Video advertisement study

Measuring ad-blocking users' perceptions of types of video advertisement

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Performed by: Dynata and eyeo GmbH
Commissioned by: The Acceptable Ads Committee

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1 Abstract

In this study, the sentiment of ad-blocking users towards websites with video ads was compared with their attitudes towards websites containing other advertising formats, and websites free of advertising. Formats tested included advertising formats that comply with the Acceptable Ads Standard as well as an animated ad and different forms of video ads. The Acceptable Ads Standard ensures that ads do not interfere negatively with the users' web experience.

A preliminary study was conducted to narrow down which factors influence the perception of disruptiveness of short form video advertisements. The preliminary study revealed that the length of a video ad has a negative impact on the user's perception of it, whereas a skip-button improves it by strengthening the user's empowerment. A multi-ads survey followed the initial video ads study and included Acceptable Ads formats as well as disruptive ads and a no-ad experience. The multi-ads survey was distributed to 4,000 ad-blocking participants from across the US, Germany, and France.

Results show a clear negative impact on users' perceptions of video advertisements longer than six seconds – they are perceived as more annoying, intrusive, and disruptive than Acceptable Ad formats. In addition, this study provided further proof points that websites using Acceptable Ads perform similarly well in users' perceptions as websites without any advertisement at all.

2 Introduction

This study was commissioned by the Acceptable Ads Committee (AAC). The AAC is the non-profit organization that sets the standards for which ads are deemed acceptable to show to Acceptable Ads users. Similar to institutions such as the Interactive Advertising Bureau, Media Rating Council, Coalition for Better Ads, and other industry bodies, the AAC is one of the few organizations setting ad standards

online. Whilst the AAC sets standards tailored to the ad-blocking user audience, other industry bodies, such as the Coalition for Better Ads (CBA) or the Interactive Advertising Bureau (iab), are the guiding industry bodies for a better advertising experience for the non-ad-blocking audience.

A preliminary study conducted on behalf of the AAC in 2019 investigated how ad-blocking users perceive common video advertisement types. With the aim to create consistency with previous studies the AAC conducted, the study exclusively measured how disruptive video advertisements are to ad-blocking users. Factors influencing the perception of video ads are quite diverse, but the study narrowed in on two specific variables as having the highest degree of impact: the presence (or absence) of a skip-button and the length of the video advertisement. It was hypothesized and found that both factors contributed greatly to the perception of disruptiveness of video advertising formats.

Building on the results from this preliminary finding, this study aims at putting the least disruptive video ad formats in the context of the whole browsing experience of a user. The least intrusive video advertising formats identified in the preliminary testing were tested amongst Acceptable Ads formats, a no ad experience, and other 'non-acceptable' ad formats.

3 Literature review

3.1 Role of video advertisement in the advertising industry

Online video content has continued to grow steadily year over year, with 78 percent of US internet-users regularly consuming online videos/content (Joa, Kim und Ha 2018). The iab recognized the importance of this development early on by creating the video centre of excellence in 2014 (Interactive Advertising Bureau 2019a). In their ad spend report for 2019, the centre states an increase by 25 percent year over year, with this trend likely to be exceeded in the years to come. Other insights estimate that three out of four buyers are planning to increase their digital video

budget for 2020 (Interactive Advertising Bureau 2019b). See also Figure 1 which shows the development of programmatic video ad spending since 2017.

Respectively, video ad formats have become a significant source of revenue for the advertising industry, with half of programmatic revenue estimated to be generated by video in 2020.

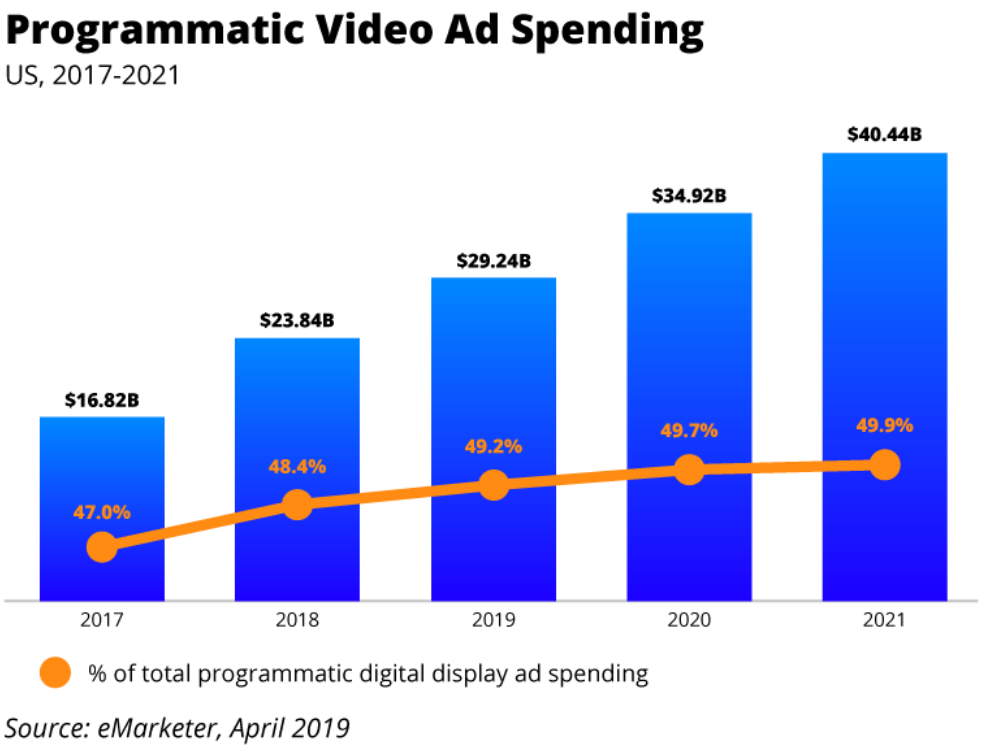


Figure 1: US Programmatic Digital Video Ad Spending (eMarketer 2019)

The increased supply of the online video advertising industry would not be possible without the rapid growth of online video consumption. Next to the YouTube sphere, where content is mostly funded by advertising, video content is often supported with the help of subscription-models. Service platforms such as Netflix currently "mitigate the need for advertising dollars" with users who are "willing to pay a premium for advertisement-free content" (Rose, et al. 2018). However, opinions within the ad tech and advertising industry assume that this trend is likely to change, with subscription model networks being forced into adopting to ad-supported models (Graham 2019, The Trade Desk 2019b). With TV networks opening inventory to digital buyers and TV advertising (Benes 2019), the trend of

growing video advertisement budgets and revenues will most likely continue, making it an even more important genre for advertisers, publishers and the whole ad-tech world alike.

From an industry perspective, the most used formats are in-stream pre-roll video advertisements. Conclusively, this potentially also means that this is the advertising format users are most exposed to, making this format especially crucial for investigation.

3.2 Role of video advertising for users

Investigations on pre-roll advertising have found that it captures the attention of the largest audience, on the other hand, it has also been considered a more intrusive form of advertising from a user perspective (Pashkevich, et al. 2012, Goodrich, Schiller und Galletta 2015).

Previous studies have shown that users gain a positive experience with ad-free sites, whereas intrusive ads impede users' information processing (Yan, Miller und Skiera 2020). When more and more intrusive advertising techniques are used to attract user attention, it follows that a drop in user experience is observed (Brajnik und Gabrielli 2010, Zha und Wu 2014). Intrusiveness is a perception or psychological consequence that occurs when an audience's cognitive processes are interrupted (Li, Edwards und Lee 2002). Intrusive advertising results in consumers having a negative psychological reaction to advertising that interferes with their ongoing cognitive processes. This reaction is even more apparent online, where consumers are often goal-directed and may find ads even more intrusive than when viewed in other media (Li, Edwards und Lee 2002). Additionally, past research confirms that consumers have developed negative attitudes toward digital marketing that they consider intrusive (Li, Edwards und Lee 2002, McCoy, et al. 2007). When users interact with a less ad-heavy or ad-intrusive environment, they can consume more information. For example, users who use ad blockers subsequently consume 20% more news articles corresponding to 10% more categories. The effect persists over

time and is largely driven by the consumption of "hard" news (Yan, Miller und Skiera 2020).

Exposing consumers to highly intrusive advertising formats has also been found to be detrimental in terms of consumers' lack of control, physiological stress and sense of a violation of freedom (Tudoran 2019). But there is also a negative effect for the firms who are offering the intrusive advertising, by means of negative attitudes towards the advertised product, lower loyalty to the website, or higher economic costs (McCoy, et al. 2007, Goldstein, et al. 2014). Intrusive advertisement, as it impedes the goal of the user, increases ad avoidance, lowers click-through rates, and increases banner blindness (Cho 2004).

Furthermore, users exposed to a highly annoying ad present greater levels of goal-impediment perceptions, willingness to install ad blockers, and favourable opinions toward prohibiting that kind of ad, compared to users exposed to a non-annoying or lesser annoying ad (Belanche 2019).

Video ads can potentially harm users' experience: Excessive usage of video, audio and animations within online content causes an overload problem of commercial content and can lead to side effects which negatively affect the user experience (Rosenkrans 2009). In part, this occurs because the user's state when watching online content is different than when they are watching traditional TV content. When watching TV, the user is relaxed and more passive, whereas when browsing the web, users are more task-oriented (Hegner, Kusse and Pruyn 2015).

A user's task orientation also affects the perceived level of advertising clutter on a website. When users are conducting an informational search, for example, or are task orientated, they perceive a higher ad-clutter level than entertainment-, exploration- and shopping-orientated consumers (Ha and McCann 2008). When a user is conducting different tasks, the user will have a different level of engagement with the website. As a website viewer becomes highly engaged with the content of a webpage and generates attentional inertia, cognitive processing is intensified, and ads are perceived with higher intrusiveness. For example, text-based and

interesting content led to more cognitive engagement and increased the intrusiveness of an advertisement (Huang and Chen 2017). Therefore, the multi-ads study evaluates ads within two different contexts where users would have different orientations: a video streaming site and a news site.

3.3 Video advertisement and Acceptable Ads

The Acceptable Ads Standard was created to allow publishers, ad networks, and ad-tech providers to monetize and support the content they create, while simultaneously offering a positive user experience for the audience. Therefore, the Standard aims at identifying the right balance between (monetary) benefits for the industry and the effect of the advertising format on the user experience.

Considering the massively growing programmatic digital video ad spending from the industry and negative impediments to the user experience, this balance seems to be hard to find in the video ad space. In order to get a more detailed understanding about users' sentiments toward video ads, a preliminary study was conducted by the Acceptable Ads Committee, aimed at identifying aspects of video ads that could mitigate negative effects.

Several studies found that the implementation of a skip button can e.g., reduce negative ad perception and increase user satisfaction (Belanche, Flavián and Pérez-Rueda 2017, Joa, Kim and Ha 2018). At the same time, it was hypothesised that shorter video advertisements could potentially interfere less with the users' engagement on the website. Hence it was concluded that shorter video advertisements would lead to a perception of the advertisement being less intrusive.

The preliminary study was conducted among 3,042 ad-blocking users, 1,026 from the US, 1,017 from France, and 999 from Germany. It showed that the existence of a skip button as well as the length of a video advertisement have a significant impact on how disruptive an advertisement is perceived by ad-blocking users.

Video Advertisements that had a skip button present, as well as shorter advertising formats were considered as less disruptive. Based on these findings, this study aims at discovering how the identified less-intrusive advertising formats are perceived when put into the context of the whole browsing experience of users; also, to compare this to formats compliant with the Acceptable Ad Standard.

4 Methodology

To acquire data, representatives of the online consumer population completed a series of questions. Respondents had to be ad-blocking users. Responses were collected through self-completed online questionnaires.

4.1 Participant Demographics

4,008 ad-blocking participants from the US, Germany, and France were recruited. The US, Germany, and France were specifically chosen since they are three of the biggest ad-blocking markets. The survey aimed for an even gender distribution, which was achieved with a male-to-female ratio of nearly 1.

4.2 Study and survey design

Before conducting the survey, 1:1 exploratory interviews with ad-blocking users were conducted to determine the pattern of the words that people use to talk about their experiences with advertisements. The words most frequently used were *intrusive* and *annoying*. In previous studies conducted by the AAC the measurement of disruptiveness was the key indicator for the user experience of different ad formats. In order to now create a more robust measurement of user experience overall, this survey tested for three dimensions: *intrusive*, *annoying*, and *disruptive*. Additionally, positive word ratings were included to counterbalance the negative, including a rating for satisfaction with the overall website experiences, and enjoyment of the advertisements. Measures and words were also vetted by examining other research conducted in the advertising space, for example by the CBA, iab, and Nielsen Norman Group (Coalition for Better Ads 2020, Interactive Advertising Bureau 2016, Nielsen Norman Group 2017).

Survey responses were collected via desktop devices. In order to assure that participants were ad-blocking users, participants first answered screening questions before being exposed to different mock-up websites which included the ad experiences.

Each participant interacted with a total of four mock-up website experiences including different advertisements or a no ad experience. A series of five questions after each experience was answered. Four questions were directed towards rating the advertisement in terms of perceived disruptiveness, intrusiveness, annoyance, and enjoyment. Additional, participants were asked to rate how satisfied they were with the overall experience of the website. In case a participant was exposed to a no ad experience, s/he only rated the overall experience of the website.

All tested advertising formats can be seen in Table 1 and in Figure 2.

Table 1: List of tested ad types

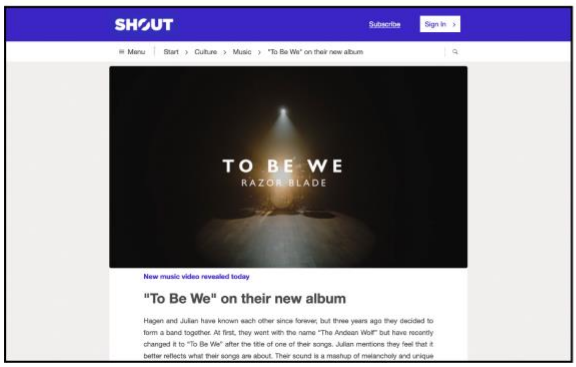
Context	**Ad Type**	**Specification of format**	**Size**
Newspaper	Banner, Top Leaderboard (static)	Acceptable Ad - above content	728 90
Newspaper	Banner, Skyscraper (animated)	next to the content	160 600
Newspaper	Video Ad, 6 sec	pre-roll, not skippable	same size as video player
Newspaper	Video Ad, 15 sec	pre-roll, skippable	same size as video player
Newspaper	Video Ad, 15 sec	pre-roll, not skippable	same size as video player
Newspaper	no ad	-	-
Video Stream	Display Ad – Rectangle (static)	Acceptable Ad - next to the video	250 150
Video Stream	Video overlay (static)	banner overlaying the video continuously while watching	400 70

Video Stream	Video Ad, 6 sec	pre-roll, not skippable	same size as video player
Video Stream	Video Ad, 15 sec	pre-roll, skippable	same size as video player
Video Stream	Video Ad, 15 sec	pre-roll, not skippable	same size as video player
Video Stream	no ad	-	-

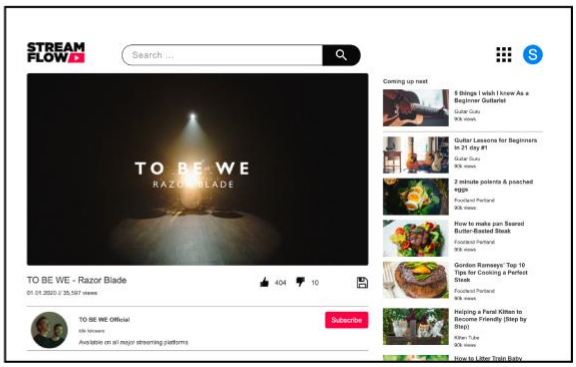
Figure 2: Images of tested ad types

No ad web experiences

Newspaper

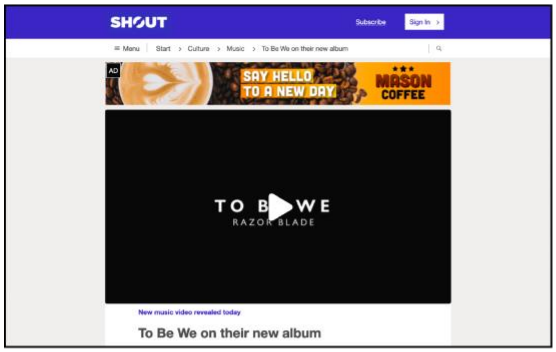


Streaming Site

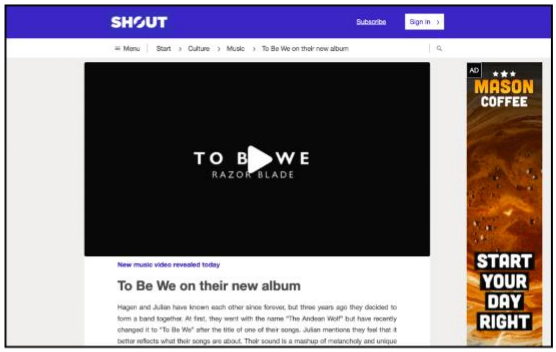


Set A: Mason Coffee | Newspaper Context

Top Leaderboard (static)

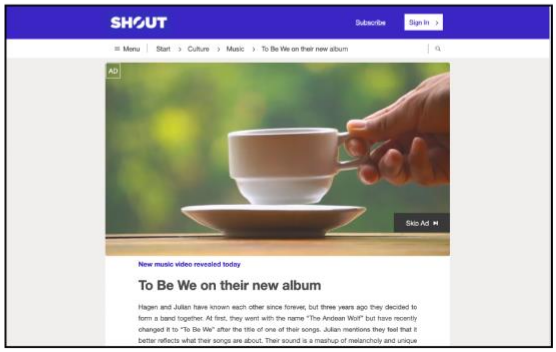


Skyscraper (animated)



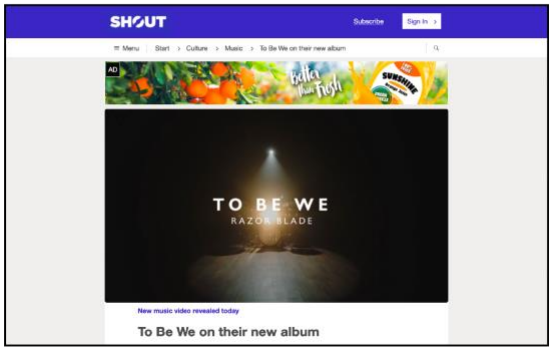
Video Ad – not skippable

Video Ad – skippable

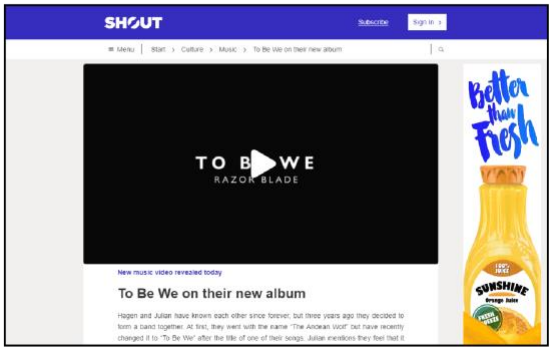


Set B: Sunshine Orange Juice | Newspaper Context

Top Leaderboard (static)



Skyscraper (animated)

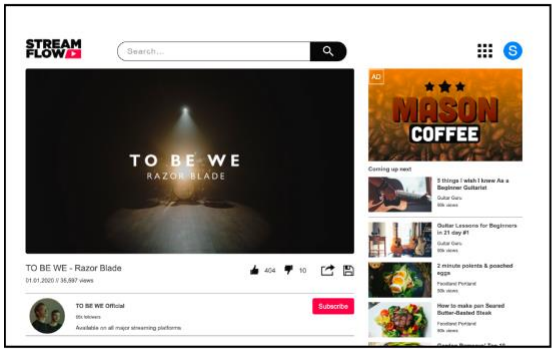


Video Ad – not skippable

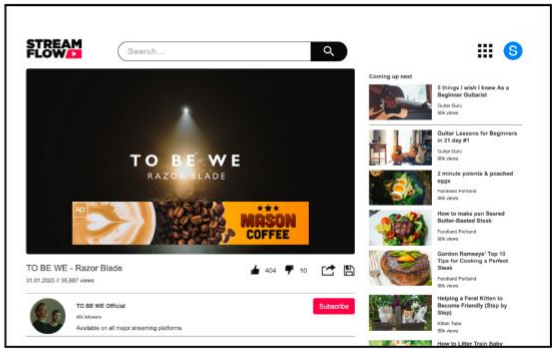
Video Ad – skippable

Set C: Mason Coffee | Streaming Platform Context

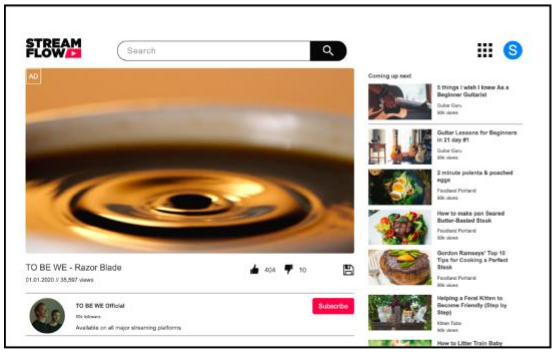
Rectangle (static)



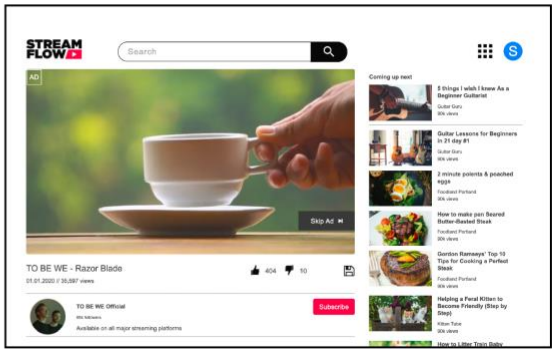
Video Overlay (static)



Video Ad – not skippable

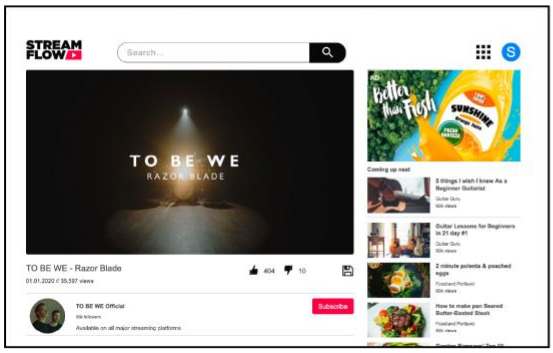


Video Ad – skippable

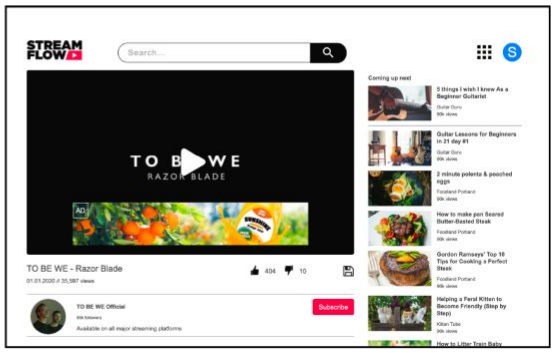


Set D: Sunshine Orange Juice Ad | Streaming Platform Context

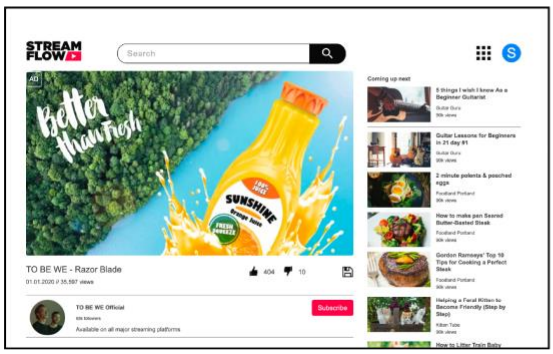
Rectangle (static)



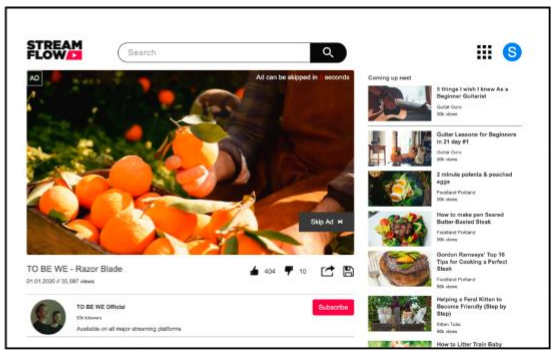
Video Overlay (static)



Video Ad – not skippable



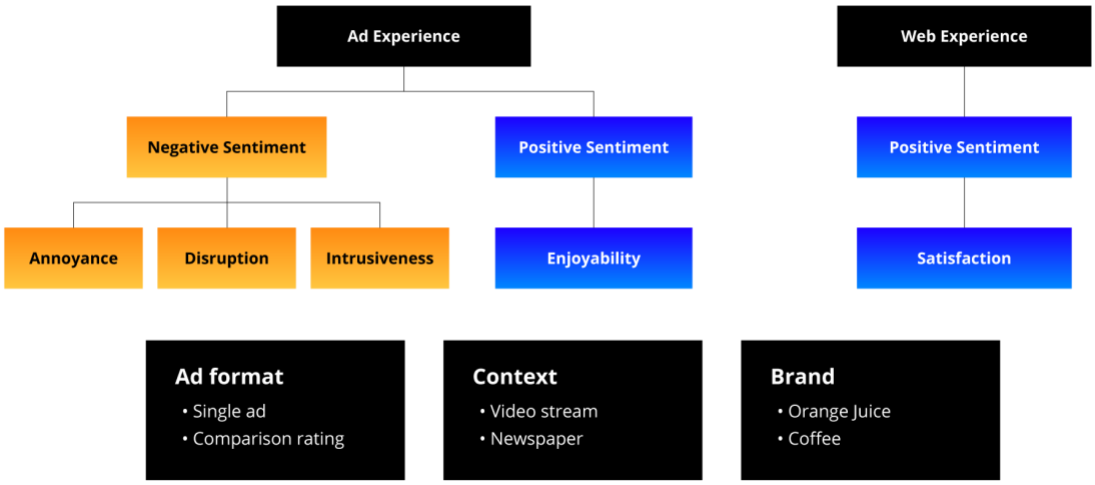
Video Ad – skippable



After each pair of experiences, the participant was asked to compare which of the two experiences was more obstructive. As delineated in several studies (Li, Edwards and Lee 2002, Cho 2004, Huang and Chen 2017) the most intrusive and annoying advertisements are normally those which obstruct a user from completing their task, or job to be done, so therefore survey participants were asked to compare two advertisements in regard to the obstructiveness to their experience.

The survey concluded with two final questions around the participant's ad-blocking behaviour and sentiments toward advertising in general. Figure 3 demonstrates what type of data was collected. The full survey questionnaire can be found in Appendix A.

Figure 3: Dimensions measured within the study



The experiences were randomized in a way that each pair of advertisements that a participant reviewed would only vary on one dimension, either the ad format or the platform (newspaper or video stream). Although two different brands were included in the study, participants were never asked to compare two advertisements from different brands to each other. The effect of brand or content within this study was purposefully limited, and therefore two reasonably neutral non-existent brands were used in the advertisements: Sunshine Orange Juice and Mason Coffee.

Once the survey was programmed, a pilot study with 400 participants was run to ensure the integrity of the data, as well as a small qualitative usability test. As a result of these steps, the introduction to the study was further clarified, and ad-matching logic was improved before conducting a second pilot study and moving onto the full launch.

4.3 Survey scale

To determine each respondent's level of disruption, intrusiveness, annoyance, and enjoyment towards different ad types, the survey utilized a five-point unipolar Likert scale for all individual ad ratings. Respondents indicated for each of the 12 different ad types their level of disruption/intrusiveness/annoyance/enjoyment by choosing any of the following five positions, shown to the participants in text-format only. Additionally, participants also indicated their level their satisfaction

with the website using a five-point bipolar Likert scale. These were then translated into the scale shown in Table 2.

Table 2: Rating Scales for web experiences and towards the perception of the ad

How disruptive was the ad to your experience?	**How intrusive was the ad to your experience?**	**How enjoyable was the ad to your experience?**	**How annoying was the ad to your experience?**	**How satisfied were you with the overall experience of viewing this page?**	**Numeric representation**
Not at all disruptive	Not at all intrusive	Not at all enjoyable	Not at all annoying	Very Dissatisfied	1
Slightly disruptive	Slightly intrusive	Slightly enjoyable	Slightly annoying	Slightly Dissatisfied	2
Disruptive	Intrusive	Enjoyable	Annoying	Neutral	3
Very Disruptive	Very intrusive	Very enjoyable	Very annoying	Slightly Satisfied	4
Extremely Disruptive	Extremely intrusive	Extremely enjoyable	Extremely Annoying	Very Satisfied	5

4.4 Survey Vendor and survey tool

After reviewing several vendors, Dynata, a market research firm, was selected because of their ability to provide video hosting services as well as a panel of international ad-blocking participants. The website experiences were hosted within the survey tool in order to minimize dropout rates which could be caused by redirecting to a website outside of the survey.

5 Presentation of results

This section describes the results of the study by looking into participants' demographics, the specific ratings (individual, in comparison, as well as the rating of the web experience), and the impact of context and marketing creatives.

5.1 General participant distribution

A total of 4,008 users participated in this study: 1,346 from the US, 1,333 from France and 1,329 from Germany. The user demographics are summarized in Table 3.

Table 3: Age-gender distribution of the participants

Gender/Age	**16-18**	**19-24**	**25-34**	**35-44**	**45-54**	**55-64**	**65 or over**	**Total sum (over gender)**
female	63	230	464	320	381	361	173	1,992
male	48	121	297	444	486	414	193	2,003
other	3	3	3	2	0	0	0	11
prefer not to say	0	1	0	1	0	0	0	2
Total sum (over age)	114	355	764	767	867	775	366	4,008

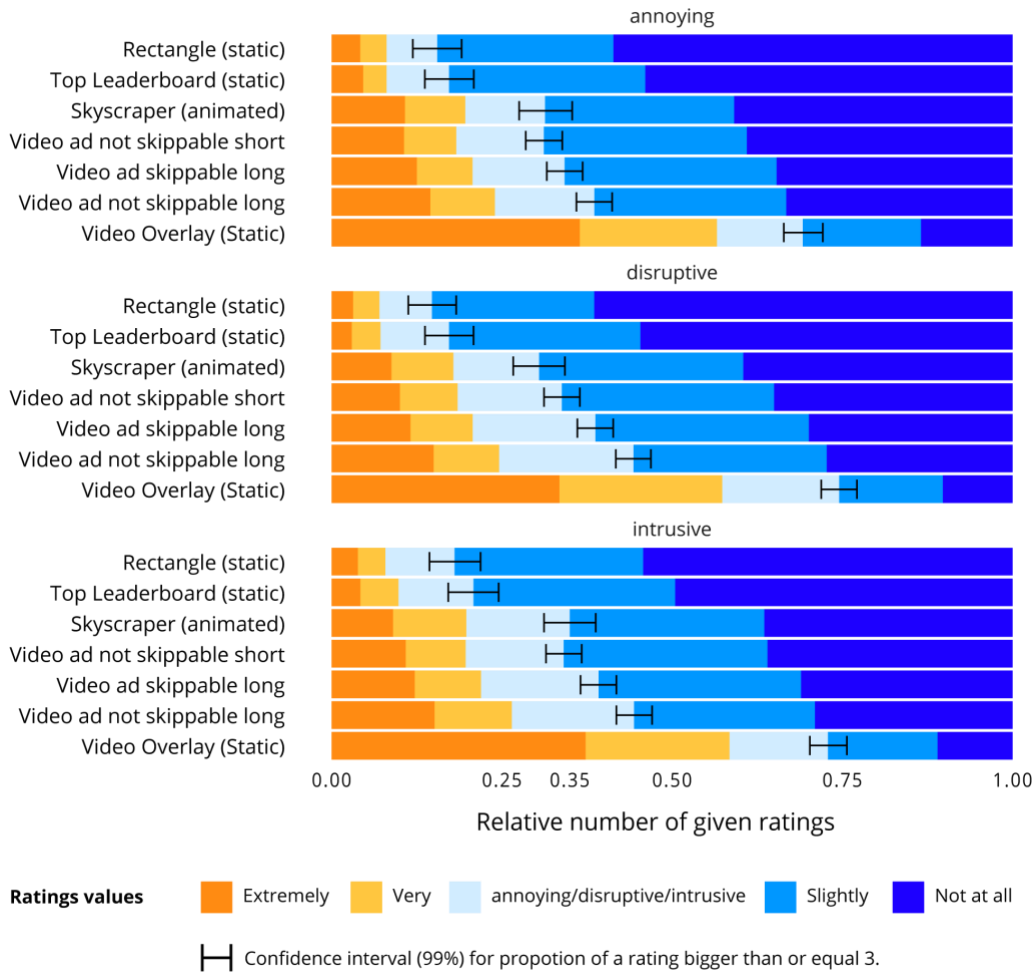
5.2 Individual ad ratings

The user took part in the survey by getting exposure to a series of diverse ads embedded in fake websites. Each web experience and the corresponding ad was rated equally often. The ads have been rated between 725 and 735 times. Each participant had to rate the ads in comparison to each other. The logic behind the comparison is to ensure that only two experiences get compared to each other, which differ in only one aspect. For example: one would not test a 15-second not

skippable video in a newspaper context with a no-ad experience in a video stream context, as not only the ad types differ but also the context changed.

Figure 4 shows how disruptive, annoying and intrusive the tested advertising formats were perceived. Acceptable Ad formats perform exceedingly well, on all the measured dimensions: annoyance, intrusiveness, and disruptiveness. An (acceptable) Top Leaderboard, for example, has been rated to be very or extremely disruptive by only 7.2% of participants. Whereas in case of the video overlay 57.4% of participants rated this ad to be very or extremely disruptive. The results to each ad format can be seen in Figure 4.

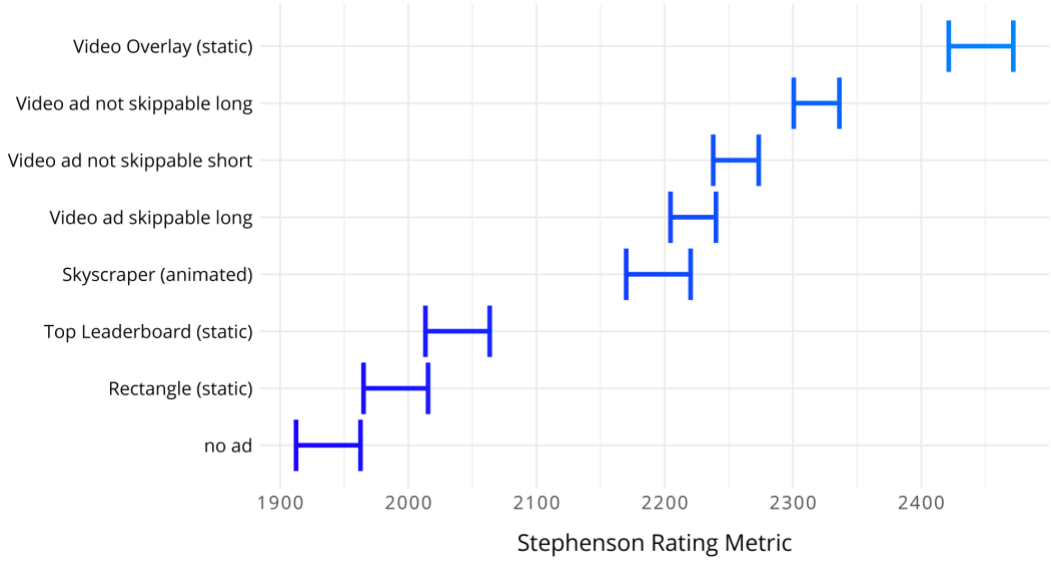
Figure 4: Disruptiveness, annoyance, and intrusiveness of the different ad formats



5.3 Comparison Ratings

Participants had to choose between two ads and had to pick the one which most obstructed them from viewing the content (see Question 10 of Appendix A). While the ad-specific ratings analyzed in Chapter 5.2 only allow an analysis of web experiences that included an advertisement, this rating also shows how participants perceived the websites that *did not* include an advertisement. This analysis cannot be conducted within the individual ratings, because participants did not receive questions to rate the advertisement on the dimensions of disruptiveness, intrusiveness, and annoyance where there was no advertisement present. A Stephenson rating system was used to evaluate the performance of the ads in comparison. The results can be seen in Figure 5.

Figure 5: Stephenson Rating System metric for each ad (two-deviation interval)



Acceptable Ad formats as well as the "no ad" experience compete very closely when it comes to evaluating how obstructed users feel from consuming the content. In direct competition Acceptable Ads perform equally well as sites that do not have an advertisement on them. Findings also show that all other formats tested within this study rank significantly worse than Acceptable Ad formats.

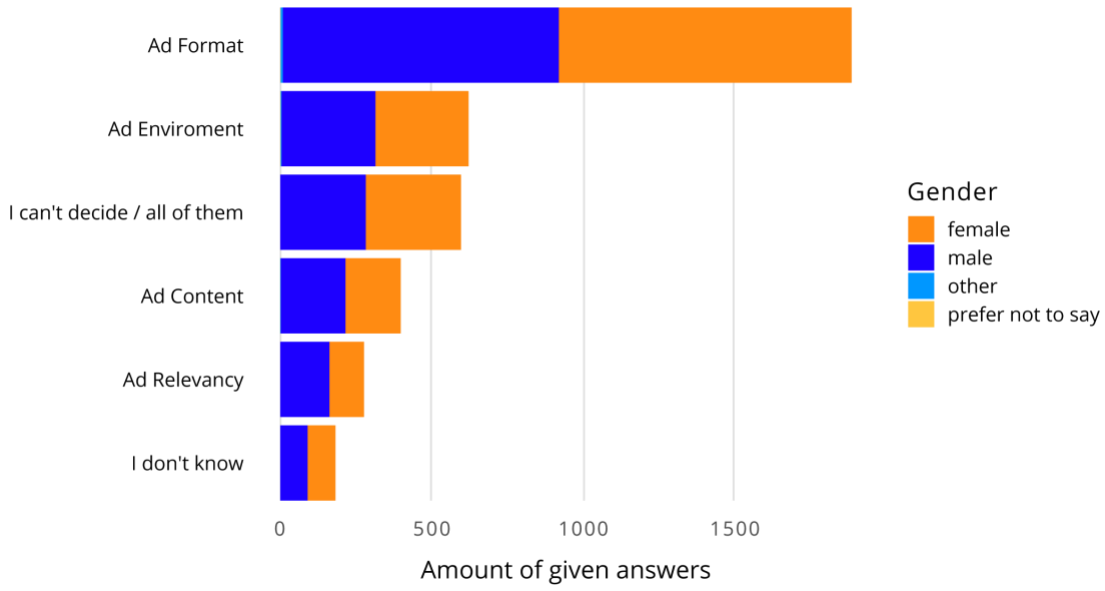
In order to get a better understanding of what influenced these ratings (individual as well as comparison), participants were asked “Which of the following do you

think had the most influence on your ratings during this survey?" with the following answer choices:

- Ad Environment
- Ad Content
- Ad Format (e.g. text, animated, video etc)
- Ad Relevancy
- I can't decide/they all influenced my ratings equally
- I don't know.

The analysis shows that the ad format is the most important factor when judging the experiences (see Figure 6). This demonstrates that the format itself has the biggest impact of the perception of the advertisement (rather than e.g. the website the ad is embedded in).

Figure 6: Factors respondents found most important when judging ads



5.4 Impact of context, marketing creatives, skip button and length of the ad

The results presented so far are aggregated results across the two chosen mock brands (Mason Coffee and Sunshine Orange Juice) as well as the two different contexts (video streaming site and newspaper site) tested within the survey.

In order to conduct a more profound analysis, the ratings were split by context, brand (as in marketing creative), and advertising formats and ratings evaluated based on the three different dimensions. The results can be seen in Figure 7.

Figure 7: Relative number of given ratings split by question for each ad type split by ad brand and web context (only negative adjectives)

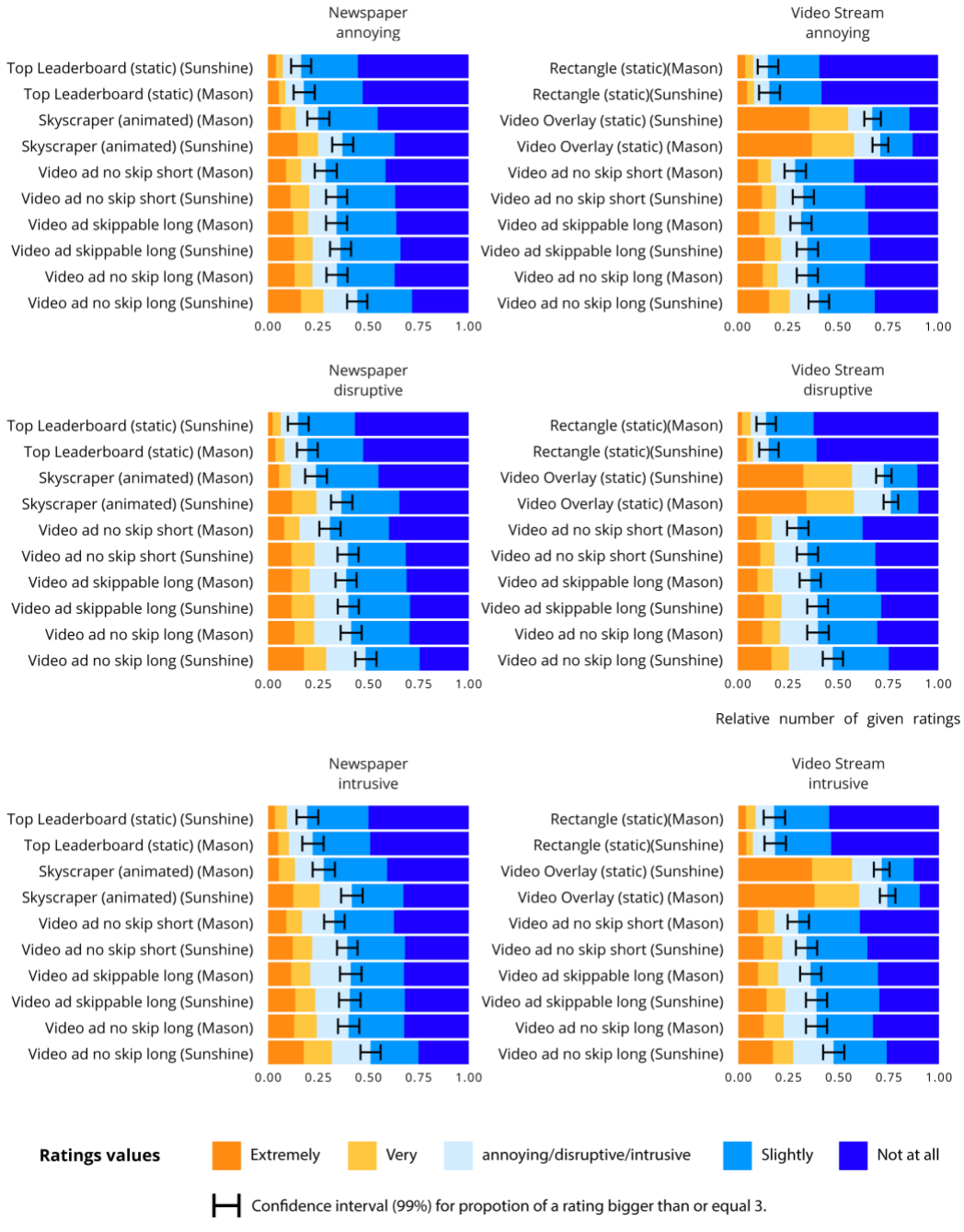


Figure 7 reveals that the ads with the Mason Coffee creative are slightly better rated than the ads containing the Sunshine Orange Juice creative. Looking at the Animated Skyscraper, one can see that the Sunshine Orange Juice creatives are statistically significantly rated more disruptive, annoying, and intrusive, than the same type of creatives advertising Mason Coffee.

To better understand what influences the participant's rating of the ad's disruption, we use an ordered logistic regression model to estimate how the marketing creative, the context, the participant's age, origin, and gender, as well as the ad type have influenced the ad's rating. Table 4 summarizes the estimation results.

Table 4: Ordered logistic regression results with the disruption rating as the dependent variable

	Estimate	**Standard error**	**t-value**	**p-value**	**Significance**
Ad brand: Sunshine	0.191	0.032	6.013	0.000	***
Context: Video Stream	-0.051	0.04	-1.291	0.197	-
male	0.173	0.032	5.368	0.000	***
Gender: other	0.677	0.282	2.397	0.017	*
Gender: prefer not to say	-0.516	0.674	-0.765	0.444	-
Age group: 19-24	0.08	0.103	0.778	0.437	-
Age group: 25-34	-0.09	0.096	-0.937	0.349	-
Age group: 35-44	-0.044	0.097	-0.456	0.649	-
Age group: 45-54	-0.177	0.096	-1.846	0.065	.
Age group: 55-64	-0.224	0.097	-2.309	0.021	*
Age group: 65 or over	-0.219	0.105	-2.091	0.037	*

Ad type: Skyscraper (animated)	0.689	0.075	9.216	0.000	***
Ad type: Video overlay	2.586	0.084	30.662	0.000	***
Ad type: Rectangle ad (AA)	-0.197	0.089	-2.201	0.028	*
Ad type: Video ad not skippable long	1.289	0.068	19.053	0.000	***
Ad type: Video ad not skippable short	0.88	0.068	13.025	0.000	***
Ad type: Video ad skippable long	1.086	0.067	16.118	0.000	***
Country: FR	-0.316	0.039	-8.072	0.000	***
Country: US	-0.249	0.039	-6.403	0.000	***

*Significance codes: *** = 0.001, ** = 0.01, * = 0.05, . = 0.1, - > 0.1*

The ad's marketing creative has a clear influence on the disruption rating. If an ad advertises Sunshine Orange Juice there is a higher probability that the ad is seen to be more disruptive than an ad advertising Mason Coffee. The context and participant's age do not have significant influence. On the other hand, the geography has a significant influence - an ad will likely get a lower disruption rating when a participant is based in the US or in France compared to a participant from Germany. Also, if the participant's gender is male, there is a higher probability that the ad is rated as being more disruptive. The same holds true for the older generation.

The effect is especially apparent when considering advertisements that 'rate in the middle'. If advertising formats are controversial and are not clearly rated as very disruptive or not disruptive, the marketing creative has a bigger impact on how the advertisement format is perceived. For the Acceptable Ads formats as well as the

ad format that is rated worst on all dimensions (the video overlay ad), the brand advertised does not have as big of an impact.

5.5 Web experience and ad experience ratings

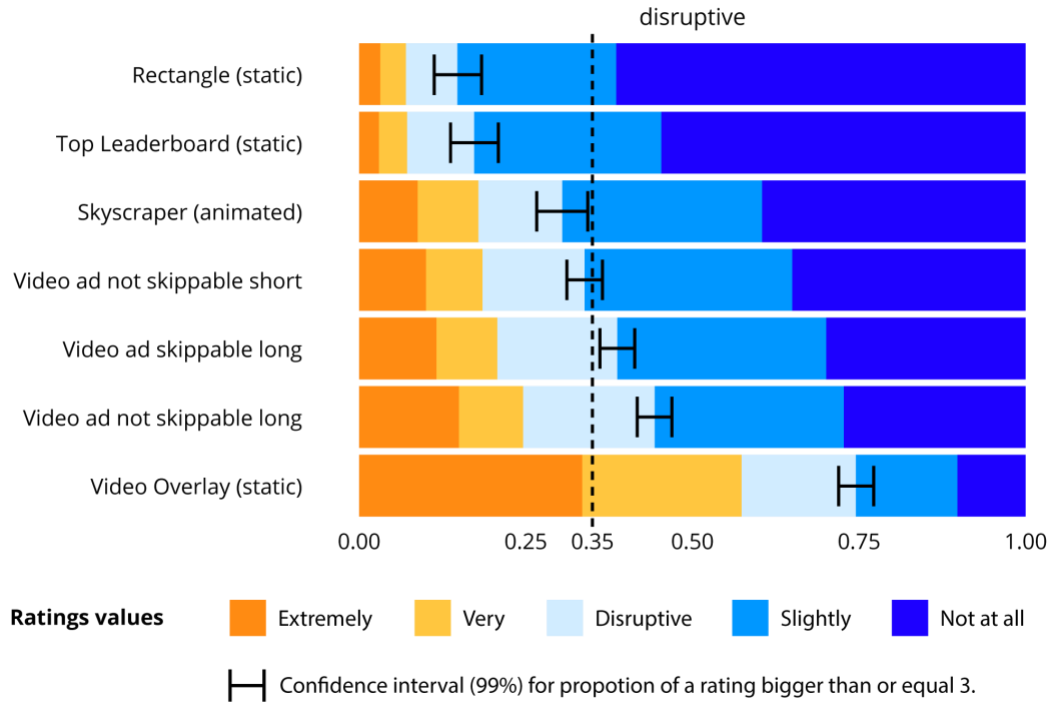
An ordered logistic regression model was used to check if the rating of the overall web experience can be explained by the individual ad ratings, by controlling for the website's context, the ad type, participant's gender and age, as well as the round when the rating was given. All questions regarding negative feelings towards an ad had a significant negative effect on the web experience rating, while the question regarding the ad's enjoyment has a significant positive effect.

However, several goodness-of-fit tests show that this model shows a lack of fit. This is not surprising as the web experience does not mainly depend on seeing one ad but rather on multiple other factors like overall website design, content, user's motive to visit the website, among many other factors. The model shows that the ad's rating influenced the web experience rating and that this influence is statistically significant. This partially explains the participant's website experience. The ad is part of the website and therefore influences part of the website experience.

5.6 Level of disruption

The level of disruption for each advertising type is presented in Figure 8. The vertical line is drawn at 35 percent following the Acceptable Ads Committee bylaws as the maximum level of accepted disruption. When looking at the *aggregated* data, three out of seven ad types fall beyond that threshold, with one advertising format – the six seconds video ad – only falling below that threshold if the confidence interval is not considered.

Figure 8: Level of Disruption

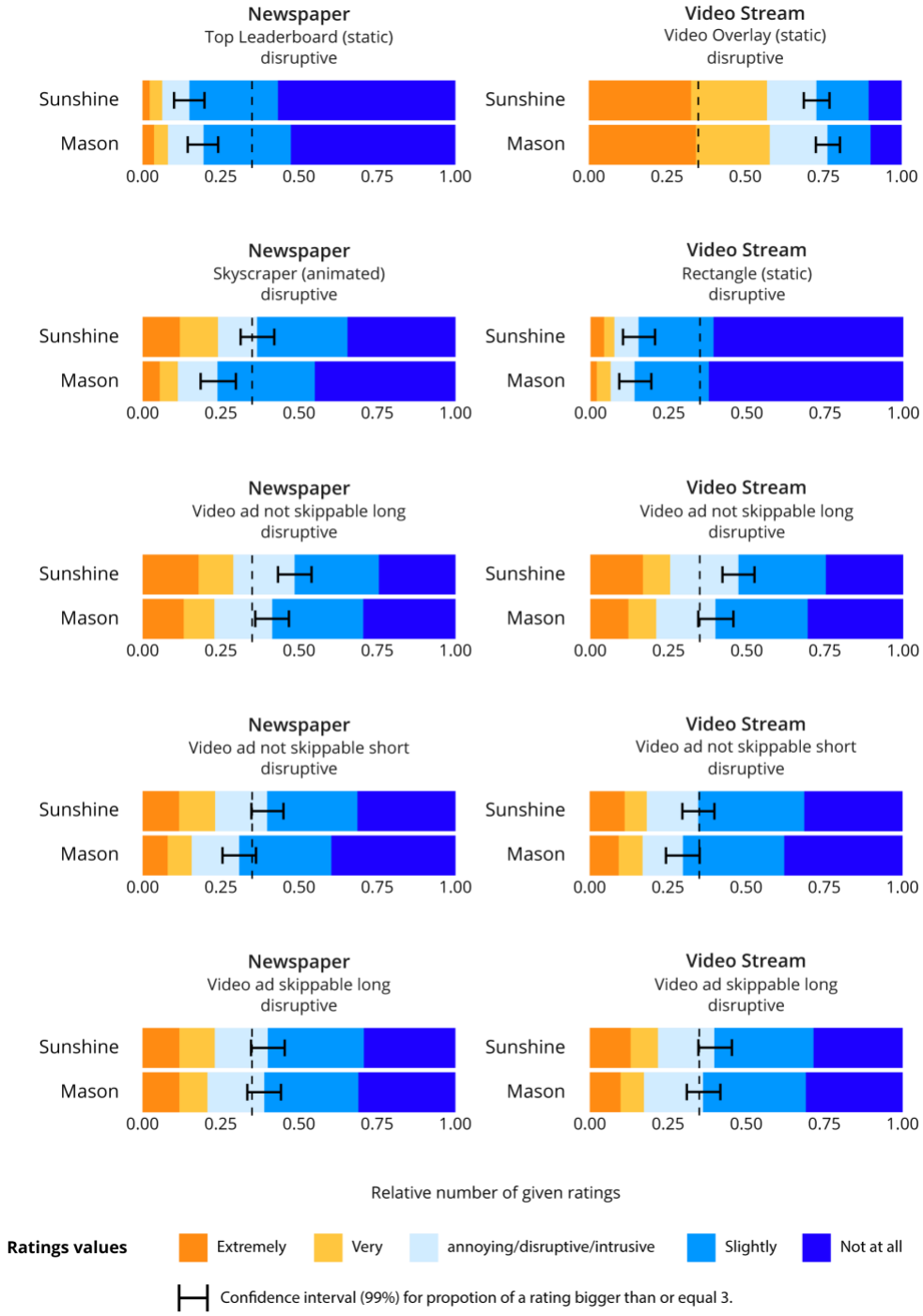


Past research on determining the Acceptability of an advertising format relied on the Level of Disruption of the advertising format, meaning in order to determine Acceptability the dimension 'Disruptiveness' was the decisive factor.

Applying this rule to this survey, this means that an ad would be considered an Acceptable Ad if the share of participants that rated an ad being more than "disruptive" (meaning a rating higher than or equal to 3 for disruptiveness) is not bigger than or equal to 35 percent. However, this would disregard additional data gathered within the survey, e.g. additional dimensions tested and the differences of ratings across brands.

Figure 9 shows the level of disruption split into brand and context. Again, the vertical line is drawn at 35 percent.

Figure 9: Level of disruption split by brand and context.



As can be seen in Figure 9, all Acceptable Ads would stay below the level of maximum disruption, across all creatives and contexts. The video overlay would reach the threshold, the same holds true for most video ads across brands and context. One exception is the six seconds video ad, which would (barely) stay below the threshold in the newspaper as well as the streaming context, if only the Mason creative was considered.

Figure 9 also demonstrates that the creative tested has a high impact in relation to the Animated Skyscraper. In this specific case, it depends on the creative whether the format exceeds the level of disruption threshold or not.

5.7 Further Analysis

The above-presented results appear to be somewhat ambivalent regarding two advertising formats:

1) the Animated Skyscraper
2) the six-seconds not skippable video ad.

Hence, further analysis was conducted moving beyond the level of disruption threshold as defined in the bylaws. This further analysis was aimed at fulfilling two requirements:

1) Introducing Acceptable Ads as a reference point

   As outlined in Chapter 5.3.2, websites with an Acceptable Ad experience perform similarly well to website experiences without advertisements. It was therefore concluded that Acceptable Ads are a suitable baseline and point of comparison when analyzing user's sentiments towards new advertising formats. This direct comparison to Acceptable Ads is important, as the main incentive to install an ad blocker is to avoid seeing any (annoying) ads.

2) Including as many collected data points as possible

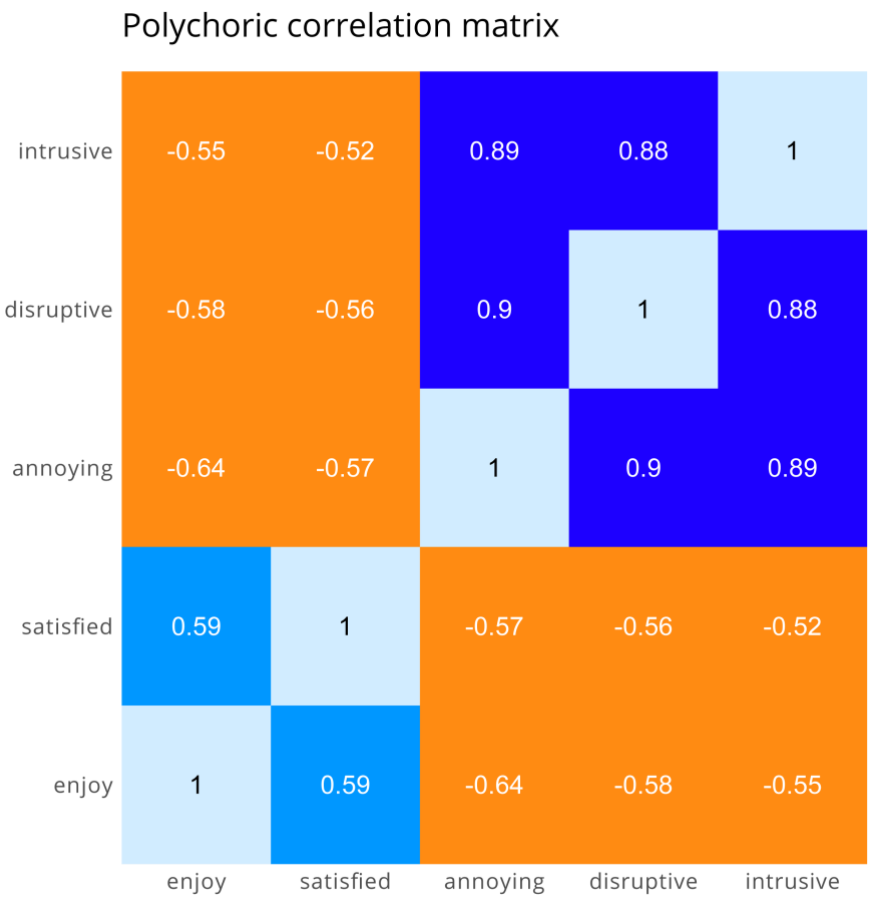
   When using the level of disruption in order to assess users' sentiments towards an ad, other valuable findings collected in this study, such as perceived intrusiveness, annoyance, but also enjoyment of an advertisement are left out of the further analysis. These measurements do not only measure negative but also positive feelings towards an ad and the degree to which the ad influences the overall website experience. This makes the approach more reliable since we do not only measure the

participant's perception of an ad as such, but also how the ad performs within a certain web context. Hence, the goal was to find a method of analysis that would allow an assessment based on all dimensions measured. The conclusion was to use distributions to treat every participant's rating equally and take every rating into account. That increases the fairness of the approach.

In order to transform all dimensions (all positive as well as negative sentiments measured) into a lower number of underlying factors and explore the latent dimensions that might be hidden in the observed variables, an Exploratory Factor Analysis (EFA) was conducted. This extracts maximum common variance from all variables. Based on the found factors a total score is calculated. This total score then is built by the sum of extracted factors. The factor analysis was used to reduce the 5-dimensionality of survey questions to form a common score that measures the overall performance of each ad. The factor analysis is based on the correlation between all five dimensions measured (disruptiveness, intrusiveness, annoyance, enjoyment, satisfaction).

Figure 10 shows the polychoric correlation between all five rating scales. The polychoric correlation matrix shows that the correlations between the questions measuring negative feelings towards an ad and those measuring positive feelings towards an ad are all negative. The higher the rating of an ad with regards to enjoyment and satisfaction, the lower the rating with regards to disruptiveness, annoyance, and intrusiveness. Theoretically, Acceptable Ads should cause in tendency more positive and less negative feelings (vice versa in case of "non-acceptable" ads).

Figure 10: Polychoric correlation between all five ratings



Different models including different dimensions were conducted in order to assess whether the general performance of the ads changed. In the first model, only negative sentiments were included; then further dimensions / positive sentiments were added. The model variants can be seen in table 5.

Table 5: Model variants for the exploratory factor analysis

Model name	**Selected variables**	**Number of extracted factors (f)**	**Total score (t) calculation**
Model 1	Annoying, disruptive, intrusive	1	$t = f1$
Model 2	Annoying, disruptive, intrusive,	2	$t = f1 + cov(f1, f2) \cdot f2$

	enjoy		
Model 3	Annoying, disruptive, intrusive, satisfied	2	$t = f1 + cov(f1, f2) \cdot f2$
Model 4	Annoying, disruptive, intrusive, enjoy, satisfied	2	$t = f1 + cov(f1, f2) \cdot f2$

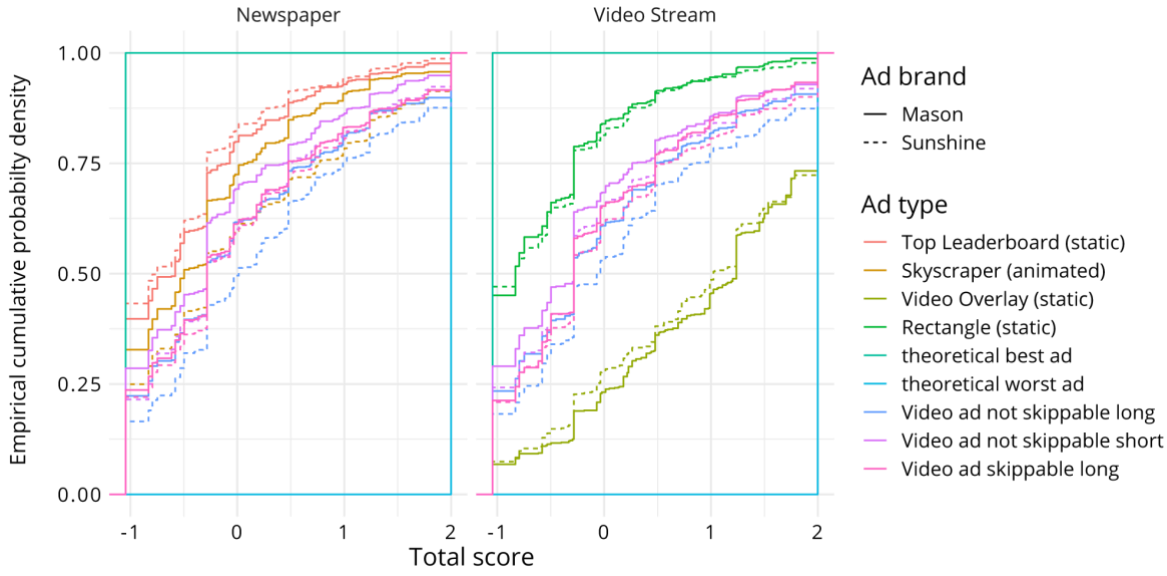
Legend 1: cov stands for the covariance. f1 is the first factor which loads on annoying, disruptive, and intrusive, while f2 is the second factor which loads on either enjoyable and/or satisfied.

The total score is based on the extracted factors. The factor loadings separate themselves clearly, so that one factor (f1) measures the negative feelings towards an ad and the other (f2) the positive feelings. Therefore, as both factors are negatively correlated, the lower the total score based on the sum of both factors (considering their covariance) the better the ad has been rated overall.

We can plot the distribution of each total score for each ad using an empirical cumulative density function (ECDF). Extending Model 1 by including positive sentiments in the analysis, however, does not lead to a significant change in the rating and ranking of the advertisements. Therefore, all following results are based on Model 1.

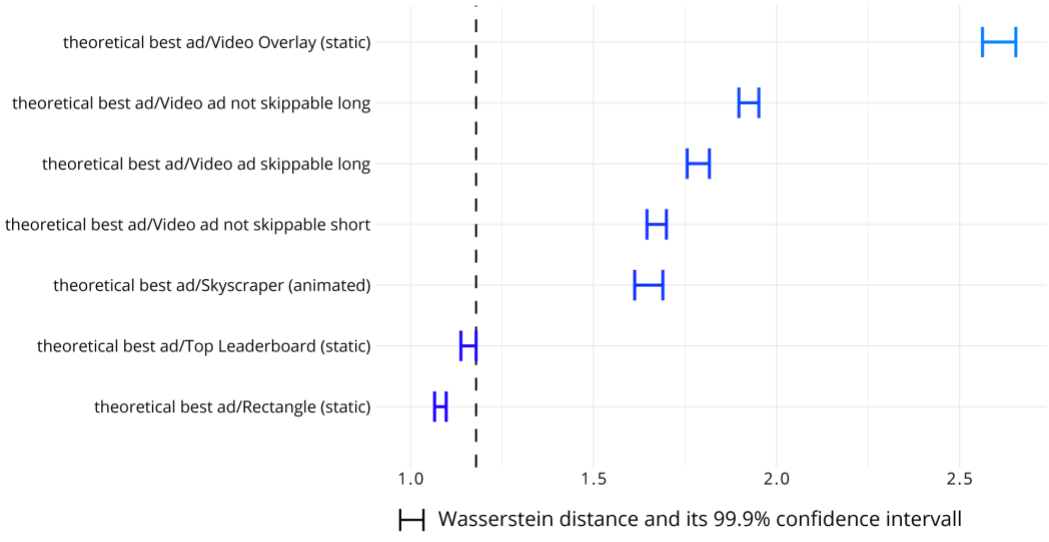
Figure 11 demonstrates the ECDFs per advertisement type. The lower the total score the better the ad is performing. Thus, the more an ECDF is bending to the left the better the ad has been perceived by the participants.

Figure 11: ECDFs per advertisement type



To understand how different these ECDFs are, a Wasserstein metric is used to measure the distance between a given ad's score distribution and the score's distribution in the theoretical best case (= Γ-shape). The theoretical best ad is an ad that would receive the best scores in every dimension tested, meaning the lowest ratings in negative sentiments and the highest ratings in positive sentiments. The lower the distance between the ad and the theoretical best ad, the better the ad's performance. Figure 12 presents the Wasserstein distances of all tested ads.

Figure 12: Wasserstein distance metric for the ECDF between ad types and the theoretical best ad with 99.9% confidence interval



As seen in previous analysis, the Acceptable Ads formats perform best among all advertisements tested. No other ad has a similar distance as the Acceptable Ads to the theoretical best ad, as none of their confidence intervals overlap with those of the Acceptable Ads (no other ad's Wasserstein distance is left to or on the dotted line). The 15-seconds not skippable video ad and the video overlay have the biggest Wasserstein distance relative to the theoretical best ad. Regarding the video overlay, the results are also comparable to the previous analysis: this advertisement is clearly the format encountering the worst user sentiments. For all other advertising formats further analysis appears to show a different picture. While the 'ranking' of the advertisements – from preforming worst to best – stays the same, the differences between the performance of Acceptable Ads formats to the Animated Skyscraper and the six-seconds not skippable video ad becomes more apparent. This is caused by the fact that ads under the Acceptable Ads standard perform outstandingly well on the annoyance, disruption, and intrusion level. All Acceptable Ads formats result in at least 50% of the participants saying the ad was "not annoying/disruptive/intrusive at all". No other ad format gets those positive ratings.

The analysis further confirms that the presence of a skip-button leads to a reduction of the distance to the theoretical best ad. As a skip-button increases the user empowerment, it directly improves the users' perception.

6 Conclusion

As outlined in Chapter 5, the approach used in previous studies to determine the acceptability of advertising formats paints a rather clear picture when assessing existing Acceptable Ad formats. This study was able to demonstrate that these formats are perceived as the least annoying, intrusive and disruptive and rank highest in enjoyment and satisfaction with the web page overall.

The results on the impact of short video ad formats with 6 seconds or less as well as an Animated Skyscraper on the user experience are less conclusive. Across tested brands they are by far perceived more negative than tested Acceptable Ad formats,

however, they are also not as impeding as longer video advertisement formats or video overlays. For these formats 'in the middle' the design of the creative itself determines how badly they are perceived.

A clear negative impact on users' perceptions of advertisements can be seen regarding the video overlay as well as video advertisements which exceed the length of six seconds. This underlines findings from previous (preliminary) studies. Long video advertisements without a skip button significantly negatively impact the user experience and are perceived as clearly intrusive, annoying, and disruptive. Reasons for that can be numerous, as elaborate in Chapter 3.2: the users' task orientation is inflicted, the user experiences a lack of control, and s/he is more impeded to consume information. Given the perceived intrusiveness of these advertising formats, it is likely that from an advertiser as well as publisher perspective that the use of such has a negative impact on the perception of the brand or product advertised and the engagement of the website where the advertisement is displayed (Goldstein, et al. 2014, McCoy, et al. 2007).

7 Limitation and further research

This study was conducted with the help of qualitative interviews and questionnaires. In order to get more in-depth insights, it would be helpful to acquire additional real-life data, by tracking user behaviour live on websites containing different advertising formats. To further extend this, a testing of a variety of different advertising formats – beyond video advertisements – would allow a more precise picture of differences and similarities between different advertisement formats, within and outside of the Acceptable Ads Standard.

In addition, the study was conducted among participants from Germany, the US, and France which only represents a certain percentage of users being exposed to Acceptable Ads. It would be interesting to investigate and explore users' perceptions in more markets, e.g., Canada, India, Mexico, the UK.

Finally, it was not investigated to as of *why* users find certain formats more annoying than others. This would allow a more comprehensive picture for publishers and advertisers alike, in order to better understand what specifics can draw users to (or away) from a brand and a website.

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V Appendix

Appendix A – Survey Questionnaire

1	**What is your gender?**
a	Male
b	Female
c	Other
d	Prefer not to answer
2	**What is your age?**
3	**What kinds of technologies do you currently own or use? (Select all that apply)**
a	Home assistant (Google Home, Amazon Echo, etc.)
b	Smart watch (Apple Watch, Pebble, etc.)
c	Ad-blocking software (Adblock Plus, AdBlock, uBlock Origin, etc.)
d	VPN (virtual private network)
e	Streaming TV service (Netflix, Hulu, etc.)
g	AI powered political content blocker
h	Haptic Taste Replicator
f	Other (Please specify)
Intro	Imagine you recently heard about a new band called "To Be We", and want to learn more about them. You will see two websites with a music video from the band. Once you have watched the video, a continue button will appear at the bottom of the page. After each website, you will answer several questions about your experience. After viewing both websites, you will compare them to each other.
Text	After you view both pages, you will be asked to compare them to each other.
4	**How satisfied were you with the OVERALL EXPERIENCE of viewing this page?**
a	Very Satisfied
b	Slightly Satisfied

c	Neutral
d	Slightly Dissatisfied
e	Very Dissatisfied
Questions after each experience:	**We would like to ask you about an ad you may have noticed:**
5	**What type of ad did you notice?**
a	Video Ad
b	Text Ad
c	Banner Ad
d	I noticed an ad, but I don't know how to describe it
e	I did not notice an ad
6	**How disruptive was the ad to your experience?**
a	Not at all disruptive
b	Slightly disruptive
c	Disruptive
d	Very Disruptive
e	Extremely Disruptive
7	**How enjoyable was the ad?**
a	Not at all enjoyable
b	Slightly enjoyable
c	Enjoyable
d	Very enjoyable
e	Extremely enjoyable
8	**How annoying did you find the ad?**
a	Not at all annoying
b	Slightly annoying
c	Annoying
d	Very annoying
e	Extremely Annoying
9	**How intrusive did you find the ad?**
a	Not at all intrusive
b	Slightly intrusive
c	Intrusive
d	Very intrusive

e	Extremely intrusive
Ad Comparisons Intro	**Now you will see screenshots of the two webpages you just viewed. Please compare those two experiences in the next two questions.**
10	**With which experience did you feel the MOST obstructed from viewing content? (you may click on each experience for a reminder)**
a	The experience you saw 1st:
b	The experience you saw 2nd:
11	**Which of the following do you think had the most influence on your ratings during this survey?**
a	Ad Environment
b	Ad Content
c	Ad Format (e.g. text, animated, video etc)
d	Ad Relevancy
e	I can't decide/they all influenced my ratings equally
f	I don't know
Final Demographics Intro	**Just two more questions before we wrap up:**
12	**Why do you use an adblocker?**
a	Ads are too intrusive
b	Ads might compromise my online privacy
c	Ads sometimes contain viruses or bugs
d	Ads take up too much screen space
e	I try to avoid all ads wherever, whether on TV or online
f	There are too many ads on the internet
g	To avoid having to see video ads before watching clips/shows
h	To speed up loading page times.
i	To stop ads being personalized based on my browsing history
j	Too many ads are annoying or irrelevant
k	I don't use an adblocker
l	Other
13	How do you feel about online advertising? Briefly describe either an enjoyable or awful experience you had with online ads?

Appendix B – Gender, Country, and Generation effects

This part assesses differences in the perception of ads between genders, countries, and generations, by taking a deep dive into the distribution of the ratings for each ad type in each of these groups.

Figure 13-15 show the distributions of the estimated scores for the different ad types grouped by country/gender/generation. The scores are derived from a factor analysis, considering the ratings on the ad's level of disruption, annoyance, intrusion, and enjoyment. Two factors are extracted: one loads on the negative attitudes and the other one on the positive attitude. Therefore, the higher the score for the second factor and the lower the score for the first factor, the better the ad has been perceived by the participant.

In Figure 13-15 a reference point for the theoretical best and theoretical worst ad is marked. The theoretical best ad is an ad that would receive the best scores in every dimension tested, meaning the lowest ratings in negative sentiments and the highest ratings in positive sentiments. The opposite holds true for the theoretical worst ad. The according scores for the theoretical best (worst) ad are marked by the green (red) circle in Figure 13-15. You can think of interpreting the presented graph as being a topographic map. The lighter the color the higher is the mass of given ratings leading to these scores' combinations. Stated differently, the more participants have rated an ad equally, the higher is the "mountain" of these ratings. The contour lines are curves that connect contiguous points of the same altitude, so in this case points with the same number of ratings. The area with especially positive ratings is marked with a green box and the area with especially negative ratings with a red box. The center of presented plots marks the average rating across all ads. Thus, if an ad gets the average positive and average negative ratings it would get a score of 0 for the negative attitude and a score of 0 for the positive

attitude[1]. This means that if an ad gets a positive rating above average and at the same time negative ratings below average the rating will get a score combination that lays in the green box. An ad which gets a positive rating below average and at the same time negative ratings above average results in a score combination which lays in the red box. That said, you can find the description of each country/gender/generation comparison next to each row of Figure 13-15. Excluded from analysis are those genders which have too few data points.

Conclusions form the countries comparisons: There are signs that a subset of German participant like static ads more than US or French participants. There are signs that a subset of French participants like short not skippable and long skippable video ads more than US or German participants. On the other hand, US participants do not perceive these ad formats that negatively like some groups of French or German participants. The video overlay as well as the long not skippable video ad are perceived negatively across all countries. See also Figure 16 for a comparison between the average scores grouped by country.

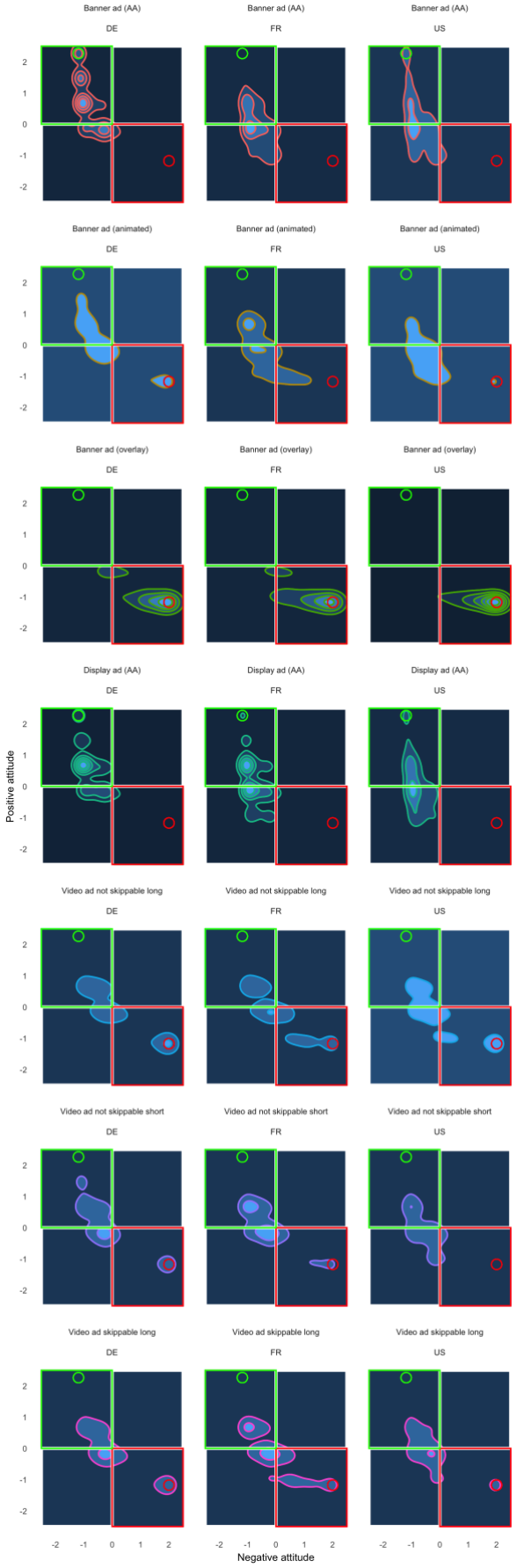
Conclusions form the genders comparisons: In general, we can see quite consistent ratings between genders. However, the short not skippable and the long skippable video ad is perceived by some female groups above average positively while some male groups perceive these ad formats above average negatively. There are signs that female participants rated the tested ads less negatively than males[2]. The reason could be that females are not that annoyed by ads than males or we just see more acquiescent responding by females than by males (see for a discussion Rammstedt, Danner and Bosnjak 2017). See also Figure 17 for a comparison between the average scores grouped by genders.

[1] The average ad rating is 2.3 for enjoyment, 2.4 for disruption, 2.3 for annoyance, and 2.4 for intrusiveness. Translated into the answers wording, this means that on average an ad is rated as being slightly enjoyable, between slightly disruptive and disruptive, slightly annoying, and between slightly intrusive and intrusive.

[2] The average estimated score of the factor measuring the negative attitude towards an ad is statistically significantly higher for the male than for the female participants.

Conclusions from the generation comparisons: We do not see many differences between the ratings across generations. There is however some indication that a short not skippable and a long skippable video ad are slightly better perceived on the negative scale by the Generation Z than by other generations. One explanation could be the mere exposure effect. As the younger generation is using mobile devices more heavily and thus are more heavily exposed to video ads, they developed a more positive attitude towards these ads, simply because they are more familiar with them. On the positive scale we can see that the Baby Boomers do not enjoy ads on average that much like the other generations. See also Figure 18 for a comparison between the average scores grouped by generations.

Figure 13: Distribution of estimated factor scores loading on the positive and negative ratings across countries



- German participants seem to like the Top Leaderboard above average compared to participants from France and the US. French and US American participants have a below average negative attitude but also a below average positive attitude towards this ad format.

- Same holds true for the animated skyscraper. However, we can see a bunch of German participants (and a few US Americans) who have strong negative sentiments towards this ad format.

- The video overlay is being perceived quite consistently across the three countries. Most of the participants perceived this ad format above average negatively and below average positively.

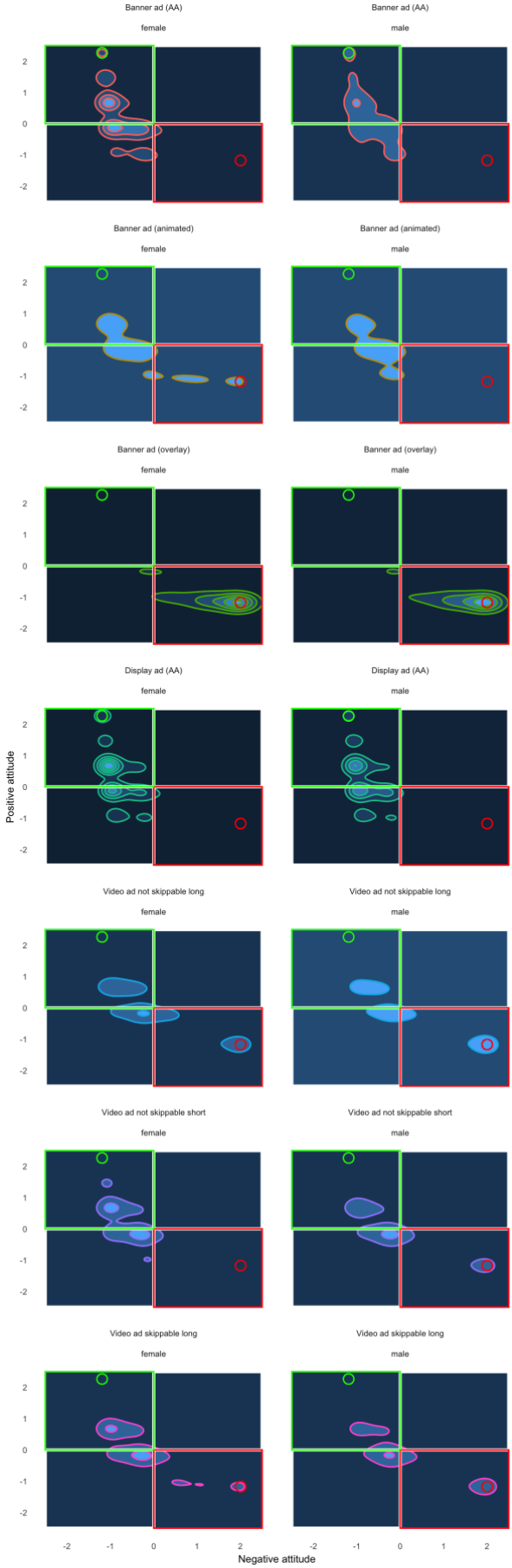
- The Rectangle Ad is in tendency more enjoyed by German and French participants. US participants enjoy this ad type, but not above average.

- The 15 sec skippable Video Ad is being rated quite consistently across all countries. We see many participants that really dislikes this ad format.

- The 6 sec not skippable Video Ad is more liked by US participants than by participants from France or Germany. However, there are some groups of participants in all three countries that perceived this ad format positively above average, especially in France.

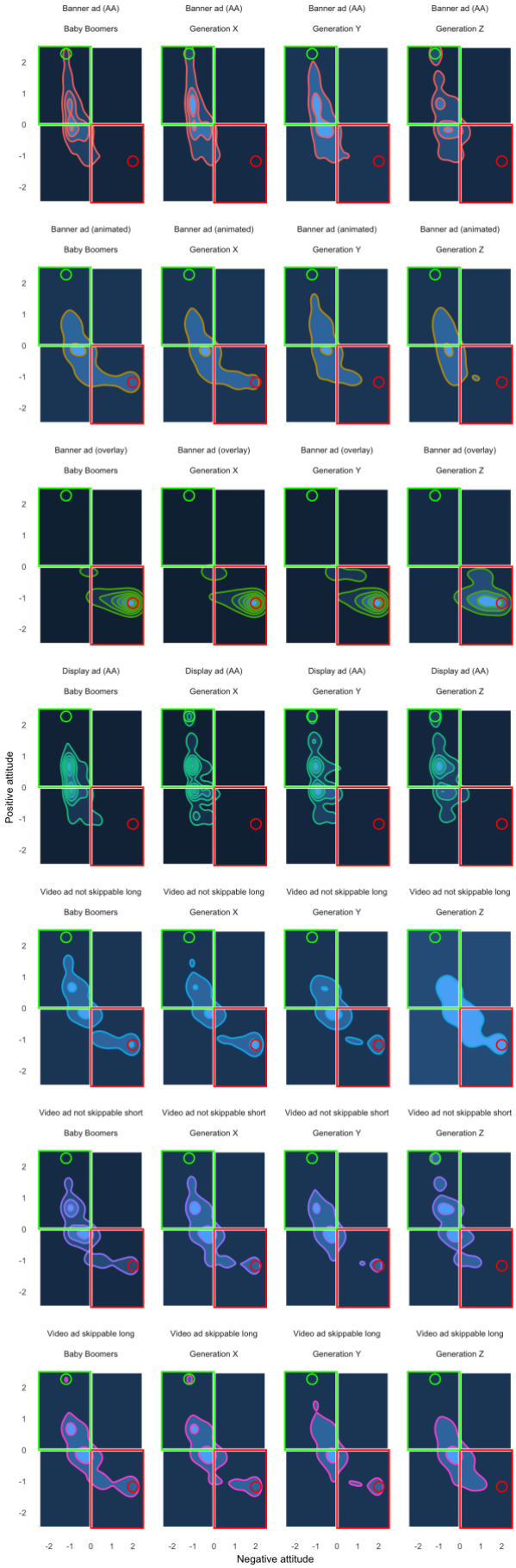
- The 15 sec Video Ad is most negatively perceived in Germany and French compared to the US. However, again like the 6 sec not skippable Video Ad there are some French participants that like this ad format above average.

Figure 14: Distribution of estimated factor scores loading on the positive and negative ratings across genders



- The perception of an top leaderboard is quite consistent across genders.
- The animated skyscraper is quite equally rated across genders. However, there are some subset of female participants that rated this ad format above average negatively.
- The perception of an video overlay is quite consistent across genders.
- The perception of an Acceptable Rectangle Ad is quite consistent across genders.
- The perception of a not skippable 15 sec Video Ad is quite consistent across genders.
- Some groups of female participants enjoyed this ad format above average, while some groups of male participants perceived this ad format above average negatively.
- Same pattern can be seen for the skippable 15 sec Video Ad.

Figure 15: Distribution of estimated factor scores loading on the positive and negative ratings across generations



- The perception of the Top Leaderboard is quite consistent across generations.

- The perception of the Top Leaderboard is quite consistent across generations. However, the Generation Z seems to perceive this format less negatively than the other generations.

- The perception of an video overlay is quite consistent across generations.

- The perception of the Rectangle Ad is quite consistent across generations. However, we can see that the Generation Z enjoys this ad format more positively than the other generations.

- The perception of an Acceptable Rectangle Ad is quite consistent across generations.

- The Generation Z seems to be not that negatively affected by a not-skippable 6 sec Video Ad compared to other generations. We see that the oldest generations (Baby Boomers, Generation X, and Generation Y) contain a subset of participants that really do not like this ad format. In all generations some participants enjoy this ad format above average.

- A similar pattern can be found for the 15 Sec skippable Video Ad. However, the Generation Z does not have that many participants that enjoy this ad format above average compared to the other generations.

Figure 16: Average attitudes grouped by country with 99% confidence interval

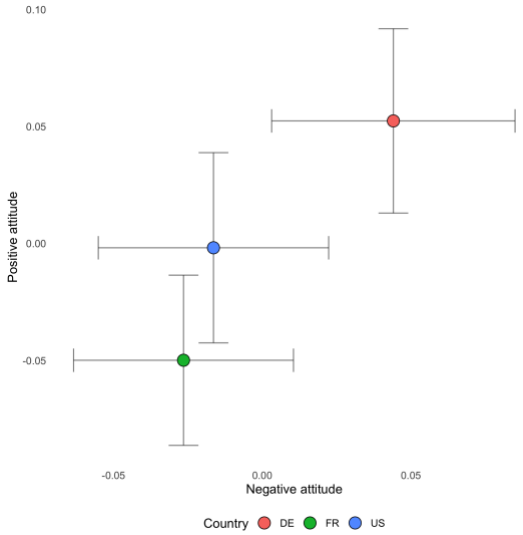


Figure 17: Average attitude grouped by gender with 99% confidence interval

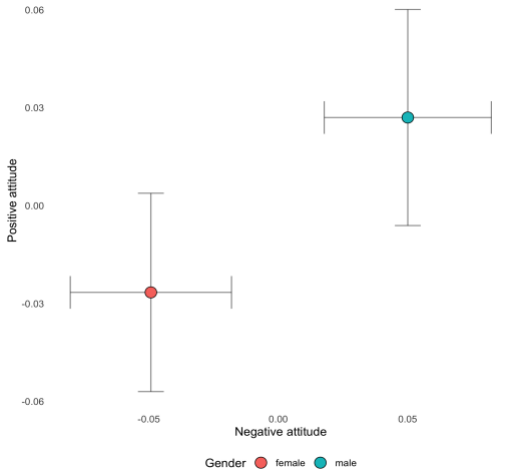


Figure 18: Average attitude grouped by generation with 99% confidence interval