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Citation: Tucker, Catherine E. "The Economics of Advertising and Privacy." International Journal of Industrial Organization 30, no. 3 (May 2012): 326–329.

As Published: http://dx.doi.org/10.1016/j.ijindorg.2011.11.004

Publisher: Elsevier

Persistent URL: http://hdl.handle.net/1721.1/99168

Version: Author's final manuscript: final author's manuscript post peer review, without publisher's formatting or copy editing

The Economics of Advertising and Privacy

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Abstract

One of the new realities of advertising is that personal information can be used to ensure that advertising is only shown and designed for a select group of consumers who stand to gain most from this information. However, to gather the data used for targeting requires some degree of privacy intrusion by advertisers. This sets up a tradeoff between the informativeness of advertising and the degree of privacy intrusion. This paper summarizes recent empirical research that illuminates this tradeoff.

Keywords: Privacy, Online Advertising

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1. Introduction

The Internet and the digital communication technology revolution has dramatically increased firms' ability to target advertising and make sure that it is shown to only certain preselected groups of people. Technological advances also mean that consumer information can be used to personalize and tailor the actual content of the advertising being shown to the interests of the person seeing them.

This theoretically means that advertising can be more informative to consumers than it was before. First, targeting means that advertising needs only be served to people who are potentially interested in making a purchase. For example, an ad explaining the technology behind a diaper that ensures there are no leaks during the night, will not be that informative for the majority of the population but may be very informative to a new mother. Second, the content of advertising can be personalized to gear the information in the ad to the mother viewing the ad. For example, the content of the ad could be geared to emphasize different properties of the diaper to mothers of newborns verses mothers of older toddlers.

In economic models of advertising, usually informativeness of advertising enters into a consumer's utility via increased awareness of different products and prices (Chamberlin, 1933). The general idea is that if firms are identical and consumers are poorly informed, from a consumer's perspective there is utility from being informed of a product's existence and prices (Butters, 1977). Therefore at first glance the fact that new digital technologies are enabling more informative advertising would appear to indirectly increase a consumer's potential utility.[1]

However, this achievement of increased informativeness may not be costless. Advertisers use consumers' 'click-streams,' their click-by-click footprints as they navigate across the web, to construct detailed profiles that can be used to target advertising more accurately than ever before. In the diapers example, an advertiser might track whether someone visits a website that deals with new babies' health issues and then use that information to serve them ads. Alternatively, an advertiser could use information that a person has posted about themselves on a social networking website such as Facebook to identify new mothers.

There are two broad reasons given in the literature why consumers may resist such advertising as privacy-invasive or overly intrusive. Consumers may be wary of being tracked too closely by firms and then firms using this information to tailor prices (Acquisti and Varian, 2005). The general equilibrium effects of such a model and behavior are beyond the boundaries of the current paper but it is accurate to say they are

[1]Such personalization was studied from a theoretical perspective by Anand and Shachar (2009), who pointed out that the signaling power of a targeted ad in the traditional ad-signaling framework (Kihlstrom and Riordan, 1984) could be strengthened by personalizing the ad, making consumers more likely to assume there is a match between them and the product.

both complex and mixed (Fudenburg and Villas-Boas, 2006). However, it is not obvious that this is the whole story. For example, in the diapers example it is unlikely that there would be a direct effect on the price paid by the mother as a result of the exposure to the ad, since diapers are largely bought offline and manufacturers are not easily able to match a cookie on a computer to a real-life offline customer.

Instead, in the diapers example the harm appears to come directly from disutility that a customer might feel from the perceived intrusiveness of the advertising. This has been directly documented in survey research. For example, Turow et al. (2009) find that 86% of young adults say they don't want tailored advertising if it is the result of following their behavior on websites other than one they are visiting.

There is no clear economic literature that helps factor such distaste into the standard utility model. Instead, as discussed by Johnson (2009), the challenge is to capture the disutility expressed by consumers when faced with more 'informative' advertising. The closest academic framework derives primarily from a social psychology literature that describes how consumers respond when they perceive something as overly intrusive or encroaching. In this case 'reactance' leads them to resist the ad's appeal (White et al., 2008). 'Reactance' describes a process where consumers resist something they find coercive by behaving in the opposite way to the one intended, which is in this case not finding the ad appealing (Brehm, 1966; Clee and Wicklund, 1980; Brehm, 1989). Fear of such resistance has led advertisers to reduce their reliance on targeting techniques (Lohr, 2010).

It is important to be clear that reactance is just one way of characterizing consumer's unfavorable response to ads. Reactance describes a strategy that consumers use to avoid complying with a persuasion attempt but does not directly characterize the cause of discomfort associated with a privacy invasion. The precise characterization of this discomfort that consumers experience when experiencing data-enriched advertising is an important direction for future research.

Therefore, an unusual feature of online advertising markets is that they are characterized by a tension between the desire of a firm to be informative to the right set of consumers, and consumers' apparent distaste for how firms use data to try to improve the informativeness of advertising. The aim of this short summary is to summarize my recent work that has empirically studied how privacy concerns affect such advertising markets.

2. Does consumers' distaste for 'intrusiveness' matter empirically?

The majority of research into distaste for intrusive advertising has been survey-based (Turow et al., 2009). However, this leaves open the question of how much it matters in terms of actual consumer behavior. This

is particularly the case as work such as Beresford et al. (2010) has found little empirical evidence of privacy concerns when it comes to choosing a vendor, though other research such as Acquisti and Spiekermann (2011) has found that interruptive advertising can reduce willingness-to-pay by consumers in a lab setting.

An obvious first question is the extent to which this matters for consumers' responses to advertising. Goldfarb and Tucker (2011a) investigate how consumer privacy concerns affect what kind of advertising techniques work and, more crucially, do not work. Faced with consumers who simply ignore online banner ads, the advertising industry developed two different techniques. First, advertisers improved their targeting of ads - for example, by making sure that ads matched the content that the web user appeared to be seeking. Second, advertisers developed obtrusive ad features using video and audio, including the ability to make an ad float above or take over content the user is seeking. We explored the effectiveness of these two techniques, both in isolation and in combination. To measure advertising effectiveness, we used a very large database of field tests for online display advertising campaigns. In isolation, these two techniques each significantly increase advertising effectiveness. However, surprisingly, attempts to combine both targeting and obtrusiveness nullify the positive effects that the two techniques have in isolation. The same obtrusive ad works far better on websites with irrelevant content than with relevant content.

One potential explanation of this result is that both of these advertising techniques impinge on users' privacy. Even weak forms of targeting rely on advertisers collecting and using more data about the user and what they are looking at online than is the case for mass-media advertising. Intentionally obtrusive ads – ads designed to compete with the content next to them – also intrude on users' privacy by interrupting their online experience without permission. Privacy concerns appear to be the underlying behavioral driver in our results, because the combination of obtrusiveness and targeting diminishes ad effectiveness more for privacy-sensitive items (such as healthcare and financial products) and for people who exhibit privacy-sensitive behavior while taking the survey.

3. How can and do firms respond?

Given this evidence that consumers do appear to respond negatively to overly intrusive advertising, the next question is how firms can directly address this. One option is to simply stop using intrusive advertising techniques. However, an obviously preferable option from the firm's perspective is if there was a way that they could obtain the benefits of highly-sophisticated targeting techniques without the costs in terms of consumers' distaste. It is this possibility that I study in Tucker (2011b).

Recent research in information systems has suggested that firms allowing their customers individual-level

control can reduce privacy concerns (Fusilier and Hoyer, 1980; Culnan and Armstrong, 1999; Malhotra et al., 2004). Therefore one potential, practical way of resolving the informativeness and intrusiveness tradeoff is to give consumers explicit control over how their information is used in the hope of reducing the disutility that results from intrusiveness. There is already signs that this is happening. For example, social networking sites like Facebook are experimenting with new technologies that allow consumers explicit control over how much information about them is publicly available. Theoretically, this could minimize the potential for reactance and improve the performance of online advertising, because behavioral research has emphasized the importance of consumer perceptions of control in reducing reactance (Taylor, 1979).

Tucker (2011b) investigates how internet users' perception of control over their personal information affects how likely they are to click on advertising. I use data from a randomized field experiment conducted by a US-based non-profit organization (NPO) to optimize its advertising campaigns on Facebook. These campaigns were shown to 1.2 million Facebook users. The NPO's aim was to raise awareness of its work improving education for women in East Africa. The NPO randomized whether it explicitly personalized the ad copy to match the user's profile. For example, sometimes the text of the ad explicitly mentioned a celebrity of whom the user had specified on their profile that they were a fan. On other occasions, the NPO showed the same group of fans an ad that was deliberately generic in the text and made no explicit mention of the celebrity.

Facebook gave users more control over their personally identifiable information in the middle of the field test, though it did not change how advertisers used anonymous data to target ads. After this change, users were twice as likely to click on personalized ads. There was no comparable change in the effectiveness of ads that did not signal that they used private information for targeting. The increase in effectiveness was more pronounced for ads that used more unusual private information (such as a user's liking for a 1960s feminist poet) to personalize their message. This suggests that giving users the perception of more control over their private information can be an effective strategy for advertising-supported websites. The paper itself features multiple robustness checks and controls that attempt to eliminate alternative explanations for the result such as media attention, changes in the ad algorithm or group of users who use Facebook.

This result is important because of its implications for the regulation of online privacy and how firms collect and store data about their customers. An increasing focus on the risks of technology-based advertising for consumers' privacy has led to enactment of privacy regulation in Europe and multiple bills currently under discussion in the US Congress. Currently, proposed and current regulations governing online advertising in the US are focused around the mechanics of how websites implement opt-in and opt-out use of cookies and

other tracking devices.

However, Tucker (2011b) suggests that it is not always the case that the trade-off between privacy protection and advertising effectiveness must be negative. Instead, by giving consumers explicit control over how their data is being used and therefore potentially increasing information about the data collection process firms may be able to alleviate some of the tradeoff between how informative their advertising can be and how intrusive consumers find it.

This tradeoff has now been shown to be real and substantial in (Goldfarb and Tucker, 2011c). That paper studies empirically the economic effects of privacy regulation for the advertising-supported internet. The implementation of privacy regulation in Europe has made it more difficult for firms to collect and use consumer browsing data to target their ads more accurately; our field test data shows these policies are associated with a 65% reduction in the influence banner ads have on purchase intent. There was no change in ad effectiveness on Europeans who looked at non-EU websites after the regulation was passed. The reduction we measured is particularly pronounced for websites offering content that is not easy to match to advertising (such as news websites and media services). It is also more pronounced for non-intrusive and smaller ads, since their appeal rests primarily on the presentation of informative rather than attention-grabbing messages. This suggests that privacy regulation might change the web landscape in unanticipated ways, with advertising becoming even more intrusive, and marketers shifting their media buys away from sites such as news providers that are difficult to match with relevant advertising.

4. Future Directions

Neither of the approaches to the governance of privacy studied in these papers are necessarily ideal. Goldfarb and Tucker (2011c) suggests there may be large costs of privacy regulation if governments simply take an approach of restricting the use of data. The introduction of Facebook privacy controls studied by Tucker (2011b), though beneficial for advertising performance, is not ideal, because it is not clear that consumers were well-informed about the extent to which the new privacy controls actually applied to data used for advertising. This suggests that there is a large degree of scope for studies that attempt to isolate better ways of addressing consumer privacy concerns but still permitting the benefits of increased informativeness of advertising.

Specifically, the results of Tucker (2011b) suggest that there is a need for empirical work that attempts to understand the extent of informational asymmetry between consumers and firms in such industries about how much data is being collected, and its consequences for online advertising. As discussed by Hermalin

and Katz (2006); Hui and Png (2006), it is this asymmetric information which prevents the classic Coasian solution proposed by Posner (1980) that is based on the allocation of a property right over data. On occasions it is reasonable to expect there is little asymmetric information: for example, 'social advertising' deliberately uses the names and actions of peoples' 'friends' on social network websites to personalize ads (Tucker, 2011a). Similarly, dynamic retargeting produces ads featuring the very product that someone previously looked at on a particular website, such as a specific type of sneakers, as the focus of the ad (Lambrecht and Tucker, 2011). In each case, it is difficult to conceive that consumers could not realize that specific and personal information was being used to target the ads. However, for more general forms of behavioral targeting, such as using a visit to a health website to target certain types of pharmaceutical advertising, it is less clear that consumers can identify whether their data is being collected and used to serve ads.

Such research is also increasingly important because though most of the debate about privacy and advertising has taken place with reference to online advertising (Evans, 2009), recent technological advances may lead such concerns to also apply to the offline world. The development of QR codes, barcode-like images that can be scanned by smartphones, mean that printed advertising now has the potential to track consumers and their locations, and in some cases link their scan of an ad to an existing data profile. Already direct mail has the potential to be intrusive (Goldfarb and Tucker, 2011b), but this means that advertiser have better means of actually tracking its effectiveness. On television and radio, which is often though of as the canonical example of mass-marketed untargeted brand advertising, technological advances in interactive advertising mean that firms can now target ads at the household level, using methods described in (Sherman, 2011).

There is also a need for more studies that understand how these growing consumer privacy concerns may affect industry dynamics and competitive structure. For example, Campbell et al. (2010) shows that an unintended consequence of privacy regulation is that it can help entrench monopolies. This paper builds a simple theoretical models of opt-in consent and show that consumers may be more likely to give such consent to large networks with a broad scope rather than less established entrants. In other words if regulation forces websites to obtain strong forms of opt-in consent, people may have been more reluctant to give such consent and try the new search engine Google in 1999, rather than the more established Altavista. However, it seems possible that there are many other potential effects of privacy on industry dynamics such as contexts where firms compete on the amount of privacy protection offered. As suggested by Evans (2009) this may be particularly relevant for models of platform competition in advertising markets.

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