

# Designing for Mobile Experience Beyond the Native Ad Click: Exploring Landing Page Presentation Style & Media Usage\*

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## Abstract

Many, if not most, free mobile applications are supported by advertising. Ads can greatly affect user perceptions and behavior. In mobile apps, ads often follow a so-called “native” format, i.e., they are designed to conform in both format and style to the actual content and context of the application. In many instances, clicking on the ad leads users to a second destination, outside of the hosting app. In such cases, the unified experience provided by native ads within the app is not necessarily reflected by the landing page the user arrives at. Little is known about whether and how this type of mobile ads is impacting user experience. In this paper, we use both quantitative and qualitative methods to study the impact of two design decisions for the landing page of a native ad on the user experience: (i) native ad style (following the style of the application) versus a non-native ad style; and (ii) pages with multimedia versus static pages. We found considerable variability in terms of user experience with mobile ad landing pages when varying presentation style and multimedia usage, especially interaction between presence of video and ad style (native or non-native). We also discuss insights and recommendations for improving the user experience with mobile native ads.

## 1 Introduction

The advertising business model that funds many of today’s free mobile applications relies on users interacting with the advertisements, ads for short, hosted within the app. Ads in mobile apps often have a so-called “native” format, suggested to lead to higher user engagement (see IAB (2013)). In

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contrast with more “traditional, display ads”, native ads are designed to conform in both format and style to the actual design, content and context of the application, despite small screen sizes. In general, the limited screen real estate of mobile phones remains challenging as discussed by Barnes and Scornavacca (2008), de Sa et al. (2013), Jones and Marsden (2006), Le and Nguyen (2014). For ads specifically, native ads present an inherent tension: a consistent experience aims to improve the user experience, but distinguishing between native ads and content is similarly crucial to preserve perceived quality and clarity in news presentation (see Cramer (2015)).

Interestingly, little attention has been paid to the experience with mobile native ads’ landing pages. Clicking on a native *ad* may lead users to a “native” landing page that provides a unified experience, reflecting the style of content of the app, or a “non-native” landing page that does not resemble the style of the hosting app. For example, in a news app, native landing page might resemble an advertorial, while a non-native landing page might resemble an explicit advertisement page. Further these landing pages may or may not have any multimedia features such as video.

For this study, we used the news app of a large Internet company as the mobile application in our study. This app shows a stream of news articles mixed with native ads. The latter provide a summary of the advertised product in a style closely aligned with that of the news article summaries. Differentiated colors, a special marker, e.g., “\$” and/or the keyword “sponsored” are used to distinguish between regular articles and ads.

In this paper, we study the impact of two design decisions for the landing page of mobile native ads on user perceptions:

- a native style ad landing page following the style of the application versus a non-Native style landing page style. Since, we selected a news app, the ads with a format traditionally used in print media, the “advertorial” were native to the experience, because some ads are written in the form of an article. Alternatively, in a news app, explicit advertisement styled landing pages were non-native style. Examples are shown in Figures 1(a) and 1(b).
- pages with multimedia versus static pages, focused on video as this is a popular feature associated with high engagement levels (e.g. Hallerman (2007)).

Figure 1 shows examples of four health related ads that differ based on *multimedia usage* and *presentation style* in the news app on a mobile phone. While we show the entire vertical length of the ad, only a limited viewport equal to the size of the screen of the smartphone would be visible, unless scrolled vertically. The four images at the top show the ads as they appear in the news app stream. Once, clicked, these ads launch the landing pages shown under the respective creative. Our main findings include:

- in the context of mobile landing pages, multimedia usage positively affects certain aspects of the user experience;
- in the context of mobile landing pages, presentation style has a mixed effect on certain aspects of the user experience;
- in the context of mobile landing pages, user experience measurement may offer nuances complementary to dwell-time and bounce-rate.



(a) Advertorial static (b) Advertorial video (c) Advertisement static (d) Advertisement video

Figure 1: Example of four health related creatives (top) and their associated landing pages (bottom) differing in multimedia usage and display style in a news-reading app.

We also discuss insights into the native ad landing page design for mobile advertising.

## 2 Related work

Apart from log-based studies of users' post-click satisfaction approximated as time spent on the landing pages such as in Lalmas et al. (2015), the user experience with landing pages in a mobile app has received little attention, but there is previous work that relates to the more general setting of our study.

**Multimedia** The earliest web ads were banner ads that displayed a static image on a website. A study by Benway (1998) found that users often do not notice a banner even though it is highlighted, brightly colored, and/or in an obvious position. This has been referred to as “banner blindness”, and has been found to be strongest for advertising banners on the right side of the page and for goal-directed tasks e.g. Resnick and Albert (2014).

Since then, advertisers have actively pursued the use of multimedia to attract attention. Its impact on advertising effectiveness was summarized in Davidavičienė (2012), showing that ads with audio and video, result in

improved perception towards the brand. Li and Leckenby (2004) also confirmed that rich media ads are more effective than banner ads. However, the use of multimedia features like animation in mobile ads that are overly simplistic have also been shown to negatively affect user experience by de Sa et al. (2013) and Goldstein et al. (2013). Similarly, it has been reported by Goldfarb and Tucker (2011) that ads led to higher purchase intent when they are either content relevant or obtrusive, but not both. Nonetheless, video marketing has been a popular format for online advertising and users have reported higher levels of engagement (Hallerman (2007)). Given the potential of *multimedia usage* to improve user engagement, we further explore whether videos continue to impact user experience positively in the context of native ad landing pages as well.

**Ad content, relevance, and trust** The content of the ads, and the trust in the advertiser are also some of the most important predictors for user acceptance of mobile advertising (e.g. Tsang et al. (2004)). Furthermore, de Sa et al. (2013) suggest the complex effects of personal and contextual relevance of the ad. Other known factors that affect trust are entertainment, information, credibility, economy, and value corruption, as reported by Azeem and Haq (2012). We control for contextual relevance by providing participants with a particular information foraging goal over a micro time window based task-scenario in our experiment.

**Advertorials** An advertorial is paid for content tailored to the publication in which it appears in terms of design, structure, visual and/or verbal content and context (e.g. Ju-Pak et al. (1995)). The effect of an advertorial on the user experience has been studied in the context of print publications. In the context of magazines, ads designed as advertorials have been found to attract greater attention, but some of the gains in attention can be attributed to deception (Kim et al. (2001)). Advertorials, however, remain a popular format among advertisers and some work suggests their positive aspects. Van Reijmersdal et al. (2005) found that advertorials were evaluated more favorably than conventional ads. Dahlén and Edenius (2007) suggest that advertorials may evoke the schema of the publication content, resulting in the advertorial being perceived as more informative and entertaining. This study further explores the impact of an advertorial style landing page on user experience with a native ad in a mobile app setting.

**Aesthetics and usability** Aesthetics of websites have been shown to be particularly significant for user satisfaction and pleasure (e.g. Lavie and Tractinsky (2004)). Aesthetics have also been found to be important when creating attitudes towards design (e.g. Schenkman and Jönsson (2000), Tractinsky (1997)). While on the one hand, clear and orderly design and guidelines like gestalt laws are important, the role of *novelty* in these designs has also been found to be significant (e.g. Lavie and Tractinsky (2004)). Study by De Angeli et al. (2006) found that *usability* and aesthetics are more complexly linked with each other than previously suggested by Tractinsky (1997). Aesthetics can even compensate for *usability* and vice versa, depend-

ing upon the context. We aim to further understand the impact of *usability* and *novelty* using native mobile ad landing pages.

**Enjoyment** In their work, van der Heijden (2003) showed that not only attractiveness or usefulness, but also factors such as enjoyment, otherwise referred to as *felt involvement*, have a significant impact on attitude towards a website.

**Measuring user experience** In general, industry metrics used for measuring an ad success are click through rate (CTR), dwell time, and bounce rate. CTR is the number of times an ad was clicked out of the number of times it has been shown, and does not account for how users experience the ad landing page after clicking on the ad, i.e. the post-click experience. Dwell time refers to the amount of time users spend on a landing page post-click, whereas bounce rate is the number of users who exit an advertisement landing page very shortly after viewing it. Higher bounce rate has been proposed by e.g. Sculley et al. (2009) as a proxy for a poor post-click user experience.

In native advertising, both dwell time and bounce rate have been proposed as proxies of an ad landing page quality by Lalmas et al. (2015). However, despite the use of these metrics to promote *successful* advertisements, users still continue to report negative reactions to ads as reported by Agarwal et al. (2013). This suggests that perhaps dwell time or ad recall alone are insufficient in measuring the user experience, as they do not capture the subjective aspects of the user experience, available through self-report measures. It is for example possible that users might spend significantly high dwell time on an ad (deeming it successful) because they are confused instead of delighted. Studies measuring proxies for user perception of ads have primarily been focused on task completion times, task workload, and advertisement recall (e.g. de Sa et al. (2013)).

Here, we were specifically interested in ads that have been measured to have similar engagement at scale (dwell time and bounce rate), and whether they may have been perceived differently based on user experience.

### 3 Study Design

We examine the effects of *multimedia usage* and *presentation style* of ad landing pages – presented after a click on a native ad (creative) in a news app of a large Internet company– on the user experience. Unlike previous studies that explore user experience with ad landing pages through log-based signals, such as dwell time and bounce rate, we aim to measure user experience as self-reported by users. To obtain responses for a representative sample of users and landing pages we use a crowd sourcing based setting, an effective way to obtain a large number of responses where crowd-workers are asked to provide ratings as non-expert users (Egelman et al. (2014)), which has also been used in the context of advertising (Dow et al. (2010)). Although not a naturalistic setting, this type of (artificial) online evaluation study provides a good approximation of user performance in such situations, as argued in Kjeldskov and Stage (2004).

We chose not to present participants with a *fictional* ad landing page by rendering the same content in each of the four landing page styles (advertorial-video, advertorial-static, advertisement-video, and advertisement-static). The content and information presented in advertorials is inherently different from regular ads. A similar argument can be made for video versus static content. Instead we chose to present crowd-workers with ads and landing pages as they occur on a news app, as researched previously by Goldstein et al. (2013). This enables generalization of our findings beyond a particular rendering and their application to a real world advertising platform. Landing pages used in our study are comparable to those shown in Figure 1.

### 3.1 Study Materials

**Creative and landing page selection** We sampled a set of 1200 advertisement landing pages with low bounce rate ( $\leq 20\%$ ) with comparable and above average dwell time (numbers withheld due to confidentiality) from the internal database of ads served on the Yahoo! news app during a one month period. Ads with low bounce rate and above average dwell time are generally assumed to be well designed, allowing them to be interesting (Yi et al. (2014)) or providing a satisfying result, i.e., they are deemed as *successful* (Fox et al. (2005)). Similarly, measuring user experience in poorly designed sites, or in our case advertiser landing pages, does not bring meaningful insights apart for that the site is hardly usable. Hence, low bounce rate and high dwell time reflected well-designed pages worth testing.

To control for product type, we selected 3 genres: auto, health and education. We compared ads with variations in presentation style and multimedia usage within these genres. This resulted in 147 auto, 154 health, and 12 education related unique ads. These ad landing pages were human coded for visual design as advertorial or explicit advertisement, and containing static or video material by a single coder. Finally, 12 ads were randomly chosen, including 4 ads for each genre: Auto, Health, and Education. Within each genre, these 4 ads were divided one each into 4 categories: advertorial-static, advertorial-video, advertisement-static and advertisement-video. For example, we had 4 auto ads, such that there was 1 advertorial-static auto ad, 1 advertorial-video auto ad, advertisement-static auto ad and advertisement-video auto ad. Similarly, for Health and Education genres.

A final factor we controlled for is the aesthetics of the landing pages since visual attractiveness of web pages has been shown to affect users' experience in terms of satisfaction, pleasure and usability (Lavie and Tractinsky (2004), Tractinsky (1997)). Given that variations in advertorial design and multimedia usage could potentially affect the aesthetics of the landing pages, we first conducted a study (not reported here for space reason) to assess variation in aesthetics of our selected pages. 480 crowd-workers of highest rated quality (rating 3) on Crowdflower from US, Canada, and UK were hired at 0.30\$ per rating (Median age = 26.1, SD = 4.9 years, 59% female) and education (43% Bachelors degree, 44% High School Diploma, 5% Masters Degree). We asked these crowd-workers to identify and rate as non-expert users if variations in multimedia usage and presentation style in our manually selected and coded pool of mobile ad landing pages result in differences in users' visual

perception of these ads on 4 factors: colorfulness, craftsmanship, diversity, and simplicity, measured using visual aesthetics scale from Moshagen and Thielsch (2013).

A Levene Test did not indicate a significant difference between the variances of the responses for colorfulness ( $p = 0.687$ ), craftsmanship ( $p = 0.100$ ), diversity, ( $p = 0.118$ ), and simplicity ( $p = 0.538$ ), suggesting that the ratings were internally homogeneous. We saw that our ad landing pages did not result in differences except in the layout dimension. This shows that the perceived visual quality of the ads across genres, presentation style and multimedia usage was similar. We next wanted to test if the reported user experience was the same across these 3 factors too.

**News app emulator** Since we are interested in user perception of native ad landing pages after clicking on a native ad and not the impact of mobile specific interactions with the app, we used a web based emulator of the news app in our experiments. The emulator was built as a HTML web client to view the stream of ads housed in a mobile phone layout, following the dimensions of an iPhone 6. Our emulator was uploaded on a local server as a web page designed to function like a mobile phone. Using the mouse users could scroll through the stream, and click on a news item or the ad, and the associated landing page would be presented within the mobile viewport. Users accessed the prototype through a URL that was shared on Crowdfunder (<http://www.crowdfunder.com>). Once logged, a user would view instructions about the task itself, click on the custom URL generated for the prototype, interact with the prototype, and subsequently provide answers to questions, including ratings on the User Engagement Scale.

**User Engagement Scale** We use an adapted version of the User Engagement Scale (UES) researched across multiple studies previously, including O'Brien and Toms (2008), O'Brien and Toms (2010), O'Brien and Lebow (2013), and Lalmas et al. (2014) to generally refer to user experience as a combination of four factors outlined below. We adapt the previous model in two ways: Instead of post-experiment delayed user-responses, we rely on direct responses to operationalize our experiment in a crowd sourcing setting. Second, while the full model measures six factors, we focus on four relevant to the task and setting: (1) *perceived usability*, which refers to affect, perceived control, effort, and the usability of the user interface itself; (2) *novelty*, indicating something attracts a user attention; (3) *felt involvement*, which refers to enjoyment with a product; (4) *endurability*, which refers to whether the experience was worthwhile or not.

Based on the above outlined previous work, each of the four user experience factors are measured using a different set of questions rated on a 5-point Likert type scale, from strongly disagree to strongly agree:

- **perceived usability:** the average sum of ratings for inverse of “*I found this item confusing to interact with*”, “*I felt in control of my experience*”, and inverse of “*I felt annoyed by this item*”;
- **novelty:** the average sum of ratings for “*I continued to view this item out of curiosity*”, “*This item aroused my imagination*”, and inverse of

*“This item was similar to what I expected it to be”;*

- **endurability:** the average sum of ratings for *“Viewing this item was worthwhile”*, inverse of *“Viewing this item was not useful”* and *“I would share/recommend this item to friends and family”*;
- **felt involvement:** the average sum of ratings for *“I really enjoyed viewing this item”*, *“The experience was fun”*, and inverse of *“I would not revisit another item from this source”*;

## 3.2 Research questions and Hypothesis

In total, we focus on four dimensions of the user experience relevant to advertising: *novelty, involvement, endurability, usability*. Here we motivate our hypothesis and research questions.

**Novelty** Previous research suggests that moving objects draw attention (Carmi and Itti (2006)) and that differences in color, brightness, size, and orientation, impact salience and attract attention (Wolfe and Horowitz (2004), Hallerman (2007)). Hence we hypothesize that:

**H1.a** The presence of video affect will affect novelty positively.

Further, as suggested by prior work (Kim et al. (2001)), the novelty of ad landing page that matches that of the host application and creative might hold. So, we hypothesize that:

**H1.b** The presence of advertorial will affect novelty positively.

**Involvement** The ads selected for our experiment have above average dwell time and low bounce rate, which are generally assumed to suggest a good user post-click experience (Lalmas et al. (2015)). Past research also shows that the perceived involvement of the user, e.g., enjoyment of an ad with multimedia will be higher to that of a static page. Hence we hypothesize:

**H2.a** The presence of video affect will affect felt involvement positively.

Further, an advertorial style page (in the context of a news reading app) is designed to mimic the experience of the host news-reading app, i.e., to provide engaging content in the form of an article. In the context of magazines advertorials were evaluated more favorably than conventional ads (Van Reijmersdal et al. (2005)). So we hypothesize:

**H2.b** The presence of advertorial will affect felt involvement positively.

**Endurability** Since video offers a different mode of communication between the advertiser and the user, users may find video-based mobile ads more worthwhile, e.g., useful, to view and gather information from. So we hypothesize:

**H3.a** The presence of video will affect endurability positively.

Also, owing to their predisposed experience to web-based ads, users may be less likely to find explicit landing pages more worthwhile and useful than advertorials, which are written in a style mimicking an article as an advertorial (in our context), as suggested in the case of magazines (Dahlén and Edenius (2007)). So we hypothesize:

**H3.b** The presence of advertorial will affect endurability positively.



**Usability** While videos might offer a secondary channel and consequently higher bandwidth for message communication, it remains unclear whether the associated intrusiveness might affect usability (de Sa et al. (2013), Goldstein et al. (2013)).

Similarly, while an advertorial based presentation style might be more usable due to its integration with the host application, it remains unclear whether this compensates for limitations on the design and functionality available in explicit ad landing pages. So, we ask:

**RQ1.a** how does the presence of video affect usability?; and

**RQ1.b** how does the presentation style affect usability?

## 4 Method

In a  $2 \times 2$  between subject study, with independent variables *presentation style* and *multimedia usage*, crowd-workers were given two rating tasks, each with a landing page that varied along only a single variable while the remaining variables were fixed. For example, first a task with an advertorial-static page and then a task with an advertorial-video page, with both pages from the health genre were rated for novelty.

All possible pairs of landing pages deviating along a single dimension were generated within each genre to create two tasks for each individual crowd-worker. Such pairwise comparison has the advantage of controlling for personal biases in human judgment based ratings. In addition, the order of the task pairs was reversed to reduce carryover effects. Each landing page was rated on one of the four user engagement factors. Ratings were subsequently aggregated for each scale at the landing page level.

376 Crowd-workers of Quality #3 (highest available on CrowdFlower) from US, Canada, and UK (Median age = 27, SD = 5.4 years, 57% female) successfully participated in the study and were paid at 1.50\$/rating. Of these, 47% crowd-workers reported to have a Bachelor's degree, 39% a high school diploma, 7% a masters degree and the rest reported no formal education or lesser than high school diploma. A crowd-worker was only allowed to participate once and rate two designs to provide 752 valid ratings in total. These workers exhibited similar background, demographics, rating level, and country of origin to the aesthetics study mentioned in "Study Materials" earlier.

**Task** A task started with a description of the task, a scenario (an information-search scenario customized to the genre of the ad, i.e., to gather information regarding education, health, or autos), and instructions on how to complete each step. Then a snapshot of a news stream of items was shown on an emulator. The instructions asked them to browse through the stream and to click on the ad creative. After clicking, a crowd-worker was shown the landing page. Here instructions asked the crowd-worker to interact with the page according to the scenario, e.g., watching the video if present and to collect information.

Afterwards, the crowd-worker was instructed to complete the UES questionnaire about all the four factors: perceived usability, novelty, endurability,

and felt-involvement, and finally presented with an opportunity to provide open-ended comments regarding the ad landing pages.

## 5 Quantitative results

We analyzed the 752 responses by fitting a mixed effects model for each of the four factors under consideration. Since each crowd-worker saw change in only factor while the second factor was held constant, we used a mixed effects model to understand the interaction between the within-subjects factor (presentation style) and between-subjects factor (multimedia presence). This was done to maintain the inter-reliability of within-factor ratings and to minimize personal biases (Munro et al. (2010)). Independent variables *presentation style* and *multimedia usage* are included as fixed effects, and participant id, the order of appearance of the landing page, and the genre are included as random effects. We begin by describing the significant interaction effects for each factor, followed by the main effects. We organize our description of the significant interaction effects as follows: first we present the factors, novelty and durability, where we find a  $2 \times 2$  interaction between the multimedia usage and presentation style variables; then we present factor of perceived usability, where we find a significant  $2 \times 3$  interaction in which genre interacts with presentation style; finally we report statistics for felt involvement for which we did not observe any significant effects. When significant effects were present, we performed Bonferroni-Holm adjustment to correct the significance thresholds ( $P; .05$ ) for multiple comparisons.

We did not find that order, genre, or participant ID were significant factors in our models for novelty and durability. We did, however, find an interaction between multimedia usage and presentation style for the novelty and durability scales.

**Novelty** Internal validity of the Novelty was found to be high ( Chronbach’s  $\alpha = 0.89$ ,  $N = 102$ ). We find a significant interaction between multimedia usage and presentation style using a partial sum of squares (type 3) F test of the model effects ( $F[1, 47.47] = 6.80, p = 0.012$ ) and effect size Cohen’s  $D = 3.16$ . This interaction is depicted graphically in Figure 2(a). We start with **H1.a** and find that Bonferroni corrected pairwise comparisons show a significant effect for the presence of video ( $F[1, 62.04] = 7.37, p = 0.01$ ) on the mean novelty score for advertising style landing pages (blue dashed line in Figure 2(a)). The mean novelty score for advertising-video landing pages was ( $M = 3.449 \pm 0.19$ ) as opposed to advertisement-static ( $M = 2.848 \pm 0.19$ ). In contrast, the presence of video did not affect novelty for advertorial oriented pages ( $F[1, 63.69] = 0.21, p = 0.65$ ) as indicated by the almost horizontal red solid line in Figure 2(a).

For **H1.b**, we find that when landing pages are static, the mean novelty score does not differ significantly (static:  $F[1, 61.77] = 1.51, p = 0.22$ ) between advertisement or advertorial style pages. We can see this by comparing the red solid and blue dashed line in the static condition in Figure 2(a). In the presence of video, however, novelty of advertorial style landing pages is significantly lower ( $F[1, 61.03] = 4.24, p = 0.044$ ) than advertisement style

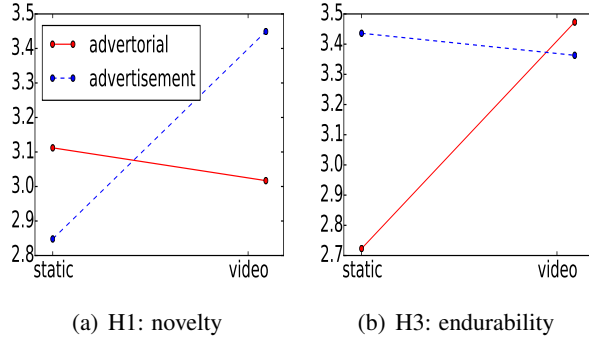


Figure 2: Summary of the interaction between multimedia usage and landing page design for novelty and endurance.

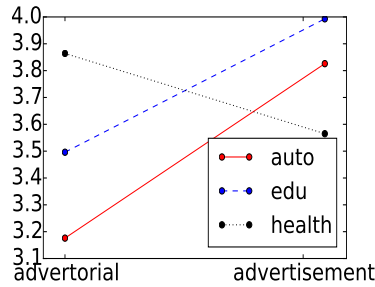
landing pages.

In summary, only in advertisement style landing pages, the presence of video positively affected the novelty rating. In advertorial style landing pages, the presence of video did not affect novelty. A higher novelty score indicates that a landing page better attracts user attention. The above findings show that advertorial and static advertisement style landing pages are worse at attracting attention than advertisement style landing pages with video.

**Endurability** The internal reliability of the three questions measured using Chronbach’s  $\alpha$  was high ( $\alpha = 0.84, N = 94$ ). The mixed effects model fitted on the endurance responses also shows a significant interaction effect between multimedia use and presentation style ( $F[1, 44.37] = 5.60, p = 0.02$ ), as depicted in Figure 2(b). However, the direction of the interaction differs from the one observed for novelty. With respect to **H3.a**, the pairwise comparisons show that the direction of the perceived endurance is affected by the presence of video, but only in advertorial-style ads ( $F[1, 65.51] = 9.47, p = 0.00$ ), as indicated by the steep slope of the red solid line in Figures 2(b). The mean scores for ads with videos ( $M = 3.47 \pm 0.17$ ) are higher than without videos ( $M = 2.72 \pm 0.17$ ), indicating that advertorial style pages are significantly more endurable, e.g., useful, when a video is present than otherwise (effect size, Cohen’s  $D=4.41$ ).

For the presentation style, i.e., **H3.b**, Bonferroni corrected pairwise comparisons show that the mean endurance score between advertorial and advertisement style landing pages is different only when videos are absent ( $F[1, 73.05] = 73.05, p = 0.00$ ). The mean score for static advertisement landing pages ( $M = 3.43 \pm 0.18$ ) is higher than static advertorial style pages ( $M = 2.72 \pm 0.17$ ), indicating that static advertorial style pages have significantly lower endurance than both static advertisement style landing pages and advertisement style landing pages with video (effect size Cohen’s  $D=4.05$ ).

To summarize, we find that using videos does indeed lead to higher perceived endurance, but only in advertorial style landing pages. Endurance is an indication of how useful a landing page is. The above findings show that static advertorial style pages are considered significantly less useful than



(a) RQ1: usability

Figure 3: Summary of interaction between genre and either landing page design

advertisement style pages. Further, both styles have comparable endurance with videos.

### 5.0.1 $2 \times 3$ Interactions with Genre

In the model for usability we observe interactions with genre.

**Usability** Internal reliability of the three questions used to measure usability measured using Chronbach’s  $\alpha$  was found to be high as well ( $\alpha = 0.72, N = 94$ ). To answer **RQ1.a**, a mixed effects model shows no significant effect of multimedia use on the perceived usability of the landing page ( $F[1, 76.30] = 0.00, p = 0.98$ ). The mean usability score for landing pages without videos was ( $M = 3.65 \pm 0.11$ ), similar to landing pages with videos ( $M = 3.65 \pm 0.11$ ) and effect size, Cohen’s  $D=0$ .

Regarding question **RQ1.b**, there is a significant interaction between the presentation style and the genre of the ad ( $F[2, 75.85] = 4.04, p = 0.02$ ). This is depicted graphically in Figure 3(a). Bonferroni corrected pairwise comparisons show that perceived usability was affected by presentation style ( $F[1, 79.95] = 7.32, p = 0.00$ ), but only for one genre, i.e., autos, as can be seen with the red solid line in Figure 3(a). The mean usability scores for landing pages with advertisement style ( $M = 3.82 \pm 0.18$ ) was higher compared to advertorial style ( $M = 3.17 \pm 0.19$ ) and effect size, Cohen’s  $D=3.51$ .

We observe that both for the education and auto genres (blue dashed and red solid lines), the mean usability score increases when an advertisement style landing page is used. For the health genre, the effect is opposite. However, the difference is not significant and smaller than the other genres. To summarize, the use of an advertisement style landing pages overall leads to higher perceived usability.

## 5.1 No Effects

**Felt Involvement** Finally, internal reliability of the three questions used to measure felt involvement, was found to be acceptable ( $\alpha = 0.69, N = 86$ ).

Regarding **H2.a** and **H2.b**, we did not find that users felt more involvement with the landing pages when the video was absent as opposed to when the video was present ( $F[1, 66.27] = 3.74, p = 0.06$ ). The mean felt involvement score for ads without videos ( $M = 3.53 \pm 0.12$ ) was similar compared to with videos ( $M = 3.25 \pm 0.12$ ) and effect size, Cohen's  $D=2.33$ . Further, the presentation style also did not have a significant effect on how users felt about their involvement with the ad landing pages ( $F[1, 61.11] = 0.28, p = 0.59$ ). To summarize, we do not observe any effect when presentation style or video presence are varied on whether users enjoy (felt involvement) a landing page.

## 6 Reflections on results based on open comments

We studied the effect on user experience with native mobile ads when their landing page presentation style and multimedia usage were varied in the context of a news app. To summarize:

**Novelty** Hypothesis H1.a was found to be partially true. Explicit advertisement styled landing pages with multimedia support were rated significantly as Novel.

Hypothesis H1.b was found to be false. Advertorial styled landing pages were not rated as Novel significantly.

First, we observed that in advertisement style landing pages, the presence of video is significantly positively related to the novelty rating across all genres. Higher novelty scores indicate that a landing page is better at attracting user attention.

This is in line with previous research about the impact of moving objects and variations in color and brightness attracting attention reported by Carmi and Itti (2006) and Wolfe and Horowitz (2004).

Second, we do not observe evidence that the novelty of advertorial style landing pages is affected by video. We also find that static advertisement and advertorial style landing pages were perceived to be comparable in terms of novelty.

This departs from research by Kim et al. (2001) in the context of magazines where advertorials were found to attract greater attention. This could be because of the following reasons:

*Context of task:* Some of the gain in attraction observed for advertorials in magazines was based on users mistaking an advertorial for actual content. However, in our setting, we explicitly indicated that workers would interact with an ad before they saw a landing page, which may explain why we do not observe a similar effect.

*Expectation Mismatch:* In some cases, expectation raised by the creative was for an advertisement style landing page. According to Dahlén and Edenius (2007), advertorials are evaluated more favorably due to their similarity to the publisher content. However, when expectation raised by the creative is for an advertisement style, we do not observe such positive evaluation. For example, P#2440 expected an explicit advertisement landing page after having seen the ad creative: “*I wasn't*

*expecting so much text; it's a bit like an article. I was expecting more of a directory-like feel, and less of an advertisement. ”*

**Felt Involvement** Hypothesis H2.a and H2.b did not find any support in our data. Neither multimedia presence, nor presentation style were reported to increase felt involvement.

Crowd-workers reported high involvement with both explicit advertisement and advertorial landing pages: *“The article that was shown was exactly how I expected it to be. It was very similar to other news articles .....I liked this article and certainly paid attention to it.”* (P#2136).

P#2129 describes a positive experience with an advertorial in the Health genre: *“I did not realize this was an advertisement until the survey asked me, which is a good sign and shows that it is a good advertisement.”* (P#2130). Similarly we find positive responses about felt involvement for explicit advertisements. For example, in the Education genre, P#1635 notes: *“I thought it was a good advert overall, well laid out and easy to navigate. It looks like the sort of page that a university would have. I would probably remove the small print at the bottom of the page and probably emphasize the phone number more or offer a call back service.”*

The lack of an observable effect on felt involvement may be a consequence of selecting ads based on high dwell time and low bounce rate, which are often associated with interestingness and satisfaction in many contexts.

**Endurability** Hypothesis H3.a and H3.b were found to be partially true. Advertorial styled landing pages with multimedia support were rated significantly as Endurable. Also, explicit advertisement styled static landing pages were found to be Endurable significantly.

Advertorial-static landing pages were found to require more effort to consume information. For example, P#2234 states about an advertorial-static landing page in the Auto genre: *“It is very wordy - there is far too much text for someone wanting to find information quickly. I think that a user would find this off-putting and distracting, and that it would be better to have some bullet-point summary at the start of the text, and some form of multimedia to make it more interesting, or the user will probably give up.”* On the other hand, regarding an advertorial-video landing page in the health genre, P#2346 comments: *“This was a well written short article that I would definitely pass on to anyone in need of extra sleep. It has a lot of relevant information and the advertisement is very subtle and non-pushy.”*

**Usability** Research question RQ1.a did not find any conclusion in our data. Multimedia presence was found to have no significant impact on perceived usability.

Regarding Research question RQ1.b, explicit advertisement styled landing pages were rated significantly more Usable.

The presence of video itself does not relate to higher usability. Unlike desktop, mobile devices have limited screen real estate and participants suggested that users should be empowered to choose how they interact with the pages within the limited space. For example, providing video as a replacement for text should be optional and controlled by the user: *“This is a good*

*ad - I really like the bold layout and choice of colors...The video might not load very quickly on less powerful phones - cut some out? Allow the viewer to make a choice?..."* (P#2448, Advertisement-Video, Auto)

Another reason to enable such customization is the context of mobile phone usage. Downloading and playing multimedia elements requires adequate access to internet, consumes battery, and might even be impossible in certain spatio-temporal contexts like public spaces. Some of our participants pointed to such constraints and suggested to make such elements optional: *"...Would prefer if the different categories were accessible at the top with jump links that expanded the content if I were interested in that feature. Also there is a lot of video which might take a while to load on some phones with slow Wifi..."* (P#2406, Advertisement-Video, Auto)

However, we found that advertisement style landing page leads to higher perceived usability for some genres. In the auto genre, using advertisement style landing pages leads to significantly higher perceived usability. A similar positive trend is observed in the education genre as well.

This suggests that advertisers could take advantage of the design opportunity provided by explicit advertisement landing pages by incorporating multimedia and other design elements. For example, P#2533 remarked about an advertisement style page with a video: *"I liked that there was a video you could click on, the video made the school seem even more professional and attainable. The form at the bottom was very simple and didn't require way too much information for just a simple brochure, and option to call right underneath."*

## 7 Summary

**Presentation style** We find that, overall, advertorial style landing pages do not necessarily result in a better user experience than an explicitly designed advertisement. However, we find that in the context of a quick information search scenario, static advertorials are considered less useful than explicit advertisements.

This suggests that, depending on the aim of the advertiser and publishing platform, an advertorial style landing page may deliver an experience lesser to that of explicit advertisement style landing pages. Since we do not observe additional benefits to using this format, in the context of native ads, advertisers may not pursue advertorials style landing pages as their default format.

**Multimedia usage** We find that in explicit advertisement style landing pages, the presence of video is successful in attracting user attention. We also find that the presence of video may improve usefulness ratings for advertorial style landing pages, but offers no benefits in terms of enjoyment, and usability. Generally, we did not observe that the presence of video on landing pages have a negative impact on the user experience.

However, participants pointed out some of the challenges associated with the use of video as a primary dissemination channel. Our participants sug-

gested having videos available on demand and using videos as aids to the text as a secondary channel for increasing durability and usability. Since we did observe additional benefits to using videos, in the context of native ads, advertisers may pursue videos as an additional channel in landing pages as their default format.

**Design Implications** Future ad landing page designers, pursuing significant extra efforts to design advertorial landing pages, should beware that these designs might backfire as they are perceived to be “very wordy”. Ad landing page designers should focus on creating explicit advertising style landing pages that users have become accustomed to and expect (as reported in comments by our participants). If they seek to add novelty, video may be embedded additionally to the text. However, video should not be used as text replacement, and should be offered as “optional”.

Further, researchers have found that novelty in ads leads to better short-term ad recall, whereas durability leads to better short-term and long-term brand recall (Sheinin et al. (2011)). So, if the designers are optimizing for short-term ad recall, they should design explicit advertisement landing pages with videos. However, if they are looking for durability, they should design advertorial landing pages with videos.

**Measurement** Dwell time and bounce rate have been popular proxies for interestingness, satisfaction, and quality. We used dwell time and bounce rate to control for variables such as content interestingness and quality of native ad landing pages. We find that our set of landing pages is homogeneous in terms of enjoyment and the usefulness of explicit advertisement style landing pages, but that considerable variability remains in terms of the usefulness of advertorial landing pages. This suggests that with respect to advertorials dwell time and bounce rate capture other aspects of these pages and further work is necessary to understand the relation between dwell time, advertorials and their usefulness.

## 8 Limitations

Our results reflect the user experience in the context of doing an information foraging and summarizing task in a micro time-window. For example, when searching for some specific information, as in our task, a wordy advertorial or a linear access medium like video can be expected to prove detrimental. Other tasks, not tested here e.g., browsing, over a longer time span, or perusing might produce alternative results and should be researched further. Further, our findings are based on user-ratings of 12 native ads. While randomly selected and carefully controlling for multiple factors such as length of text/video, genre, log based metrics, and aesthetics our results may not generalize to other types of videos, content, and advertisement styles.

Third, the ratings presented in the paper were given by crowd-workers. A broader discussion of the characteristics of crowd-workers, and how to leverage the platform for survey-based research can be found in work by Huff and



Tingley (2015). They show that the geographic and employment characteristics of US-based crowd-work based respondents are similar to the broader population, and suggest a number of ways in which researchers can leverage the platform - for example when specific populations would be of interest. In our case, online crowd-workers offers a sample online population that is also likely to encounter online ads. Future work may be needed to validate this with non crowd-workers.

Finally, our results are obtained using a mobile phone emulator to accommodate a scalable crowd sourcing based study. We leave confirmation of our findings on actual mobile phones as future work.

## 9 Conclusion

Despite our limitations, widespread user frustration with ads and recent steps by manufacturers like Apple to block ads continue to suggest that the advertising design space requires improvement. We show that manipulating design by presentation-style and multimedia-usage on ad landing pages, and inexpensive evaluation using crowds can significantly impact user experience, which we propose should be an essential criteria when designing ads or when choosing to run ads on a platform. Since we do not observe additional benefits to using advertorials, in the context of native ads, we recommend that advertisers may not pursue advertorials style landing pages as their default format. Further, since we did observe additional benefits to using videos, in the context of native ads, we recommend that advertisers may pursue videos as an additional channel in landing pages as their default format. Further research in this direction will improve our knowledge of multimedia and presentation style effects on mobile web design.

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