JOURNAL OF MARKETING THEORY AND PRACTICE
https://doi.org/10.1080/10696679.2024.2398701

To block or not to block? Predictors of ad blocker usage

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ABSTRACT

Despite their growing prevalence, limited academic research exists on predictors of ad blocker software usage. A survey of 299 U.S. Internet users explores potential predictors for ad blocker users' (ABUs) continued usage and ad blocker non-users' (ABNUs) future usage (i.e. installation of blockers). Findings demonstrate that advertising avoidance and satisfaction are predictors for ABUs and privacy concern predicts ad blocker installation among ABNUs. Moreover, mobile (desktop) Internet usage positively (negatively) predicts installation among ABNUs. Our findings make unique contributions to an understudied topic within the advertising avoidance literature in the ever-changing digital age.

The Internet's usage for communication, entertainment, and information has been matched by its popularity among marketers as a means for tracking, measuring, and targeting consumers. The popularity of online advertising among marketers increases year over year, with a 7.3% increase in digital ad revenues from 2022 to 2023 alone, totaling $225 billion (Internet Advertising Bureau, 2024b). Indeed, in the digital realm, there are few avenues or platforms in which advertising does not have some kind of presence, whether on websites, tablet/smartphone apps, or Internet-connected games. For example, while most users likely do not consider the Uber service or the physical Vizio TV sets by default as ad platforms, the former is predicted to generate close to $1 billion in revenue mostly from its in-app ads, while Vizio was purchased in early 2024 by Walmart primarily for monetizing the digital interface of its TV sets as an ad platform (Lindsay, 2024).

As a result of this proliferation and encroachment of, and constant user encounter with, commercial messages online, there has been rising consumer concern about both online privacy and excessive marketing exposure (Goswami, 2020). While some technology firms have attempted to respond to consumer concerns in this area by implementing changes to ad and data tracking within their digital products, often these changes are explained in somewhat unclear ways or may not truly address core consumer concerns. For instance, in the description of Google Chrome's Do Not Track feature (which must be manually activated by a user), it is noted that even with the feature turned on, "Many websites will still collect and use your browsing data to improve security, provide content, services, ads and recommendations on their websites, and generate reporting statistics. Most websites and web services, including Google's, don't change their behavior when they receive a Do Not Track request" (https://support.google.com/chrome/answer/2790761). Apple's description of its Privacy Preserving Ad Measurement function for Safari browsers does not make clear that turning this function *on* specifically allows sending of ad effectiveness data to advertisers, while turning it *off* prevents this (in addition, this explanation is located as a small section in a lengthy Legal documentation page: https://www.apple.com/legal/privacy/data/en/safari).

The growing deluge of online ads and the often confusing array of platform/browser changes and features have resulted in a growing number of consumers attempting to take matters into their own hands to efficiently reduce the tide of ads they are exposed to online via ad blocker adoption. There are numerous ad blocking apps and browser extensions that are easy to install and use, often provided at no financial cost to consumers (e.g. two of the most utilized ad blockers, Adblock Plus and AdBlock). While such applications cannot block all forms of marketing messages, they are highly effective at eliminating many third-party, paid advertising forms, such as banners, pop-ups, video pre-rolls, third-party links, and sponsored social media posts, and may boost consumers' perceptions of increased privacy. Recent industry reports find that approximately a third of U.S. Internet users overall

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Supplemental data for this article can be accessed online at https://doi.org/10.1080/10696679.2024.2398701.

(33.6%) report using some form of ad-blocking software (Statista, 2023), with server-side tracking measures showing 27% ad blocker usage on desktop computers and approximately 22% on tablets and smartphones (eyeo, 2023). While these percentages do not indicate a majority of US Internet users utilizing ad blockers (yet), current rates of ad blocker usage are estimated to result in $24 billion worth of lost online ad revenue in 2024 (eyeo, 2023).

Marketers are understandably concerned about the proliferation of such technologies by consumers due to the resulting ad-mitigating (and revenue-reducing) outcomes. If a significant number of Internet users avoid their messages, the impact of marketers' online advertising efforts will be drastically reduced and their Internet ad spend wasted. However, despite their growing penetration as a part of consumers' online activities, especially as Internet access grows due to the popularity of mobile devices and as American consumers place increasing importance on data privacy (Lucas & Stein, 2020), thus far there have been relatively few academic studies of ad blocker usage, although the literature is slowly growing. The few published academic studies in this area have largely adopted the marketer's perspective, taking a game theoretic or econometric approach through theoretical simulations, or acquiring a large industry-sourced dataset and analyzing the impact on platform/vehicle revenue and exposure (e.g. Johnson, 2013; Todri, 2022). Even fewer academic studies have investigated predictors of ad blocker usage among consumers.

Among these handful of predictor-focused studies, ad blocker users/usage has been investigated without a comparative basis with non-blocker users (e.g. Söllner & Dost, 2019, where all survey responders were chosen specifically because they were ad blocker users). Alternately, ad blocker usage as a dependent variable has commonly been conceptualized dichotomously as either a research participant being a current user vs. a past user of ad blockers (Redondo & Aznar, 2018) or having an ad blocker installed vs. not (Brinson et al., 2018). These conceptualizations are understandable and reasonable given the focus on understanding what leads consumers to use ad blockers. An exception to this is Brinson and Britt (2021), who categorized participants as current ad blocker users, former users, never users but considering usage, and never users with no interest in usage. The current research shifts this conceptualization to not only compare users and non-users of ad blockers but to focus specifically on actual future intentions regarding ad blocker usage. While marketers are generally interested in whether a consumer is an ad blocker user in the moment, given the ad and product revenue-reducing impacts of ad blockers, we posit that understanding future consistent likelihood regarding ad blocker usage is also critical for marketers to understand so that they can plan for long-term potential consequences of these actions.

The current research builds on a handful of prior predictor-oriented studies of ad blocking. Via a survey of 299 U.S. Internet users, we (1) expand the outcome focus from static ad blocker usage status (e.g. whether one currently uses an ad blocker) to ad blocker intention by investigating potential predictors of ad blocker users' (ABUs) *likelihood of continuing to use* ad blockers and ad blocker non-users' (ABNUs) *likelihood of installing* ad blockers, (2) assess the degree to which extent of desktop and mobile device usage separately relate to ABUs' vs ABNUs' ad blocker intentions (which has not been investigated in prior academic ad blocker studies), (3) directly measure the separate contribution of privacy concern and perceived privacy control on said intentions, and (4) propose and investigate the predictor variable of satisfaction that captures the predictive impact of prior ad blocker experience quality.

Conceptual framework and hypotheses

Ad blockers as advertising avoidance

In their seminal work, Speck and Elliott (1997) conceptualized three core types of advertising avoidance – behavioral, cognitive, and mechanical. Behavioral avoidance involves physical, non-tool-based actions on the part of the audience to avoid marketing (e.g. leaving a website that is inundated with too many ads or closing pop-up and roll-over ads). Audiences engage in cognitive avoidance by mentally ignoring messages recognized as being promotional in nature, including simply tuning out all such persuasion efforts or actively counterarguing their messages. When engaging in mechanical avoidance, audiences utilize specific medium-related tools to avoid exposure. This kind of avoidance has typically been studied in the context of TV where audiences can perform actions such as clicking the mute button or fast-forwarding through commercials when playing back recorded content (e.g. Rojas-Méndez & Davies, 2017).

Ad blockers are a form of mechanical avoidance in that they are an Internet-specific tool that aids consumers in non-exposure to commercial messages. However, ad blockers have a property distinguishing them from other mechanical avoidance tools as well as

behavioral and cognitive avoidance tactics. Almost any other form of ad avoidance is done on a case-by-case basis in response to specific ads. For example, skipping TV commercials requires either fast forwarding past them or pressing a button to skip each (set of) ads all at once as they appear. Clicking to close/skip pop-up and pre-roll ads involves manual effort. While ad blockers require up-front effort by the user (e.g. selecting, downloading, and installing), once this is completed, ad avoidance is automatic and passive. Ad blockers function as a highly effective penetrative filter between Internet users and most kinds of ads they encounter. This filter removes even the opportunity for ad exposure – after ad blocker installation, consumers can conduct their Internet activities as normal and never be exposed to most online ads. Thus, the concern among marketers regarding this form of avoidance is quite understandable.

Predictors of ABUs' and ABNUs' future utilization of ad blockers

Advertising avoidance

While there has been significant work examining ad avoidance broadly (e.g. Ketelaar et al., 2015), there has been limited academic study of user behavior and intentions related to ad blockers. Using a game theoretic approach, Johnson (2013) concluded that as consumers block more ads, companies respond by increasing the number of ads targeted at non-avoiding users, which in turn results in more consumers avoiding ads and so on. More recently, Todri (2022) demonstrated that ad blocker usage decreases consumer spending by $14.2 billion per year and that it leads to both less brand search online and a preference to seek out familiar brands.

We adopt a different approach from the above-discussed studies by focusing on ad blocking from the consumer's perspective and conducting a survey to investigate potential predictors of ad blocker usage. In general, a limited number of studies that have adopted this approach investigate the issue by framing ad blocker usage as a function of consumers' overall perceptions of (online) advertising in general (e.g. perceived intrusiveness, utility, affective feelings). However, results in this specific area have been mixed. Framing their study in terms of personalized online ads and reactance theory, Brinson et al. (2018) find no statistically significant relationship between attitudes toward personalized advertising and ad blocker usage. A follow-up study's path model also revealed that, with the sole exception of the combination of higher ad skepticism and lower trust in online marketers together, general ad perception items were not related to former or current ad blocker usage (Brinson & Britt, 2021). However, Redondo and Aznar's (2018) survey of online users in Spain revealed attitude toward online advertising in general was positively predictive of both the current usage of ad blockers and the former usage of ad blockers. Similarly, as part of a larger study, Söllner and Dost (2019) conducted a thematic analysis of an open-ended question regarding ad blocker usage among visitors to a German classifieds website. Their sample's most commonly reported reasons for using ad blockers were broadly related to negative perceptions of the utility of online ads (e.g. being annoying, thwarting user goals, invasiveness). Given these mixed results regarding attitude toward online advertising as a predictor of ad blocker usage, we shift the focus to avoidance as a predictor in itself.

Much of the advertising avoidance literature treats avoidance as the final dependent variable of interest, often contextualized to a specific medium/device (e.g. Gironda & Korgaonkar, 2014; Shin & Lin, 2016) or broken down into specific kinds of behaviors such as clicking to delete unwanted online ads (Rojas-Méndez & Davies, 2005; Speck & Elliott, 1997). In the current study, we measure ad avoidance using Cho and Cheon's (2004) scale because all its items are specific to an online context, and it is comprised of a mix of items addressing behavioral, cognitive, and affective avoidance. Since ABUs already use ad blockers, if they should also engage in other online ad avoidance behaviors it would indicate a clear orientation to avoiding marketer-originating messages, thus making it likely that they will continue using ad blockers. Similarly, while ABNUs do not use ad blockers, ABNUs who engage in other kinds of ad avoidance may also demonstrate a propensity to avoid commercial messages, and thus it is reasonable to predict they are more likely to demonstrate greater likelihood of installing ad blockers. Rather than a final outcome, we treat Internet ad avoidance as a predictor of ad blocker usage specifically. Thus,

H1a: For ABUs, online advertising avoidance will be positively related to the likelihood of continuing to use ad blockers.

H1b: For ABNUs, online advertising avoidance will be positively related to the likelihood of installing ad blockers.

Privacy Control and Concern

Concerns about privacy have grown with the use of the Internet by consumers and marketers, and academics

have increased scholarship on this topic as well (Frik & Gaudeul, 2020). A key issue regarding privacy and the Internet is that marketers have access to vast troves of secondary consumer data, the ability (unmatched among non-digital media) to track and collect detailed primary data on users of their sites and services, and the means to use this data to deliver highly personalized ads and other marketing communication forms to consumers (Aguirre et al., 2016). While privacy is complex, its conceptualization as it relates to advertising is effectively summarized by Baek and Morimoto as (2012, p. 63): "*the degree to which a consumer is worried about the potential invasion of the right to prevent the disclosure of personal information to others*." Communication Privacy Management (CPM) theory (Petronio, 2002) has foundational tenets germane to this discussion. CPM proposes that people have a core need for and *concern* about privacy as relates to their personal information and that this personal information is by default contained within a metaphoric "boundary" zone. Further, the information within the boundary is treated as a possession like any other and it is the right of the owner to share it to the extent they wish (Child & Petronio, 2011) – i.e. it is (or should be) under one's *control*. This conceptualization addresses two separate, but interrelated, aspects of online privacy: (1) the perceived capability to control access and usage of one's personal information by marketers and (2) the extent of concern regarding the level/amount of privacy one has when engaging in online activities.

In direct permission-based contexts, such as social media platforms offering users customizable privacy settings that can be applied per post or consumers voluntarily signing up to receive texts or other promotional messages from specific companies, privacy control is generally perceived as higher and overall privacy concern lower (e.g. Lankton et al., 2017; Wu et al., 2012), resulting in a more positive inclination to use the platforms or receive future messaging. However, in the situation of online browsing across multiple sites, beyond the high number of ads consumers are exposed to, as people go about their activities and begin seeing more messages targeted at them based on their behaviors or prior websites visited (particularly from companies they did not specifically give permission to for such tracking and data use), perceived control over personal information decreases and privacy concern increases. In turn, consumers are more likely to avoid websites or marketers that collect/require such information, fabricate or provide incomplete information, request removal from e-mail lists, and be less willing to make purchases or renew orders (e.g. Tucker, 2014; Wirtz et al., 2007; Youn, 2009). With regard to ad avoidance in general, a few studies have investigated the impact of privacy issues and showed that greater privacy concern and lower perceived control over how one's information is used result in increased avoidance of highly personalized online behavioral ads (Baek & Morimoto, 2012; Ham, 2017) and greater avoidance of and accompanying negative attitude toward social media ads (Kelly et al., 2010). In addition, privacy concern and lack of control result in increased use of Internet browsing anonymizers and cookie erasers (Wirtz et al., 2007), increase in specific technological behaviors to mitigate undesired tracking on smartphones (Ketelaar & van Balen, 2018), and undertaking specific tracking and ad avoidance actions (ad blocker use was not one of the possible options; McKee et al., 2024).

In terms of ad blockers specifically, we note that while *discussion* of privacy issues is common in academic ad blocker research and is often highlighted as an issue important to consumers who use such tools, actual measurement of the impact of privacy-related constructs on ad blocker usage intentions are highly limited. Two extant studies reveal somewhat opposing results. Privacy threat (a composite measure somewhat akin to privacy concern that included some items related to privacy control as an aspect) was unrelated with attitudes toward personalized ads, which in turn was unrelated with ad blocker usage in a survey (Brinson et al., 2018), while a broad open-ended question asked of current ad blocker users showed that, among other things, broadly defined privacy concerns were one reason that German online users used such technologies (Söllner & Dost, 2019).

Notwithstanding the somewhat mixed findings of the two above ad blocker studies regarding the impact of privacy concern and control on ab blocker use, based on the broader literature and CPM theory discussed above, we derive the following predictions. ABUs already use ad blockers and thus are expected to desire to continue using them, particularly if they have a greater sense of control over their online information (derived from using ad blockers) and a heightened sense of privacy concern in general. ABNUs do not currently use blockers, but if they have concern about their online privacy, they will have a greater likelihood of installing ad blockers. However, if ABNUs perceive that they already have control over their privacy while online, they likely will see limited need to install ad blockers in the future. Specifically:

H2a: For ABUs, the level of perceived privacy control will be positively related to the likelihood of continuing to use ad blockers.

H2b: For ABNUs, the level of perceived privacy control will be negatively related to the likelihood of installing ad blockers.

H3a: For ABUs, concerns regarding online privacy will be positively related to the likelihood of continuing to use ad blockers.

H3b: For ABNUs, concerns regarding online privacy will be positively related to the likelihood of installing ad blockers.

Internet Usage – Desktop and Mobile

The evidence regarding the extent of media usage and ad avoidance in general on those media is limited in number and conflicting in nature. For non-digital media, some researchers find no relationship between the amount of media usage and ad avoidance (e.g. Abernethy, 1991; Heeter & Greenberg, 1985), while others find a negative relationship (Speck & Elliott, 1997). With regard to online contexts, prior studies report an inverse relationship between Internet usage and general avoidance actions (Seyedghorban et al., 2016) as well as social media usage and social media ad avoidance (Chinchanachokchai & de Gregorio, 2020).

The literature generally suggests that as Web usage increases, there is a general concomitant increase in advertising exposure. Given the ease with which companies track and collect consumer data, this increased ad exposure via higher Internet usage results in the increased likelihood of exposure to greater amounts of highly targeted, personalized, and intrusive forms of promotion (e.g. Tucker, 2014). In turn, this greater exposure may result in heightened perceptions of ad clutter (the negative state of ad content exceeding a consumer's level of acceptance and expectation in a medium; Ha & McCann, 2008), and in turn leading to greater ad avoidance online (Cho & Cheon, 2004; Ferreira et al., 2017). However, while broad motivations for ad avoidance generally are likely similar regardless of desktop vs mobile platform (e.g. perceived low utility or high interference of ads - Cho & Cheon, 2004; Rau et al., 2013), there has been no prior academic study specifically comparing desktop and mobile ad blocking based on usage. In addition, to our knowledge, only one published academic study has specifically compared ad avoidance in general on desktop vs. mobile platforms. Using eye-tracking methodology, across five target ads and three online articles, Schmidt and Maier (2022) find that ads are avoided on both types of devices, but viewing time of ads on mobile is 66% shorter than the same ads on desktop.

The mobile environment does have distinctive characteristics that may impact ad blocker usage intentions differentially from desktop. For example, mobile ads enable marketers to target consumers in real-time based on their location and physical activities (Danaher et al., 2015). The mobile environment is also much more easily and conveniently accessible anywhere the consumer is located, is physically closer to the user via portable devices such as smartphones and watches and, therefore, psychologically more connected and personal to them (e.g. Brasel & Gips, 2014; Okazaki et al., 2012). This sense of physical and psychological closeness and the perceived omni-presence of mobile environments may serve to enhance the degree to which greater media use affects the likelihood of continuing to use ad blockers and the likelihood of installing ad blockers. In addition, due to their smaller screen sizes in comparison to desktop environments, manually shutting off, ignoring, and simply scrolling past ads to continue perusing their desired content is likely more inconvenient on mobile devices for consumers (Shon et al., 2021). Thus, due to the paucity of specific comparisons of desktop vs mobile ad avoidance in general and ad blocker usage in particular, differences in the characteristics of the two environments, as well as the conflicting findings regarding media usage and general ad avoidance, we develop the following separate exploratory research questions:

RQ1a: For ABUs, what is the relationship between desktop Internet usage and the likelihood of continuing to use ad blockers?

RQ1b: For ABNUs, what is the relationship between desktop Internet usage and the likelihood of installing ad blockers

RQ2a: For ABUs, what is the relationship between mobile Internet usage and the likelihood of continuing to use ad blockers?

RQ2b: For ABNUs, what is the relationship between mobile Internet usage and the likelihood of installing ad blockers?

Ad Blocker Current Usage Satisfaction

Satisfaction among current users of a product/service is a widely used outcome in the marketing literature, given its priority as a key goal among organizations (Finn et al., 2009). Satisfaction has been found to be related to a host of positive firm- and consumer-level outcomes, but most germane to the current study is that of

continued product usage. Studies measuring both intention and actual behaviors demonstrate it is one of the strongest predictors of repeat usage for both digital and non-digital products/services (e.g. Mittal & Kamakura, 2001; Otto et al., 2020). To our knowledge, no prior study has assessed satisfaction with ad blockers as a predictor of future use. The construct is generally conceptualized as a form of expectation disconfirmation – consumers assess the overall performance/quality of a product against a baseline expectation derived from external information and any prior experience (Oliver, 2014).

Although not tangible, ad blockers are products and after selection and installation of such products, they typically become embedded in Internet users' web browsing experiences, unlike other ad avoidance technologies that require active effort on the part of the user (e.g. skipping ads on recorded TV programs). We expect to find a similar positive relationship between satisfaction and likelihood of continuing to use ad blockers in the current study. If ABUs are satisfied with the experience and effectiveness of using ad blockers, it is likely they will continue usage. ABNUs by definition do not use ad blockers and therefore satisfaction is not germane to them. Thus, we predict:

H4: For ABUs, satisfaction will be positively related to the likelihood of continuing to use ad blockers.

Figure 1 shows the conceptual framework summarizing the hypotheses.

Method

Sample and data collection

The current study employed a survey administered to an online sample from Amazon's Mechanical Turk (MTurk) service. The quality of data resulting from MTurk samples has received strong support across numerous domains (Coppock, 2019; Kees et al., 2017). Indeed, MTurk has been found to outperform both panel data procured from research firms (Kees et al., 2017) and nationally drawn samples (Coppock, 2019), as well as to be satisfactorily representative of many age groups in the US with regard to privacy and online security perceptions (Redmiles et al., 2019). The remuneration was $0.80 per participant. The respondents were recruited using an announcement on the MTurk platform. The wording indicating that the research study was about consumer attitudes toward and perception of online advertisements generally so as not to precue participants in advance about their opinions on ad blockers. We also adopted preventive remedies to prevent common method bias such as making the wording of the questions clear, concise, and accurate, adapting scale items to the focal context of the study, and guaranteeing the anonymity for the survey respondents (MacKenzie & Podsakoff, 2012; Podsakoff et al., 2003). The total number of respondents who completed our survey was 299 after removing two respondents whose answers exhibited a lack of attention to the questionnaire. The age of the respondents ranged from 18 to 82 years old. Among the 299 respondents, 42.8% were female. For additional demographic characteristics of

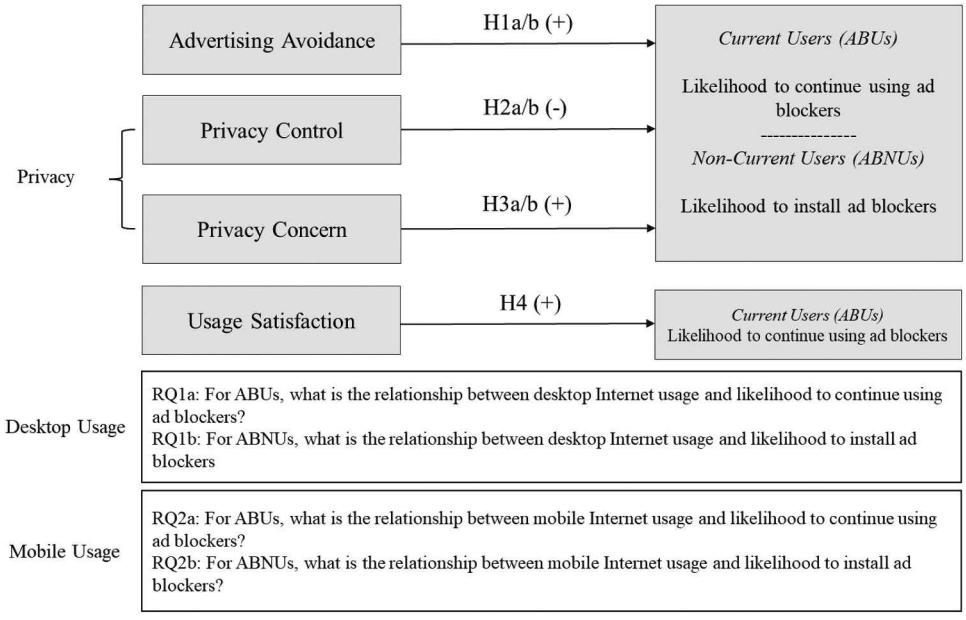

Figure 1. Conceptual framework, hypotheses, and research questions.

the respondents, please see Appendix 1 in the online supplementary materials.

The respondents first answered a dichotomous classification item to identify whether they were current (ABUs) or non-current (ABNUs) ad blocker users. They were then directed to the items corresponding to their usage status. The only differences between the ABU and ABNU questionnaires were the satisfaction measure and dependent variable item (detailed in the next section). ABUs were asked about their likelihood of continuing to use ad blockers, while ABNUs were asked about their likelihood of installing ad blockers. Among the total respondents, 206 (68.9%) reported they were currently using one or more ad blockers (ABUs) while 93 (31.1%) reported they were not currently using any ad blockers (ABNUs).

Independent variables

Construct measurement items were adapted from existing scales, with minor modifications to accommodate the digital context. Online advertising avoidance was assessed using an 18-item, seven-point Likert-type scale adapted from Cho and Cheon (2004). This widely used scale measures the behavioral, cognitive, and affective forms of avoidance previously discussed. The reliability (α) of the scale was .97. Privacy concern was assessed using Youn's (2009) widely used measure ("How concerned are you about the ways that companies collect and use personal information about you on the Internet?") in line with prior single-item assessments of this construct (e.g. Milne & Boza, 1999; Phelps et al., 2000). Recent empirical comparisons of single- vs multi-item measures have shown that single-item assessments can quite often be of equivalent validity and reliability as multi-item versions (e.g. Ang & Eisend, 2018; Matthews et al., 2022). Because the item wording and privacy concern construct are concrete and specific in their focus, and the single-item length minimizes participant fatigue, utilizing a single-item measure as a direct, global self-assessment of participants' overall concern about privacy was desirable in this study. Privacy control was assessed on a three-item, seven-point scale used by Tucker (2014). The three items were found to be reliable (α = .94). Mobile and desktop usage were measured by requesting respondents estimate how many minutes per day they use the Internet on desktop and mobile devices. Lastly, in line with prior satisfaction research (e.g. Finn et al., 2009), and due to the concrete and specific nature of the construct being measured (Allen et al., 2022; Matthews et al., 2022), to assess overall satisfaction among ABUs, we utilize a single-item measure ("How satisfied are you with your current usage of ad blockers?").

Dependent variables

We first ascertained whether participants used ad blockers in the following manner: "An ad blocker is a program, browser extension, and/or application that is specifically designed to remove advertising from an Internet user's online experience. Antivirus software is not considered an ad blocker. Do you currently use one or more ad blockers?" (yes/no). Participants who responded that they used one or more ad blockers were then asked, "On which kinds of devices do you use at least one ad blocker?," with response options of "Desktop or laptop computer," "Mobile device (smartphone or tablet)," or "Both desktop/laptop and mobile device." Two dependent variables measuring ABUs' and ABNUs' ad blocker usage intentions were likelihood of continuing to use ad blockers and likelihood of installing ad blockers, respectively. Likelihood of continuing to use ad blockers was measured by asking "How likely are you to continue using ad blockers?" Likelihood of installing ad blockers was measured by asking "How likely are you to install ad blockers in the future?" (both items on a seven-point scale). For all measures and items used in the study, please see Appendix 2 in the online supplementary materials.

Results

Usage statistics

Among ABUs, 93.7% reported they use free ad blockers, while 2.4% use paid ad blockers and 3.9% use both free and paid blockers, with 82.5% using ad blockers on desktop computers, only 0.5% using them solely on mobile devices, and 17% using them on both desktop and mobile devices. Among ABNUs, 51.6% reported they had used free ad blockers in the past.

Correlation analyses

The relationships among online advertising avoidance, privacy concern, perceived privacy control, desktop and mobile usage, and ad blocker intentions were first examined using correlation analyses. As shown in Table 1, for ABUs, ad avoidance is positively correlated with the likelihood of continuing to use ad blockers ($r = .33$,

Table 1. Descriptive statistics and correlation coefficient matrix – users (ABUs).

	V1	V2	V3	V4	V5	V6	V7	Mean (*SD*)	Collinearity Statistics	
									Tolerance	VIF
Ad Avoidance (V1)	1.00							5.52 (1.37)	0.88	1.14
Privacy Control (V2)	−.15*	1.00						4.39 (1.50)	0.79	1.27
Privacy Concern (V3)	.23**	−.40**	1.00					4.00 (1.10)	0.80	1.26
Desktop Usage (V4)	.10	−.08	.09	1.00				370.41 (450.14)	0.96	1.04
Mobile Usage (V5)	−.12	.02	−.09	.11	1.00			96.33 (118.79)	0.96	1.05
Usage Satisfaction (V6)	.07	.23**	−.11	.06	.07	1.00		5.84 (1.02)	0.93	1.08
Continued Usage (V7)	.33**	−.02	.15*	.10	−.03	.39**	1.00	6.57 (0.67)		

**Correlation is significant at .01 level (2-tailed).
*Correlation is significant at .05 level (2-tailed).

$p < .01$). Other variables that have positive relationships with the likelihood of continuing to use ad blockers are privacy concern ($r = .15$, $p < .05$) and current ad blocker usage satisfaction ($r = .39$, $p < .01$). Tests to see if the data met the assumption of collinearity indicated that multicollinearity was not a concern (see Table 1 for Tolerance and VIF scores for the independent variables).

Regarding ABNUs, privacy concern was positively correlated with the likelihood of installing ad blockers ($r = .25$, $p < .05$, respectively), as shown in Table 2. Desktop usage demonstrated a negative relationship with the likelihood of installing ad blockers ($r = -.29$, $p < .01$), while mobile usage showed a positive relationship ($r = .28$, $p < .01$). Tests to see if the data met the assumption of collinearity indicated that multicollinearity was not a concern (see Table 2 for Tolerance and VIF scores for the independent variables).

Multiple regression analyses

We predicted that Internet advertising avoidance, privacy concern, and perceived privacy control would be associated with future ad blocker usage behaviors for both ABUs and ABNUs. As shown in Table 3, estimates derived from multiple regression analyses were used to test our hypotheses.

ABUs

For current users, analysis controlling for the device type the ad blocker is installed on (desktop vs mobile) showed Internet advertising avoidance having a significant positive effect on the likelihood of continuing to use ad blockers (H1a, β .27, $t = 4.25$, $p < .001$). The analysis also revealed respondents' perceived control over and concern about their online privacy were not predictors of likelihood of continuing to use ad blockers (H2a, $\beta = -.02$, $t = -0.14$,

Table 2. Descriptive statistics and correlation coefficient matrix – non-users (ABNUs).

	V1	V2	V3	V4	V5	V6	Mean (*SD*)	Collinearity Statistics	
								Tolerance	VIF
Ad Avoidance (V1)	1.00						4.94 (1.56)	0.94	1.06
Privacy Control (V2)	−.06	1.00					4.46 (1.50)	0.95	1.06
Privacy Concern (V3)	.16	−.23*	1.00				3.83 (0.99)	0.90	1.11
Desktop Usage (V4)	−.01	.02	.01	1.00			275.89 (178.92)	0.98	1.01
Mobile Usage (V5)	−.04	−.01	.06	.14	1.00		88.01 (112.82)	0.99	1.00
Likelihood of Installing Blockers (V6)	.09	.07	.25*	−29**	.28**	1.00	3.86 (1.64)		

**Correlation is significant at .01 level (2-tailed).
*Correlation is significant at .05 level (2-tailed).

Table 3. Multiple regression models.

	Ad Block Users (ABUs)[a]		Non-Ad Block Users (ABNUs)[b]	
	Beta (SE)	*t*	Beta (SE)	*t*
Ad Avoidance (H1a,b)	.27 (.03)***	4.25	.07 (.10)	0.75
Privacy Control (H2a,b)	−.02 (.03)	−0.14	.14 (.10)	1.46
Privacy Concern (H3a,b)	.12 (.04)	1.76	.25 (.16)**	2.65
Desktop Usage (RQ1a,b)	.04 (.00)	0.62	−.34 (.00)***	−3.69
Mobile Usage (RQ2a,b)	−.01 (.00)	−0.21	.32 (.00)***	3.41
Current Usage Satisfaction (H4)	.39 (.04)***	6.12	n/a	n/a
R^2	.26		.27	

Note: *$p < .05$, **$p < .01$, ***$p < .001$.
[a]ABUs analysis controlled for the device(s) ad blockers was installed on (n.s.).
[b]ABNUs analysis controlled for past usage (n.s.).

p = n.s. and H3a, $\beta = .12$, $t = 1.76$, p = n.s., respectively). In addition, the multiple regression analysis showed that neither the extent of desktop usage (RQ1a, = .04, $t = 0.62$, p = n.s.) nor mobile usage (RQ2a, $\beta = -.01$, $t = -0.21$, p = n.s.) were related to the likelihood of continuing to use ad blockers. However, satisfaction with ad blockers was a predictor of the likelihood of continuing to use ad blockers in the hypothesized direction (H4, $\beta = .39$, $t = 6.12$, $p < .001$).

ABNUs

For ABNUs, analysis controlling for past usage showed that online advertising avoidance did not have a significant effect on the likelihood of installing ad blockers (H1b, $\beta = .08$, $t = 0.75$, p = n.s.). Regarding the two privacy-related variables, perceived privacy control did not result in a significant effect on likelihood of installing ad blockers (H2b, $\beta = .14$, $t = 1.46$, p = n.s.), but a significant positive relationship with likelihood of installing ad blockers was revealed for privacy concern (H3b, $\beta = .25$, $t = 2.65$, $p < .01$). Regarding media usage, greater desktop Internet usage was found to be negatively related with likelihood of installing ad blockers (RQ1b, $\beta = -.34$, $t = -3.69$, $p < .001$). On the other hand, mobile Internet usage showed a positive relationship with the likelihood of installing ad blockers (RQ2b, $\beta = .32$, $t = 3.41$, $p < .001$).

Discussion

Companies continue to heavily rely on online advertising revenue, which reached an all-time high of $225 billion in 2023 (Internet Advertising Bureau, 2024b). Yet with more than 900 million users worldwide (eyeo, 2023), ad blockers are more popular than ever. This research, which examines users vs. non-users of ad blockers to better understand their perceptions and intended behaviors, is very timely, given this tension between advertisers and consumers.

Our results suggest important differences between ABUs and ABNUs. We find that while advertising avoidance and satisfaction are particularly important for current users, privacy concern is key among non-current users, and is positively related to the likelihood of installing ad blockers. Furthermore, among non-users, mobile Internet usage positively predicts the likelihood of installing ad blockers, while desktop Internet usage serves as a negative predictor.

First, for ABUs, Internet ad avoidance generally and satisfaction are positively related with likelihood of continuing to use ad blockers. These findings add to the literature on avoidance of location-targeted digital advertising (Shin & Lin, 2016), social media advertising (Gironda & Korgaonkar, 2014; Kelly et al., 2010), and mobile advertising (Okazaki et al., 2012) by demonstrating the importance of the Internet ad avoidance construct in the ad blocking context. Note that the Internet Advertising Avoidance scale utilized in the current study does not include ad blockers as an avoidance method – indicating that ABUs are still willing to continue using ad blockers even when they are also avoiding online ads in other ways. In contrast, ABNUs' likelihood of installing ad blockers is not impacted by the extent to which they avoid online marketing in other ways. While marketers or platforms may be tempted to "block blockers" and not allow ABUs to access content without them first shutting of these tools, a recent study by de Haan (2024) shows that on sites where both ABUs and ABNUs are permitted, banner ads are 190% more effective on ABNUs (effectiveness operationalized as an advertised brand being mentioned via uncued prompting). In addition, as noted previously, unlike most other online ad avoidance tools or methods, ad blockers are largely passive and "always on," preventing even the

appearance of most digital ads automatically. Thus, allowing ABUs on sites results in an enhanced benefit to marketers of increasing the ad effectiveness on ABNUs – even though ABNUs may be manually avoiding online ads in other ways, they are doing so in ways that are more manually taxing and as such are prone not to avoid all such ads. Furthermore, consistent with prior literature on satisfaction (Mittal & Kamakura, 2001; Otto et al., 2020), our results add support for the relationship between satisfaction and likelihood of continuing product usage in the context of a seldom studied but continuously evolving product (e.g. ad blockers).

In a world where ad blockers are not only popular but dozens of product options are available (eyeo, 2023), it is important that ABUs are satisfied with their choices if they are to continue using ad blockers. Internet advertising is more prevalent than ever, and marketers' efforts to reach consumers through personalized advertising are becoming even more efficient through generative AI. Precisely due to the prevalence and highly personalized nature of much of today's online advertising, marketers must understand not only ABUs' motivator to continue blocking ads but also how such actions impact ABNUs.

Irrespective of mobile or desktop usage, for ABUs, the (dis)satisfaction level with the experience of ad blocker usage is a driving force in whether they will continue to use these ad avoidance tools. However, for ABNUs, our findings demonstrate some nuanced differences between mobile vs. desktop usage of ad blockers. Results show that for ABNUs, mobile (desktop) usage is positively (negatively) related to the likelihood of installing ad blockers (while also showing no impact of desktop nor mobile usage for ABUs on the likelihood of continuing to use ad blockers). These results are interesting in light of industry reports that in the US there is currently a higher usage of ad blockers by desktop users than mobile users (eyeo, 2023), despite a higher proportion of Internet traffic now originating from mobile devices (Similarweb, 2024).

Given that desktop Internet capabilities have been available to and popular among Internet users for several decades, both ABNUs and ABUs may have simply become habituated to ads being a part of their desktop Internet environment. However, for ABNUs who by definition do not use ad blockers, concern is largely driven by mobile platforms. Because mobile devices accompany users as they go about their activities, they are more likely than desktop devices to track an Internet user's behaviors with location-tracking technologies, and thus ABNUs may be starting to feel they need more protection when using such devices. In addition, mobile devices are smaller than desktops, which means that ads take up more space on a smaller screen and are more difficult to mentally ignore and/or manually close. Furthermore, extant research shows mobile devices are not just commonly kept physically closer to oneself and interacted with using close touch interfaces, but by extension are psychologically closer and considered an extension of the self in many ways (Brasel & Gips, 2014; Ross & Bayer, 2021). Thus, ads on mobile devices may be viewed to a much greater extent than on typical computers as obtrusive, interfering with consumers' actions, and a form of intrusion into a psychologically close object. Thus, the ads on mobile devices may result in greater annoyance than on desktops, leading to more willingness by ABNUs to install blockers on such devices. When designing and implementing ad campaigns, advertisers must be conscious of the smaller screens that Internet users are navigating on mobile devices compared to desktops and the fact that mobile devices are likely to be perceived as an extension of users' selves, and therefore ensure that their ads do not inhibit the mobile user experience. Moreover, they should strive to confirm that their messages target relevant consumers and that these ads minimally interfere with consumers' content access and browsing/navigation experience. If advertisers can create seamless experiences with mobile ads that consumers find to be informative and useful, they may be able to effectively curtail mobile Internet users' desire to install ad blockers.

With regard to privacy issues, our results expand upon those found by Söllner and Dost (2019) and Brinson et al. (2018). As a precursor to their main study investigating appeals to persuade users to turn off their ad blockers, Söllner and Dost's (2019) qualitative inquiry about reasons for ad blocker usage revealed that the broad theme of "privacy concerns" was mentioned by 6.8% of respondents. However, the nature of the concerns was not specified, thus limiting to some extent understanding of how concern was conceptualized by their sample. In Brinson et al. (2018) work, concern about information privacy (framed in terms of perceived threat) was found to be unrelated to attitudes regarding personalized ads, which in turn were found to be unrelated to ad blocker usage. In addition, Brinson and Britt's (2021) measured privacy control as a facet of privacy concern rather than as a separate construct. Building on CPM, the current study separately investigates the effects of privacy concern and perceived privacy control. Given that a lack of perceived control does not automatically equate to a concern regarding one's privacy, we add to the scant ad blocker literature applying CPM as a theoretical framework and

offer greater nuance to the results revealed in prior ad blocker studies. By distinguishing between privacy concern and perceived privacy control among Internet users who use different types of technology, this research adds to the broader body of literature on consumer privacy, which often does not distinguish among privacy-related constructs and tends to take a general affective approach (Fox & Royne, 2018). Our work further demonstrates the theoretical and managerial importances of assessing differences between privacy-related constructs and measures.

For ABNUs, we find that while perceived privacy control did not have a significant effect on the likelihood of installing ad blockers, privacy concern positively affected this likelihood. For ABUs, our results show that neither privacy concern nor perceived privacy control was predictive of likelihood of continuing to use ad blockers. Once ABUs start using ad blockers, the technology likely becomes "out of sight, out of mind," in the sense that users become accustomed to browsing the Internet without the presence of ads, which differs from other forms of avoidance that are manually undertaken in response to specific ads (e.g. clicking to close pop-ups, which necessitate, at least brief exposures to recognize that there is something to avoid in the first place). Although consumers are increasingly concerned with the amount of information collected by organizations (Taylor et al., 2015), ad blockers automatically prevent the vast majority of ad forms from even appearing to the user, perhaps reducing or eliminating the salience of privacy as a concern. Ad blockers may be viewed as preventative in that they create a perception of privacy control and a subsequent layer of protection against privacy concerns for ABUs, whereby ABUs no longer factor these privacy issues into their behavioral intentions. Given that most U.S. consumers do not feel that they understand what companies are doing with their data, nor do they believe that they have much control over it (Research, 2023), ad blockers may be an approach that gives Internet users the feeling that they can protect their privacy.

Consumers with greater privacy concern are more likely to engage in protective behaviors (Sheehan & Hoy, 1999), and our findings support this in the context of future actions related to the use of ad blockers. ABNUs must be concerned about their privacy for it to impact their intention to use ad blockers, so even if consumers perceive their control over their privacy is low, if they are unconcerned about their online privacy the lack of this control may not be of concern. Because modern ad blockers are generally straightforward for most Internet users to install – often as easy as visiting a website (i.e. www.getadblock.com) and adding the extension to one's web browser – if ABNUs are concerned about their privacy, ad blocker installation is a simple action that they can take to help alleviate concern. Such results support research that highlights the importance of studying privacy from the perspective of a consumer's *worry* about potential privacy invasion (Baek & Morimoto, 2012) to capture negative perceptions. Indeed, nearly half of U.S. consumers have stopped using a device, website, or app due to worry about how their personal information was being used (Research, 2023). Federal and state regulatory attention toward consumers' online privacy is rapidly increasing (Law, 2024), and it is imperative that advertisers work with website and app developers, as well as law and policymakers, to strive to alleviate Internet users' privacy concerns. If consumers are less concerned about their privacy, they may be less inclined to feel that their online experience requires the use of ad blockers. Given the exponential annual increase in digital ad spend, especially video ads (Internet Advertising Bureau, 2024a), which can lead to user frustration due to poor performance, this should be of utmost importance to advertisers moving forward.

Limitations, future directions, and conclusion

Ad blocking is a significant barrier for companies to communicate directly with consumers and remains a fruitful topic for future research by scholars and practitioners. With little published academic research focused explicitly on ad blocker usage predictors, our study has some limitations. The breakdown of ad blocker users (69%) vs. non-ad blocker users in our sample does not represent the general U.S. population, with recent estimates suggesting that a third of U.S. Internet users are ad blocking (e.g. Statista, 2023). This limitation could be due to our sample being MTurk workers, in that they may be more tech-savvy than the average Internet user. However, as we were specifically interested in ad blocking, we chose MTurk as our sample frame given Mathur et al. (2018) finding that two-thirds of MTurk workers use some kind of content blocker or privacy enhancing tool online. Furthermore, a recent comparison of MTurk responses with a web panel representative of the U.S. Census and a probabilistic phone-based sample with regard to privacy issues showed MTurk sample results to be satisfactorily generalizable to the 18–49-year-old population but not older individuals (Redmiles et al., 2019). Thus, while our proportion of ad blocker users vs. non-users is not representative of all U.S. Internet users, our findings

regarding relationships between the various predictors and ad blocking intentions are acceptably representative for the 18–49 age range.

Another potential limitation is our use of single-item measures for some constructs. Empirical evidence has shown that single-item measures can perform as well as multiple-item scales when the constructs in question can be conceptualized as concrete and singular (Bergkvist & Rossiter, 2007; Matthews et al., 2022). Moreover, several of the single-item measures in our study have been widely used in other studies (e.g. Youn's (2009) privacy concern scale; Chen and Chen (2015)). However, future research could test the relationships using multi-item measures of constructs where we utilize single-item measures, thus allowing researchers to assess whether this issue changes the patterns of results.

We also acknowledge a limitation related to the sample size, specifically in the ABNUs condition. This might limit the statistical power of the analysis and the generalizability of the findings. Given the constraints of the sample size, we opted to use multiple regression analysis, a method that is robust and capable of handling multiple predictors even with smaller sample sizes. While this approach has its own set of assumptions and requirements, it allowed us to explore the relationships between the variables of interest effectively. The findings from this exploratory study provide valuable insights despite these limitations, and future research is encouraged to test the effects with larger sample sizes to further validate and extend our results.

Moving forward, scholars should seek to conduct experiments with more robust and directly representative samples to isolate specific effects in the context of ad blockers on Internet users. For example, if an ad successfully circumnavigates an ad blocker, would ABUs react more negatively to the ad and, subsequently, the brand, than ABNUs? Would ABUs' attitudes toward and/or perceptions of ad blockers in general be affected by this incident, or would it just affect their attitudes toward and/or perceptions of the particular ad blocker software they have installed on their device?

Our findings suggest that ad avoidance, satisfaction, desktop vs. mobile device usage, and privacy concern are important in the ad blocker context. Industry research finds that free online content is made possible by the presence of advertisements, despite consumers' inability and/or unwillingness to recognize this (Kent & McGrath, 2017). As such, marketing practitioners should strive to educate consumers about this practice. Scholars should seek to better understand consumers' cognitive and affective reactions to online advertisements and their role in the availability of online content to Internet users, both in mobile and desktop contexts. Moreover, given the importance of privacy, especially for ANBUs, future research should examine additional privacy-related constructs such as knowledge of data collection (Nowak & Phelps, 1997) and perceived privacy empowerment (Kim & Kim, 2011) to build on the current study and expand our understanding of the role of privacy plays in ad blocker usage. Scholars should also seek to understand if, indeed, perceptions of privacy control are essentially meaningless for non-users of a technology, especially if those non-users do not fully understand how the technology functions. Indeed, popular websites and platforms are more focused than ever on understanding consumers' use of ad blockers (Mauran, 2024). How users vs. non-users of a technology approach privacy-related concerns and perceptions is a fruitful avenue for further exploration in our increasingly connected world.

Disclosure statement

No potential conflict of interest was reported by the author(s).

References

Abernethy, A. M. (1991). Television exposure: Programs vs. advertising. *Current Issues and Research in Advertising*, *13* (1–2), 61–77. https://doi.org/10.1080/01633392.1991.10504959

Aguirre, E., Roggeveen, A. L., Grewal, D., & Wetzels, M. (2016). The personalization-privacy paradox: Implications for new media. *Journal of Consumer Marketing*, *33*(2), 98–110. https://doi.org/10.1108/JCM-06-2015-1458

Allen, M. S., Iliescu, D., & Greiff, S. (2022). Single item measures in psychological science. *European Journal of Psychological Assessment*, *38*(1), 1–5. https://doi.org/10.1027/1015-5759/a000699

Ang, L., & Eisend, M. (2018). Single versus multiple measurement of attitudes: A meta-analysis of advertising studies validates the single-item measure approach. *Journal of Advertising Research*, *58*(2), 218–227. https://doi.org/10.2501/JAR-2017-001

Baek, T. H., & Morimoto, M. (2012). Stay away from me: Examining the determinants of individual avoidance of personalized advertising. *Journal of Advertising*, *41*(1), 59–76. https://doi.org/10.2753/JOA0091-3367410105

Bergkvist, L., & Rossiter, J. R. (2007). The predictive validity of multiple-item versus single-item measures of the same constructs. *Journal of Marketing Research*, *44*(2), 175–184. https://doi.org/10.1509/jmkr.44.2.175

Brasel, S. A., & Gips, J. (2014). Tablets, touchscreens, and touchpads: How varying touch interfaces trigger psychological ownership and endowment. *Journal of Consumer Psychology*, *24*(2), 226–233. https://doi.org/10.1016/j.jcps.2013.10.003

Brinson, N. H., & Britt, B. C. (2021). Reactance and turbulence: Examining the cognitive and affective antecedents of ad blocking. *Journal of Research in Interactive Marketing*, *15*(4), 549–570. https://doi.org/10.1108/JRIM-04-2020-0083

Brinson, N. H., Eastin, M. S., & Cicchirillo, V. J. (2018). Reactance to personalization: Understanding the drivers behind the growth of ad blocking. *Journal of Interactive Advertising*, *18*(2), 136–147. https://doi.org/10.1080/15252019.2018.1491350

Chen, H.-T., & Chen, W. (2015). Couldn't or wouldn't? The influence of privacy concerns and self-efficacy in privacy management on privacy protection. *Cyberpsychology, Behavior and Social Networking*, *18*(1), 13–19. https://doi.org/10.1089/cyber.2014.0456

Child, J. T., & Petronio, S. (2011). Unpacking the paradoxes of privacy in CMC relationships: The challenges of blogging and relational communication on the internet. In K. B. Wright & L. M. Webb (Eds.), *Computer-mediated communication in personal relationships* (pp. 21–40). Peter Lang.

Chinchanachokchai, S., & de Gregorio, F. (2020). A consumer socialization approach to understanding advertising avoidance on social media. *Journal of Business Research*, *110*, 474–483. https://doi.org/10.1016/j.jbusres.2020.01.062

Cho, C. H., & Cheon, H. J. (2004). Why do people avoid advertising on the internet? *Journal of Advertising*, *33*(4), 89–97. https://doi.org/10.1080/00913367.2004.10639175

Coppock, A. (2019). Generalizing from survey experiments conducted on mechanical Turk: A replication approach. *Political Science Research and Methods*, *7*(3), 613–628. https://doi.org/10.1017/psrm.2018.10

Danaher, P. J., Smith, M. S., Ranasinghe, K., & Danaher, T. S. (2015). Where, when, and how long: Factors that influence the redemption of mobile phone coupons. *Journal of Marketing Research*, *52*(5), 710–725. https://doi.org/10.1509/jmr.13.0341

de Haan, E. (2024). The drivers and consequences of ad blocking: A self-filtering mechanism that increases ad effectiveness. *Journal of Interactive Marketing*, *59*(1), 59–75. https://doi.org/10.1177/10949968231180500

eyeo. (2023). *2023 eyeo ad-filtering report*. https://info.eyeo.com/adfiltering-report

Ferreira, C., Michaelidou, N., Moraes, C., & McGrath, M. (2017). Social media advertising: Factors influencing consumer ad avoidance. *Journal of Customer Behaviour*, *16*(2), 183–201. https://doi.org/10.1362/147539217X14909733609398

Finn, A., Wang, L., & Frank, T. (2009). Attribute perceptions, customer satisfaction and intention to recommend e-services. *Journal of Interactive Marketing*, *23*(3), 209–220. https://doi.org/10.1016/j.intmar.2009.04.006

Fox, A. K., & Royne, M. B. (2018). Private information in a social world: Assessing consumers' fear and understanding of social media privacy. *Journal of Marketing Theory & Practice*, *26*(1–2), 72–89. https://doi.org/10.1080/10696679.2017.1389242

Frik, A., & Gaudeul, A. (2020). A measure of the implicit value of privacy under risk. *Journal of Consumer Marketing*, *37*(4), 457–472. https://doi.org/10.1108/JCM-06-2019-3286

Gironda, J. T., & Korgaonkar, P. K. (2014). Understanding consumers' social networking site usage. *Journal of Marketing Management*, *30*(5–6), 571–605. https://doi.org/10.1080/0267257X.2013.851106

Goswami, S. (2020, December 14). *The rising concern around consumer data and privacy*. https://www.forbes.com/sites/forbestechcouncil/2020/12/14/the-rising-concern-around-consumer-data-and-privacy/?sh=364c3860487e

Ha, L., & McCann, K. (2008). An integrated model of advertising clutter in offline and online media. *International Journal of Advertising*, *27*(4), 569–592. https://doi.org/10.2501/S0265048708080153

Ham, C. D. (2017). Exploring how consumers cope with online behavioral advertising. *International Journal of Advertising*, *36*(4), 632–658. https://doi.org/10.1080/02650487.2016.1239878

Heeter, C., & Greenberg, B. S. (1985). Profiling the zappers. *Journal of Advertising Research*, *25*(2), 15–19.

Internet Advertising Bureau. (2024a, May 15). *Digital video ad spend & strategy report. Part one: Market size & growth projections*. https://www.iab.com/insights/video-ad-spend-report-2024/

Internet Advertising Bureau. (2024b), May 14. 2023. *U.S. digital advertising industry hits new record, according to IAB's annual internet advertising revenue report*. https://www.iab.com/news/2023-u-s-digital-advertising-industry-hits-new-record-according-to-iabs-annual-internet-advertising-revenue-report/

Johnson, J. P. (2013). Targeted advertising and advertising avoidance. *The RAND Journal of Economics*, *44*(1), 128–144. https://doi.org/10.1111/1756-2171.12014

Kees, J., Berry, C., Burton, S., & Sheehan, K. (2017). An analysis of data quality: Professional panels, student subject pools, and amazon's mechanical Turk. *Journal of Advertising*, *46*(1), 141–155. https://doi.org/10.1080/00913367.2016.1269304

Kelly, L., Kerr, G., & Drennan, J. (2010). Avoidance of advertising in social networking sites: The teenage perspective. *Journal of Interactive Advertising*, *10*(2), 16–27. https://doi.org/10.1080/15252019.2010.10722167

Kent, P., & McGrath, F. (2017). *The state of mobile ad-blocking in 2017. GlobalWebindex custom report Q2*.

Ketelaar, P. E., Konig, R., Smit, E. G., & Thorbjørnsen, H. (2015). In ads we trust. Religiousness as a predictor of advertising trustworthiness and avoidance. *Journal of Consumer Marketing*, *32*(3), 190–198. https://doi.org/10.1108/JCM-09-2014-1149

Ketelaar, P. E., & van Balen, M. (2018). The smartphone as your follower: The role of smartphone literacy in the relation between privacy concerns, attitude, and behaviour towards phone-embedded tracking. *Computers in Human Behavior*, *78*, 174–182. https://doi.org/10.1016/j.chb.2017.09.034

Kim, K., & Kim, J. (2011). Third-party privacy certification as an online advertising strategy: An investigation of the factors affecting the relationship between third-party certification and initial trust. *Journal of Interactive Marketing*, *25*(3), 145–158. https://doi.org/10.1016/j.intmar.2010.09.003

Lankton, N. K., McKnight, D. H., & Tripp, J. F. (2017). Facebook privacy management strategies: A cluster analysis of user privacy behaviors. *Computers in Human Behavior*, *76*, 149–163. https://doi.org/10.1016/j.chb.2017.07.015

Law, B. (2024). *Which states have consumer data privacy laws?* https://pro.bloomberglaw.com/insights/privacy/state-privacy-legislation-tracker/

Lindsay, K. (2024). *Something went terribly wrong with online ads*. https://www.theatlantic.com/technology/archive/2024/02/online-ads-more-annoying/677576/

Lucas, O., & Stein, S. (2020). *The new imperative for corporate data responsibility*. https://advisory.kpmg.us/content/dam/advisory/en/pdfs/2020/consumer-data-report-kpmg.pdf

MacKenzie, S. B., & Podsakoff, P. M. (2012). Common method bias in marketing: Causes, mechanisms, and procedural remedies. *Journal of Retailing*, *88*(4), 542–555. https://doi.org/10.1016/j.jretai.2012.08.001

Mathur, A., Vitak, J., Narayanan, A., & Chetty, M. (2018). Characterizing the use of browser-based blocking extensions to prevent online tracking. *Fourteenth Symposium on Usable Privacy and Security*, Baltimore, MD (pp. 103–116).

Matthews, R. A., Pineault, L., & Hong, Y. H. (2022). Normalizing the use of single-item measures: Validation of the single-item compendium for organizational psychology. *Journal of Business & Psychology*, *37*(4), 639–673. https://doi.org/10.1007/s10869-022-09813-3

Mauran, C. (2024). *YouTube just got more serious about its ad blocker crackdown*. https://mashable.com/article/youtube-more-serious-ad-blocker-crackdown

McKee, K. M., Dahl, A. J., & Peltier, J. W. (2024). Gen z's personalization paradoxes: A privacy calculus examination of digital personalization and brand behaviors. *Journal of Consumer Behaviour*, *23*(2), 405–422. https://doi.org/10.1002/cb.2199

Milne, G. R., & Boza, M. E. (1999). Trust and concern in consumers' perceptions of marketing information management practices. *Journal of Interactive Marketing*, *13*(1), 5–24. https://doi.org/10.1002/(SICI)1520-6653(199924)13:1<5::AID-DIR2>3.0.CO;2-9

Mittal, V., & Kamakura, W. A. (2001). Satisfaction, repurchase intent, and repurchase behavior: Investigating the moderating effect of customer characteristics. *Journal of Marketing Research*, *38*(1), 131–142. https://doi.org/10.1509/jmkr.38.1.131.18832

Nowak, G. J., & Phelps, J. (1997). Direct marketing and the use of individual-level consumer information: Determining how and when "privacy" matters. *Journal of Direct Marketing*, *11*(4), 94–108. https://doi.org/10.1002/(SICI)1522-7138(199723)11:4<94::AID-DIR11>3.0.CO;2-F

Okazaki, S., Molina, F. J., & Hirose, M. (2012). Mobile advertising avoidance: Exploring the role of ubiquity. *Electronic Markets*, *22*(3), 169–183. https://doi.org/10.1007/s12525-012-0087-1

Oliver, R. L. (2014). *Satisfaction: A behavioral perspective on the consumer*. Routledge.

Otto, A. S., Szymanski, D. M., & Varadarajan, R. (2020). Customer satisfaction and firm performance: Insights from over a quarter century of empirical research. *Journal of the Academy of Marketing Science*, *48*(3), 543–564. https://doi.org/10.1007/s11747-019-00657-7

Petronio, S. (2002). *Boundaries of privacy: Dialectics of disclosure*. Suny Press.

Phelps, J., Nowak, G., & Ferrell, E. (2000). Privacy concerns and consumer willingness to provide personal information. *Journal of Public Policy & Marketing*, *19*(1), 27–41. https://doi.org/10.1509/jppm.19.1.27.16941

Podsakoff, P. M., MacKenzie, S. B., Lee, J.-Y., & Podsakoff, N. P. (2003). Common method biases in behavioral research: A critical review of the literature and recommended remedies. *Journal of Applied Psychology*, *88*(5), 879–903. https://doi.org/10.1037/0021-9010.88.5.879

Rau, P. L. P., Liao, Q., & Chen, C. (2013). Factors influencing mobile advertising avoidance. *International Journal of Mobile Communications*, *11*(2), 123–139. https://doi.org/10.1504/IJMC.2013.052637

Redmiles, E. M., Kross, S., & Mazurek, M. L. (2019, May). How well do my results generalize? Comparing security and privacy survey results from MTurk, web, and telephone samples. *2019 IEEE Symposium on Security and Privacy*, San Francisco, CA (pp. 1326–1343).

Redondo, I., & Aznar, G. (2018). To use or not to use ad blockers? The roles of knowledge of ad blockers and attitude toward online advertising. *Telematics and Informatics*, *35*(6), 1607–1616. https://doi.org/10.1016/j.tele.2018.04.008

Research, P. (2023). *How Americans view data privacy*. https://www.pewresearch.org/internet/2023/10/18/how-americans-view-data-privacy/

Rojas-Méndez, J. I., & Davies, G. (2005). Avoiding television advertising: Some explanations from time allocation theory. *Journal of Advertising Research*, *45*(1), 34–48. https://doi.org/10.1017/S0021849905050154

Rojas-Méndez, J. I., & Davies, G. (2017). Time pressure and time planning in explaining advertising avoidance behavior. *Journal of Promotion Management*, *23*(4), 481–503. https://doi.org/10.1080/10496491.2017.1297972

Ross, M. Q., & Bayer, J. B. (2021). Explicating self-phones: Dimensions and correlates of smartphone self-extension. *Mobile Media & Communication*, *9*(3), 488–512. https://doi.org/10.1177/2050157920980508

Schmidt, L. L., & Maier, E. (2022). Interactive ad avoidance on mobile phones. *Journal of Advertising*, *51*(4), 440–449. https://doi.org/10.1080/00913367.2022.2077266

Seyedghorban, Z., Tahernejad, H., & Matanda, M. J. (2016). Reinquiry into advertising avoidance on the internet: A conceptual replication and extension. *Journal of Advertising*, *45*(1), 120–129. https://doi.org/10.1080/00913367.2015.1085819

Sheehan, K. B., & Hoy, M. G. (1999). Flaming, complaining, abstaining: How online users respond to privacy concerns. *Journal of Advertising*, *28*(3), 37–51. https://doi.org/10.1080/00913367.1999.10673588

Shin, W., & Lin, T. T. C. (2016). Who avoids location-based advertising and why? Investigating the relationship between user perceptions and advertising avoidance. *Computers in Human Behavior*, *63*, 444–452. https://doi.org/10.1016/j.chb.2016.05.036

Shon, M., Shin, J., Hwang, J., & Lee, D. (2021). Free contents vs. inconvenience costs: Two faces of online video advertising. *Telematics and Informatics*, *56*, 101476. https://doi.org/10.1016/j.tele.2020.101476

Similarweb. (2024). *Mobile vs. desktop vs. tablet traffic market share*. https://www.similarweb.com/platforms/

Söllner, J., & Dost, F. (2019). Exploring the selective use of ad blockers and testing banner appeals to reduce ad blocking. *Journal of Advertising*, *48*(3), 302–312. https://doi.org/10.1080/00913367.2019.1613699

Speck, P. S., & Elliott, M. T. (1997). Predictors of advertising avoidance in print and broadcast media. *Journal of Advertising*, *26*(3), 61–76. https://doi.org/10.1080/00913367.1997.10673529

Statista. (2023). *Adblocking penetration rate in selected countries/territories worldwide*. as of 3rd quarter 2022. https://www.statista.com/statistics/351862/adblocking-usage/

Taylor, J. F., Ferguson, J., & Ellen, P. S. (2015). From trait to state: Understanding privacy concerns. *Journal of Consumer Marketing*, *32*(2), 99–112. https://doi.org/10.1108/JCM-07-2014-1078

Todri, V. (2022). Frontiers: The impact of ad-blockers on online consumer behavior. *Marketing Science*, *41*(1), 7–18. https://doi.org/10.1287/mksc.2021.1309

Tucker, C. E. (2014). Social networks, personalized advertising, and privacy controls. *Journal of Marketing Research*, *51*(5), 546–562. https://doi.org/10.1509/jmr.10.0355

Wirtz, J., Lwin, M. O., & Williams, J. D. (2007). Causes and consequences of consumer online privacy concern. *International Journal of Service Industry Management*, *18*(4), 326–348. https://doi.org/10.1108/09564230710778128

Wu, K. W., Huang, S. Y., Yen, D. C., & Popova, I. (2012). The effect of online privacy policy on consumer privacy concern and trust. *Computers in Human Behavior*, *28*(3), 889–897. https://doi.org/10.1016/j.chb.2011.12.008

Youn, S. (2009). Determinants of online privacy concern and its influence on privacy protection behaviors among young adolescents. *The Journal of Consumer Affairs*, *43*(3), 389–418. https://doi.org/10.1111/j.1745-6606.2009.01146.x

Supplementary Material: Appendix 1

Demographic profile of the sample.

	Frequency	Percentage
Gender		
Male	171	57.2%
Female	128	42.8%
Total	299	100%
Age group		
<25	31	10.4%
26-35	146	48.9%
36-45	65	21.7%
46-55	31	10.4%
Over 55	26	8.7%
Total	299	100%
Education Level		
High school graduate	76	25.4%
Associate degree	64	21.4%
Bachelor's degree	128	42.8%
Master's degree	22	7.4%
Doctorate	6	2%
Other	2	0.7%
Total	299	100%
Ethnicity		
African American	26	8.7%
Asian	22	7.4%
Caucasian	220	73.6%
Hispanic or Latino	17	5.7%
Native American	2	0.7%
Other/Mixed Race	12	4%
Total	299	100%

Supplementary Material: Appendix 2

Measures and items.

Internet Advertising Avoidance (adapted from Cho and Cheon, 2004)
"When I visit Websites,"
Cognitive ad avoidance
I intentionally ignore any ads on the Web.
I intentionally don't put my eyes on banner ads.
I intentionally don't put my eyes on pop-up ads.
I intentionally don't put my eyes on any ads on the Web.
I intentionally don't pay attention to banner ads.
I intentionally don't pay attention to pop-up ads.
1 intentionally don't pay attention to any ads on the Web.
I intentionally don't click on any ads on the Web, even if the ads draw my attention.

Affective ad avoidance
I hate banner ads.
I hate pop-up ads.
I hate any ads on the Web.
It would be better if there were no banner ads on the Web.
It would be better if there were no pop-up ads on the Web.
It would be better if there were no ads on the Web

Behavioral ad avoidance
I scroll down Web pages to avoid banner ads.
I close windows to avoid pop-up ads.
I do any action to avoid ads on the Web.
I click away from the page if it displays ads without other content.

Privacy Concern (Youn, 2009)
How concerned are you about the ways that companies collect and use personal information about you on the Internet?

Perceived Privacy Control (Tucker, 2014)
How much in control do you feel of your:
Personal information?
Internet data?
Privacy?

Desktop/mobile usage
On average, how many minutes per day do you use the Internet on a desktop or laptop computer (a mobile device)?

Current usage satisfaction
How satisfied are you with your current usage of ad blockers?

Likelihood to Continue Using Ad Blockers
How likely are you to continue using ad blockers?

Likelihood to Install Ad Blockers
How likely are you to install ad blockers in the future?