

OF ADS AND APPS: THE INFLUENCE OF ADVERTISING ON USER ATTITUDES
TOWARD TABLET NEWSPAPERS

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by
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The undersigned, appointed by the dean of the Graduate School, have examined the
thesis entitled

OF ADS AND APPS: THE INFLUENCE OF ADVERTISING ON
USER ATTITUDES TOWARD TABLET NEWSPAPERS

presented by Patrick Howe,

a candidate for the degree of master of arts,

and hereby certify that, in their opinion, it is worthy of acceptance.

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DEDICATION

Dedicated to the world's foxiest grant maker, Dr. Heidi Freeman, to whom I am married, and to our two endlessly fascinating variables, Abigail and Coleman, who are alternately dependent and independent.

I'd also like to thank the ocean for the waves; every time I was stuck on something I went surfing and it seemed to help.

I was inspired by this quote from Marshal McLuhan (1994):

"The hybrid or the meeting of two media is a moment of truth and revelation from which new form is born. For the parallel between two media holds us on the frontiers between forms that snaps us out of the Narcissus-narcosis. The moment of the meeting of media is a moment of freedom and release from the ordinary trance and numbness imposed by them on our senses." (55)

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I wish to express my deep gratitude to my chair, Dr. Shelly Rodgers, whose name alone opens doors. I developed the beginnings of this idea in her class and grew as a thinker and scientist under her guidance for this project. I will always be in her debt.

Additional robust thanks go to my committee members, who all lead vigorous academic lives and to whom each additional burden must seem one too many, and yet responded to my requests for their time and help with seeming enthusiasm. In particular, I thank Kennon Sheldon for his questions regarding the proposal; the work I put into answering his questions made the results and discussion sections far easier. Finally, I thank Roger Fidler. His work on e-readers and tablets inspired me and he was generous with his time via email and phone.

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ABSTRACT

This study examined the relationship between the inclusion and style of advertising in tablet newspapers and user attitudes, including intention to adopt. The study created a mock newspaper app on an iPad with versions differing by the existence and style of advertising – the two independent variables. The dependent variables were attitudes toward tablet newspapers and intentions to adopt tablet newspapers. Post-stimuli measures were taken in survey form and, in addition to the dependent measures, participants provided demographic information and experience with various media.

The hypotheses predicted significant differences between print-style ads (main effect) and Internet-style ads (main effect), with print-style ads scoring more positive on attitude measures. The hypotheses also predicted that the print-style main effect was dependent on the absence of Internet-style ads (interaction). Additional hypotheses predicted significant difference between print-style ads and Internet-style ads on an intention-to-adopt measure. A two-way analysis of variance (ANOVA) was used to evaluate differences among the groups. There were no significant differences among the

groups that saw the print-style ads versus the Internet-style ads versus a mix of both styles and no ads on user attitudinal measures. There also were no significant differences related to the style of ads and intention to adopt tablet newspapers. However, theoretical concepts and research reviewed for this study, together with the non-significant findings do suggest that the existence of advertising might have a positive effect on attitudes toward a medium and further research is recommended to explore this idea.

Chapter 1: Introduction

Print-based newspapers face large challenges in the digital age. In addition to long-declining circulation numbers, newspapers as a whole lost 38 percent of their revenue from 2005 to 2010 (Moses, 2010) and 30 percent of their employees from 2000 to 2010 (Pew, 2011). The statistics are so alarming that scholars and professionals alike are predicting the complete end of the printed newspaper industry—some give the market decades to exist, others just years. Much of the decline in print newspaper readership, however, is being made up by increases in readership of online newspapers (Pew, 2010), and those figures likely underestimate the total, as they do not include readership through mobile devices. Moreover, consumers report spending roughly as much time reading newspaper-generated news as they did 15 years ago. Thus, newspaper publishers do not so much face a crisis in getting readers to consume their product in a digital age as they face problems finding ways to economically capitalize on digital readership. A great deal of work has sought to address this problem by exploring mechanisms to reinstate a subscription-based model for digital content that was largely abandoned in the move to Web-based newspapers. The research proposed here, however, aims to explore the advertising side of the economic equation as newspaper publishers explore a shift toward distributing their product through portable electronic readers.

This study aimed to understand the effect that advertising has on the attitudes of users of tablet-based newspapers. To explore this question the author used a 2 x 2 factorial design between-groups experiment based on four otherwise identical versions of a mocked-up newspaper presented on Apple's iPad device. This allowed for the exploration of two independent variables—in this case exposure to print-style advertisements (yes/no) and exposure to online-style advertisements (yes/no)—to measure the effect on the dependent variable of user attitudes toward the medium.

The goal of the research is to offer information to publishers that could aid decisions regarding whether, and at what costs, they should push to include advertisements in tablet-based newspapers. The experiment also aimed to offer publishers helpful information regarding how the type and format of advertising they choose to sell influences consumer attitudes and adoption decisions.

This information is needed because the publishers of e-reader and tablet newspapers currently face the rare opportunity of considering whether to include advertisements, what they should look like, and how they should behave. For nearly as long as there have been newspapers in America, they have been paid for in part through advertising. Most researchers who have explored the question of whether people like or dislike advertising in general have assumed they do not (Zanot, 1981, Kaiser & Song, 2009). Looking at six decades of survey research, Calfee and Ringold (1994) found that while the majority of consumers generally assumed that advertising was untruthful, they also found that it contains useful information and that its benefits outweigh its deficits. Particularly with regard to newspapers, the empirical research has been far more positive.

Attitude surveys (Bogart, 1989, Elliott & Speck, 1998) have found that newspaper advertising is considered by readers to be informative and useful in much the same way as is editorial content and, further, that readers perceive newspapers advertising less as “clutter” than they do advertising in other mediums. Several recent studies have found that consumer attitudes toward print advertising are more positive than are their attitudes toward electronic advertising (Ha & McCann, 2008, citing Ha, 1996 and Grussell, 2007). Interestingly, much of the work on the effect of advertising on user perceptions toward a medium has been done by economists rather than mass communication scholars. For example, Sonnac (2000) asked the question of whether print readers are ad-lovers or ad-averse, noting that if more are ad-lovers, publishers could expect a spiral effect between circulation and advertising. She found that readers’ attitudes vary depending on what country they’re from but noted that scholars assume American readers to be ad-lovers. Kaiser and Song, meanwhile, found empirical support for a general appreciation of advertising among readers of a variety of German consumer magazines.

Attitudes are far less positive, however, regarding Internet advertisements. Several studies that have shown increasing avoidance of Internet advertising are backed by continuing declines in click-through rates (Cho & Choen, 2004, Drèze & Hussherr, 2003). While ads that offer information and entertainment are considered most valuable to consumers, most people do not see high entertainment or information value in online ads (Ha, 2008). Brackett and Carr (2001) found U.S. college students reported finding Internet ads irritating.

What remains unexplored, however, is if and how these findings regarding attitudes toward advertising in print and the Internet apply to portable electronic newspapers. For technological reasons, readers who have read versions of newspapers available on e-reader devices such as the Amazon Kindle, the predominant medium for portable electronic newspapers until about 2009, generally have done so without any advertising. This is changing, however, as tablet multimedia devices, primarily Apple's iPad, take over the primary role (McMullan, 2011). While there is a wealth of research into attitudes toward print advertising and online advertising, there is little or no peer-reviewed research into the effect that advertising has on attitudes toward tablet newspapers.

Chapter 2: Development And Definitions Of Tablet Newspapers

The idea of reading newspapers on portable electronic devices has existed for decades. Roger Fidler proposed and explored electronic delivery of newspapers via tablets—he even used the term—in 1981 (Fidler, 1997). By the early 1990s, Knight Ridder’s defunct Information Design Laboratory experimented with a continually updating tablet that would offer news and advertising in a portable unit. It was never produced and Knight Ridder shut down the laboratory in 1995. The newspaper industry made wide use of the World Wide Web beginning around that same time to offer online versions of newspapers (Boczkowski, 2002), but for reasons described below these electronic versions of newspapers remain distinct from the concept of newspapers offered on portable electronic tablets. Visions for a portable newspaper reader remained largely conceptual through the early 21st century.

The Development of Tablet Newspapers

Portable electronic newspapers have recently experienced a rise in popularity along with sales of dedicated electronic reading devices and multimedia tablets such as Amazon’s Kindle, the Barnes & Noble Nook, Sony’s Reader, Apple’s iPad and others. Today more than 15 million iPads alone are in use (Apple, 2011).

Indeed, newspapers are banding together to encourage portable electronic newspapers. The University of Missouri’s Donald W. Reynolds Journalism Institute’s

Digital Publishing Alliance involves more than 30 organizations including the *Washington Post*, *L.A. Times*, *New York Times* and the *Wall Street Journal*, working to test and develop new products and formats for e-readers and tablets (Fidler, 2009). Publishers have been eager to publish via the devices. One Hearst Publishing company official in 2008 told the *New York Times* the company looked to e-readers and tablets to, in one stroke, eliminate costs of printing, delivery and ink that in one major metro daily account for 65 percent of fixed costs (Taub, 2008). A publisher-backed e-reader consortium, Next Issue Media, has predicted that U.S. print publishers could realize \$3 billion in consumer revenue by 2014 from sales of e-reader-based publications (Moses). Meanwhile, contrary to most free Web-based newspaper offerings, all of the newspapers available on the Kindle have been sold via subscriptions, echoing that aspect of the economic print model of newspapers (Collins Stewart). Newspapers with editions available as applications on tablet-based newspapers have also sought to implement pay models that vary between selling apps and giving away content to selling content and giving away apps (McMullan, 2011). A Pew Center State of the News Media report for 2011 (Pew, 2011) found that 10 percent of adults who used apps to connect to local news sources paid to use the apps. This data applied to all mobile devices, not merely tablets. The study said this figure represented about 1 percent of American adults.

Advertising in E-readers and Tablets

For a variety of reasons, most e-reader newspapers have not included advertisements. One of the primary reasons is technological. Until new options such as the Kindle 3 were introduced in 2010, all Amazon Kindle devices were sold with free

unlimited 3G wireless delivery. In other words, a person did not need a home Wi-Fi setup to receive new content on those versions of the Kindle. Because of this, the costs of bandwidth made the parent company Amazon reluctant to allow advertising within media content (Pew, 2010).

The lack of advertising in portable newspapers, however, has changed due to the ascendancy of Apple's iPad multimedia device. Apple's model relies on the consumer to supply or pay for his or her own wireless connections, thus removing the disincentive toward advertiser-supported content. Prominent publishers were quoted saying they welcomed the iPad because it could allow them the ability to include advertising in iPad newspapers. Further, planned industry-backed portable electronic newspaper devices include the ability to offer ads (Moses, 2010).

Definitions

Before proceeding further, it is important to establish terminology. What is a tablet newspaper? As he recounts in the preface to *Mediamorphosis* (1997) Fidler first wrote about the concept of a tablet newspaper in a paper for the Associated Press Managing Editors association in 1981. The term was used generically to refer to any handheld electronic newspaper for decades after. In recent years, however, the definition of tablets and, thus, tablet newspapers, has conventionally grown to be distinct from that of a related device, the e-reader. As product categories, the term "e-reader" refers to a handheld device dedicated to reading print on e-paper displays while a "tablet" refers to a general purpose computer with an LCD display contained in a single panel that is operated by touch (Cubbison, 2010).

Another concept that should be articulated is the notion of attitude. Attitude broadly has been defined as “a psychological tendency that is expressed by evaluating a particular entity with some degree of favor or disfavor” (p.1) (Eagly & Chaiken, 1993). Specifically applied to advertising, attitudes are defined as “a learned predisposition to respond in a consistently favorable or unfavorable manner to advertising in general” (Lutz, 1985). To address related definitions, advertising will be defined conventionally as the paid public promotion of a product or service.

Chapter III: Literature Review

A search of the literature shows that researchers exploring tablet newspapers and related technologies have used multiple theories to guide their work, picking and choosing among any number of fields including economics and psychology and often eschewing the traditional theoretical approaches to media studies such as gatekeeping and agenda setting. Much of the work ignores theory altogether, focusing narrowly on applied research into specific media technologies. The following literature review will be broken into four parts. Part one will discuss relevant applied studies. Part two will discuss theory, and introduce the information processing perspective. Part three will discuss information processing in advertising and part four will introduce and support the concept of exploring attitude toward advertising in general (A-adv) and attitude-toward-the-ad (A-ad) as predictors of attitude toward a medium (A-m).

Relevant Applied Studies

Because it is a new and evolving medium, there are only a few scholarly studies focusing on tablet newspapers. Those that exist have focused on issues ranging from conceptual ideas such as whether or not portable electronic newspapers can help save print publishers, to exploring how people process information differently on the devices

as compared with other mediums, to nuts-and-bolts matters such as whether people prefer portrait over landscape-style displays.

A Swedish researcher, Ihlström (2005) conducted workshops, interviews and brainstorming sessions with newspaper managers and members of a Swedish association of newspaper publishers. She focused specifically on their experiences with on-line editions in an effort to identify likely challenges in portable electronic newspapers. The research subsequently identified 26 issues related to a potential convergence into electronic newspapers. The 26 issues were divided into five categories. The first category was “Ownership.” This category covered such questions as, if the content is delivered through a proprietary device, can the newspaper publisher still be said to own the distribution? The second category was “Business model.” Questions here included whether a newspaper should subsidize the device, and whether a convergence to electronic newspaper delivery would invite new competitors. Other questions involved the price of the product, and how to market it. The third issue identified was “Organization.” Here, concerns centered on adopting 24/7 deadlines to allow for continuously updated content. The fourth category was “Product,” and centered on questions about the design of the newspaper, the level of depth of the stories, and whether to plan for multiple targeted editions. The final category of concerns was “Advertising.” One question publishers pondered, by way of example, was whether to copy an online model in which readers could connect directly with advertisers. Also, publishers wondered exactly how long an e-newspaper ad would run (i.e. would it sit for an entire day even if the content were updated continuously?).

The researcher concluded that design, organization and business model were the most central questions. A key question in design was how to make an electronic newspaper efficient for linear reading like a paper newspaper, yet allow for hyperlink-style browsing as is available in on-line editions. In terms of organizations, one key question identified was how to convince skeptical employees to adopt 24/7 deadlines. The business model section noted that on-line editions, after a period of questioning, have settled into predictable models wherein certain content is offered for free and other content is offered only to subscribers, and advertising is done through predictable avenues such as banner ads. The paper suggested e-newspapers will go through a similar period of searching before landing on answers to such questions.

Other research has shown that design issues dramatically affect the users' experience. Weardon (1998), for example, demonstrated that users showed a preference for portrait-oriented screen displays as compared to landscape-oriented displays in tablet-style devices. Although there have been competing concepts for the portable electronic newspaper, all have set as goals that they be portable, easy to navigate, and easy to read (Ihlström, C., Åkesson, M. & Nordqvist, S., 2004). Further, Ihlström and Svensson (2006) determined that mobility, interactivity and readability were the three factors considered to give an e-reader newspaper its largest advantages in an adoption decision.

Discussion of Theory

This study will explore the relationship between the dependent and independent variables through the information processing approach. If one were interested only in understanding the conscious motivations that drive users to choose tablet newspapers,

uses and gratifications, which has frequently been used to explore the motivations behind the use of new media technologies (e.g. Shaver,1983, Korgoankar & Wolin, 1999, Perse & Dunn, 1998, Mings,1997, and Chen & Cokindale,2008) would be helpful.

Conversely, if one were interested only in how attitudes affect adoption behaviors, they might look to diffusion of innovations. This research, however, is concerned with what happens in between the creation of motivations and the resulting actions. Strict adherence to uses and gratifications theory might have a researcher presume that their subjects would be able to articulate that their attitudes toward a medium were influenced because they explicitly recognized that it contained advertising, and this recognition influenced their attitude toward the medium either positively or negatively.

The proposed study, however, does not presume that subjects are making their choices in this manner. In fact, it presumes that their attitudes may be influenced even if they cannot explicitly point to advertising as a variable. The information processing approach can explain this relationship.

Information processing

Originally drawn from psychology, information processing has been an important topic in mass communication research (Fleming & Thorson, 2006, citing Eveland, 1998, 2001). It has its roots in artificial intelligence as well as information theory—which conceptualizes communication as similar to a mechanized process—and linguistics (Rodgers & Thorson, 2000). Information processing, like uses and gratifications, keeps

its focus on audience members as paramount, but instead of asking why and how individuals use a medium, it is asking the related questions of whether they remember, comprehend, and like the content of the medium, regardless of whether or not they can articulate their perceptions.

Graber has done important work in relating information processing to mass media communication. Looking at readers of newspapers, Graber found that readers rely on a mix of their own interests and presentation cues to select content for consumption (Graber, 1988). She distinguished between people's initial screening of the news and actual information processing, which she described as part of the process of using schemata, or mental templates, to store information beyond short-term memory. It is through this process that readers often fill in blanks in stories or recall with cultural information that corresponds to those templates.

Subsequent media studies have focused on how information processing strategies could help content creators to deliver certain messages. For example, it has been suggested that explorations in information processing could help improve how to communicate health information (Eveland, 2001, Fleming & Thorson, 2008).

Information processing and advertising

A great deal of work has been done on information processing and advertising, as the theory proposes some hope of answering important questions such as what exactly goes on in the brain that makes one advertisement effective and another not at all. Some of the foundational research into information processing in advertising was devoted

toward defining various hierarchy-of-effects models (e.g. Krugman, 1965, Preston, 1982) that conceptualized the steps consumers take in making purchasing decisions. Subsequent work began to focus on the role of emotions; (Rodgers, Thorson & Jin, 2009). Additional work has explored how the type and format of ads affect cognitive processes. Rodgers and Thorson, for example, in articulating their Interactive Advertising Model (2000) predicted that different ad formats result in different processing and outcomes.

The information processing approach is particularly useful to this study as it assumes that people may process advertisements in ways different from how either the creators of the advertisements or the publishers of the medium intend. People may, for example, process ads as information or entertainment and may not distinguish between news and advertising messages in terms of how they process and make use of information (Sundar, 1999). This concept will be explored in more depth in the following section.

Advertising as an independent variable acting on attitudes toward a medium

Lutz established that one of the primary factors determining attitude toward an advertisement is attitude toward advertising in general. Others subsequently have proposed that attitude toward a medium has an even more powerful effect as an intervening variable between A-ad and A-adv (Bruner II & Kumar, 2007, citing Elliot & Speck 1998, Stewart & Ward, 1994). Chaudhuri and Buck (1995) found strong support for the idea that the choice of a medium, holding other variables constant, can cause different responses to advertisements; the study found that print media engender rational or analytic involvement while electronic media engender emotional and affective involvement in advertisements. Accepting that research has established that both attitude

toward advertising in general (A-adv) and attitude toward a medium (A-m) influence attitude toward the ad (A-ad), the study proposed here seeks to explore the effect that A-adv and A-ad have on A-m. Several studies have taken related approaches, exploring such aspects as the influence of advertising on credibility, attitude toward content, and attitude toward the medium.

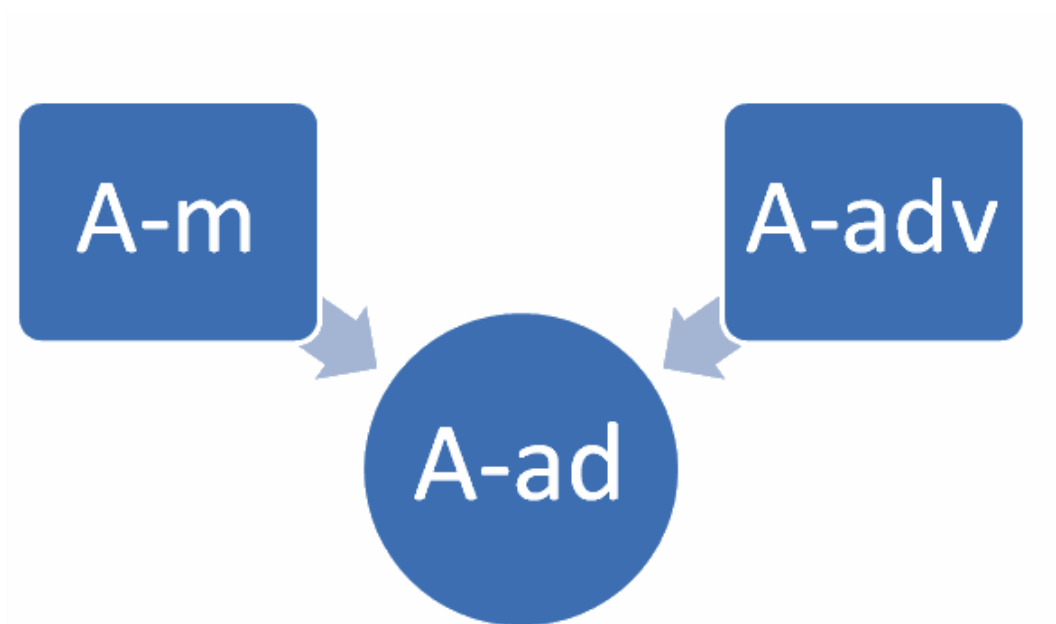


Figure 3.1: Research has shown that A-m and A-adv are predictors of A-ad.

On the theoretical level, Postman has argued that banal television advertising can undermine credibility of serious news stories (1986). In a test, Biocca et al. did not find unambiguous support for this idea, but Yang and Oliver (2004) argue that this finding may simply be because television viewers have become adept at ignoring or discounting television advertising. One more recent experiment found that television viewers who were in positive moods by virtue of watching positive television commercials perceived

television news stories as more entertaining, realistic and credible than did viewers who watched neutral commercials (Wirth, W., et al., 2010).

Shavitt, Vargas and Lowrey (2002) linked A-m with how intrusive are the medium's characteristic advertisements. They found that media that offer self-selected ad experiences, such as catalogs and classified ads, are better liked than are those that do not, such as television and radio. Rodgers, Cameron and Brill (2005) explored whether Internet sponsorships conveyed benefits to e-newspapers. In an experiment that tested the effect on attitudes of sponsor information timed to appear, respectively, at the beginning, middle and end of a story, the work found no significant differences on the e-newspaper's credibility. Yet the same work revealed that, while recall toward the sponsor was highest when sponsor information was placed in the middle and thus likely interrupted cognitive processing of the content, credibility toward the content was higher when the sponsor information was placed at the end. The authors noted:

“It is clear from these findings that sponsor timing can benefit sponsors but with some drawbacks to the e-newspaper. The findings imply that advertisers and newspapers must compromise so that advertisers can attain their marketing goals without exploiting the e-newspaper and its contents” (p.25).

Importantly for the author's research, this study suggests that choices that publishers make regarding the format and location of advertising could influence user attitudes toward the medium. If print-style ads have a positive effect on attitudes toward

the medium while online-style advertisements have a negative effect on attitudes, work linking A-m and A-adv, A-m and A-ad, or both, could suggest that people use different cognitive mechanisms in their responses to both. Users may, for example, be conditioned to have their defenses up when presented with online advertisements as they guard against expected pop-ups and interruptions while they may be conditioned to expect that print-style advertisements will stay in their place, not interrupt and be available for perusal when they want them.

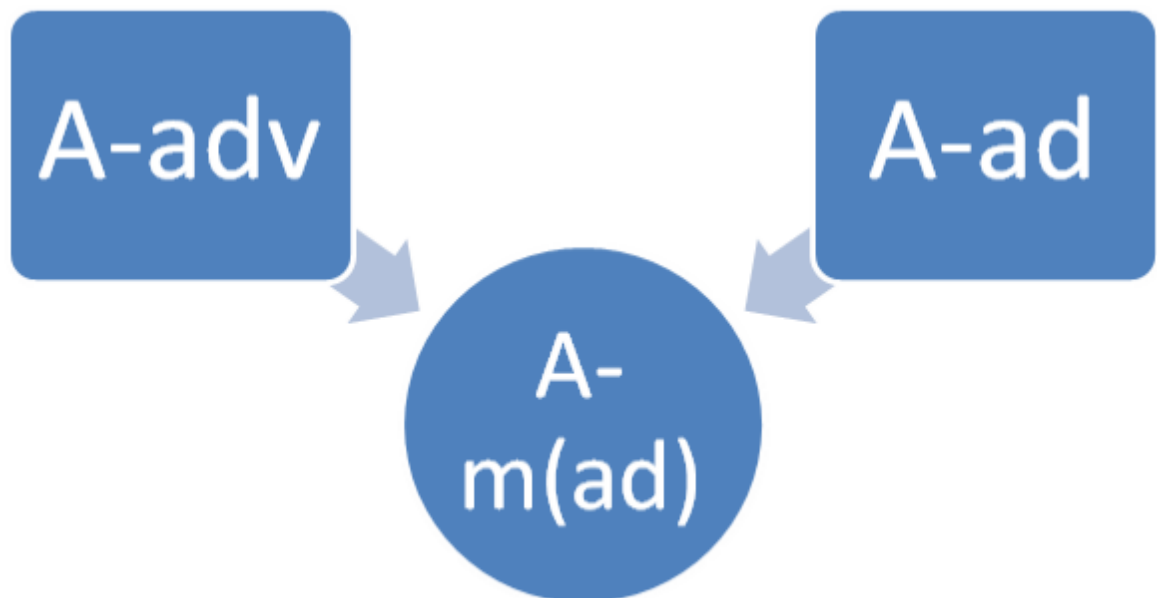


Figure 3.2: A-adv and A-ad may also be predictors of A-m(when there are ads)

The prediction in this study was that the presence of print-style advertising in tablet newspapers is positively related to attitude toward the medium. This hypothesis is based on the logic that research has generally shown print readers to have positive views

toward advertising, while the opposite has been true of Internet users. Specifically, the hypotheses are:

H1: Exposure to print-style advertising is positively related to user attitudes toward tablet newspapers.

H1a: Exposure to print-style advertisements is positively related to user intentions to adopt tablet newspapers.

H2: Exposure to Internet-style advertising is negatively related to user attitudes toward tablet newspapers.

H2a: Exposure to Internet-style advertising is negatively related to user intentions to adopt tablet newspapers.

H3: The positive effect of print-style advertisements on user attitudes toward tablet newspapers depends on the absence of Internet-style advertising.

H3a: The positive effect of print-style advertisements on user intentions to adopt tablet newspapers depends on the absence of Internet-style advertising.

Chapter IV: Research Design

The research project in this paper was designed to explore the relationship between advertising and reader attitudes toward tablet newspapers. The author used a 2 (exposure to print-style ads yes/no) x 2 (exposure to Internet style ads yes/no) factorial design experiment to test the influence that the presence of advertising has on the attitudes of users toward the medium. The dependent variable (attitude toward the medium) was measured based on a Likert-style scale. The design of the experiment is summarized in Table 4.1:

Table 4.1

	Internet-style ads	No Internet-style ads
Print-style ads	Group I	Group II
No print-style ads	Group III	Group IV

Overview of Experiment

In the experiment four groups of people were asked to peruse a mock-up of one days' version of a tablet newspaper via Apple's second-generation iPad device. Both independent variables were between-subjects factors. Among the advantages offered by between-subjects experimental designs is that they require fewer participants than separate experiments. The newspaper was designed by the author, a media professional. It was created via html and accessed through an Internet connection but designed to simulate the look of an app. The subjects were randomly assigned to the groups in the order they arrived for the experiment. Group I was presented with a mocked-up tablet newspaper with both print-style ads and Internet-style ads. Group II was presented with an otherwise identical mocked-up tablet newspaper with only print-style ads attached to each story. Group III saw an identical version with only Internet-style ads attached to each story. Group IV saw an identical version without any advertisements. All participants received an identical questionnaire after the treatment.

Component 1: Participants

A total of 63 individuals participated in the study. They were recruited from a non-probability convenience sample of students and staff at a community college on California's Central Coast. The students were encouraged to participate in the experiment through on-campus flyers and the offer of extra credit from their instructors. Nine participants took the study without the promise of extra credit; these included several individuals who were library staff. They were apparently drawn by the novelty of either the ability to participate in a study (the community college rarely if ever sees research announcements on campus) or the prospect of exploring an iPad (in this case, an

iPad2). The survey instruments did not record whether the taker was an incentivized or unincentivized volunteer, so there was no way to test whether there were differences in these groups

Component 2: Materials and Discussion of Instruments

Among the important instruments created for this experiment were:

The mock tablet newspaper

The author created the mock tablet newspapers using a Web-based service, www.weebly.com, that offers free hosting and publishing of sub domains and an integrated content management system. Although the sites were in reality accessed via a browser on the iPads, they were designed to mimic the look and operation of an app through a simple, straightforward table of contents and touch-screen navigation. The addresses of the four versions, which correspond with the group numbers, are:

<http://www.newnews1.weebly.com>

<http://www.newnews2.weebly.com>

<http://www.newnews3.weebly.com>

<http://www.newnews4.weebly.com>

Participants were presented the mocked up versions already loaded on their screens, so as to minimize any distinction between an app and a browser-based newspaper

The ads

In selecting the ads, a pre-test was conducted using a variety of real print ads (n=20) selected from PDF versions of recent editions of the local mid-sized daily print newspaper. Real brands were chosen rather than fictitious brands to increase external validity. The pre-test consisted of asking 10 subjects not in the final experiment to rank 20 selected ads on a scale of 1-10 based on the standard “Looks like a typical newspaper ad.” The 10 with the highest scores were selected for inclusion in the study. There was, however, little variability. The average score of selected ads was 9.4 compared to 8.9 for those not selected.

A similar pre-test was conducted to select typical Internet ads. Again, the ads were selected from those displayed on the local print newspaper, as well as some displayed on the L.A. Times. Unfortunately, however, technical problems resulted in an inability of the author to control the appearance of the ads. They were placed on the screen via html links to Google’s DoubleClick ad service, and they changed during the course of the experiment. All, however, displayed as rectangular ads that featured local or state-specific content (for example, an ad to a local fun run). All Internet ad stimuli used flash animation typical to Internet ads.

The stories

Ten stories made up the mock newspaper. They were selected from recent stories available on local and state news sources. They were chosen to offer a cross-section of

different types of stories available in online and print editions. The mock-up included 10 total stories including two each representing world, national, local, sports and entertainment news. The only difference was the inclusion of ads of differing types on right side of the screen. The experiment was run over a period of 8 days.

The post-test questionnaire

The post-test questionnaire used 18 questions to record basic demographic information, participants' media use habits, and user attitudes toward the tablet newspaper, advertising in general, and advertising on tablet newspapers. Answers were recorded with either a yes/no format or, in the case of attitude, via 5-point semantic differential scales. Three items were considered to make up the general attitude score: appealing/not appealing, credible/not credible, responsible/not responsible. A fourth measure of likely/not likely to subscribe to a tablet newspaper, again based on a Likert-style scale but based on answers to a single question, was also considered to measure adoption likelihood.

Component 3: Experimental Procedures

In the weeks prior to the experiment, letters and emails were sent to instructors in the Languages and Communications department of the school's Humanities division explaining the goals and procedures of the study and asking them to publicize and/or offer extra credit to students who participated. Permission from Missouri's Institutional Review Board was attained through an "exempt" process. No deception was used; the consent forms explained the goals of the experiment in the second sentence using the

words: “The aim of this study is to understand more about the impact of certain design decisions, including the inclusion and type of advertising, on attitudes regarding tablet-based newspapers.” Once IRB approval was attained, students were encouraged to sign up for available slots. The slots were offered in 15 minute increments between 9 a.m. and 12:30 p.m. The experiment was conducted in a block of study carrels in the college’s library.

Informed consent forms were provided, explained by the researcher, and signed by the subjects. An opportunity for questions was provided. The participants were encouraged to approach the mock newspaper in as natural a way as possible, with one exception. Directions used the script: “When you read an actual newspaper you might want to read some stories all the way through, skim others, and skip others entirely. Please do the same here, with the exception that you are asked not to make the decision to read, skim, or skip an article until you have clicked into it and it has presented itself fully on the screen.” These instructions were provided because the advertising existed only on the story pages. Students were randomly assigned to their groups. The two independent variables are inclusion of (1) print style advertising and (2) Internet-style advertising. In each case that included ads, the advertisements appeared on the right half of the screen.

Component 4: Dependent Measures

The hypotheses were tested based on mean “attitude-toward-the tablet” and “intention-to-adopt” measures for each of the items using a two-way analysis of variance (ANOVA). Hypotheses 1 (main), 2 (main) and 3 (interaction) were tested using a composite score derived from three measures of attitude toward the tablet newspaper on a

5-point Likert-type scale: Appealing/not appealing, credible/not credible, responsible/not responsible. Hypotheses 1a, 2a, and 3a were tested using a measure of intention to adopt tablet newspapers, again based on a 5-point scale.

CHAPTER V: RESULTS

A two-way between groups analysis of variance was conducted to explore the impact of advertising on overall attitudes toward the newspaper. The test examined the attitude-toward-the-medium level of people who were exposed to an otherwise identical mocked-up newspaper with the different advertising elements of Internet-style ads only, print-style ads-only, a combination of print and Internet ads, and no advertising. None of the hypotheses were supported. The means were contrary to the predicted directions and none of the findings were significant at the .05 or .1 levels. The ANOVA chart showed a high standard deviation relative to the size of the mean and thus *p* values were high across all measures.

The results are presented by hypothesis groupings.

Hypothesis 1, 2, 3:

For this analysis the user attitude scores of the four groups were compared based on the mean of three attitude measures—appealing/not appealing, credible/not credible/responsible/not responsible using a two-way analysis of variance (ANOVA) via SYSTAT

package 13. Table 5.1 shows there is no significant difference in the attitude measure for each of the four groups.

Table 5.1

Summary of ANOVA for Attitude Measure

Source	Sum of Squares	df	Mean Square	F	p
Print	0.267	1	0.267	0.577	0.451
Internet	0.474	1	0.474	1.025	0.316
Print/Internet	0.067	1	0.067	0.144	0.706
Error	25.896	56	0.462		

Contrary to predictions, the mean attitude score was higher ($M = 1.73$, $SD = .84$), and thus more positive, for the group exposed to Internet-style ads than for the group exposed to print-style ads ($M = 1.78$, $SD = .70$). The attitude measure was lowest, and thus most positive, for the group exposed to both styles of ads ($M = 1.53$, $SD = .69$). The attitude measure was highest ($M = 1.84$, $SD = 1.1$), thus least positive, for the group exposed to no advertising. The main effect of print yielded an F ratio of $F(1, 56) = .58$, $p = .451$. The main effect of Internet yielded an F ratio of $F(1, 56) = 1.03$, $p = .316$. The interaction effect was also non-significant, $F(1, 56) = .07$, $p = .706$. The mean scores are presented in Table 5.2.

Table 5.2

Means for Attitude Measure

Source	Mean	SD	N
No Ads	1.84	1.1	15
Internet Only	1.73	.84	15
Print Only	1.78	.70	15
Both	1.53	.69	15

Hypothesis 1a, 2a, 3a:

For this analysis the intention-to-adopt scores of the four groups were also compared based using a two-way ANOVA. Table 5.3 shows there is no significant difference in the attitude score for each of the four groups. The main effect of print yielded an F of $F(1, 56) = 1.15, p = .287$. The main effect of Internet yielded an F of $F(1, 56) = 0.05, p = .831$. The interaction effect was also non-significant, $F(1, 56) = 0.74, p = .394$.

Table 5.3

Summary of ANOVA for Intention to Adopt Measure

Source	Sum of Squares	df	Mean Square	F	p
Print	1.667	1	1.667	1.153	0.287
Internet	0.067	1	0.067	0.046	0.831
Print/Internet	1.067	1	1.067	0.738	0.394
Error	80.933	56	1.445		

Looking now at the mean scores, participants in the group exposed to both styles of advertising ranked as most positive on the intention-to-adopt measure ($M = 2.47$, $SD = 1.25$). The group was followed by print only ($M = 2.67$, $SD = 1.11$), no advertising ($M = 2.73$, $SD = 0.96$) and Internet only ($M = 3.07$, $SD = 1.44$). Table 5.4 shows the mean scores.

Table 5.4

Means for Intention-to-Adopt Measure

Source	Mean	SD	N
No Ads	2.73	0.96	15
Internet Only	3.07	1.44	15
Print Only	2.67	1.11	15
Both	2.47	1.25	15

Additional Tests

Additional tests were conducted to further understand the data. Because the demographic profile was broader than one might expect based on the population (45 of the 60 participants were between 18 and 29, with the rest spread out across other age groups including an unexpected 5 in the 59 or older category) the data were adjusted by age to see if stratified samples might have yielded more meaningful results. Separately, the data was also adjusted by gender to explore the same question. None of the results varied notably, however, and no results were statistically significant.

ANOVAs were also conducted separately for each of the three questions that made up the overall attitude test (appealing, responsible, credible). None of the results were statistically significant. The closest was a main effect for Internet, which had a p of 0.21. Another ANOVA was conducted on the average score across all four attitude measures (appealing, responsible, credible and intention to adopt). The ANOVA grid and least square means are presented in tables 5.5 and 5.6, respectively.

Table 5.5

Summary of ANOVA for Attitude/Intention-to-Adopt Combined

Source	Sum of Squares	df	Mean Square	F	p
Print	0.241	1	0.241	0.734	0.395
Internet	0.081	1	0.081	0.246	0.622
Print/Internet	0.150	1	0.150	0.457	0.502
Error	18.368	56	0.328		

Table 5.6

Means for Attitude/Intention-to-Adopt Measures Combined

Source	Mean	SD	N
No Ads	1.95	0.746	15
Internet Only	1.98	0.417	15
Print Only	1.92	0.613	15
Both	1.75	0.45	15

In this test, the “both” group again had the most positive score ($M = 1.75$, $SD = .45$) followed by the group that saw print-only ads ($M = 1.92$, $SD = .61$), the group that saw no ads ($M = 1.95$, $SD = .75$), and the group that saw Internet ads only ($M = 1.98$, $SD = .42$). Again, no results were statistically significant.

The author then explored the question of whether the question asking participants their explicit views toward advertising in general was correlated with reported attitude toward the medium measures. In other words, was there a relationship between their self report of their attitude toward advertising generally and the results of their attitude measures? A Pearson product-moment correlation coefficient was computed to assess the relationship between the attitude toward advertising in general and attitude toward the medium measures. There was no correlation between the variables, $r = -.04$, suggesting that people’s attitudes toward advertising in general may not be good predictors of how or if the presence of advertising influences their opinion of a particular media product.

CHAPTER VI: DISCUSSION

The experiment used a 2 x 2 factorial design to explore the impact of advertising on overall attitudes toward a tablet newspaper. The test measured the attitudes of people who were exposed to an otherwise identical mocked-up newspaper on an iPad device with the different advertising elements of Internet-style ads only, print-style ads-only, a combination of print and Internet ads, and no advertising.

While none of the hypotheses were supported, the data in the attitude measure showing the most negative mean attitude score for the group that saw no ads did suggest a trend where the existence of advertising might have a positive effect on attitudes. Further, the lack of a correlation between attitude scores and responses to the attitude-toward-advertising-in-general question suggests that explicit attitudes toward advertising may not reflect their response toward advertising on a medium.

If the presence of advertising positively impacts attitudes toward a medium, this could be important information for publishers designing their iPad newspapers. Similarly, if there is no correlation between participants' explicit views toward advertising in general and their performance on such a test, this could guide publishers' decisions as well.

Finally, the fact that participants from the group seeing both styles of ads ranked highest on both attitude measures and intention-to-adopt measures may indicate that viewers conceptualize tablet newspapers as a hybrid between print and web-based versions and thus find comfort with a mix of both styles of advertising.

Theoretical Implications

The information processing approach assumes that people may process advertisements in ways different from those intended by their creators. People may, for example, process ads as information or even entertainment. Scholars accept that the medium through which an ad is viewed can cause different responses to advertisements. The theory guiding this study is that the reverse may also be true, that responses to advertisements can cause different responses to the medium. The author argued that some advertisements can positively influence responses to the medium. Based on research showing generally more positive responses to print ads as compared to Internet ads, the author made hypotheses predicting participants' responses to specific types of ads on tablet newspapers.

The hypotheses were not supported. Participants did not prefer print-style ads to Internet-style ads on this tablet newspaper. This does not, however, necessarily challenge the larger theory that responses to advertisements can cause responses to a medium, particularly given that the trend from the survey showed that those who experienced both types of advertising had the most positive attitude scores and those who saw none had the least positive scores. If these trends are confirmed in further research, it would offer support to the theory guiding this research.

Practical Implications

Such research would be helpful to publishers, who seem to be looking to tablet newspapers to undo the perceived missteps they made in regards to their online editions, in which they conditioned readers to endlessly free content delivered in a format that has eroded newspapers' print audience and their associated profits. With web content, newspapers have been seen to be subsidizing their own demise. The hope of publishers is that tablet newspapers can offer a second chance at a digital future that will save them as much as 60 percent of their operating costs—the amount associated with printing, delivery and ink—while preserving print's traditional three-legged economic model of subscriptions, advertising and per-issue sales. As with all wishes, this one seems unlikely to come true, at least not entirely. If, however, tablet newspapers continue to surge in popularity—the first phase of a multi-year research project into iPad for news found that 99 percent of survey respondents said they use their device daily to consume news (McMullan)—then publishers have the chance of converting print readers at the same time they attract new digital-age readers to a format that is well-suited to experiencing the newspaper in a sort of hybrid manner that contains many of the most appealing aspects of both. But the devil will be in the details, and the design of advertising is sure to be one of the more important details. As is so often the case with research into new arenas, perhaps the most important finding from this study is that choices regarding the inclusion and style of advertising on future tablet newspapers are a productive arena for additional study.

Limitations and Directions for Future Research

This study offered original research into a new and emerging medium. Its results could offer useful information to those now attempting to design, create content for, and develop business models that work in this new arena. By using a factorial design, the author was able to study multiple variables efficiently. Care was taken in experiment design to control for factors other than the variables that might have influenced the outcome and to identify and plan for internal and external validity threats. Nonetheless, the author is reminded of a section in the second edition of Wimmer and Dominick's introductory text on mass media research (1987) entitled "The Hazards of Research."

Among the 10 hazards listed were: "No matter how many people review a research proposal and say that it's perfect before you start, people will always have suggestions to make it better after the study is completed," and "A sample is always too small," and "Subjects never tell you how they really feel or what they really think or do." (p.40) With this advice in mind, the design of the experiment suffered from various potential sources of error, including:

- Technical limitations prevented the author from controlling the precise content of the Internet-style ads. They were placed via an html link leading to Google's DoubleClick ad service, and thus changed during the course of the experiment. Although this was

discovered during a pre-test, it could not be overcome while still presenting advertisements in a Flash-type format.

- The fact that the bulk of the participants were students at a community college (others were faculty and staff who volunteered) may mean the results may not be easily generalized to the larger population.
- The Internet-style ads did not reflect the most cumbersome and intrusive style of ads, such as those that expand greatly or move across a screen; they were rectangle or square-shaped ads that included Flash-style animation but otherwise stayed in place.
- The print-style ads were taken directly from an electronic edition of the print version of the local newspapers, but it was difficult to locate ads that were both in color and of potential interest to a wide demographic group; the print ads tended to focus on items such as hearing loss, retirement savings, and furniture sales—items that may be of less interest to the community college-age students in the study.

More broadly, it is possible that the fact that relatively few participants reported owning a tablet or e-reader device (n=5) was a possible threat to external validity; they may have, in other words, been more preoccupied with exploring the device itself and less attuned to the advertising on this first use than they would have been if repeated uses

induced a more ritualized reading process. Of course, the purpose of lab-based experiments is to have high internal validity to rule out possible confound effects. And while it is ideal to have as much “realism” in an experiment as possible, to enhance external validity, it is almost impossible to produce an experiment that has both high external and internal validity. The trade-off in this study to have high internal validity at the expense of, perhaps, “realism” in the way that experienced/inexperienced participants use tablets is arguably an acceptable trade-off. Future studies can examine the impact or, perhaps, moderating role of experience with tablets and control by including measures for higher versus lower experienced subjects.

Another likely explanation for the findings is that, as discussed in the literature review, a great deal of work has been done to suggest that people tune out ads when they are searching the Internet, and this effect is especially pronounced when people are hunting for information rather than in a perusal mode. Although the experiment was designed to be as natural as possible, it was not a natural setting and the newspaper was a mocked up one, so participants may have been in a more hunting mode than they otherwise would be. Future research might overcome this limitation by inserting differing ads in real tablet newspapers that participants read at their leisure. Such a study, however, would take careful design, technical expertise and, potentially, the participation of a publisher.

Addressing the sample itself, the author sought to attract 100 participants; 90 signed up to participate, but only 63 showed up at their appointed times and completed the experiment. Three began the experiment but did not complete due to time limitations.

The total number of individuals to complete the experiment was 60, thus each group had 15 participants who were randomly assigned to the conditions to control for individual subject differences. Although this number is smaller than hoped for, the author is again reminded of Wimmer and Dominick's "Hazards" advice. A post-hoc power analysis showed that, considering the high standard deviation in responses and relatively small differences, the overall N would had to have been about 700 in order to attain a statistically significant result.

Conclusion

The question asked in this study was whether the presence and style of advertising influence attitudes toward tablet newspapers, including intention to adopt. The most straightforward interpretation of the data gathered in this experiment suggests that the presence and style of advertising either has no impact on attitudes toward a tablet-based newspaper, that any impact is small, or that a significant impact depends on major differences in the style of ads that were not present in this experiment.

Still, precisely because there were not significant differences between the groups, the experiment yielded what is in effect a small survey, which offered interesting findings of its own. Among the most basic, and important, of findings is that participants came away from their exploration of a very basic version of an iPad newspaper with positive attitudes toward the medium. As a group, they found the experience appealing: The average score was 1.8 on a 5-point semantic scale, translating to an average of slightly better than "somewhat appealing." This alone bodes well for the transition to a digital future for newspaper via tablets. Other results from the data that could be hopeful to

publishers are that of those who spent time perusing a mocked-up version of an iPad newspaper, more than a third (n=23) said they would consider paying \$2 or more per week for a subscription. Taken strictly as a survey, the data is promising for publishers looking to transition to a new style of digital distribution. Combined with the trends found in the experiment and the knowledge gained from the review of relevant scholarly work, this study points the way toward further research into the role that advertising can play in shaping attitudes toward tablet newspapers.

APPENDIX

Consent form:

CONSENT FORM

About the study

You have been invited to participate in a research study conducted by a master's student at the University of Missouri School of Journalism. The aim of this study is to understand more about the impact of certain design decisions, including the inclusion and type of advertising, on attitudes regarding tablet-based newspapers.

Only participants 18 years of age or older may take part. All data from this study will be kept confidential and anonymous. Participation is one-time and voluntary, meaning you may choose to withdraw from the study at any time without penalty. If you are receiving extra credit from your instructor for participating in this study, this extra credit will be granted even if you should choose to stop participating after the study has begun.

Procedures

Participants in the study will examine a tablet-based version of a newspaper and then be asked to complete a paper-based questionnaire about their opinions regarding tablet-based newspapers. The participants will be asked to read or thoroughly skim each of 10 stories on the tablet. Participants are also asked to provide basic demographics information and answer questions about their own experience with tablet-based newspapers and media use in general. The entire activity should take about 20 minutes. If you have any questions at any time, please raise your hand for assistance.

Contact information

The researchers conducting this study are Patrick Howe and Dr. Shelly Rodgers, of the University of Missouri. If you have questions about the study, feel free to contact Patrick Howe at pathowe@gmail.com or (805) 286-6528. If you would like to speak with Dr. Rodgers, her e-mail address is srodgers@missouri.edu.

If you have any questions or concerns regarding your rights as a study participant, or are dissatisfied at any time with any aspect of this study, you may contact - anonymously, if you wish - the Campus IRB office at Campus Institutional Review Board, 483 McReynolds, University of Missouri, Columbia, MO 65211. The web site is available at www.research.missouri.edu/cirb/index.htm and the phone number is (573) 882-9585.

Statement of consent

By signing your name, you state that you have read and understand the above information, are 18 years of age or older, and voluntarily consent to participate in the study.
I voluntarily consent to participate in this study.

Name: (printed) _____ Date:

Signature: _____

Instructor (if they have agreed to offer extra credit for this study):

Survey questions

General questions

First you are going to be asked a series of questions about yourself. All answers you give throughout this questionnaire will remain anonymous.

1. How old are you?

18-19

19-29

29-39

39-49

49-59

59 or older

2. What is your gender? (circle one)

a. Male

b. Female

3. Do you own a tablet device such as an iPad, Kindle, Nook, Sony Reader, etc?

a. Yes

b. No

3. (a). If yes, which? _____

4. Do you own a smart phone?

a. Yes

b. No

4 (a). If yes, do you use a smart phone to access electronic editions of any newspapers (such as apps for the New York Times, for example)?

a. Yes

b. No

5. Have you read a printed newspaper in the past 2 days?

a. Yes

b. No

6. Have you read newspaper content on the Web in the past 2 days?

a. Yes

b. No

7. Have you read a printed magazine in the past 2 days?

a. Yes

b. No

8. Have you read magazine content online in the past 2 days?

a. Yes

b. No

Attitude:

Below you will be asked a series of questions about your attitudes toward the tablet newspaper you recently examined.

9. Did you find the newspaper appealing? (Circle one)

a. Very appealing

b. Somewhat appealing

- c. Neither appealing or not
- d. Somewhat unappealing
- e. Very unappealing

10. Did you find the newspaper to be credible?

- a. Very credible
- b. Somewhat credible
- c. Neither credible or not
- d. Somewhat non credible
- e. Very not credible

11. Did you find the newspaper to be responsible?

- a. Very responsible
- b. Somewhat responsible
- c. Neither responsible or not
- d. Somewhat not responsible
- e. Very not responsible

12. Based on your experience, how likely would you say you would be to subscribe to an electronic tablet newspaper?

- a. Very likely
- b. Somewhat likely
- c. Neither likely or not
- d. Somewhat unlikely
- e. Very unlikely

Next you will be asked your opinion on a number of different matters.

13. How important to you is it that a tablet-based newspaper be presented in color?

- a. Very important
- b. Somewhat important
- c. Neither important or unimportant
- d. Somewhat unimportant
- e. Very unimportant

14. How important to you is it that a tablet-based newspaper offer multimedia content such as videos, slideshows and interactive charts?

- a. Very important
- b. Somewhat important
- c. Neither important or unimportant
- d. Somewhat unimportant
- e. Very unimportant

15. Speaking generally, what is your attitude regarding advertising in general?

- a. Very much like advertising
- b. Somewhat like advertising
- c. Neither like or dislike advertising
- d. Somewhat dislike advertising
- e. Very much dislike advertising

16. What is your attitude toward advertising on tablet-based newspapers?

- a. Very much like advertising on tablet newspapers
- b. Somewhat like advertising on tablet newspapers
- c. Neither like or dislike advertising on tablet newspapers
- d. Somewhat dislike advertising on tablet newspapers
- e. Very much dislike advertising on tablet newspapers

17. How do you think the presence of advertising on a tablet newspaper would influence your opinion of the newspaper?

- a. Very much improve my opinion of the newspaper
- b. Somewhat improve my opinion of the newspaper
- c. Neither improve or diminish my opinion of the newspapers
- d. Somewhat diminish my opinion of the newspaper.
- e. Very much diminish my opinion of the newspaper.

18. How much do you think you would be willing to pay to read a tablet newspaper every day?

- a. More than \$3 per week
- b. About \$3 per week
- c. About \$2 per week
- d. About \$1 per week
- e. Something less than \$1 per week
- f. Nothing: I would not consider paying for a tablet newspaper.

That is the end of the questionnaire. Please turn this in to the person who gave it to you. Thank you for your time.


Mock newspaper

Screenshot of main screen of mock newspaper:


The New News

Home


Nation

 **Tiny drone creates buzz**
Hillary spy cam that looks like hummingbird has critics worried over privacy concerns.


World

 **Refugees flee Libya**
More than 100,000 pour into neighboring countries amid strife as chaos continues.


Entertainment

 **Charlie Sheen keeps it up**
Actor takes us his battle against the Two and a Half Men makers with sitcom made bits.


Sports

 **Good ratings, great games**
The NBA hasn't been this entertaining in a while. Will a strike bring it all to an end?


Local

 **Fire, police top list**
Review of Arroyo Grande, Grover Beach and Pismo Beach finds police and fire employees rank among top earners.


Nation

 **Texas wildfire rages**
Scorched and weary residents of a Texas Panhandle town were allowed to return to what was left of homes on Monday.


Sports

 **Barajas living his dream**
Scorched and weary residents of a Texas Panhandle town were allowed to return to what was left of homes on Monday.


World

 **Pirates strike again**
Pirates in the Arabian Sea hijacked a yacht carrying seven Danish citizens, including three children.

Local

 **More buyers use cash**
All-cash buyers grabbed a record 30.9% share of California house and condo sales in January.

Entertainment

 **Ali, the sculpture**
Seed bags, artfully placed, form giant sculpture of Muhammad Ali at L.A. Live.

Create a free website with [woobly](#)

Screenshot of sample story, Group 1 (both style of ads):

The New News

[Home](#)

Tiny drone creates buzz over privacy

By JULIE WATSON, Associated Press



SAV DDDG - You'll never look at hummingbirds in the same way again.

The Pentagon has poured millions of dollars into the development of tiny drones inspired by biology, each equipped with video and audio equipment that can record sights and sounds.

They could be used to spy but also to locate people inside earthquake-crumbled buildings or to detect hazardous chemical leaks.

The smaller, the better.

Besides the hummingbird, engineers in the growing unmanned aircraft industry are working on drones that look like insects and the helicopter-like maple leaf seed.

Researchers are even exploring ways to implant surveillance and other equipment into an insect as it is undergoing metamorphosis. They want to be able to control the creature.

The devices could end up being used by police officers and firefighters.

Their potential use outside of battle zones, however, is raising questions about privacy and the dangers of the winged creatures buzzing around in the same skies as aircraft.

For now, most of these devices are just inspiring awe.

With a 6.5-inch wing span, the remote-controlled bird weighs less than an AA battery and can fly at speeds of up to 11 miles per hour, propelled only by the flapping of its two wings. A tiny video camera sits in its belly. The bird can climb and descend vertically, fly sideways, forward and backward. It can rotate clockwise and counterclockwise.

Most of all it can hover and perch on a window ledge while it gathers intelligence, unbeknownst to the enemy.

"We were almost laughing out of being scared because we had signed up to do this," said Matt Kaennon, senior project engineer of AeroVironment Inc. of Monterey, Calif., which built the hummingbird.

The Pentagon asked the firm to develop a pocket-sized aircraft for surveillance and reconnaissance that mimicked biology. It could be anything, they said, from a dragonfly to a hummingbird.

Five years and \$4 million later, the company has developed what it calls the world's first hummingbird spy plane. "It was very daunting up front and remained that way for quite some time," Kaennon said, after the drone flew by his head and landed on his hand during a demonstration.

Advertisement

 Kork-Ease Ava (Pink Veg) Sandal \$135 GO	 Belle by Sajeetson Blushes Sandal \$225 GO	 Kork-Ease Brandy (Dill) Stripes Sandal \$135 GO
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Zappos.com Why am I seeing these ads? [Learn more](#)

SLO: SPECIAL DISCOUNT \$825

We are offering the first three people that rent an apt. in the month of February this special price with a \$200/discount on their third months rent. One bedrm, townhouse apt. with walk-ins closets, Swimming pool, laundry facilities, private parking.

Call (805) 544-8620 or stop by 721 Johnson Ave

Create a free website with [weebly](#)

Screenshot of Group 2 (only print-style ads):

Home

Tiny drone creates buzz over privacy



By JULIE WATSON, Associated Press

SAV DOPPO - You'll never look at hummingbirds in the same way again.

The Pentagon has poured millions of dollars into the development of tiny drones inspired by biology, each equipped with video and audio equipment that can record sights and sounds.

They could be used to spy but also to locate people inside earthquake-rumpled buildings or to detect hazardous chemical leaks.

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Call (805) 544-8620
or stop by 721 Johnson Ave

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- High Performance - Low VOC

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www.nhance.com

Create a free website with weebly

Screenshot of Group 3 (Only Internet-style ads):

The New News

[Home](#)

Tiny drone creates buzz

By JULIE WATSON, Associated Press



SAV DDDGO - You'll never look at hummingbirds in the same way again.

The Pentagon has poured millions of dollars into the development of tiny drones inspired by biology, each equipped with video and audio equipment that can record sights and sounds.

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The devices could end up being used by police officers and firefighters.

Their potential use outside of battle zones, however, is raising questions about privacy and the dangers of the winged creatures buzzing around in the same skies as aircraft.

For now, most of these devices are just inspiring awe.

With a 6.5-inch wing span, the remote-controlled bird weighs less than an AA battery and can fly at speeds of up to 11 miles per hour, propelled only by the flapping of its two wings. A tiny video camera sits in its belly. The bird can climb and descend vertically, fly sideways, forward and backward. It can rotate clockwise and counterclockwise.

Most of all it can hover and perch on a window ledge while it gathers intelligence, unbeknownst to the enemy.

"We were almost laughing out of being scared because we had signed up to do this," said Matt Keannon, senior project engineer of AeroVironment Inc. of Monrovia, Calif., which built the hummingbird.

The Pentagon asked the firm to develop a pocket-sized aircraft for surveillance and reconnaissance that mimicked biology. It could be anything, they said, from a dragonfly to a hummingbird.

Five years and \$4 million later, the company has developed what it calls the world's first hummingbird spy plane. "It was very daunting up front and remained that way for quite some time," Keannon said, after the drone blew by his head and landed on his hand during a demonstration.



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Tiny drone creates buzz



By JULIE WATSON, Associated Press

SAV DDDGO - You'll never look at hummingbirds in the same way again.

The Pentagon has poured millions of dollars into the development of tiny drones inspired by biology, each equipped with video and audio equipment that can record sights and sounds.

They could be used to spy but also to locate people inside earthquake-crumbled buildings or to detect hazardous chemical leaks.

The smaller, the better.

Besides the hummingbird, engineers in the growing unmanned aircraft industry are working on drones that look like insects and the helicopter-like maple leaf seed.

Researchers are even exploring ways to implant surveillance and other equipment into an insect as it is undergoing metamorphosis. They want to be able to control the creature.

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