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ONLINE ADVERTISEMENT INTRUSIVENESS AND

AD BLOCKERS

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I hereby declare that I have compiled the paper independently

and all works, important standpoints and data by other authors

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ABSTRACT

The aim of this study is to find the best practices for online advertising. The study pursues this aim in three directions of attitude, design and content, and online tools. In addition, it also provides some of the best practices by well-known literature and initiatives. Another contribution of this study is the usage of R programming language to reveal more meaningful correlations between questions and their results. This approach makes this study unique in the methods used for the analysing the answers to the survey and therefore the discussion. This study finds that hours spent online have a direct impact on the usage of ad blockers. However, it is almost impossible to draw a solid conclusion on some occasions due to lack of significant data and model. Furthermore, from ad presentation perspective also, it shows that the most relevant factor in the design of online ads might be the placement of ads. The results also call for a balance between relevance and personalisation online ads. As opposed to search engines, when ads are being placed in shopping websites they are being perceived as less disruptive. This study shows that it is important to recognize users' different web browsing habits and tools as they are influential factors when it comes to best practices of online advertising. The study uses exploratory data analysis and basic statistics and it suggests that a more complicated model is needed for better understanding of the significance result and further research.

Keyword: online advertisement, ad blocker, ad intrusiveness, ad annoyance, attitude, web browser, ad presentation

INTRODUCTION

Online advertisement comes in different forms and uses different delivery methods. From web banners to frame ads to sponsored links on search engines, all these methods use the internet as their primary tool to deliver. In 2016, online ad revenues surpassed ads displayed in cable news and broadcasting channels (IAB, 2017). On one hand, every day more and more people across the globe are joining the internet. On the other hand, online ads are being increasingly perceived as intrusive and users seek different ways to avoid them. Different factors that contribute to this avoidance include but not limited to the issues such as ads' content and presentation as well as user's privacy and security concerns. These issues and concerns have led to the recent rise of a group of software commonly known as ad blockers. Adblocking was already on the rise but adoption of new regulations such as General Data Protection Regulation (GDPR) in 2018, combined with previous users concerns such as usability (UX) issues and ad intrusiveness, has led to wider usage of adblockers on both mobile and desktop. In this new age of big data, it is crucial to understand how internet users surf the web and what are their preferences. This helps both online advertisers and users to come up with solutions to have a better experience online overall. Studying online attitude and behaviour of users toward online advertisement is the key to understanding the motives and reasoning behind adblocking.

Online advertisers and marketers, including the author of this study, are responsible for creating online ads for most of the major ad platforms. Creating and an online ad usually consists of three different aspects. First to have an understanding of the business and the target users' attitude towards online ads. Second, to create compelling content. And third, to create an inviting and non-intrusive design. Interestingly enough these three aspects are the same as my academic backgrounds. Therefore, my academic background and work experience are one of the main motivation for this study.

The primary goal of this research is to find the best practices for online advertising. The goal is further pursued through investigating three research objectives; 1) understand the attitude of the target demography towards online advertising/ad-blocking 2) investigate the factors in ad presentation that affects the perception of ads intrusiveness and annoyance and thus the avoidance behaviour and 3) the effects of online tools and browsers on the ad-avoidance and ad-blocking behaviour. Each objective then is translated into a research question:

Q1: Among annoyance, privacy or security, what is the main users' motivations for adblocking?

Q2: What are the main factors in ads content and presentation that increase avoidance behaviour?

Secondary questions:

Q3: How different online tools such as web browser and adblocker that a user uses changes the perception of ad intrusiveness and thus avoidance behaviour?

In order to answer these research questions, there will be three research tasks. First, this thesis explores the literature relevant to each of the objectives/questions in order to situate the research in a meaningful theoretical and practical ground. Second, this thesis will gather data about web users' tools and web browsing habit and past experiences in regard to ad intrusiveness. These data will be collected via an online survey distributed among people residing in Estonia, mostly university students. Third, the results will be analysed using R programming languages. Additionally, ggplot2 package will be used to draw plots. These plots can be helpful to understand the participants' answers not only to one question but considering other factors such as gender and age. Essentially, every question can be defined as a variable in the code and these variables can be analysed not in only an isolated way but also in correlation to each other. The results then will be turned in a plot using ggplot2. The axis on these plots will representative a question and the visualized data reveals useful comparison and/or information. Findings and result can be used as a foundation for further research on the topic of this thesis. The outcome of this research can help advertisers and marketers to prioritize the obstacles that they need to address to improve user's receptivity to ads and thus their related marketing strategies in that context.

The current study has three main chapters.

The first chapter will focus on the definitions, background of this research and core concepts. Motivations of ad avoidance, as well as factors in ad avoidance from two different perspectives, visual and content, are discussed in this chapter.

The second chapter will focus on a description of the sample and methodology also answering the research questions. This chapter also discusses the questionnaire and how they are connected to the theoretical framework mentioned in chapter 1. Furthermore, the scales for questions are displayed in this chapter.

Last and third chapter will present the results. Based on those results this chapter presents a discussion including suggestions. In the end limitations of the research will be clarified and the author makes a conclusion.

1. LITERATURE REVIEW

The increasing use of the internet and online platforms have made online advertising a crucial form of advertising and marketing strategy. Digital advertising worldwide was nearly 170 billion U.S dollars in 2015 and is predicted to grow to more than 330 billion U.S. dollars by 2021 (Statista, 2016).
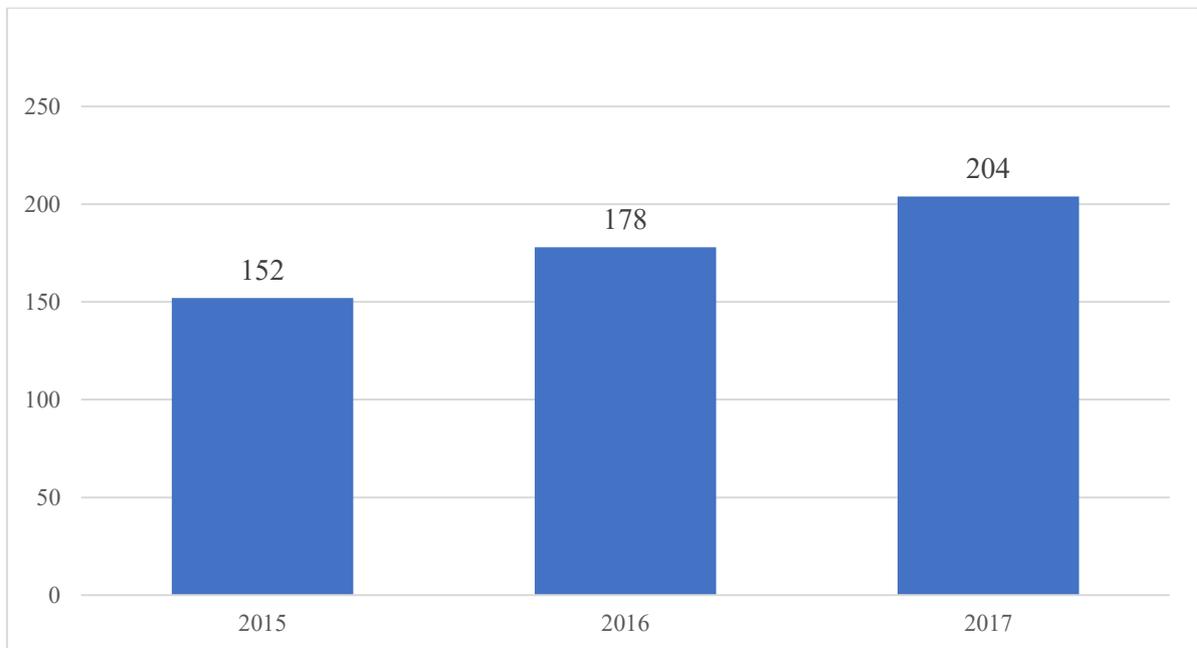
Figure 1.1. Digital advertising spending worldwide from 2015 to 2017 (in billion U.S. dollars)
Source: Statista (2016)

Internet advertising revenues in the United States was $88.0 billion in 2017, while online social media advertising consists of approximately a quarter of all internet ad revenues (IAB, 2017). The growing online advertising industry has also been increasingly challenged by its audiences' lack of trust and receptiveness of online ads.

The users' perception of ad intrusiveness and annoyance directly affects their avoidance behaviour which challenges many companies that rely on online advertising as the main channel of revenue. The avoidance behaviour has been increasingly operationalized through using ad-blocking apps and add-ons that prevent users' exposure to online ads.

There have been several studies on the customers' attitude towards online advertising and the reasons behind avoidance behaviour to improve the online advertising channels, content and presentation. In order to understand the literature relevant to these research objectives, this review

is organized in four main parts; 1) definition of the key terms 2) ad avoidance behaviours; theories and causes 3) Effect of factors in ad presentation on avoidance behaviour 4) Effect of online tools (Browsers and ad-blocking software) on avoidance behaviour.

This chapter provides a review of previous research that helps to understand the factors contributing to the best online advertising practices in the categories of users' attitudes, ad presentation and content, and tools and browsers use. The review has been an essential part of the research as it has revealed the most important factors, approaches and aspects in studying the best practices of online advertising.

In studying the important factors in the attitude towards online advertising avoidance, Cho and Cheon (2004) framework is a seminal resource that has been frequently referenced in the literature. The framework emphasis on three factors contributing to ad avoidance of 1) perceived goal impediment, 2) perceived ad clutter and 3) prior negative experience. This theory has been a guiding framework for designing the questionnaire and analysing the data.

In the literature related to the effect of ad presentation and content on ad effectiveness and avoidance, the most important concepts that repeatedly discussed are "Relevance" and "Personalization" as they can positively or negatively affect the avoidance behaviours. These terms indirectly have been included in the questions in the survey. In terms of factors related to ad presentation, the two guidelines were indispensable to this research: 1) Coalition for Better Ads and 2) Acceptable Ads Initiatives. The two guidelines provide the important factors in ad presentation such as type, placement, size and animation affecting avoidance behaviour. Again, the recommendations from these guidelines reflected in the survey and data analysis.

Acceptable ads initiative guideline was also crucial for understanding the important factors related to the internet tools in ad avoidance context.

1.1. Definition of the key terms

1.1.1. Ad avoidance definition

According to Speck & Elliott (1997), ad avoidance is defined as "all actions by media users that differentially reduce their exposure to ad content".

Ad avoidance reaction of consumers while watching TV commercials has been described with different terms. Regardless of these different names, these reactions to irritating ads show a similar

pattern in many studies. If consumers are given the choice and tools, they will avoid these ads (Li, Edwards, and Lee, 2002). According to Speck and Elliott (1997), there were three different types of avoidance. Cognitive avoidance, behavioural avoidance and mechanical avoidance. Ad avoidance occurs in the full spectrum of print media to digital media. Cognitive ad avoidance was shifting focus. Behavioural ad avoidance was activities like leaving the room and mechanical ad avoidance.

There are factors for ad avoidance occurrence. Some studies suggest that the general attitude towards ads can play an important role in ad avoidance. Cronin and Menelly (1992) found that it is very likely that ads get avoided upon its occurrence regardless of their content. However, studies on ad irritation show that usefulness and the content of the ads matter in the degree that an ad can be perceived as irritating (Lee and Lumpkin 1992). Therefore, the content and specification of online ads are very important as they can cause avoidance and not transmitting an advertising message to targeted consumers.

1.1.2. Ad Intrusiveness definition

Ad intrusiveness is a well-researched field in traditional media. Ha (1996) defines intrusiveness as "the presence of a large amount of non-editorial content in an editorial medium". Advertisement can cause interference and interruption while browsing the web, especially when a user is reading. If the amount of advertising is too much and exceeds consumer's ability to process the information then it is conceptualized as over advertising (Guardia, 2009).

On one hand whether in traditional media advertisement or in an online advertisement, ads can be perceived as irritating. Especially if the ads are lacking the utility and usefulness. on the other hand, placement, size, content and other various elements are crucial to make or break an ad. Ha (1996, p. 77) also defined intrusiveness as "the degree to which advertisements in a media vehicle interrupt the flow of an editorial unit." to understand ad intrusiveness we need to fully understand intrusiveness as a concept. According to (Li et al, 2002) intrusiveness is "is a perception or psychological consequence that occurs when an audience's cognitive processes are interrupted. Therefore, ads within programming or editorial units are not themselves intrusive, but rather, the ads must be perceived as interrupting the goals of the viewers to be considered intrusive."

This perceived intrusiveness has a rather interesting point of view because it suggests that ad intrusiveness is related to some other external factors and not entirely on the ad itself. Considering the fact that these studies have been done mostly in the last decade, it is not hard to see why many

authors suggest that placement is the key factor for an ad to be perceived as intrusive. Ad placement, clearly, plays a big role but in today's media-rich world wide web other elements like UI or User Interface and UX or user experience of the ads also plays a vital role for ads to be considered irritating and therefore leading to avoidance.

1.1.3. Ad irritation definition

According to Guardia (2009), "Advertising content, as well as certain advertising practices, can offend or irritate the consumer. According to Aaker & Bruzzone (1985), an irritating ad is one that is "provoking, causing displeasure and momentary impatience". Irritation is considered less negative than offensiveness which usually incorporates a moral concern (Li et al, 2002). Different attributes in ad content, execution, and placement cause irritation (Li et al, 2002). Factors contributing to irritating connect are untruthfulness, exaggeration, confusion, or insults the viewer's intelligence. Poor execution as being too loud, too long, or too large (Li et al, 2002). In the placement of the ad, extreme frequency is one the most important annoying components (Li et al, 2002).

1.1.4. Ad blockers definition

Redondo & Aznar, (2018), defines ad blockers as "various software tools (most typically browser plug-ins) that monitor browsers' requests for editorial and advertising content and prevent the display of any advertising content that matches an entry in the blacklists maintained by ad blocking companies/user communities."

1.2. Ad avoidance behaviours theories and causes

Studies on ad avoidance are not new and have been started long before the online advertisement. In traditional media such as TV, two different ad avoidance behaviour have been recognized. First, cognitive behaviour such as ignoring the ads or not making any decision based on those ads. Second, physical ad avoidance such as leave the place for breaks between sports event or changing the channel. Ad avoidance on the internet can be interpreted as an exclusively cognitive construct (Guardia, 2009).

Ad avoidance According to Cho and Cheon (2004) has been linked to three main factors: perceived goal impediment, perceived clutter on internet websites, and negative experiences in the past. They

proposed the model in Figure 1 which explains these three antecedents of internet ad avoidance. Ad clutter as the second antecedents can cause people to ignore an advertisement online. The perceived ad clutter can be defined as one or combination of bad placement, timing, size and different types of undesirable interactivities a user experience. These findings in perceived ad clutter are in line with what happens in traditional media and ad avoidance in Television, magazines, etc. (Elliott and Speck 1998). Excessiveness of these clutter in online advertising can cause ad avoidance all together (Cho and Cheon 2004). Furthermore, as the third antecedent, Cho and Cheon argue that a consumer past experiences regarding online advertising are also very important when it comes to ad avoidance. There are three main elements that can create these negative experiences. According to this model, dissatisfaction, perceived lack of utility and perceived lack of incentives are these three elements.
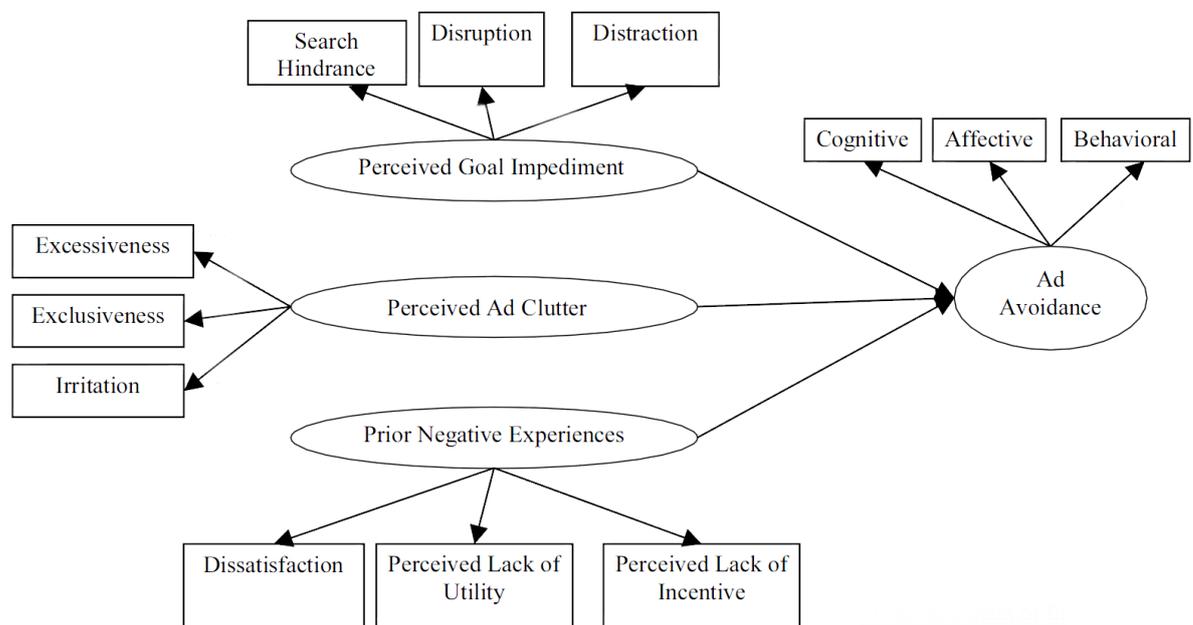
Figure 1.2. Analysis of Hypothesized Model of Ad Avoidance
Source: Cho and Cheon (2004)

Online advertisements that are not targeted correctly and leads to undesirable links on the internet can create mistrust among users (Grant 2005). However, this is a very challenging task as the same study shows if the ads are targeted too well people experience more than just annoyance and they develop concerns on deeper levels. This can translate to a feeling of invasion of privacy to the extent that they feel they are being monitored and watched (Grant 2005).

1.3. Impact of ad presentation and content on ad effectiveness and avoidance

Ad effectiveness and avoidance studies have explored different factors in an ad's content and presentation that affects the users' perception of online advertising. This section of the review summarizes some of the key factors that have been recurrently investigated in the literature.

1.3.1. Factors in ad content

In regard to ad content and user behaviour, *Relevance* is a key concept. Relevance has been mentioned as an important factor in ad creativity and thus its effectiveness (Smith and Yang, 2004). Smith and Yang (2004) define relevance as "a stimulus property where some aspect of an advertisement is important, meaningful, or valuable to the consumer". In addition to relevance, divergence or novelty of the ad has been considered an influential factor in ad creativity and ad designers should find a balance between these two. McStay (2010) further develops the concept of relevance by defining two important related components of "contextual relevance" and "intrusiveness". Contextually relevant advertising is defined "as advertising that works within the informational flows that the Web is used for, and this includes timing as well as content, with display advertising largely deemed as irrelevant whilst search advertising is considered so relevant that it is not even perceived as advertising" (McStay, 2010). Related to the concept of contextual relevance is the concept of ad congruency. This specifically means that if the ad content is relevant to the website's (or any other online platform) content (Kuisma, 2015). Incongruent ad contents are associated with more irritation in the users (Goldstein et al, 2013; Kuisma, 2015). This also underlies the user's browsing mode or goal is an important factor in the importance of ad congruency. While the users are more open to ads when they are free-browsing, they might be more sensitive to incongruent ads when they are browsing for a specific goal (Kuisma, 2015).

While online advertising provides opportunities for larger brands to use pull marketing that is perceived less intrusive, smaller brands that want to just establish their presence use push marketing that embodies in pop-up ads that have higher click-through rate but is considered more intrusive (McStay, 2010).

Related to the effect of ad's content, *Personalization* is another key area of research. Research shows that because of increasing noise in online advertising, the click-through rate has been decreased significantly and this is why major business such as Google and Facebook focus on personalization of the online ads that try to retarget the ads with the most relevant audience based on the individuals' online interactions and information (Bleier & Eisenbeiss, 2015). The interesting

point in the context of the personalization is that if you show the exact product that the user has just visited in an online store, this would be effective very close to the time of the visit, but its effectiveness decreases as the time goes by. This is framed as an over-personalization issue (Bleier & Eisenbeiss, 2015). In contrast, moderately personalized ads can be more effective in longer time periods since there is more chance that they keep their level of relevance (Bleier & Eisenbeiss, 2015).

1.3.2. Factors in ad presentation

The acceptable ad initiative comprising three distinct coalitions: User Advocates Coalition (digital rights organization, ad-block user), For-Profit Coalition (advertiser, advertising agency, ad-tech company, publisher/content creator) and the Expert Coalition (user agent, creative agent, researcher/academia) in 2017 provides a general guideline related to ads appearance and presentation. The three main criteria that they discuss include Placement, Distinction and Size (Acceptable Ads, no date). Below are the excerpts from the website on acceptable criteria for each category:

Placement:

"Ads must not disrupt the user's natural reading flow. Such ads must be placed on top, side or below the Primary Content."
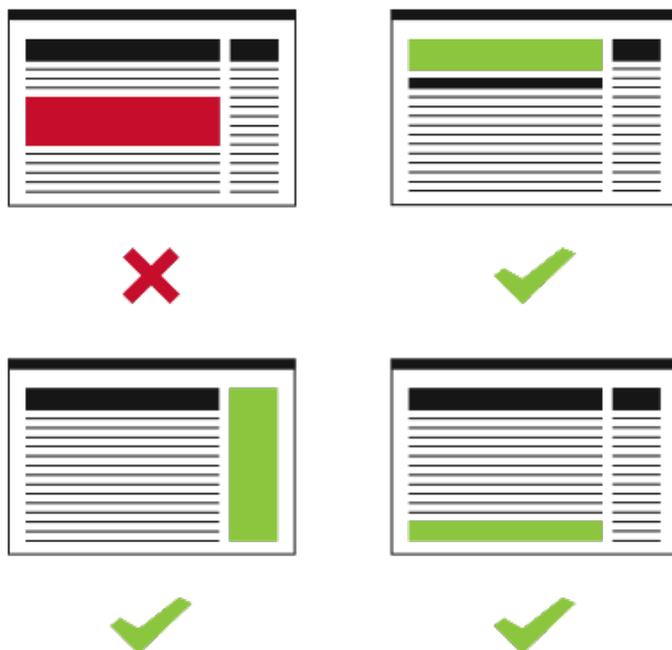

Figure 1.3. General criteria for ad placement
Source: Acceptable Ads criteria (2019)

Distinction:

"Ads should always be recognizable as ads and distinguishable from all other content (e.g. are not hiding the label, are not misleading users into thinking an ad is part of the primary content). Ads should be clearly marked with the word "advertisement" or its equivalent."
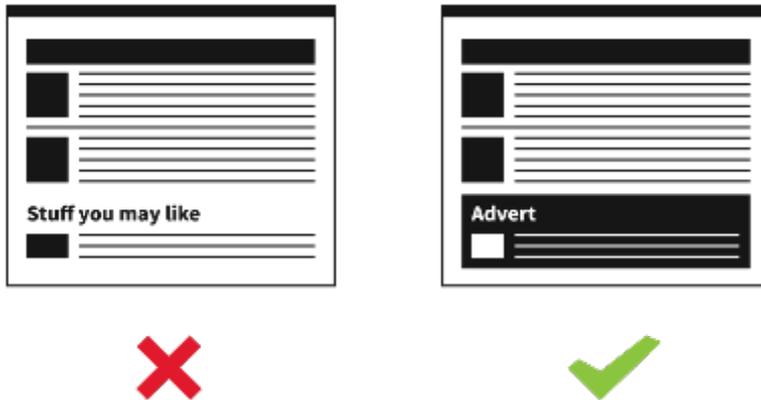
Figure 1.4. General criteria for ad label
Source: Acceptable Ads criteria (2019)

Size:

"Individual ad-size requirements depend on the placement of the ad: When placed above the primary content, the maximum height of an ad should be 200px. When placed on the side of the primary content, the maximum width of an ad should be 350px. When placed below the primary content, the maximum height of an ad should be 400px. Ads must always leave sufficient space for the Primary Content on the common screen size of 1366x768 for desktop, 360x640 for mobile devices and 768x1024 for tablets. All ads that are placed above the fold (the portion of the webpage visible in the browser window when the page first loads under the common screen size) must not occupy in total more than 15 percent of the visible portion of the web page. If placed below the fold, ads must not occupy in total more than 25 percent of the visible portion of the webpage."
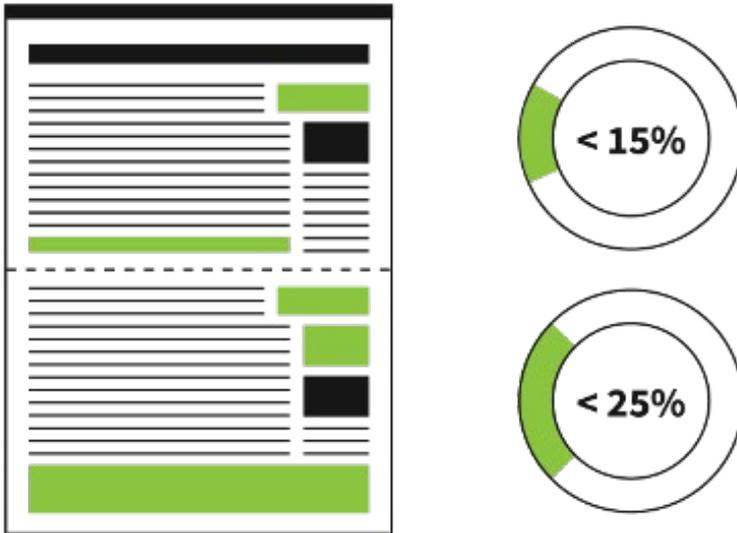
Figure 1.5. General criteria for ad percentages
Source: Acceptable Ads criteria (2019)

The recommendations from acceptable ad guideline aim to decrease ad annoyance and intrusiveness and increase a sense of trust. There have been also other studies that identify the most important factors in ad presentation that increase users' recognition of the ads. Animation and repetition have been mentioned as two important factors (Kuisma, 2015). The saliency of the ad is increased when using animation. While greater saliency increases greater attention to an ad, but this does not necessarily result in increasing the users' recognition of the ads. Animation typically adds to online clutter. Excessive motion seems to increase users' ad avoidance (Kuisma, 2015). It has been mentioned as one that the most frequent topic contributing to ad annoyance (Goldstein et al. ,2013). Furthermore, animation impact might be different for different placement of ad such as skyscrapers or banners (Kuisma, 2015). Repetition of ad with the same content in the same place can add familiarity of the ads and ad effectiveness. The caveat is that extreme repetition can result in boredom, ignorance and irritation (Kuisma, 2015).

The results of these type of analysis can be used by advertisers and UX designers. The consequences of the decisions are very considerable. Goldstein et al (2013) provide a comprehensive analysis on how annoying ads force costs to major businesses.

1.3. Online tools

1.3.1. Web browsers evolution

A web browser is the gateway of users to the internet. Web browsers started as software with innovative ideas that were fighting for dominance in the internet space. Netscape and Microsoft were leading this "browser war" back in the 90s. At that time, they came to agreements on important web standards (Phillips, 1998). After a couple of years, other new browsers came to the market. These browsers were trying to differentiate themselves in bringing new technologies but in a more open way. Firefox and Opera started to gain more popularity and in 2008 Google introduced a new web browser called Google Chrome. Now more than a decade later, Google Chrome has the lead in market share when it comes to web browsers. Because of Google's experience with web technologies and their initiatives to create and improve the existing modern web technologies known as HTML5, the Blink engine has become the industry standard. Opera ditched its in-house rendering engine, Presto, in favour of Blink. In 2019, Microsoft also announced that they will abandon their own rendering engine and use Chromium, the same engine that Google Chrome is built upon. Not only Chrome has the highest market share among all web browsers, but also with 44%, Google has the highest market share in online ads by far. (Business Insider, 2017)

In today's web browsers world, the differentiating factor is less about the under-the-hood technologies they use and more about the feature and general approach they take on privacy, customization and flexibility. Most modern web browsers come with a wide selection of "browser extensions". This the primary way to expand the capability of the browser by adding small pieces of software on top of the default browser. Ad blockers are one of the main categories of extensions on Web browsers.

Some of the well-known browsers such as Opera recognized this pattern and tried to offer these features as built-in options. There two main web browser that are very interesting to study in the scope of this research: Opera and Brave. What makes these two web browsers unique is their approach to privacy and security and more specifically to online ads. For example, Opera is offering built-in adblocker and VPN services free of charge. Opera for decades has been one of the major web browsers and this shift of focus on privacy and security is very interesting. Brave web browser is new to the market but also very important. Creators of Brave claim that they understand the value of online advertisement and its crucial part in a free and open web. Therefore, Brave introduces a new gamified approach to viewing or ignoring web advertisements. By using

a concept known as wallet the browser rewards its users for watching certain ads and users can pay their favourite creators on the web by those digital tokens. Since this web browser is a new software it is yet to see a significant market share among other web browsers and is yet to be proved to work. (Brave Software Inc., 2019)

1.3.2. Ad blockers evolution

History of ad blockers goes back to the inception of the web. according to (Adguard, 2017) one of the biggest ad blocking tools, it was in the 1980s that the first ad blocker was used. It was mainly for a specific web portal called Prodigy. A decade later in the 1990s the first real mass product in ad blocking, Ad Muncher, was introduced. It required no installation and it was able to remove all ads in Microsoft Windows. However, Ad muncher was not a free of charge software, unlike many modern ad blockers. Ad Muncher deleted the part of the page that was populated by Ads. This is different than the modern techniques used for ad blocking. Phoenix Browser which later got renamed as Mozilla Firefox brought a new platform for software to install known as "Extensions". In 2002, AdBlock was created for this browser and it was interestingly different in the approach in which blocked ads on the web browser. Instead of not downloading the advertisements, it acted as a service on top of the browser to hide the already downloaded advertisement (Adguard, 2017). After this project became discontinued by its original developer, it was picked up by another developer in 2006 and started to receive updates and new features such as not downloading ads entirely. This version has been named AdBlock Plus which entirely differentiate itself from the original AdBlock extensions. Later on, Adblock Plus decision to join the Acceptable Ads Initiative led to criticisms (Digital Trends, 2013). criticisms were mostly due to the fact that AdBlock Plus business model is based on "whitelists". According to Acceptable Ads: "Ads must comply with specific criteria to be shown to users of ad-blocking software." these criteria are ad placement, distinction and size. Creation of these "whitelists" raises the question of the usefulness and trustworthiness of ad blockers. Nowadays many ad blockers give the choice to their users to turn on/off and fully customise "whitelist" in order to be fully transparent.

Adblocking is important because it can cause damage to the advertising revenue of a firm. Ad blockers users are growing daily. According to (PageFair, 2017) "1% of global netizens (18% of North Americans and 20% of Western Europeans) were blocking online advertising in December 2016, with 615 million devices running ad-blocking software, about 30% more than in December 2015".

1.3.3. Mobile versus desktop

Ad blocking software uses different approaches in order to achieve a somewhat similar task. With the recent rise of ad blockers now it is more challenging than ever to filter out the "paywalls" and other counter ad blocking mechanisms. These mechanisms are including but not limited to web browser integration, DNS filtering, local VPN and more. This is very important especially to mobile devices. As of the writing of this thesis Google the company behind the biggest mobile platform, Android, does not allow web browser extensions on their platform. In 2013 a change to Google Play Developer Distribution Agreement made it impossible for ad blocking software to be distributed through one of the largest online app marketplaces. according to the paragraph 4.4 "development or distribution of Products that interferes with, disrupts, damages, or accesses in an unauthorized manner the devices, servers, networks, or other properties or services of any third party". This was one of the main reasons why many developers tried to create alternative web browsers that had ad blockers built-in. From AdBlock plus to UC browser in China, now many web browsers had ad blocking as part of their feature set. Opera Mobile was also amongst these browsers and later on, it introduced ad blocking feature as a built-in feature we no need of extension software.)

In today's Mobile-first world, more and more companies are trying to focus on mobile platforms instead of desktop computers. According to (Chen, Liu and Dai, 2013) participants of their survey in China know that "advertising is unavoidable in modern society". But "for other types of advertising, such as apps, mobile advergaming, and product placement, the participants displayed a more positive attitude and were more inclined to accept them." correspondingly it worth noting that according to a 2012 study done by Persaud and Azhar on Canadian consumers, participants favour mobile marketing and more specifically location-based marketing. As "This type of mobile marketing can also go viral easily as consumers can quickly and easily share information about offers or new products within their social network." Based on these two pieces of research we can see a more positive attitude towards the new wave of online marketing. But these new techniques need to be creative and not intrusive to be less irritating.

 This research will try to find out more about attitudes towards mobile ads versus desktop ads. Because most mobile Ads are being served through in-app advertisement the survey compares the attitudes towards these types of ads.

2. METHODOLOGY

To understand web users motives on using and not using ad blockers as well as finding the main reasons behind ad intrusiveness, this thesis gathers data about online ads via an online survey. The questionnaire has three different sections. Some of the sections and questions are based on other studies. In this chapter, these details will be discussed in more details.

2.1. Method of the research

The questionnaire starts with a simple question on facts about participants. Starting with easier questions will encourage the participants to see it as an easy and simple task. After that, the questionnaire gets more focused and more specific with the questions and choices. Different type of questions is being used to ensure the best possible response according to certain questions. The second section of the questionnaire uses a combination of multiple-choice questions. Starting with a dichotomous question in order to simplify the start of the questionnaire. The third part of the questionnaire uses different types from the Likert scale to the rating scale. Furthermore, a picture-choice question has been included in this section based on the definitions and graphics from the Coalition for Better Ads. By doing so the questionnaire ensures that the participants know the exact type of ads in question. The fourth and the last part of the questionnaire consists of three Likert scale questions to obtain information about participants attitude towards online ads.

2.2. Sample characteristics

The sample of this study consists of individuals who are between 18 to 54 living in Estonia. Three factors are the main driver for choosing this sample. First, this age group is responsible for the 77% of ad blockers users globally in (Invesp, 2016). As of 29th of April 2019, there are only 45 results for keyword "Adblock Estonia" in Google Scholar and none of these results are reflective of this study. Very few studies have been done on the topic and on this demographic. The third reason is convenience and the practicality of access to these proportion of web users and convenience for the author.

2.3. Questionnaire design

The questionnaire is designed with four different sections in mind. Each section is shown on different pages. This approach has two main benefits. First, it reduces clutter and let the participants stay focused on fewer questions at a time. Secondly, it provides a better bridge between the concepts. Furthermore, because internet privacy and security is an important topic, especially in recent year, and it is likely that the participants are concerned about their online privacy, the questionnaire specifically ensures the participants about the anonymity of their responses by telling them upfront about no collection of IP or email addresses.

The questionnaire has been created with this sequence in mind:

1. The purpose of the research and presenting its anonymous nature. This section is designed to provide a better user experience for the participants by letting them know how many questions in total are in this questionnaire and how long it takes to answer them.

2. Online tools and usage. Section two is dedicated to broad, general questions. These questions are mainly based on what the participants already use. Since this section asks about their past experiences and current online tools, it provides a simple way to start the questionnaire which in theory should encourage them to proceed to the next sections.

3. Online advertisement intrusiveness and ad blocking. The third section is for more focused questions on ad intrusiveness, ad blocking reasons, graphical representation of some well-known type of ads and their preferences and the participants' perception of privacy in an online environment. This section is crucial to the main research questions and they have been designed based on well-known studies to gather and compare the data to previous studies.

The third section of the questionnaire has six questions. The first and fourth question in this section, investigate the users' perception of Ad intrusiveness. While the first question, measures the general attitude toward ad intrusiveness, the fourth question aims to understand the underlying reasons for the perception of ad intrusiveness. The fourth question is from a (Mobile Advertising Study, 2018) that is perfectly relevant to ad intrusiveness literature that mentioned before. The choices available for the fourth question include "relevance" as one of the most important factors in ad intrusiveness which has been discussed in detail in section 1.3.1 of the literature review. The other choices also include phrases related to the intrusiveness criteria such as privacy concerns as well as hardware/software interruptions.

Second and third questions are particularly targeted to investigate the factors in the presentation of the ad that influences the perception of ad intrusiveness. Based on the section 1.3.2 of the literature review Placement, Distinction and Size, Animation and Repetition are important presentation factors in user annoyance and perception of intrusiveness. While the different ad types represent endless combinations of different types of placement, distinction, size, animation and repetition, the Coalition for Better Ads summarizes the most common ad types in desktop experience in four main types. This helps to understand the users' response to the ad presentation factors through example (Second question). The third question is also from the (Mobile Advertising Study, 2018) and directly asks the importance of the main factors related to presentation (size, placement, animation) and content in users' perception of ad intrusiveness.

Question fifth and sixth explores deeper the context of ad intrusiveness by asking about the web browsing context (question 5) and the importance of privacy concerns (question 6).

Below are the excerpts from a report in the website Coalition for Better Ads that define each ad type. The report is called "An experimental methodology to measure consumers' perceptions of online ad experiences" and conducted by Ad Experience Research Group in April 2016.

"Pop-up ads are a type of interstitial ad that do exactly what they say — pop up and block the main content of the page. They appear after content on the page begins to load and are among the most commonly cited annoyances for visitors to a website. Pop-up ads come in many varieties – they can take up part of the screen, or the entire screen." (Coalition for Better Ads, 2019)
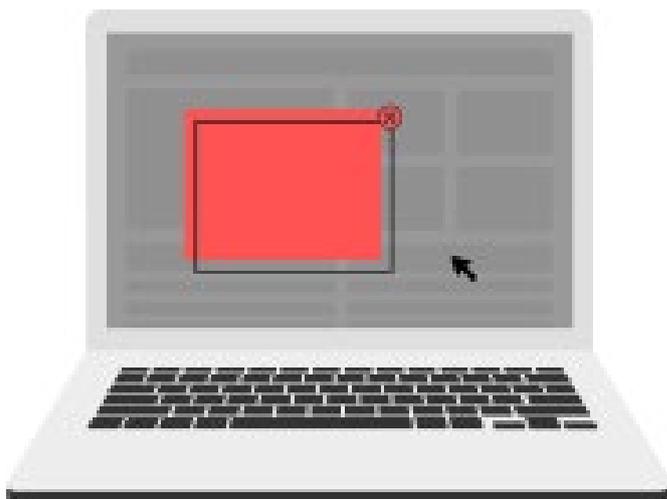

Figure 2.1. Pop-up Ads
Source: Coalition for Better Ads (2019)

"Auto-playing video ads play sound without any user interaction.

These experiences are especially disruptive to users, as they catch the readers off guard, and often compel them to quickly close the window or tab in order to stop the sound. Ads that require a click to activate sound did not fall beneath the Better Ads Standard. The Better Ads Methodology has not yet tested video ads that appear before ("pre-roll") or during ("mid-roll") video content that is relevant to the content of the page itself." (Coalition for Better Ads, 2019)
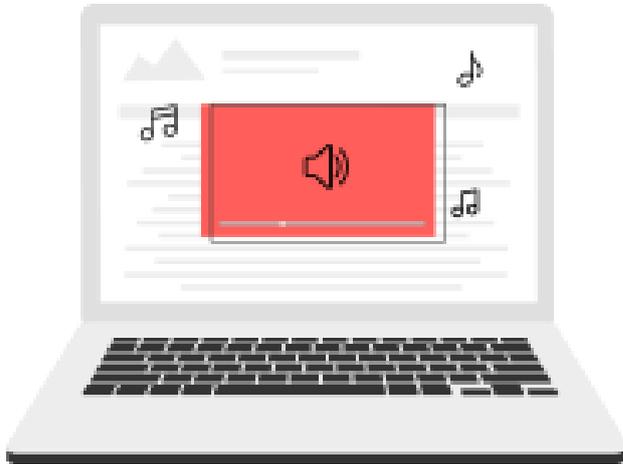
Figure 2.2. Auto-playing video ads with sound
Source: Coalition for Better Ads (2019)

"Prestitial "Countdown" ads appear before the content of the page has loaded, forcing the user to wait a number of seconds before they can dismiss the ad, or the ad closes on its own. These ads can disrupt users in a way that dissuades them from waiting for the countdown to finish and continuing onto their content. In desktop environments, prestitial ads that can be dismissed immediately did not fall beneath the Better Ads Standard for desktop." (Coalition for Better Ads, 2019)

Figure 2.3. Prestitial Ads with Countdown
Source: Coalition for Better Ads (2019)

 "Large Sticky Ads stick to the bottom edge of a page, regardless of a user's efforts to scroll. As the user browses the page, this static, immobile sticky ad takes up more than 30% of the screen's real estate. A Large Sticky Ad has an impeding effect by continuing to obstruct a portion of the page view regardless of where the user moves on the page." (Coalition for Better Ads, 2019)

Figure 2.4. Large Sticky Ads
Source: Coalition for Better Ads (2019)

4. Attitude towards online advertising. This section helps to obtain the necessary information on how different attitudes towards online ads can impact the perceived ad intrusiveness and as its result ad avoidance. The third question in this section is entirely based on (Redondo & Aznar, 2018). Furthermore, attitude toward mobile ads is the first question in this section. This question helps to gather information on how the participants see mobile ads and a new wave of advertisement in comparison with more traditional desktop/laptop ads.

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3. RESULTS AND DISCUSSION

3.1. Findings Scope and discussions

As mentioned before the survey was designed to 1) understand the attitude of the target demography towards online advertising/ad-blocking 2) investigate the factors in ad presentation that affects the perception of ads intrusiveness and annoyance and thus the avoidance behaviour and 3) the effects of online tools and browsers on the ad-avoidance and ad-blocking behaviour.

The survey was designed as a Google Form. The survey was shared online with participants who live in Estonia. 71 participants responded to the survey in three days. The responses are further analysed to find a meaningful pattern in the data that can shed light on each objective listed above. R programming language has been used for exploratory data analysis and pattern findings in the data. Since the code for data cleaning has been written in R, repeatability of the analysis with new data sets is an advantage compared to other software application such as Microsoft Excel. This approach is an ideal foundation for future studies since they can easily build upon the current solutions and code to create more significant results.

Data visualisation have been done using ggplot2 which is a package commonly used for the statistical programming language R. In many of these plots two questions can be seen on a different axis. These plots can be extremely helpful to draw a meaningful conclusion between more than two questions and their responses.

On the following page is the summary of the variables in the dataset:

```
  i..Gender                    Age              webSurfHours
Female:38    18-34          :58    1-2          :13
Male  :33    34-54          :10    3-4          :26
             Older than 54  : 2    5-8          :19
             Younger than 18: 1    More than 8:13




                          Browser                          VPNuse
Chrome                      :50    I don't know what is a VPN:17
Combination of web browsers: 9    No                        :32
Firefox                     : 6    Yes                       :22
Opera                       : 6




                          AdBlockerUse              AdDisruptivness
I don't know what is an ad blocker: 6    Neutral              : 9
No                                :14    Somewhat disruptive  :24
Yes                               :51    Somewhat undisruptive:11
                                         Very disruptive      :27




                          AnnyoingAdType        AdPresentation
Auto-playing Video Ads with Sound:28    Ad animation: 7
Large Sticky Ads                  : 9    Ad content  :15
Pop-up Ads                        :14    Ad placement:31
Prestitial Ads with Countdown     :20    Ad size     :18




                          AdDesPlace PrivacyInvasion
Inside apps and software not web browser: 5    Min.   :1.000
On Search result page                   :15    1st Qu.:3.000
On shopping sites                       :29    Median :4.000
On Social Media                         :22    Mean   :3.845
                                               3rd Qu.:5.000
                                               Max.   :5.000

          PhoneAdPre              AdforFreeWeb              PositiveAdAtti
Agree           : 9    Agree          :22    Agree             :17
Disagree        :26    Disagree       :11    Disagree          :13
Neutral         :18    Neutral        :30    Neutral           :32
Strongly disagree:18    Strongly Agree : 1    Strongly agree    : 2
                        Strongly disagree: 7    Strongly disagree: 7
```

Figure 3.1. Summary of the dataset from RStudio
Source: author's own calculation

In order to better read and understand this console output, the table below shows the variables used and their respective questions which they represent.

Table 1. Legend for variable names used

Questions	Variable names
What is your age?	Age
How many hours a day you surf the web?	webSurfHours
Which web browser do you use?	Browser
Do you use a VPN?	VPNuse
Do you use ad blockers?	AdBlockerUse
Please think of all the different forms of advertising you encounter in your daily life and rank how disruptive you find each advertising type?	AdDisruptivness
What factors do you find most important when judging ads?	AnnyoingAdType
Where is the most desirable place for Online Ad in your opinion?	AdDesPlace
On a scale of 1-5 how invading online ads are when it comes to your privacy?	PrivacyInvasion
I prefer to see ads in-app on my smartphone rather than a desktop/laptop?	PhoneAdPre
Online advertising is the way to support the free web	AdforFreeWeb
Generally, I consider Internet advertising to be a good thing	PositiveAdAtti

Furthermore, to have a plot with less visual clutter, abbreviations are used in the code for some of the responses. These abbreviations are as follow:

Table 2. Legend for abbreviation used for graphs in the results

Scale items	Abbreviations used in graphs
Strongly disagree	SD
Disagree	D
Neutral	N
Agree	A
Strongly agree	SA

3.2. Discussions

3.2.1. Impact of respondents' attitude towards online ads and privacy on ad blocking

There are several questions/variables that can help to understand the attitude of the users towards ad blocking. An important question in this regard is the fourth questions of section three that directly asks the reasons behind ad-blocking behaviour. As it can be seen in the chart below the

dominant responses are "too many ads are annoying and irrelevant" and "ads are intrusive". These responses are in line with the subcomponents of "perceived ad clutter"- excessiveness and irritation- in Cho and Cheon (2004) framework.
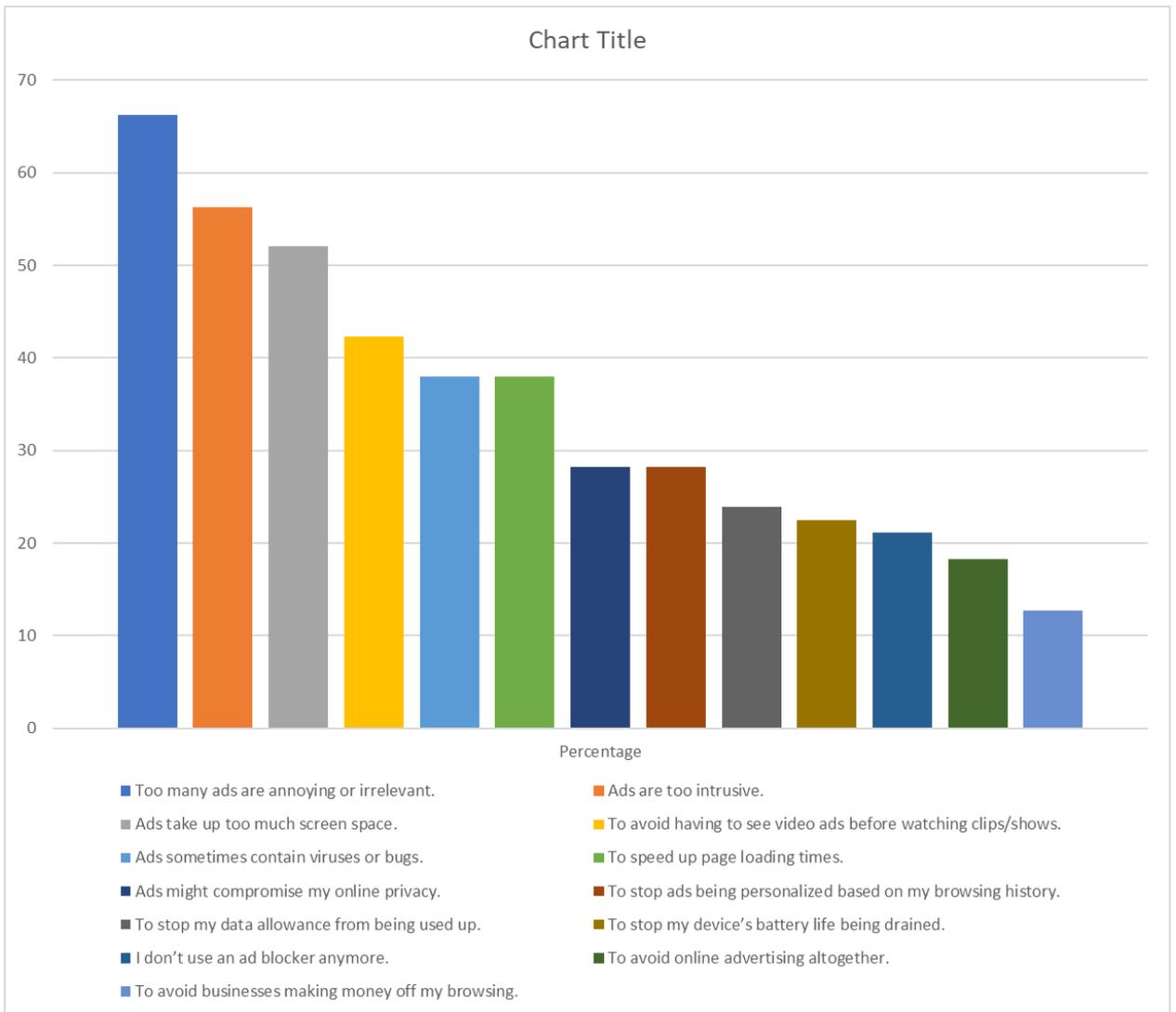

Figure 3.2. Main reasons to use ad blockers
Source: author's own calculation

The table below breaks down the results from the same question even further, for better demonstration purposes:

Table 3. Main reasons to use ad blockers

Reasons	Percentage
Too many ads are annoying or irrelevant.	66.2
Ads are too intrusive.	56.3
Ads take up too much screen space.	52.1
To avoid having to see video ads before watching clips/shows.	42.3

Ads sometimes contain viruses or bugs.	38
To speed up page loading times.	38
Ads might compromise my online privacy.	28.2
To stop ads being personalized based on my browsing history.	28.2
To stop my data allowance from being used up.	23.9
To stop my device's battery life being drained.	22.5
I don't use an ad blocker anymore.	21.1
To avoid online advertising altogether.	18.3
To avoid businesses making money off my browsing.	12.7

Another interesting aspect related to attitude to online advertising and VPN use can be in the boxplots below. As shown in Figure 3.3., users that had a lower perception of ad invasion, don't use a VPN.
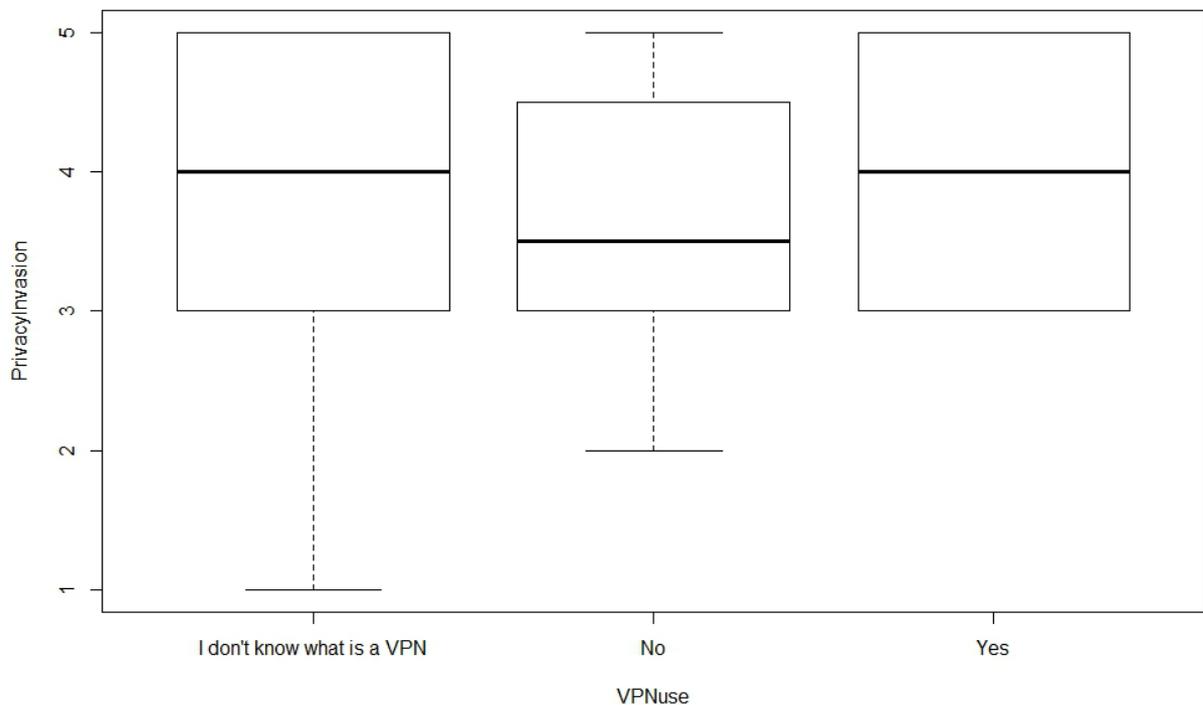

Figure 3.3. The relation between VPN usage and perception of privacy invasion
Source: author's own calculation

The chart below shows that surprisingly many participants who think that online advertising is a good thing, use ad-blockers. This reinforces the premise of this research that online advertising can be more received if they are not intrusive, irrelevant and annoying as people per se are not opposed to the idea of online advertising as they are to its format and content.
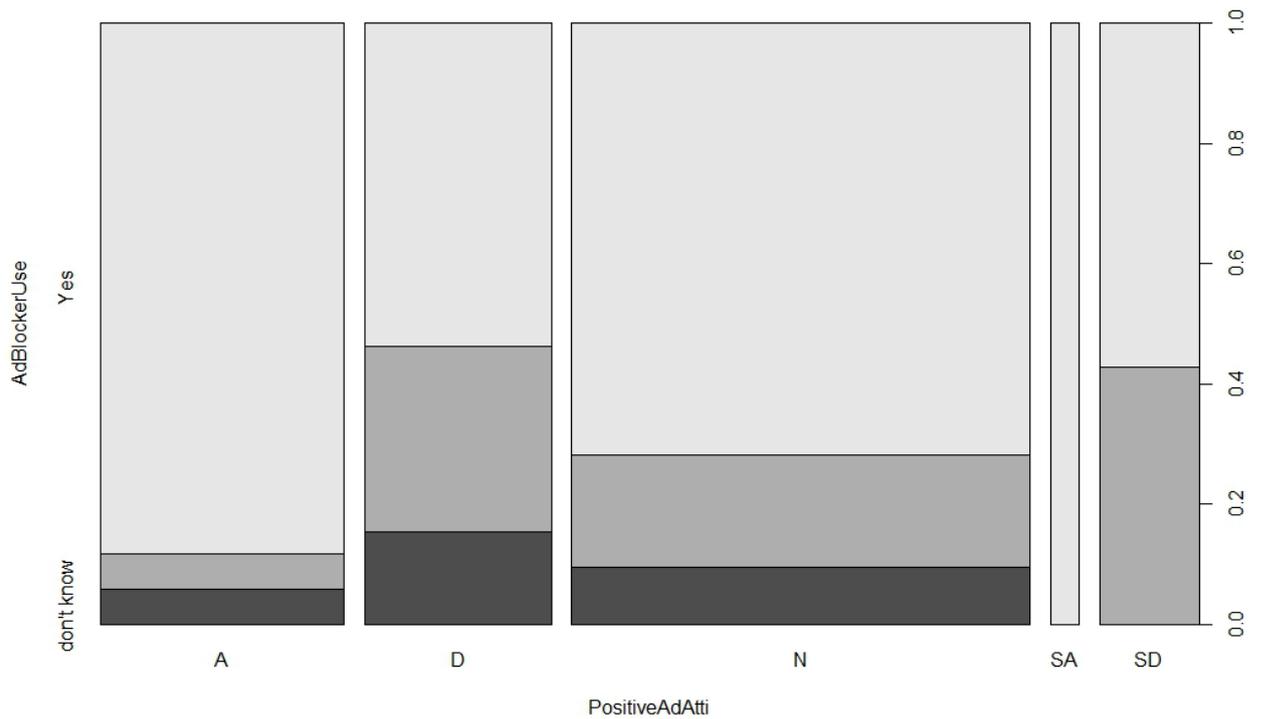
Figure 3.4. The relation between ad blocker users and attitude towards online ads
Source: author's own calculation

In terms of the relationship of gender to ad blocking, the plot below shows a higher rate of ad blocking in the male participants. Furthermore, participants who did not know about ad blockers were entirely female
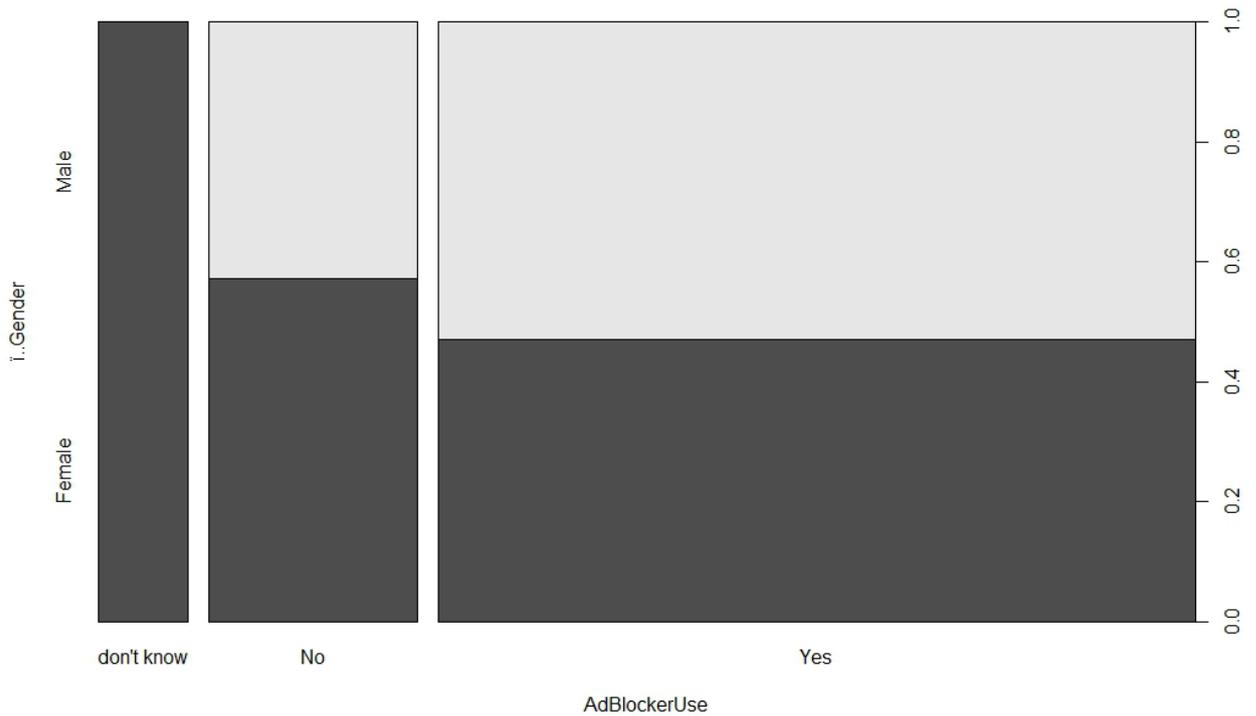
Figure 3.5. The relation between ad blocking knowledge and gender
Source: author's own calculation

The chart below shows that the context in which the ad is presented for different age group might also matter. As it shows that people in age 34-54 are more likely to consider online advertisements as the way to support a free web, as the age group 18-33 are mostly indifferent to this statement.
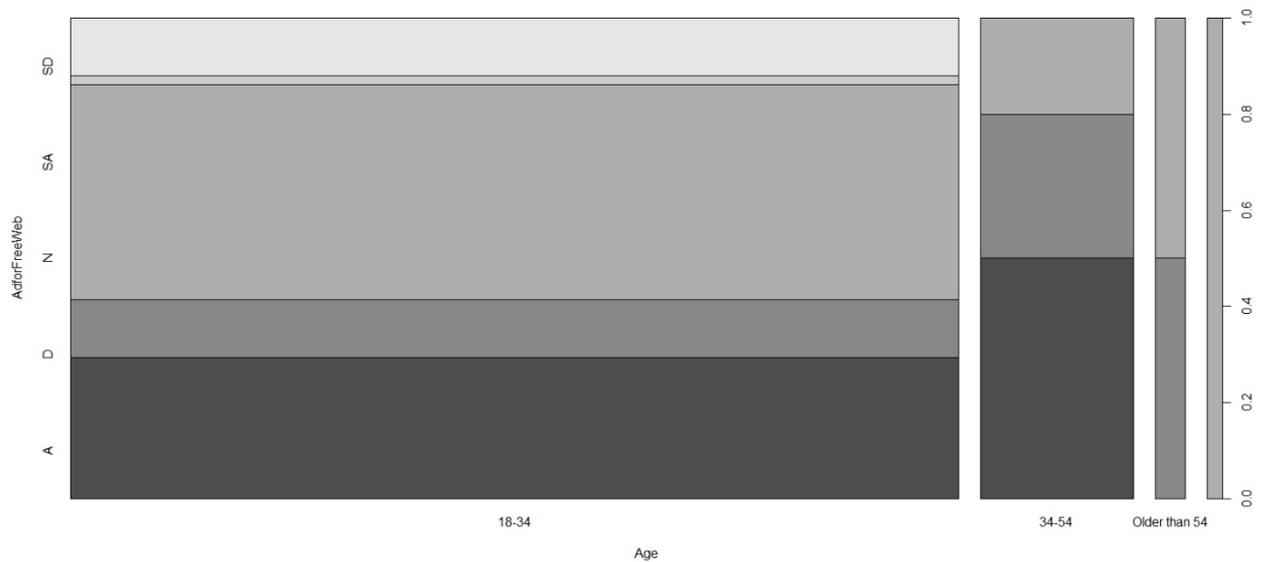

Figure 3.6. The relation between age and support of free web via online ads
Source: author's own calculation

3.2.2. Respondents' perceived ad intrusiveness and annoyance factors

Looking at the responses to the questions that target the relationship of ad presentation and content to ad-blocking behaviour, we see that ad placement is the most important factor in the perception of ads. Meanwhile, most participants believe that "Auto-playing video with sounds" is the most annoying ad format. This answer might imply that "Auto-playing video with sounds" format is also perceived as the most disruptive type.
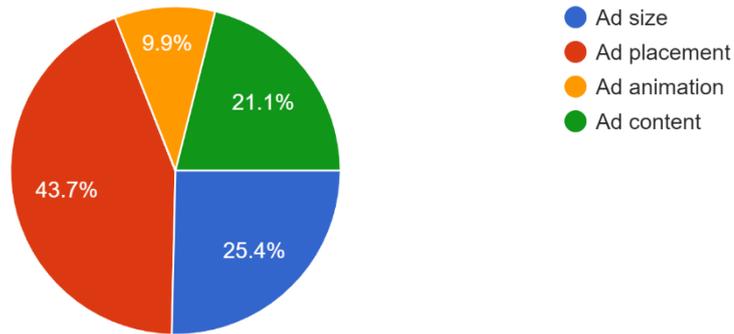

Figure 3.7. Most important factors to judge ads.
Source: author's own calculation, Question is based on Acceptable Ads Committee (2018)
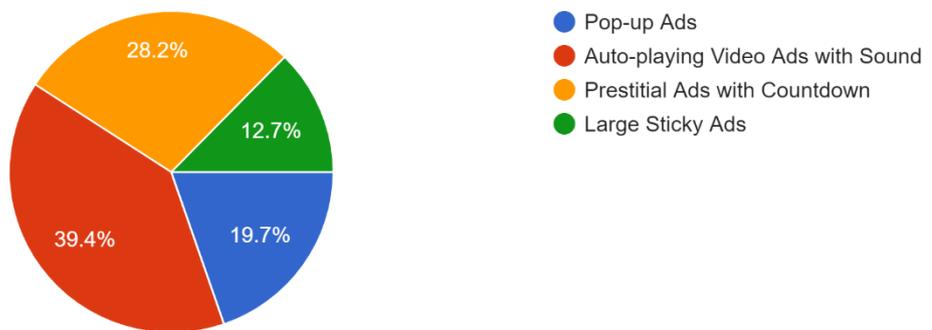
Figure 3.8. Most annoying type of online ads.
Source: author's own calculation

The chart below shows when ads are placed in the context of shopping sites are perceived as less disruptive. While when they are presented on the search results are perceived higher in disruptiveness. This again, ties to the concepts of ad relevance and personalization. And how while personalization helps increasing ad relevance, too much personalization such as the ones that come in the search results raise privacy concerns and might further result in avoidance behaviour.
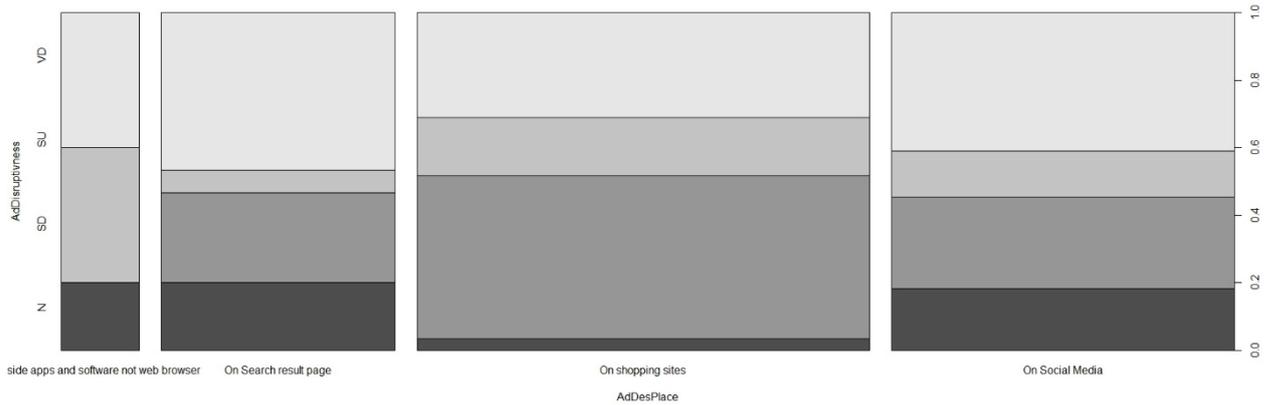
Figure 3.9. Ad disruptiveness on different channels.
Source: author's own calculation

3.2.3. Impact of respondents' online tools on ad avoidance and ad blocking behaviour

The charts below show that as people spend more time surfing the web, they are more likely to use ad blockers. In addition, people that have a dedicated web browser are more likely to use ad blockers than those that use a combination of the browsers.
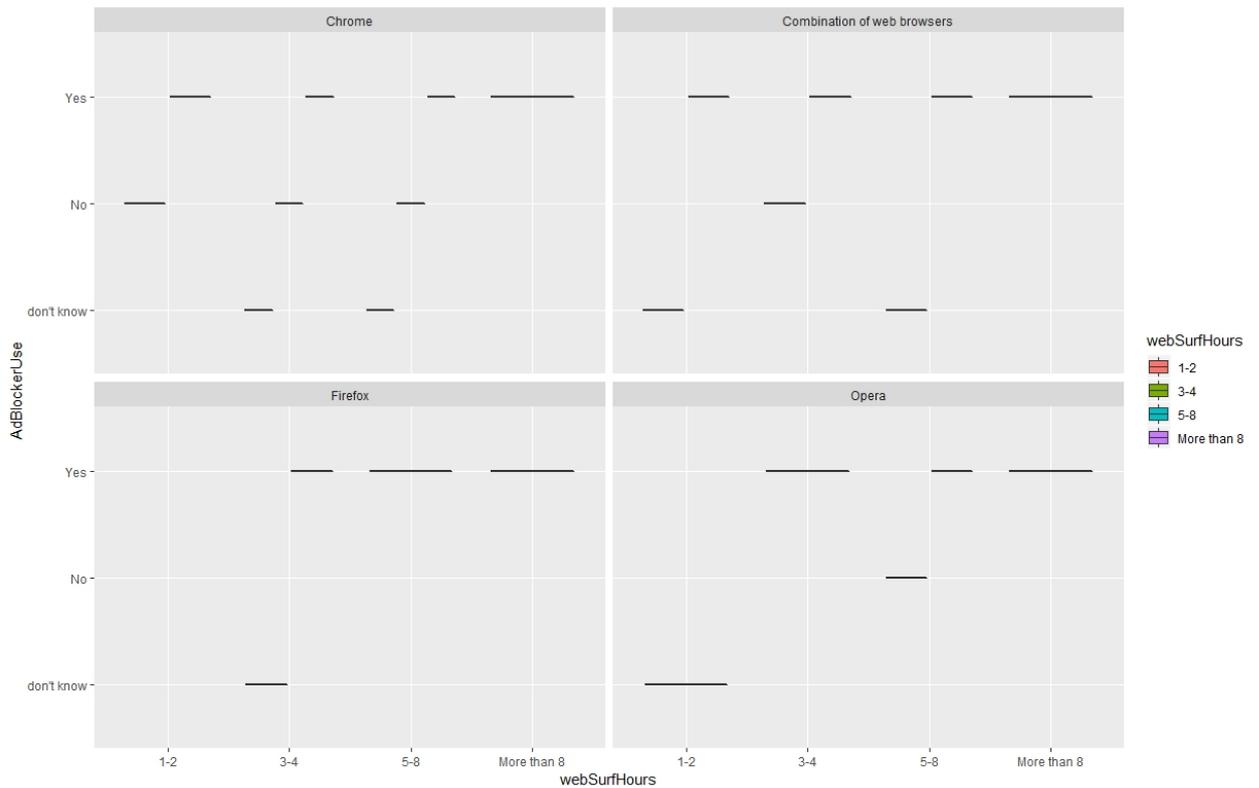

Figure 3.10. We browsers and ad blocking usage based on time spent on the web
Source: author's own calculation

As shown in figure 3.11, participants who spent more than 8 hours a day on the web have a better knowledge of ad blocking and they all are users of ad blocking software. The correlation of hours spent on web and ad blocking usage seems very consistent as it gradually decreases when fewer hours are being spent on the web.
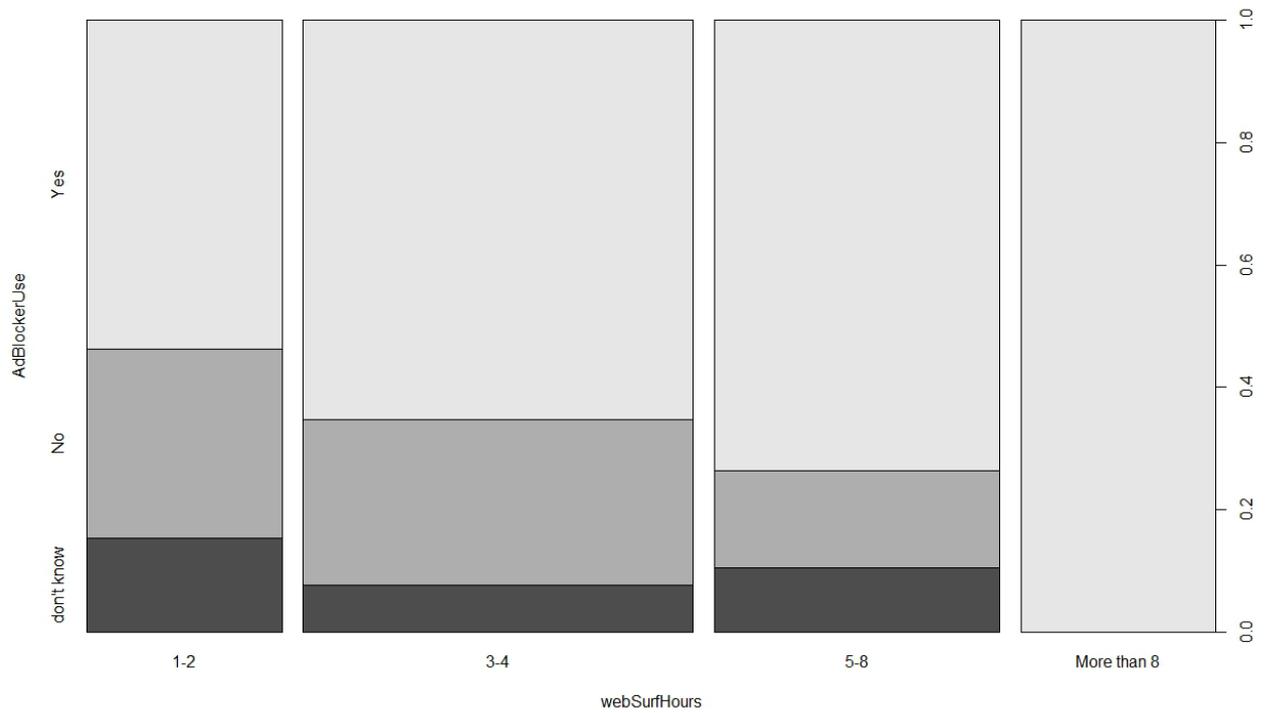

Figure 3.11. Hours spent on the web and ad blocking usage
Source: author's own calculation

The userbase of Mozilla Firefox has a better knowledge of ad blocking. This is particularly interesting due to the fact that Firefox was one of the early browsers that enabled ad blocking features via extension software as discussed in chapter 1.
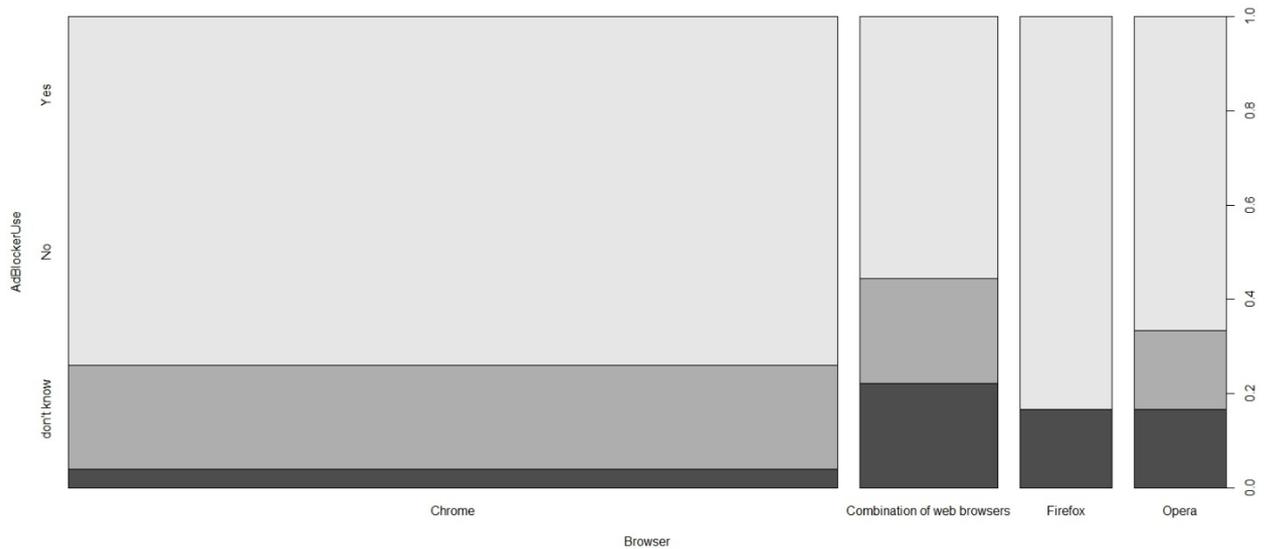
Figure 3.12. The relation between web browsers and ad blocking usage
Source: author's own calculation

Since the majority of the participants use Chrome as their main browser, Figure 3.13, the data for other browsers is significantly limited and thus does not result in a meaningful conclusion about the differences between each browser.
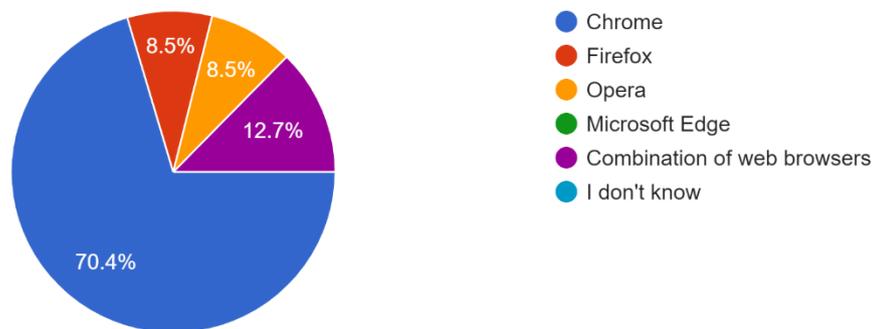
Figure 3.13. web browser usage
Source: author's own calculation

3.3. Limitations and further research

As of the writing of this study, in 2019, the significance of mobile online advertising is undeniable. One of the limitations of this study is due to the fact that it focuses mainly on desktop and laptop devices.

Another limitation of this study which is inevitable is the fact that ad blocking techniques constantly evolve and they are ever-changing. With the rise of machine learning and big data, the

way advertisers and users look at online ads might change dramatically in and few years parts of this study can be irrelevant. These methods focus more on the behaviour of the users rather than just simple text files as rules to block and not to block online ads.

Furthermore, it is almost impossible to have a truly random sample of internet users without having a very large number of participants in the survey. Although the 71 respondents are somewhat reflective of the internet users in the targeted demography, it is far from the ideal number. This is clearly visible in some questions such as web browser usage. In this question, the same number of participants who use Mozilla's Firefox and Opera are the same and around 8.4% which shows that the participants are more tech-savvy than average web users. This can be due to the fact that the author distributed this questionnaire among university students.

It is important to emphasise that the findings of this research have been written based on exploratory data analysis and basic statistics. The significance of the mentioned differences between variables or the likelihood of the correlations between them only can be assessed by running a regression model and acquiring the p-values for each of the variables. The most relevant regression model to this study is multinomial logistic regression with ordinal independent variables such as adInvasion, AdDisruptiveness, PositiveAttitude and the dependent variable as adblocking. Since this is a highly complicated model, it is beyond the scope of this thesis. However, it is a crucial next step for understanding data and the most important limitation of the current study.

CONCLUSION

The aim of this study was to: 1) understand the attitude of the target demography towards online advertising/ad-blocking 2) investigate the factors in ad presentation that affects the perception of ads intrusiveness and annoyance and thus the avoidance behaviour and 3) the effects of online tools and browsers on the ad-avoidance and ad-blocking behaviour. In order to do so, the current study presented theoretical frameworks and related literature review which showed some of the main best practices when it comes to online advertising presentation and content. Furthermore, an online questionnaire was conducted which received 71 respondents.

The findings of this thesis highlighted the important factors that marketers and online advertisers need to consider complying with best practices for online advertising.

In addressing the first research objective, the results of this research showed that the dominant reasons for ad block usage were, "too many ads are annoying and irrelevant" and "ads are intrusive". This result is in line with the literature on the direct relationship of perception of ad intrusiveness, annoyance and irrelevance to ad avoidance behaviour. The responses also reflect the component of disruption in the "perceived goal impediment" part of avoidance behaviour. The results of this study also have shown that avoidance behaviour does not necessarily originate from a generally negative attitude towards online advertising, but it is influenced by ads presentation and content. This study also has highlighted that ad audience demography characteristics such as age and gender also might be a relevant factor for the decisions on online advertising strategies.

In addressing the second research objective, the results of this research have depicted that in terms of ad presentation, it is important to understand the primary categories of ad design and the factors that influence users' perception of ads. While initiatives such as Coalition for Better Ads and Acceptable Ads Initiatives provide classifications of ad presentations, this study has shown that the most relevant representational factor in the design of online ads might be the placement. In addition, video ads with sounds are perceived as the most disruptive ones and disliked by most of the participants. Findings call for a balanced approach between relevance and personalisation in the ad content. As the personalization is helpful in increasing relevance and thus ad receptivity, too much of personalization raises privacy issues. Lastly, for the third objective, this thesis has shown that it is important to recognize users' different web browsing habits and tools as they are influential factors when it comes to best practices of online advertising.

The contributions of this study are twofold; as it can be seen in the discussed results above for each of the research objectives; some findings such as the effect of ad annoyance on the avoidance behaviour are reinforcing the existing literature and theories, while other findings such as the paradox of positive attitude towards online advertising and using adblockers are shedding new light on the context of ad-blocking behavioural study. Furthermore, the usage of the R programming language to write code and compare the results and find meaningful results was one of the contributions of this study. This enabled the study to draw meaningful results between questions. Since the code for data cleaning has been written in R, any updated dataset can be easily replaced for producing similar analyses. In this sense, data analysis in R programming language has an edge on using software applications such as Microsoft Excel that requires many adjustments for each new dataset. The availability of in-depth statistical functions and packages in R, also makes it a relevant choice for exploratory data analysis since it can be further augmented by more complicated models in future research.

The presented conclusion is limited by the sample size and the statistic method used in the study. It is recommended to conduct further research on the topic of this study in future based on more complex statistical approaches and different data gathering method.

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APPENDICES

Appendix 1. The Questionnaire

Questions	Option items
Section 2 of 4: Online tools and usage	
Q1: What is your gender?	Female Male
Q2: What is your age?	Younger than 18 18-34 34-54 Older than 54
Q3: How many hours a day you surf the web?	1-2 3-4 5-8 More than 8
Q4: Which web browser do you use?	Chrome Firefox Opera Microsoft Edge Combination of web browsers I don't know
Q5: Do you use VPN?	Yes No I don't know what VPN is
Q6: Do you use ad blockers?	Yes No I don't know what ad blocker is
Section 3 of 4: Online advertisement intrusiveness and Ad Blocking	
Q1: Please think of all the different forms of advertising you encounter in your daily life and rank how disruptive you find each advertising type?	Not disruptive at all Somewhat undisruptive Neutral Somewhat disruptive Very disruptive
Q2: Which type of online Ad is the most annoying?	Pop-up Ads Auto-playing Video Ads with Sound Prestitial Ads with Countdown Large Sticky Ads
Q3: What factors do you find most important when judging ads?	Ad size Ad placement Ad content Ad animation

The table continues on the following page.

Appendix 1. The Questionnaire continued

Q4: Why do you use an ad blocker? (Select all that apply)	Ads are too intrusive Ads might compromise my online privacy Ads sometimes contain viruses or bugs Ads take up too much screen space Too many ads are annoying or irrelevant To speed up page loading times To avoid having to see video ads before watching clips/shows To avoid businesses making money off my browsing To avoid online advertising altogether To stop ads being personalized based on my browsing history To stop my data allowance from being used up To stop my device's battery life being drained I don't use an ad blocker anymore
Q5: Where is the most desirable place for Online Ad in your opinion?	On Social Media On Search result page On shopping sites Inside apps and software not web browsers
Q6: On a scale of 1-5 how invading online ads are when it comes to your privacy?	1 2 3 4 5
Section 4 of 4: Attitude toward online advertising	
Q1: I prefer to see ads in-app on my smartphone rather than a desktop/laptop?	Strongly disagree Disagree Neutral Agree Strongly agree
Q2: Online advertising is the way to support the free web	Strongly disagree Disagree Neutral Agree Strongly agree
Q3: Generally, I consider Internet advertising to be a good thing	Strongly disagree Disagree Neutral Agree Strongly agree

Sources: Acceptable Ads Committee, (2018), Coalition for Better Ad standards, (2018) and Based on Redondo and Aznar (2018)