

Original Research

Advertisement Format and Sexual Content as Heuristic Cues for the Credibility of News Delivered to South Korean Audiences Through Mobile Devices

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ABSTRACT

We tested the heuristic processing of online advertisements embedded in a mobile news site. Based on the bias hypothesis of the heuristic-systematic model (HSM) of information processing, we investigated whether the advertisement format (i.e., banner vs. pop-up) and sexual content serve as heuristic cues. Specifically, we looked for heuristic cues negatively associated with the evaluations of online news readers, including the credibility of the news agency and the news content, their perceived importance of and interest in news stories, and their intention to revisit the news website. The results of online experiments indicated that participants' perceived credibility of news articles, perceived news importance and interest in news stories were negatively associated with the appearance of online advertisements showing sexually provocative content in the news stories. However, we found no association among the advertisement format, perceived credibility of the news agency and intention to revisit a news website. Our findings suggest that an advertisement featuring sexual appeals in mobile environments can function as a negative heuristic cue.

KEYWORDS

heuristic-systematic model (HSM), banner ads, pop-up ads, sexually appealing ads, news credibility

Mobile advertisement accounts for an increasing proportion of the online advertisement industry. In South Korea (hereinafter, Korea), mobile-only platforms accounted for 55% of all online advertisements in 2020 (Researchad, 2020). Further, news agencies accounted for eight of ten online platforms with the largest numbers of advertisers. However, when it comes to the total advertising expenditure, only two news agencies were in the top 10. This means that the number of mobile advertisements on news agencies is large, but overall, relatively inexpensive (or low-quality) advertisements have been executed.

Also, the growing reliance of consumers on smartphones has made mobile apps the major channel, through which the public access news and stories. In 2021, about 79% of the population in Korea consumed news through smartphones (Korea Press Foundation, 2021). On the screens of these devices, the unexpected appearance of intrusive advertisements, in particular banner and pop-up ads, can impact news consumption behavior significantly. Moreover, as Dunaway and Soroka (2019) pointed out, the relatively small screens and font sizes on mobile phones can impede consumers' processing of information. Thus, news consumers may experience frustration when confronted with pop-up advertisements that lead them to find and click on an "X" to remove such unwanted contents (An, 2020). We reasoned that the distraction caused by such advertisements might be amplified when they include sexual content. Basically, Park and Choi (2013) found that Korean mobile consumers frequently received mobile advertisements and felt annoyed about them.

Of the sites that we visited for this research, we found intrusive and sexually appealing advertisements on most online news sites. Online banners and floating advertisements such as pop-ups can hinder audiences' information processing activities since they share the same visual space with the news content. Thus, Lee et al. (2016) reported that online users were bothered by intrusive advertisements that directly hid the content, including banner as well as pop-up ads, especially when the advertisement was irrelevant to the content. Further, according to Kim (2018), sexually appealing advertisements have been overused on news sites. Therefore, most news consumers tend to avoid such intrusive or sexually appealing advertisements (Cho & Cheon, 2004). Such ad avoidance phenomenon might affect them to negatively assess the credibility of the advertisement and news content, and even the news agencies that display such advertisements.

While some scholars have examined the effects

of online and social media advertisements on brand recognition (Chatterjee, 2008; Kim et al., 2019), only a few studies (e.g., Goyal et al., 2018) have focused on the mobile environment and accounted for the combined influence of the format and the content of advertisements on consumers' evaluations of news content and news agencies. Currently, more and more consumers access news through smartphones (Reuters Institute for the Study of Journalism, 2018), especially in public settings such as while commuting on public transportation or waiting in line. However, some news sites have received criticism for excessive amounts of intrusive (Riedel et al., 2018) and sexually appealing (Samson, 2018) advertisements. As a result, the credibility of online journalism can be threatened. Given the increase in the number of advertisements on mobile news sites, individual perceptions of the news content and the news agency can be influenced significantly by the online advertisements they deliver.

To address this gap in research, we conducted an online experiment using stimuli designed to mimic a typical Korean news site. Our theoretical framework for this experiment was the heuristic-systematic model (HSM, Chaiken et al., 1989). We assumed that both ad intrusiveness and sex appeals in ads can serve as heuristic cues affecting the evaluations of online news contents by users. From a theoretical perspective, our research contributes to the study of the role of heuristics in online news reading. In practical terms, our findings can inform the drafting of policies regulating online advertisement by news agencies.

Intrusive Advertisements as Heuristic Cues

Consumers of online news articles tend to be goal-oriented (You et al., 2013). To achieve their goals (e.g., gathering information about current issues), they navigate websites, and they may encounter online advertisements along the way. Because the advertisements are designed to attract users'

attention—which means distracting them from reading articles—the information-gathering goals of the user conflict with the goals of the advertisers (Danaher & Mullarkey, 2003). The distraction caused by advertisements is often referred to as intrusiveness, a “psychological consequence that occurs when an audience’s cognitive processes are interrupted” (Li et al., 2002, p. 39). A website with advertisements that a user considers excessive in this regard can trigger negative emotional reactions (Li et al., 2002), including those toward the site itself (McCoy et al., 2017), owing to the perception of a threat to or loss of control over the processing and gathering of information. Riedel et al. (2018) described the effect of intrusive advertisements as flow disruption, that is, “the interruption to the cognitive process relating to the active task caused by the advertisement” (p. 760). Thus, the interruption caused by and the irrelevance of an advertisement are components of flow disruption. Further, advertisement content that is unconnected with the content of a website (in this case, a news site) may be perceived as especially intrusive, to the point of inducing some users to avoid not only the advertisements but even the sites on which they appear (Riedel et al., 2018).

As noted, banner and pop-up advertisements represent different levels of intrusiveness. Banners are clickable online advertisements that typically combine still or moving images and sound but do not block the main page. Pop-up advertisements, on the other hand, block some portions of the content, taking the form of windows, usually relatively small, superimposed over the main website. Like a banner advertisement, a pop-up often contains text, images, or other multimedia elements designed to enhance its visibility. Thus, pop-up windows tend to cause sudden and unexpected changes in the visual field through no action of the user. Chatterjee (2008) found that, though pop-up advertisements could successfully capture users’ attention, users were more likely to avoid them actively than banner advertisements.

Some scholars attempted to understand the

effect of intrusive advertisements in processing news and advertisements using HSM, that is instructive ad as a heuristic cue (Diao & Sundar, 2004). Heuristic processing can be defined as “a set of low-level cognitive decision-making processes” (Johnson & Ewbank, 2018, p. 10) that lead to an interpretation of information that has been acquired. On the other hand, systematic processing involves a “comprehensive, analytical orientation in which perceivers assess and scrutinize all information input for its relevance and importance to their judgment task and integrate all useful information in forming their judgment” (Chaiken et al., 1989, p. 212). These *judgmental shortcuts* serve to organize and simplify choices (Sniderman et al., 1991) through the identification of specific cues for assessing the trustworthiness of content and the nature of distal information (Sundar et al., 2007) gleaned from proximal resources. Chaiken et al. (1999) accordingly defined a heuristic cue as “some salient, easily processed piece of stimulus information that gives rise, automatically, to a particular perception and activates a stored decision rule” (p. 199).

Individuals tend to use heuristic cues to make decisions quickly and with minimal cognitive effort (Fiske & Taylor, 1991). Chaiken et al. (1989) well described heuristic processing as the use of “minimal informational input in conjunction with simple (declarative or procedural) knowledge structures to determine message validity quickly and efficiently” (p. 216). The idea is that, when individuals identify heuristic cues indicating that information is trustworthy, they may proceed to further information processing. Heuristic cues also direct audiences to make reasonable final investments of their attention, even when doing so may not be the optimal use of this limited resource (Popkin, 2008). These investments may not involve elaborate or detailed knowledge because an individual’s heuristics tend to simplify the process of choosing among multiple options (Bingham &

Eisenhardt, 2011; Popkin, 2008).

The HSM accounts for a dual process for information processing involving the simultaneous activation of both high-effort (systematic) and low-effort (heuristic) modes of information processing (Chaiken, 1980; Chaiken et al., 1989). Systematic processing is highly analytical, entailing careful consideration of messages (Chaiken, 1980). When systematic processing is activated, individuals make judgments based on the arguments or information presented in messages (Chaiken & Eagly, 1983). Todorov et al. (2002) argued that when systematic information processing is activated, “people consider all relevant pieces of information, elaborate on these pieces of information, and form a judgment based on these elaborations” (p. 196). Such a judgment requires the cognitive ability to comprehend the information as well as considerable time and effort compared with heuristic processing.

During heuristic processing, recipients expend little effort and rely on easily accessible cues like the characteristics or attributes of the information sources, to draw conclusions. The least effort principle of heuristic processing indicates that heuristic information processing is the default approach because people naturally prefer to engage in less cognitive effort (Bohner et al., 1995). Individual heuristics are stored in memory and automatically activated in response to the corresponding cues. Heuristic processing, therefore, varies from individual to individual based on personal theories derived from unique sets of previous experiences (St. Jean et al., 2011). It also follows that the attitudes shaped by heuristic processing tend to be more capable of change and less stable than those shaped by systematic processing.

The HSM accounts for a dual process for information processing involving the simultaneous activation of both high-effort (systematic) and low-effort (heuristic) modes of information processing (Chaiken, 1980; Chaiken et al., 1989). Bias hypothesis is one of the three types

of simultaneous activation of both modes. The hypothesis explains biased judgments in terms of previous influences that create by some degree of expectation regarding an issue or the marketing of a product. Thus, activation of a bias may result in heuristic processing that alters judgment indirectly, in that individual’s use of heuristic cues to shape expectations or inferences regarding the validity of the messages and arguments (Chung & Waheed, 2016; Maheswaran & Chaiken, 1991). For example, reading an ambiguous message about a specific issue or product may activate heuristic processing that originates in bias, thereby limiting or countering systematic processing (Chaiken & Maheswaran, 1994).

Among the scholars who have studied intrusive advertisements in relation to heuristic cues, Diao and Sundar (2004) found that the perception of pop-up advertisements as intrusive, unexpected, and novel stimuli formed negative impressions, such as mistrust of the content presented on a website. Sundar (2008) suggested that *intrusiveness heuristics* triggered by unwelcome information such as that provided by pop-ups in websites can be a source of annoyance for users. In fact, when the intrusive heuristics is cued, it is likely to have a negative impact on online content evaluations. Similarly, Metzger et al. (2010) found that violations of users’ original expectations about a website—such as the presence of intrusive material, explicit content, or advertisements—immediately generated suspicions about its credibility.

Sexually Appealing Advertisements

Wirtz et al. (2018) well defined sexual appeals as “a persuasion attempt that uses words, images, and/or actions by models appearing in ads to deliver an explicit or implicit sexual message designed to evoke sexual thoughts, feelings, and/or arousal in a targeted audience” (p. 169). Nudity and sexual innuendo are two forms of sexual appeals used in advertisements. For the academic definition of nudity, Putrevu (2008) suggested

“the amount and style of clothing worn by the models” (mainly women) in advertisements and, for sexual innuendo, “the sexually provocative language and actions of models” (p. 57). Such appeals or cues are prevalent in mass media generally (Lo et al., 1999) and advertisement especially (Reichert, 2003) in the belief that “sex sells” (MacCannell, 2012, p. 521). Usually, sexual appeals in advertisements have no meaningful connection with the product being advertised, as is the case for news sites since the articles do not normally deal with sexual content.

Studies of the effectiveness of sexual appeals in advertisements have reached various conclusions. On the one hand, sexual appeals can help a message to stand out in cluttered media environments (Reichert, 2002; Reichert et al., 2001) and automatically attract viewers’ attention to their information processing (Severn et al., 1990). On the other hand, such appeals may distract audiences from processing brand-related information even though they enhance viewers’ memories of the advertisements (Samson, 2018). Scholars have argued that sexually appealing advertisements may motivate audiences to process the sexual imagery rather than the message of an advertisement (Reichert, 2002), arouse emotional responses and automatic information processing (Lang et al., 1993), and reduce the mental resources available for processing (Chaiken et al., 1989).

Sundar (2008) suggested the *distraction heuristics*, a sensory overstimulation that internet users can experience during their navigations on websites. The distraction heuristics is more likely to detract internet users from evaluating content in an effortful manner. Morris (2012) pointed that the greater degrees of sexual content in advertisements could produce negative reactions to internet users. Overall, sexual appeals in advertisements can initiate heuristic cues by providing distal information that triggers emotional reactions (Sundar et al., 2007).

The Association Between Intrusive and Sexually Appealing Advertisements and News Evaluations

There are criteria for evaluating online news sites. First, media credibility refers to the tendency of consumers to trust the accuracy of the information that a site provides (Metzger et al., 2003). That is, credibility in this context describes audiences’ evaluations of the believability of the messages in news stories. The evaluation of messages can be affected by other factors, such as their quality. Slater and Rouner (1997) defined message quality in terms of presentation and argued that effective presentation tends to enhance credibility. Fogg et al. (2003) pointed to the visual design of websites as the key feature in evaluations of their credibility. Other scholars have established that advertisements can affect the credibility of media outlets. Speck and Elliott (1997) reported negative reactions by audiences to unusually large numbers of advertisements as well as sensitive content that, in turn, undermined the perceived credibility of the media outlets on which the ads appeared. Also, negative emotional impressions of advertisements may elicit negative evaluations of the media in general (Kim et al., 2010).

Heuristic cues such as intrusive and sexually provocative advertisements could be negatively impactful on the credibility of online news article and news agency. Several scholars have reported that pop-up advertisements negatively affected users’ evaluations of the credibility of websites (Metzger et al., 2010; Sundar, 2008). If readers perceive intrusive advertisements as irrelevant to the news articles they accompany, they can stop processing the news article (Riedel et al., 2018). In any case, researchers have found that interruptions by online pop-up ads, like those by other types of advertisements, elicited negative emotions such as irritation as well as avoidance of ads (Chatterjee, 2008; Edwards et al., 2002). Therefore, such interruptions pose a potential threat to the credibility of news sites on which they appear.

Similarly, sexual appeals in advertisements may distract attention from the information in which consumers of news are interested and interfere with their understanding of the content of articles (Morris, 2012; Sundar, 2008).

News importance, news interest, and the intention to revisit a news source are other key aspects of audiences' assessments of online news sites (Sundar, 1999). News importance refers to readers' judgments and perceptions regarding whether a story qualifies as news, as opposed to other types of content. Graber (1984) found that consumers looked for cues relating to importance provided by editors as well as their own concerns when choosing which news stories to read. News interest refers to the extent to which consumers enjoy or learn from news stories and correlates with positive emotions. Regarding the intention to revisit a news website, in most cases, consumers tend to revisit sites toward which they have positive attitudes (McCoy et al., 2017).

Yang and Oliver (2004) found that advertisement interruptions on news sites by pop-up ads had a negative effect on consumers' perceptions of news importance. Sexually appealing advertisements irrelevant to the surrounding news content have been found to elicit emotional responses from consumers (Lang et al., 1993; Morris, 2012), including the perceptions that they are unethical and offensive (LaTour & Henthorne, 1994; Tai, 1999). Such negative emotions triggered by sexually appealing advertisements could, in turn, negatively impact perceptions of news importance and interest. McCoy et al. (2017) found that individual perceptions of the intrusiveness of ads negatively affected news consumers' intention to revisit a news site since they perceived that such news sites presented redundant information. Heuristic cues elicited by sexually appealing advertisements could be perceived to conflict with consumers' reasons for visiting news sites. In other words, visitors to a news website may come away with negative feelings about it when advertisements hinder their information-gathering activity and may even conclude that the

site fails to meet their information-processing needs and is not worth revisiting.

We defined the reading of online news content conceptually as a systematic processing activity requiring high-level cognitive ability and the main goal of those who visit online news sites. We tested the effects of two heuristic cues (advertisement format and content) on the credibility of online news and news agency, individual perceived news importance, and perceived interest, and intention to revisit a news website. Both intrusive and distraction heuristics cued by banner or pop-up and sexually provocative advertisements can be negatively impactful on the evaluations of websites (Metzger et al., 2010; Sundar, 2008), because they can stimulate expectation violation for goal-oriented online readers (You et al., 2013). The bias hypothesis of the HSM provided a suitable basis for our research because the systematic and heuristic cues may work to opposite effect on mobile news sites concurrently. We assumed that intrusive (Metzger et al., 2010; Sundar, 2008) and sexually provocative (Morris, 2012; Samson, 2018; Severn et al., 1990) advertisements can perform as heuristic cues and can further elicit negative evaluations of news sites and content. Based on the arguments, we set two hypotheses.

H1: Compared with banner advertisements, pop-up advertisements have a greater negative effect on news consumers' evaluations: (a) news agencies' credibility, (b) news credibility, (c) news importance, (d) news interest, and (e) whether to revisit a news website.

H2: Compared with advertisements lacking sexual content, advertisements featuring sexually appealing imagery have a greater negative effect on news consumers' evaluations: (a) news agencies' credibility, (b) news credibility, (c) news importance, (d) news interest, and (e) whether to revisit a news website.

METHOD

To test our hypotheses, we conducted an online experiment. For this study, we created an artificial online news media site that featured news articles credited to the actual Korean news agencies that originally published the articles, as well as online advertisements. Before the main experiment, we interviewed a focus group consisting of 11 college students, whom we asked to describe the aspects of consuming media content on mobile devices that they considered unpleasant. A number of the participants in the focus group mentioned online advertisements that were excessive, intrusive, and/or sexually appealing. Based on these results, we narrowed the scope of the main study: the format of advertisements (banner or pop-up) and the presence or absence of sexual appeals in advertisements.

Participants

480 Korean respondents who were randomly assigned to stimuli participated in the online experiment. We recruited them through a specialized research institute using a quota-sampling method based on gender and age groups (i.e., 18 to 35, 35 to 50, and over 50). The criteria for the study limited participation to adults who declared that they regularly consumed news on a mobile device. Of the original 480 respondents, 16 who did not fully complete the survey (e.g., missing answers) were excluded from the analysis, so the final sample consisted of 464 participants. The sample was 50.4% male ($n = 234$) and 49.6% female ($n = 230$) with an age distribution ranging from 20 to 63 and an average age of 40.73 years.

Experimental Stimuli

In our experiment, the banner advertisements served as the low-intrusive condition and pop-up advertisements as the highly-intrusive condition. To manipulate the intrusiveness

of the advertisements, we followed the Better Ads Standards guidelines (Coalition for Better Ads, 2018). We chose as stimuli (1) pop-up advertisements and (2) banner advertisements that occupied 30% of the screen because these have been the most common types of advertisements in the Korean mobile environment (Interworks Media, 2019; Reuters Institute for the Study of Journalism, 2018). We designed the banner advertisements to occupy about 30% of the screen on mobile phones because larger ads may be perceived as intrusive even when they do not hide news articles (Coalition for Better Ads, 2018). We designed the pop-up advertisements to occupy one-third the space of the banner ads but to hide the text of the news articles.

To manipulate the sexual appeals, we chose urology advertisements featuring a partially nude female image for the “sexual” condition and advertisements showing the rates for a Korean mobile carrier’s plan for the “non-sexual” condition (see Appendix). We chose these two advertisements because they have been commonly found in online advertisements (Jung, 2020; Kim, 2014). We used three news articles published concurrently to control for other variables, such as the participants’ commitment to particular stories. We designed the experimental stimulus website to mimic a typical Korean online news site in a real mobile environment. We sourced the articles from Yonhap News Agency because this media outlet is considered fairly neutral politically (Lim, 2011). During the experiment, the participants accessed the experimental stimuli on the artificial website through their web browsers in a way that mimicked a mobile environment.

Procedure

We asked the participants to complete a survey that measured their attitudes toward the advertisements on the artificial news site. First, before exposure to the stimuli (i.e., the advertisements), they stated their baseline attitudes toward the simulated news agency. As discussed, they viewed a set of

three published news stories to control for such confounding variables as commitment to a specific story and to minimize biases triggered by the news articles themselves. The topics of the three stories were the minimum wage, conscientious objection to military service, and an act of violence by a company CEO, i.e., issues that were prominent in the news at the time. The content of the stories included only straightforward reporting of the facts without interpretation or commentary.

Next, we assigned the participants randomly to one of the 12 research conditions. Thus, each read one of the three stories accompanied by one of the four types of advertisement (i.e., sexual banner, sexual pop-up, non-sexual banner, or non-sexual pop-up). We instructed them to read the articles thoroughly and told them that their responses would provide data important for the development of the Korean news industry. We manipulated the experimental procedure so that the participants had the option of clicking an “X” on the advertisement to receive access to the full articles without any advertisements. Lastly, after each had read a news article, we asked the participants to rate the advertisements with respect to intrusiveness and sexual content. Our procedure was similar to that used by Chaiken and Maheswaran (1994), having been designed so that, for participants who followed the directions correctly, reading the news was their primary goal while the advertisements provided heuristic cues.

Measures

We asked participants to evaluate the credibility of news contents and news agencies, individual perceived news importance, perceived news interest, and their intention to revisit the news site.

News Credibility

We measured the credibility of the news articles and the news agency using three of the assessments—fair, objective, and reliable—that Yang and Oliver (2004) used in their study of media credibility. The

participants rated the credibility of the news articles by responding to the statements “This news article is fair,” “This news article is objective,” and “This news article is reliable” on a five-point scale ranging from 1 = *Strongly disagree* to 5 = *Strongly agree*. We summed the responses to the three statements (Cronbach’s $\alpha = .78$).

News Agency’s Credibility

We evaluated the participants’ ratings of the news agency’s credibility by asking them to respond to the statements “Yonhap News is a fair media source,” “Yonhap News is an objective media source,” and “Yonhap News is a reliable media source” on a five-point scale. We measured the credibility of the news agency twice, (1) before (Cronbach’s $\alpha = .93$), and (2) after (Cronbach’s $\alpha = .94$), the participants’ exposure to the stimuli and calculated the credibility of the news agency by subtracting each participant’s total credibility score before exposure to the stimuli (the pre-credibility score) from the score after exposure (the post-credibility score).

Perceived News Importance and Interest

We measured perceived news importance and perceived news interest by asking participants to respond to the statements “The news article that I read was important” (i.e., important, newsworthy, and valuable; Cronbach’s $\alpha = .76$) and “The news article that I read was interesting” (i.e., interesting, lively, and entertaining; Cronbach’s $\alpha = .74$) using the same five-point scale.

Intention to Revisit

To measure the participants’ intention to revisit the site, we asked them to respond to the statements “After being exposed to this advertisement, I would like to visit Yonhap News again” using the five-point scale.

RESULTS

Our analyses consisted of two parts: preliminary analysis followed by hypothesis testing. First, we checked the manipulation of treatments and balance of each experimental condition. Then, to test the hypotheses, we used Jamovi, a statistical software, to conduct five univariate analyses (ANOVAs) of the experimental data corresponding to the individual contributions of the independent variables to the five dependent variables. The experimental design included two dimensions of the independent variables and the degree of advertisement intrusiveness differentiated based on format (banner or pop-up) and the sexual appeals. We measured the dependent variables— news credibility, the credibility of the news agency (post-credibility – pre-credibility), individual perceived news importance and perceived news interest, and their intention to revisit the news site.

Preliminary Analyses

We successfully manipulated ad intrusiveness by format ($F[1, 462] = 8.48, p = .017$). Thus, the participants assigned to the pop-up-type condition perceived greater intrusiveness ($M = 13.92, SD = 3.21$) than those assigned to the banner-type condition ($M = 12.88, SD = 3.26$). We also successfully manipulated ad sexuality ($F[1, 462] = 311.81, p < .001$). Thus, the participants rated the advertisement with a sexual image as more sexual ($M = 13.16, SD = 2.03$) than that without a sexual image ($M = 9.06, SD = 2.89$).

We performed balance tests to check the randomness of the participants’ assignment to the experimental conditions using age, gender, and the pre-credibility score for the news agency. Howe and Teufel (2014) found respondents’ age to correlate with the credibility scores for news articles and news agencies, while Putrevu (2008) found a difference in remembering advertisements between male and female respondents. The results of the balance tests indicated that the assignments had, indeed, been random, there being no statistical differences between the experimental conditions, including ad format (gender: $\chi^2 = 0.02, p = .711$; age: $F[1, 462] = .63, p = .802$). Also, to check for the confounding effect of the news article type, we conducted a multivariate analysis of variance (MANOVA) of the main effect of news article type and its interaction effect with the other dependent variables. We found no main effect of news type (Wilks’ $\lambda = .99, F[6, 900] = 0.92, p = .646$) and no interaction effects (news type x ad sexuality: Wilks’ $\lambda = .99, F[6, 900] = 1.17, p = .748$; news type x ad format: Wilks’ $\lambda = .98, F[6, 900] = 1.39, p = .644$) on the dependent variables.

Testing of the Hypotheses

Hypothesis 1 concerned the association between advertisement format (banner or pop-up) and the online news readers evaluations of news credibility, the credibility of the agency, individual perceived news importance, perceived news interest, and their intention to revisit the site. The five ANOVA tests showed no main effects of the

Table 1. Means, Standard Deviations, and ANOVA Statistics for Advertisement Format Condition

Variable	Banner		Pop-up		F(1, 462)	p	η^2
	M	SD	M	SD			
News agency credibility	-0.27	2.15	-0.21	1.79	0.13	.724	<.01
News credibility	9.43	2.56	9.36	2.61	0.04	.834	<.01
News importance	9.24	2.82	9.34	2.81	0.21	.646	<.01
News interest	8.79	2.50	8.94	2.63	0.49	.483	<.01
Intention to revisit	2.59	1.04	2.62	1.09	0.11	.740	<.01

format of the advertisements on the evaluations of five dependent variables. Thus, Hypothesis 1 was rejected (Table 1).

Hypothesis 2 tested the association between the content of the advertisement (sexually appealing or not) and news readers' evaluations of news credibility, the credibility of the agency, individual perceived news importance, perceived news interest, and their intention to revisit the site. Among the five ANOVA tests, we found three significant effects of sexually appealing advertisements. Specifically, the sexually appealing advertisement was negatively associated with news credibility, news importance, and news interest. Thus, Hypotheses 2(b), 2(c), and 2(d) were supported, while hypotheses 2(a) and 2(e) were rejected (Table 2). The descriptive statistics suggested that the participants who were exposed to the non-sexual advertisements rated the news credibility more highly ($M = 9.68$, $SD = 2.39$) than those exposed to the sexual advertisements ($M = 9.11$, $SD = 2.74$), $F(1, 462) = 5.65$, $p = .018$. Likewise, the participants who were exposed to the non-sexual advertisements rated the news importance more highly ($M = 9.59$, $SD = 2.59$) than those exposed to the sexual advertisements ($M = 8.99$, $SD = 3.00$), $F(1, 462) = 5.30$, $p = .022$. Lastly, the participants who were exposed to the non-sexual advertisements showed higher levels of news interest ($M = 9.10$, $SD = 2.36$) than those exposed to the sexual advertisements ($M = 8.63$, $SD = 2.74$), $F(1, 462) = 4.05$, $p = .045$.

DISCUSSION

Using the HSM, we analyzed online news consumption through mobile devices from the perspective on human information processing. In our experiment, online news articles were conceptualized as systematic processing cues, and advertisements (ad intrusiveness and sexual appeals in ads) were defined as heuristic processing cues.

Our results did not support the first hypothesis on the effect of advertisement format. Thus, the advertisement format—banner or pop-up—did not affect the participants' evaluations of news credibility, news agency's credibility, their perceived news importance, perceived news interest, or their intention to revisit the website. Within the theoretical framework of the HSM, this result indicates that the advertisement format did not act as a negative heuristic cue during information processing and, therefore, did not affect the evaluations of the participants in the study. These results contrast with those of Metzger et al. (2010) and Sundar (2008), which indicated that intrusiveness functioned as a negative heuristic cue. Our results are, however, consistent with those of Krushali et al. (2018), who found that online users perceived both pop-up and banner advertisements to be irritating.

Mobile users are now commonly exposed to all forms of advertisements, including both pop-ups and banners, while reading online articles; such advertisements are simply unavoidable. For this reason, advertisement intrusion rarely functions as an information cue that affects

Table 2. Means, Standard Deviations, and ANOVA Statistics for Advertisement Content Condition

Variable	Non-sexual		Sexual		$F(1, 462)$	p	η^2
	M	SD	M	SD			
News agency credibility	-0.68	1.66	-0.41	2.23	3.78	.052	.01
News credibility	9.68	2.39	9.11	2.74	5.65	.018	.02
News importance	9.59	2.59	8.99	3.00	5.30	.022	.01
News interest	9.10	2.36	8.63	2.74	4.05	.045	.01
Intention to revisit	2.69	0.99	2.52	1.13	2.82	.093	.01

the reading of articles, for readers click on the articles without worrying in advance whether the inevitable advertisements will interfere with the fulfillment of their information-gathering goals. The implication, then, is that the intrusiveness of advertisements does not serve as a cue for information processing.

Second hypothesis that sexual appeals in advertisement would function as a negative heuristic cue was partly supported by the results for the three dependent variables. The participants who were exposed to the non-sexual advertisement rated news credibility higher than those who were exposed to the sexual advertisement (H2b). Likewise, the participants rated the articles accompanied by the non-sexual advertisements as more important (H2c) and interesting (H2d) than the articles accompanied by the ads with sexual content. For these news consumers, the advertisements, as unexpected stimuli, hindered their processing of the news content and caused them to evaluate the news articles and news agency as low-quality and low-credibility resources. In terms of the bias hypothesis of the HSM, the sexually appealing advertisement seems to have activated a biased heuristic cue, limiting the systematic processing necessary to consume news. Other studies have found that news consumers may perceive sexually appealing advertisements to be unethical (LaTour & Henthorne, 1994; Tai, 1999). This trait can elicit in them uncongenial heuristics.

In general, news consumers choose articles to read on a website by clicking on the titles of interest, even when advertisements, and even those with sexual content, are associated with the articles. Nevertheless, we inferred that only sexually appealing advertisements served as influential heuristic cues for the following reasons. First, sexual appeals, as part of the content of advertisements, affect the process of reading a news article. On the other hand, since the intrusiveness of advertisements is a matter of form rather than content, it may not influence consumers' processing of information and cues while they

read the content of an article. The frequent visual intrusion caused by pop-up advertisements has been recognized as problematic for marketing efforts (Mialki, 2020) since it is not what news consumers are seeking when they view a website. Of course, when advertisers include irrelevant sexual content in their marketing, the users of news websites can simply click through or otherwise avoid the advertisements so as to read the articles of interest to them.

Second, we concluded that only sexually appealing advertisements served as influential heuristic cues because the participants in general rated the articles that were not associated with sexual advertisements more interesting (H2d). This result can also be interpreted in several ways. For instance, as mentioned, the readers of online articles engage in sequential information processing and are goal-oriented (You et al., 2013). When they find the title of an article interesting and click on it to read the text, they are not interested in sexual advertisement and are, therefore, likely to consider advertisement with sexual appeals bothersome when they are reading news articles. Such an expectancy violation has the potential to affect assessments of the credibility of the content (Metzger et al., 2010) and their perceived news interest.

The non-significant interaction effect between pop-up advertisements and sexually appealing advertisements indicated that the participants tended not to respond negatively to certain pop-up advertisements simply because of their sexual content. We found the same result with the banner format. Based on the HSM, a sexually appealing advertisement would serve as a heuristic cue (in contrast with non-sexual advertisements), but the influence of such cues could depend in turn on the format (i.e., banner or pop-up). Online news consumers are already exposed to a wide range of advertisement formats irrespective of the content of the articles that they read.

The results of this study have several practical implications. In the first place, no matter how

good a news article is, its association with sexually provocative content can negatively impact users' evaluations of the article's credibility, their perceived importance and interest. In addition, these results suggest that advertisement content that strays far from the topic of the article may negatively impact users' evaluations in this regard. A further implication is that the professional reputations of the journalists who write articles associated with sexual content may also be damaged in the process.

We acknowledge that this study is subject to certain limitations which also represent areas for additional study. To begin with, expanding the scope of the experiments could increase the generalizability and external validity of research such as this. More specifically, use of a wide range of systematic and heuristic cues would serve to verify the application of the HSM in this study. Such research could make use of, for example, the measurement scale for distinguishing systematic from heuristic information processing proposed by Griffin et al. (2002). Further, the present study involved no advertisement condition. By extending the stimuli to include sites and articles associated with no intrusive and sexual ads, researchers can identify with greater precision the factors that are associated with the effectiveness of marketing in mobile environments. Also, we conducted the online experiments for this study in an artificial mobile environment. While we carefully mimicked the layout of real-world news websites on the devices that the participants used for the experiments, future research of this type would benefit from the use of smartphones when conducting the experiments. Lastly, our use of a well-known real-world news organization (Yonhap) may have influenced the participants' perceptions of the news stories during the experiment. Individual pre-existing attitudes can affect information processing (Chung et al., 2020). Thus, future research could substitute a fictitious news organization created for the purpose of the experiment that mimics a real-

world site but more accurately measures the participants' responses because they would have no preconceptions about it.

Despite these limitations, the theoretical implications of this study are significant. We have shown that the intrusive effect of advertisements on the processing of an online article feeds into the heuristic information process. In this respect, our work here contributes to a discussion that has recently attracted a great deal of interest among researchers. Due to a relatively small screen and font size (Dunaway & Soroka, 2019), news readers who used mobile devices can be more impeded in reading news. In addition, as a closing button in a mobile setting can be even troublesome for readers (An, 2020), sexual images on screens can even bother their news reading. Moreover, given the increasingly diverse formats and content of the advertisements associated with online articles, the findings presented here suggest that news organizations can take practical steps to maintain their credibility by remaining attentive to the content and intrusiveness of the advertisements that they post alongside the news articles.

REFERENCES

- An, M. (2020, January 14). Why people block ads (and what it means for marketers and advertisers). *Hubspot*.
<https://blog.hubspot.com/marketing/why-people-block-ads-and-what-it-means-for-marketers-and-advertisers>
- Bingham, C. B., & Eisenhardt, K. M. (2011). Rational heuristics: The 'simple rules' that strategists learn from process experience. *Strategic Management Journal*, 32(13), 1437–1464.
<https://doi.org/10.1002/smj.965>
- Bohner, G., Moskowitz, G. B., & Chaiken, S. (1995). The interplay of heuristic and systematic processing of social information. *European Review of Social Psychology*, 6(1), 33–68.

- <https://doi.org/10.1080/1479277944300003>
- Chaiken, S. (1980). Heuristic versus systematic information processing and the use of source versus message cues in persuasion. *Journal of Personality and Social Psychology*, 39(5), 752–766.
<https://doi.org/10.1037/0022-3514.39.5.752>
- Chaiken, S., & Eagly, A. H. (1983). Communication modality as a determinant of persuasion: The role of communicator salience. *Journal of Personality and Social Psychology*, 45(2), 241–256.
<https://doi.org/10.1037/0022-3514.45.2.241>
- Chaiken, S., Liberman, A., & Eagly, A. (1989). Heuristic and systematic processing within and beyond the persuasion context. In J. S. Uleman & J. A. Bargh (Eds.), *Unintended thought* (pp. 212–252). Guilford Press.
- Chaiken, S., & Maheswaran, D. (1994). Heuristic processing can bias systematic processing: Effects of source credibility, argument ambiguity, and task importance on attitude judgment. *Journal of Personality and Social Psychology*, 66(3), 460–473.
<https://doi.org/10.1037/0022-3514.66.3.460>
- Chaiken, S., Duckworth, K. L., & Darke, P. (1999). When parsimony fails ... *Psychological Inquiry*, 10(2), 118–123.
<https://doi.org/10.1207/s15327965pl100204>
- Chatterjee, P. (2008). Are unclicked ads wasted? Immediate and long-term impact of banner & pop-up ads on communication outcomes. *Journal of Electronic Commerce Research*, 9(1), 51–61.
https://papers.ssrn.com/sol3/papers.cfm?abstract_id=1861220
- Cho, C.-H., & Cheon, H. J. (2004). Why do people avoid advertising on the Internet? *Journal of Advertising*, 33(4), 89–97.
<https://doi.org/10.1080/00913367.2004.10639175>
- Chung, S., Carpenter, C., Shin, H., & Lee, W. (2020). Three models for persuasive effects of source expertise: The heuristic cue model, the evidence model, and the moderator model. *Asian Communication Research*, 17(1), 40–75.
<http://doi.org/10.20879/acr.2020.17.1.40>
- Chung, S., & Waheed, M. (2016). “Biased” systematic and heuristic processing of politicians’ messages: Effects of source favorability and political interest on attitude judgment. *International Journal of Communication*, 10, 2556–2575.
<https://ijoc.org/index.php/ijoc/article/view/4288/1666>
- Coalition for Better Ads. (n.d.). Ad experience: Ad density higher than 30%. In *The better ads standards: Mobile web experiences*. Retrieved February 16, 2018, from <https://www.betterads.org/mobile-ad-density-higher-than-30/>
- Danaher, P. J., & Mullarkey, G. W. (2003). Factors affecting online advertising recall: A study of students. *Journal of Advertising Research*, 43(3), 252–267.
<https://doi.org/10.2501/JAR-43-3-252-267>
- Diao, F., & Sundar, S. S. (2004). Orienting response and memory for web advertisements: Exploring effects of pop-up window and animation. *Communication Research*, 31(5), 537–567.
<https://doi.org/10.1177/0093650204267932>
- Dunaway, J., & Soroka, S. (2019). Smartphone-size screens constrain cognitive access to video news stories. *Information, Communication & Society*, 24(1), 69–84.
<https://doi.org/10.1080/1369118x.2019.1631367>
- Edwards, S. M., Li, H., & Lee, J.-H. (2002). Forced exposure and psychological reactance: Antecedents and consequences of the perceived intrusiveness of pop-up ads. *Journal of Advertising*, 31(3), 83–95.
<https://doi.org/10.1080/00913367.2002.10673678>
- Fiske, S. T., & Taylor, S. E. (1991). *Social cognition* (2nd ed.). McGraw Hill.

- Fogg, B. J., Soohoo, C., Danielson, D. R., Marable, L., Stanford, J., & Tauber, E. R. (2003). How do users evaluate the credibility of web sites? A study with over 2,500 participants. *DUX '03: Proceedings of the 2003 Conference on Designing for User Experiences* (pp. 1–15). ACM. <https://doi.org/10.1145/997078.997097>
- Goyal, N., Bron, M., Lalmas, M., Haines, A., & Cramer, H. (2018). Designing for mobile experience beyond the native ad click: Exploring landing page presentation style and media usage. *Journal of the Association for Information Science and Technology*, 69(7), 913–923. <https://doi.org/10.1002/asi.24016>
- Graber, D. A. (1984). *Processing the news: How people tame the information tide*. Longman.
- Griffin, R. J., Neuwirth, K., Giese, J., & Dunwoody, S. (2002). Linking the heuristic-systematic model and depth of processing. *Communication Research*, 29(6), 705–732. <https://doi.org/10.1177/009365002237833>
- Howe, P., & Teufel, B. (2014). Native advertising and digital natives: The effects of age and advertisement format on news website credibility judgments. *International Symposium on Online Journalism*, 4(1), 78–90.
- Interworks Media (2019). *Always with your campaign: The introduction to Interworks Media*. <https://cdn.interworksmedia.co.kr/interview/interworksMedia.pdf>
- Johnson, S. T., & Ewbank, A. D. (2018). Heuristics: An approach to evaluating news obtained through social media. *Knowledge Quest*, 47(1), 8–14. <https://eric.ed.gov/?id=EJ1191005>
- Jung, C. (2020, September 10). “Free television with your internet service...” 800 million won will be fined for mobile carriers that posted exaggerated advertisements. Chosun Ilbo. https://www.chosun.com/economy/tech_it/2020/09/10/3R7M7YAZBBDTRH6ZQJREK4MPGE/
- Kim, B. (2014, April 10). *Why are “urology advertisements” commonly found in online news sites?* Media Today. <http://www.mediatoday.co.kr/news/articleView.html?idxno=115884>
- Kim, H. (2018). *The number of advertisements in Korean news site, 2.4 times that of the US. Serious sexuality advertisements issue*. Edaily. <https://www.edaily.co.kr/news/read?newsid=03253766619438520>
- Kim, J., Yoon, H. J., & Lee, S. Y. (2010). Integrating advertising and publicity. *Journal of Advertising*, 39(1), 97–114. <https://doi.org/10.2753/joa0091-3367390107>
- Kim, M., Lee, J. K., & Lee, K.-Y. (2019). Interplay of content type and product type in the consumer response to native advertising on social media. *Asian Journal of Communication*, 29(6), 464–482. <https://doi.org/10.1080/01292986.2019.1679852>
- Korea Press Foundation (2021). *Media users in Korea 2021*. <https://www.kpf.or.kr/synap/skin/doc.html?fn=1642385587147.pdf&rfs=/synap/result/research/>
- Krushali, S., Jojo, N., & Manivannan, A. (2018). Cognitive marketing and purchase decision with reference to pop up and banner advertisements. *The Journal of Social Sciences Research*, 4(12), 718–735. https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3741053
- Lang, P. J., Greenwald, M. K., Bradley, M. M., & Hamm, A. O. (1993). Looking at pictures: Affective, facial, visceral, and behavioral reactions. *Psychophysiology*, 30(3), 261–273. <https://doi.org/10.1111/j.1469-8986.1993.tb03352.x>
- LaTour, M. S., & Henthorne, T. L. (1994). Female nudity in advertisements, arousal and response: A parsimonious extension. *Psychological Reports*, 75, 1683–1690. <https://doi.org/10.2466/pr0.1994.75.3f.1683>
- Lee, K., Lee, H., & Hong, M. (2016). Inconvenient

- online advertising and online users' perception. *The Korean Journal of Advertising*, 27(5), 53–73. <https://www.earticle.net/Article/A278986>
- Li, H., Edwards, S. M., & Lee, J.-H. (2002). Measuring the intrusiveness of advertisements: Scale development and validation. *Journal of Advertising*, 31(2), 37–47. <https://doi.org/10.1080/00913367.2002.10673665>
- Lim, J. (2011). First-level and second-level intermedia agenda-setting among major news websites. *Asian Journal of Communication*, 21(2), 167–185. <https://doi.org/10.1080/01292986.2010.539300>
- Lo, V.-H., Neilan, E., Sun, M.-P., & Chiang, S.-I. (1999). Exposure of Taiwanese adolescents to pornographic media and its impact on sexual attitudes and behaviour. *Asian Journal of Communication*, 9(1), 50–71. <https://doi.org/10.1080/01292989909359614>
- MacCannell, D. (2012). 'Sex sells': Comment on gender images and myth in advertising. In J. Umiker-Sebeok (Ed.), *Marketing and semiotics: New directions in the study of signs for sale* (pp. 521–532). De Gruyter Mouton. <https://doi.org/10.1515/9783110853254.521>
- Maheswaran, D., & Chaiken, S. (1991). Promoting systematic processing in low-motivation settings: Effect of incongruent information on processing and judgment. *Journal of Personality and Social Psychology*, 61(1), 13–25. <https://doi.org/10.1037/0022-3514.61.1.13>
- McCoy, S., Everard, A., Galletta, D. F., & Moody, G. D. (2017). Here we go again! The impact of website ad repetition on recall, intrusiveness, attitudes, and site revisit intentions. *Information & Management*, 54(1), 14–24. <https://doi.org/10.1016/j.im.2016.03.005>
- Metzger, M. J., Flanagin, A. J., Eyal, K., Lemus, D. R., & McCann, R. M. (2003). Credibility for the 21st century: Integrating perspectives on source, message, and media credibility in the contemporary media environment. *Annals of the International Communication Association*, 27(1), 293–335. <https://doi.org/10.1080/23808985.2003.11679029>
- Metzger, M. J., Flanagin, A. J., & Medders, R. B. (2010). Social and heuristic approaches to credibility evaluation online. *Journal of Communication*, 60(3), 413–439. <https://doi.org/10.1111/j.1460-2466.2010.01488.x>
- Mialki, S. (2020, August 17). *How to avoid intrusive advertising & deliver better ads*. Instapage. <https://instapage.com/blog/intrusive-advertising>
- Morris, J. (2012). Theories of emotion and affect in marketing communications. In S. Rodgers & E. Thorson (Eds.), *Advertising theory* (pp. 85–104). Routledge.
- Park, S. & Choi, J. (2013). A comparative analysis of the effects of mobile advertising communication in South Korea and the United States. *Asian Communication Research*, 10(12), 5–29. http://uci.kci.go.kr/resolution/result.do?res_cd=G704-SER00003827.2013.10.12.002&res_svc_cd=
- Popkin, S. L. (2008). *The reasoning voter: Communication and persuasion in presidential campaigns*. University of Chicago Press.
- Putrevu, S. (2008). Consumer responses toward sexual and nonsexual appeals: The influence of involvement, need for cognition (NFC), and gender. *Journal of Advertising*, 37(2), 57–70. <https://doi.org/10.2753/joa0091-3367370205>
- Researchad. (2020). *Mobile report: The status of exposed advertisements on mobile internet in October 2020*. Korean Digital Advertising Association. <http://onlinead.or.kr/17/?idx=5446969&bmode=view>
- Reichert, T. (2002). Sex in advertising research: A review of content, effects, and functions of sexual information in consumer advertising. *Annual Review of Sex Research*, 13(1), 241–273. <https://www.tandfonline.com/doi/abs/10.1080/10532528.2002.10559806>

- Reichert, T. (2003). The prevalence of sexual imagery in ads targeted to young adults. *The Journal of Consumer Affairs*, 37(2), 403–412. <https://doi.org/10.1111/j.1745-6606.2003.tb00460.x>
- Reichert, T., Heckler, S. E., & Jackson, S. (2001). The effects of sexual social marketing appeals on cognitive processing and persuasion. *Journal of Advertising*, 30(1), 13–27. <https://doi.org/10.1080/00913367.2001.10673628>
- Reuters Institute for the Study of Journalism. (2018). *Reuters institute digital news report 2018*. <https://reutersinstitute.politics.ox.ac.uk/sites/default/files/digital-news-report-2018.pdf>
- Riedel, A. S., Weeks, C. S., & Beatson, A. T. (2018). Am I intruding? Developing a conceptualisation of advertising intrusiveness. *Journal of Marketing Management*, 34(9–10), 750–774. <https://doi.org/10.1080/0267257x.2018.1496130>
- Samson, L. (2018). The effectiveness of using sexual appeals in advertising: Memory for sexual and nonsexual visual content across genders. *Journal of Media Psychology*, 30(4), 184–195. <https://doi.org/10.1027/1864-1105/a000194>
- Severn, J., Belch, G. E., & Belch, M. A. (1990). The effects of sexual and non-sexual advertising appeals and information level on cognitive processing and communication effectiveness. *Journal of Advertising*, 19(1), 14–22. <https://doi.org/10.1080/00913367.1990.10673176>
- Slater, M. D., & Rouner, D. (1997). How message evaluation and source attributes may influence credibility assessment and belief change. *Journalism & Mass Communication Quarterly*, 73(4), 974–991. <https://doi.org/10.1177/107769909607300415>
- Sniderman, P. M., Brody, R. A., & Tetlock, P. E. (1991). The role of heuristics in political reasoning: A theory sketch. In P. M. Sniderman, R. A. Brody, & P. E. Tetlock (Eds.), *Reasoning and choice: Explorations in political psychology* (pp. 14–30). Cambridge University Press.
- Speck, P. S., & Elliott, M. T. (1997). Predictors of advertising avoidance in print and broadcast media. *Journal of Advertising*, 26(3), 61–76. <https://doi.org/10.1080/00913367.1997.10673529>
- St. Jean, B., Rieh, S. Y., Yang, J. Y., & Kim, Y.-M. (2011). How content contributors assess and establish credibility on the web. *Proceedings of the American Society for Information Science and Technology*, 48(1), 1–11. <https://doi.org/10.1002/meet.2011.14504801163>
- Sundar, S. S. (1999). Exploring receivers' criteria for perception of print and online news. *Journalism & Mass Communication Quarterly*, 76(2), 373–386. <https://doi.org/10.1177/107769909907600213>
- Sundar, S. S. (2008). The MAIN model: A heuristic approach to understanding technology effects on credibility. In M. J. Metzger & A. J. Flanagin (Eds.), *Digital media, youth, and credibility* (pp. 73–100). MIT Press.
- Sundar, S. S., Knobloch-Westerwick, S., & Hastall, M. R. (2007). News cues: Information scent and cognitive heuristics. *Journal of the American Society for Information Science and Technology*, 58(3), 366–378. <https://doi.org/10.1002/asi.20511>
- Tai, H. S. (1999). Advertising ethics: The use of sexual appeal in Chinese advertising. *Teaching Business Ethics*, 3, 87–100. <https://doi.org/10.1023/A:1009840623567>
- Todorov, A., Chaiken, S., & Henderson, M. D. (2002). The heuristic-systematic model of social information processing. In J. P. Dillard & M. Pfau (Eds.), *The persuasion handbook: Developments in theory and practice* (pp. 195–211). Sage.
- Wirtz, J. G., Sparks, J. V., & Zimbres, T. M. (2018). The effect of exposure to sexual appeals in advertisements on memory, attitude, and

purchase intention: A meta-analytic review. *International Journal of Advertising*, 37(2), 168–198.
<https://doi.org/10.1080/02650487.2017.1334996>

Yang, H., & Oliver, M. B. (2004). Exploring the effects of online advertising on readers' perceptions of online news. *Journalism & Mass Communication Quarterly*, 81(4), 733–749.
<https://doi.org/10.1177/107769900408100402>

You, K. H., Lee, A., Lee, J. K., & Kang, H. (2013). Why read online news? The structural relationships among motivations, behaviors, and consumption in South Korea. *Information, Communication & Society*, 16(10), 1574–1595.
<https://doi.org/10.1080/1369118x.2012.724435>

Appendix

Experimental Stimuli

A

B

C

D

Note. Panel A: High intrusive (pop-up) with sexual content, Panel B: Low intrusive (banner) with sexual content, Panel C: High intrusive (pop-up) with non-sexual content, and Panel D: Low intrusive (banner) with non-sexual content