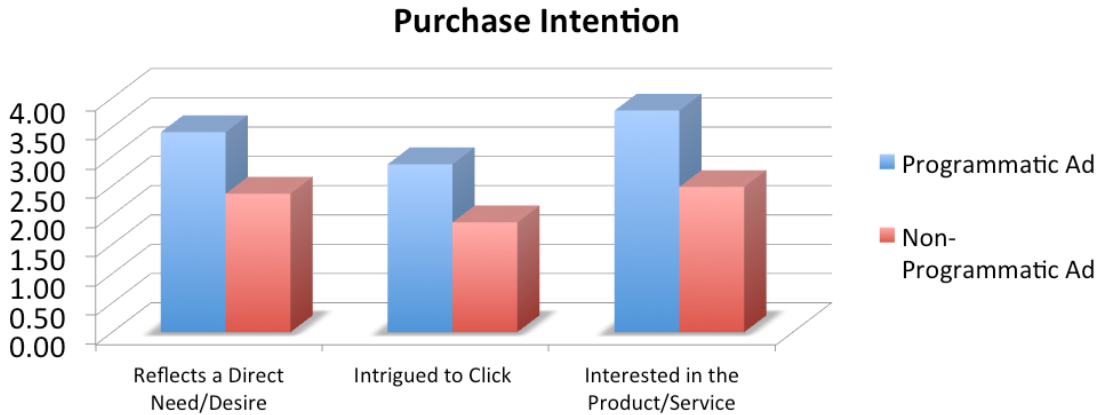


Figure 2



V. GENERAL DISCUSSION

The topic of programmatic advertising is of high importance to researchers, organizations, and policy makers. This is one of the first instances where consumers' online behavior was measured as an effect of programmatic advertising. Across three studies, we confirm the hypotheses that programmatic advertising generates greater efficiency and accountability of marketing expenditures, and heightens the abuse of consumer privacy. Similarly, results reinforce the hypotheses that programmatic advertising positively affects purchase intentions of online shoppers to a greater extent than other forms of online advertising, and builds more positive attitudes towards brands.

Overall, our findings contribute to theory (e.g. online consumer behavior, and consumer perception) and have significant implications for organizations (e.g. publishers, advertisers, and intermediaries) and policy makers (e.g. consumer privacy, and Internet fraud).

Theoretical Implications

This research provides an early examination into the effects of programmatic advertisements. We uncover how programmatic advertising is altering consumer attitudes

towards brands and purchase intentions. By utilizing consumer data to more accurately implement target efforts, consumers have a propensity to associate to the brand, and recommend the brand to friends and family. In contrast, availability of this data creates a dissonance among consumers, who also reveal that they believe the data is being misused. This relationship presents a compelling case for researchers and policy makers to study and address the extent to which mass collection and use of consumers' personal data contradicts consumers' attitudes towards brands.

Managerial Implications

Our findings offer several important implications for managers, as key findings suggest reason for managers to adopt programmatic advertising. Through programmatic means, managers have the ability to positively affect consumers' attitudes towards their brand, as well as increase the likelihood of generating purchase intention online. For instance, 87% of marketers produce a greater return on their marketing expenditures through programmatic means compared to other forms of online advertising. Similarly, our findings indicate that programmatic advertising revenues will grow by over \$4B by 2020, providing financial incentive for managers to strengthen their education of this tool, as well as begin initiating action to increase programmatic spending within their marketing strategy.

This research can also motivate publishers to sell inventory programmatically in order to increase efficiency of their current media selling strategy, as well as to generate higher revenue for current advertising inventory. Additionally, this research serves marketers, publishers, and intermediaries alike the education needed to effectively implement a programmatic media buying strategy, while also cautioning participants on the dangers of it.

Lastly, these findings increase the transparency of online personal data usage, providing consumers the opportunity to further understand how participants are using their information to enhance the online experience. Contrarily, this research provides consumers the opportunity to understand the dangers that exist in voluntarily giving up personal information. Additionally, policy makers designing interventions for both personal data usage and advertising can benefit from this research. Perhaps positively enhancing data transparency will have similar positive enhancements on advertising transparency and effectiveness.

Limitations and Future Research

This research measured respondents' self-reported online behavior. Self-reported online behavior is not nearly as accurate as data collected from observed online behavior. Respondents were given a restricted number of online decisions, whereas online data collected from observed online behavior would provide a much deeper understanding of the consumer. Therefore, this research cannot confirm that the online behavior of respondents is how the respondent would *actually* react in the world outside of our survey. Similarly, this research created a makeshift programmatic process. The process that was executed does not take into account the variety of algorithms or data used in an actual programmatic process. While our research provides compelling evidence for the effects of programmatic advertisements on consumer attitudes towards brands and online purchase intention, it still falls short of claiming causation.

Future research could provide a test for causation. For instance, does an advertisement that is served programmatically result in greater sales than an advertisement that is served non-programmatically? A longitudinal study could perhaps find evidence for such a relationship. Similarly, future research could include a test for consumers' resistance to persuasion, and

whether that has an effect on online purchase intention. For instance, how are the effects of a programmatic advertisement moderated by a consumer's resistance to persuasion?

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APPENDIX

Measures used in Study 1

Interviewees

- I. Diego Rodriguez
 - a. Diego is a business development and strategy manager at Pandora, a personalized music service that has recently shifted to programmatic advertising buying. Prior to Pandora, Diego has a track record in digital advertising for the past 6 years.
- II. Laura Loveless
 - a. Laura is an associate director at Rise Interactive, a digital marketing agency that specializes in digital media, customer experience, and advanced analytics. Laura is a dynamic programmatic display specialist, demonstrating deep knowledge of advertising technology & exchanges for display and mobile devices. Specializes in buy side integrations and bidding technology.
- III. Nikhil Hunshikatti
 - a. Nikhil is the vice president of marketing at the Columbus Dispatch, a large newspaper publication that sells inventory programmatically. Nikhil is responsible for all media strategy, and has significant experience working in the publishing industry.

Interview Bank

- I. Common Questions for all interviewees
 - a. In your opinion, why is programmatic important to the future of advertising?
 - b. What has been the biggest shift in programmatic that you have witnessed over the last year or two?
 - c. What companies are utilizing programmatic very well on the brand side? On the publisher side?
 - d. There has been an uptake in new programmatic platforms such as Facebook, Twitter, and Pinterest. What are your experiences on these platforms and what are the benefits and challenges of each?
 - e. What are the weak points of programmatic for advertisers? In what situation is programmatic not the best platform to use?
 - f. What are trends that you see developing in the programmatic realm?
 - g. Can you explain the impact growing abuse of consumers personal data is making on the industry?

Measures used in Study 2

Data Collection

- I. Demographic Data
 - a. Gender
 - b. Age
- II. Behavioral Data
 - a. Please indicate which website you are most likely to visit:

- i. BuzzFeed
 - ii. Bleacher Report
 - iii. Elite Daily
 - iv. Wall Street Journal
 - b. Please indicate which website you are most likely to browse:
 - i. Twitter
 - ii. LinkedIn
 - iii. Facebook
 - iv. Pinterest
 - c. Please indicate which of the following websites you would be most likely to shop on:
 - i. Macys.com
 - ii. DicksSportingGoods.com
 - iii. Nordstrom.com
 - iv. Lululemon.com
 - d. Which of the following choices is most important to you?
 - i. Comfort/Functionality
 - 1. Which of the following items are you most likely to purchase?
 - a. Athletic apparel
 - b. Professional or semi-professional clothing
 - ii. Fashion/Style
 - 1. Which of the following items are you most likely to purchase?
 - a. Fashion accessories
 - b. Professional clothing
- III. Advertisements Served
- a. Control Group





- I. Please indicate how much you agree or disagree with the following statements (1=strongly disagree, 5=strongly agree)
- a. This advertisement is relevant to me
 - b. I would recommend this brand to friends and family
 - c. This advertisement reflects my online behavior
 - d. I associate myself with this brand
 - e. This brand has effective advertising
 - f. The product or service being advertised is familiar to me
 - g. This advertisement is directly related to my recent online shopping behavior
 - h. This advertisement was served to me based on my previous answers
 - i. I enjoy viewing this advertisement
 - j. I want to learn more about the product or service being advertised
 - k. I would like to see more advertisements like this
 - l. This advertisement appeals to me
 - m. The product or service being advertised reflects a direct need or desire of mine
 - n. I am intrigued to click on this advertisement
 - o. My knowledge of this brand is above average
 - p. I am interested in the product or service being advertised

IV. Advertisements Served

- a. Test Group
 - i. Based on demographic data

(If male)



(If female)



- a. Test Group
 - a. Based on retargeting data (all advertisements were retargeted based on previous answers to makeshift online shopping experience)
 - b. Each item represents a purchase decision by the respondent





amazon.com

FOSSIL WOMEN'S ES3817 ...

★★★★★ (23)

\$115.00 Prime

Shop now



\$173.52 at Amazon - ★★★★★

Casio G-Shock G-STEEL Series Solar Powered World Time Analog Digital Gold Black... - \$173.52

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