THE EFFECTS OF ONLINE ADVERTISING

Consumers' first impressions (and loyalties) are made in the opening moments of a Web site visit and the degree to which that visit may be intruded by pop-ups, pop-unders, and banner ads.

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Online advertising techniques such as banners, pop-ups, and pop-unders are quite salient to Internet users. Some studies have reported that consumers despise these annoyances and even feel violated and molested by their presence [12].

In traditional media, intrusiveness has been recognized as a leading cause of advertising annoyance. Television commercials have long been considered unwanted yet omnipresent. Although Rust and Varki [11] predicted that advertisements in new media would be less intrusive than in traditional media, Li et al. [9] report that online consumers are goal-oriented and judge online advertisements even more harshly than those in other media. Further, they found that the negative attitudes online consumers develop ultimately contribute to decisions not return to the site.

Internet advertising reached over $10 billion in 2005 in the U.S., according to [2], representing 5.3% of all advertising—a 30% increase over 2004. The sheer magnitude of online advertising makes it clear that firms must closely monitor the impact of their advertising techniques.

While early ads were found to be effective in creating brand awareness and positive attitudes, recent Internet advertising has been described as nonsensical, uninformative, forgettable, ineffective, and intrusive. One change over that period of time has been the development of alternate forms of advertising—pop-ups and pop-unders intended to better focus consumers' attention,

and the in-line (most often banner) ad that appears in the same window as the site hosting the ad. By 1999, patience was already beginning to wear thin, and a Jupiter Research survey showed that 69% of users considered pop-ups annoying, and, further, 23% said they would not return to the site simply because of the ads.

Concerns about consumer behavior are well founded. Although some research has reported that users find information helpful when presented in an enjoyable context, many of these studies report that consumers develop such negative attitudes toward the ads that they avoid them whenever possible. These negative attitudes are thought to affect brand perceptions, leading to ad avoidance [1]. In a Web context this means avoidance of the site itself.

Rather than diminish their intrusiveness as Rust and Varki [11] expected, Reed [10] found that advertisements in the Web environment were disturbing. Abernethy [1] paints a picture of television viewers who can leave the room or change the channel during a commercial, while Internet users are deterred—at least a little—from achieving their online goals [9]. Users have little remedy other than to interrupt their task, scroll past ads, or close the pop-up/pop-under windows. The more important or urgent the task, the more intrusive the interruption is likely to be perceived.

Pop-up or pop-under windows represent tactics by some online advertisers to make the ads very difficult to avoid. The effects of those additional windows have not been studied thoroughly in the literature to date. Although some believe the war on pop-ups to be over, given the various pop-up blockers many users employ, there is an "arm's race" that is bound to have more than a few twists and turns along the way over the next several years. Millions of people are still unprotected. Many have older versions of browsers (that do not block such ads) and others do not install free third-party blockers. At the same time, advertising developers engineer new ways to defeat pop-up blockers that have been deployed.

Thus, it is interesting and useful to determine the effects of different forms of Web advertising and find answers to the following research questions:

- *How intrusive are online ads?* Will the ads lead users to not return to the site hosting the ads?
- *Are some forms of online ads more intrusive than others?* Will it make a difference if the ads are not related to the subject matter of the site?
- *Will online ads interfere with users' ability to remember site content?* Which types will provide most interference?

EXPERIMENT DETAILS
We conducted an experiment with different forms and types of ads. An artificial Web site was created for the experiment that contained images, prices, and descriptions of familiar products and product categories. The products were those that would be carried by a general store and included food, health care, and household products. Nine search tasks were assigned to participants that would force them to traverse a variety of portions of the site. The products and product categories were designed to be familiar to anyone who shops in physical stores, consumes products, or understands the

names of common household goods.

Two sets of six original ads and slogans were created. Existing ads and slogans were avoided to prevent prior exposure from contaminating our results. All were presented as pop-ups, pop-unders, or in-line ads, with one set being congruent to each particular task *and* to the other products on the site, and the other site being non-congruent. The experimental Web sites were accessed over the Internet in a controlled laboratory setting by 536 undergraduate students enrolled in two U.S. universities and one Mexican university.

One ad was placed on each of six strategically chosen pages (about 5% of the 121 pages in the site). Each of those pages was on a path users would follow to complete the search tasks assigned to them. All ads appeared in the same place on the page, toward the right side as found in many high-traffic sites. No text was obscured when a page contained an ad, in

Figure 1. Perceived intrusiveness of various forms of Web advertisements (7-item scale; caution: the origin of the Y axis is not 0).

the conventional style of in-line ads. In practice, many pop-ups do obscure text, but we chose to control placement precisely and focus on the ad type itself. Once the subjects had completed all nine search tasks, they completed an online survey in which data on the outcome variables was collected.

RESULTS AND INTERPRETATIONS

Our first set of research questions addressed the intrusiveness of online ads and how that intrusiveness would manifest itself in future behavior. We asked participants to respond to seven items measuring the intrusiveness of the ads on the site. The scale for each question ranged from 1 (not very intrusive) to 7 (very intrusive). The 417 users who were exposed to ads reported an average of 3.6 (standard deviation of 1.8). This score appears to be in the middle of the scale and alone does not seem to indicate there is any reason for alarm. However, an important consideration is how these ads would affect users' behavioral intentions to return to the site. Our expectation was that intentions to return would be more positive for subjects who were not exposed to advertisements of any kind. Indeed, subjects who were not exposed to ads reported they were 11% more likely to return or recommend the site to others than those who were exposed to ads ($p<.01$).

Although that difference is statistically significant, its magnitude might not appear on the surface to be very important. On the contrary, recent reports show that a site such as Amazon enjoys about 48 million unique visitors per month. A drop of 11% would represent more than five million fewer visitors per month. Such a drop would be interpreted as a serious problem requiring decisive action, and the ROI of the advertisement could actually become negative. Assuming a uniform distribution of buyers among browsers before and after the drop, the revenue produced by an ad might not make up for the 11% shortfall in sales.

We were interested in understanding why the shortfall occurs, and found that theories of attention from the psychology literature can explain the problem. In cognitive psychology, researchers discovered that interruptions from a task cause people not only to suffer in their recall performance but also to react negatively to the need to expend additional effort to process both the information provided in the interruption and the information provided on the host Web site.

The second set of questions raised the prospect that different types of ads have different levels of impact on people who browse a site. Advertisements take many forms, and users' reactions to them are
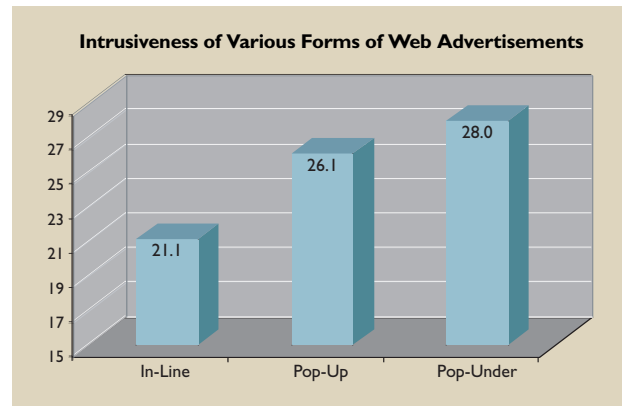
Congruence in our study addressed the relationship or relevance of the ad content with the site content and the task that was being performed.

largely unexplored. In a previous study, the banner ad was better received than pop-ups [4]. Interference was an explanation: 84% of respondents stated pop-ups interfere with reading or using a Web page, while only 54% said banner ads interfere with Web usage.

Pop-ups and pop-unders were expected to be perceived as more intrusive than in-line ads. Indeed, as illustrated by Figure 1, pop-ups were 24% more intrusive than in-line ads (p<.001) and pop-unders were 33.1% more intrusive than in-line ads (p<.001). Although we expected that behavioral intentions to return to the site would be more positive for participants who were exposed to in-line ads compared to those who were subjected to pop-ups, that was not the case. It appears that advertisements of any kind, regardless of mode, negatively affect decisions to return to the site (see Figure 2).

Figure 2. Intentions to revisit the site containing the ads (4-item scale; caution: the origin of the Y axis is not 0).

The third set of questions addressed whether online ads would interfere with users' ability to remember the content of the hosting site. Retention of site content is crucial to promote users to visit again and to refer the site to other potential visitors. If advertisements stand in the way of referrals and subsequent visits, there would be significant hesitation in hosting those ads. It is important to note that ad recall has already been studied, and, from the advertisers' perspective, the results are in that pop-up ads are remembered more than banner ads [5]. However, we are interested in this problem from the host site's perspective.

The results of psychological studies of attention indicate that disruption interferes with attention, limiting information that is received, and by interfering with processing, and therefore, how information is understood [7]. We therefore expected that ads would indeed interfere with the use of the site and would contribute to lowering retention of site content.

Contrary to our expectations, there was no significant difference found in site retention between users of sites with ads and users of sites without ads. The claim by Chan et al. [3] that users only focus on the "X" to close the window in most of our ad conditions (pop-up and pop-under) could have revealed a coping mechanism for people who browse a site and encounter pop-ups and pop-unders.

Although ads in general did not seem to affect retention of site content, we examined the separate results from each type of ad. We expected that ads requiring more effort (to close a window) would provide more of a disruption and therefore would disturb recall. Comparing retention of users across the sites with different types of ads (pop-up versus in-line), we found that retention was indeed higher for those exposed to in-line ads. Subjects exposed to in-line ads remembered 3.4% more of the material in the site than those exposed to pop-ups.

We also examined the congruence between the site content and ad content. Congruence in our study addressed the relationship or relevance of the ad content with the site content and the task that was being performed. For example, a car advertisement was not congruent with the "general store" site, and clearly not congruent with a need to find the price of potato chips. However, an advertisement for eyedrops was congruent with the theme of the site, and with the task to find a contact lens accessory.

We expected that retention of Web site material would be higher for subjects exposed to non-congruent advertisement material than for those exposed to congruent ads. We also expected that irritation would be higher when users are exposed to non-congruent ads, consistent with the findings of Chan et al. [3].

The expectation was based on dual-process theories in psychology, which suggest that a person recognizes and internalizes general regularities in other people with one process, but requires a second, more conscious and effortful process to form representations of unique or novel ideas. Although people are different from Web sites, researchers have studied impression formation in the context of an organization or firm, and it has been shown that people formulate impressions of a site [6]. Another way to consider this and frame it in the Web advertisement domain is for advertisers to strive to target their ads to sites that are closely related in content. Such a move betrays an assumption that congruent ads are not as likely to be perceived as an interruption.

Our findings were that, as expected, those exposed to non–congruent ads remembered about 3.5% more of the Web site material than those exposed to congruent ads (p<.005). However, those exposed to non-

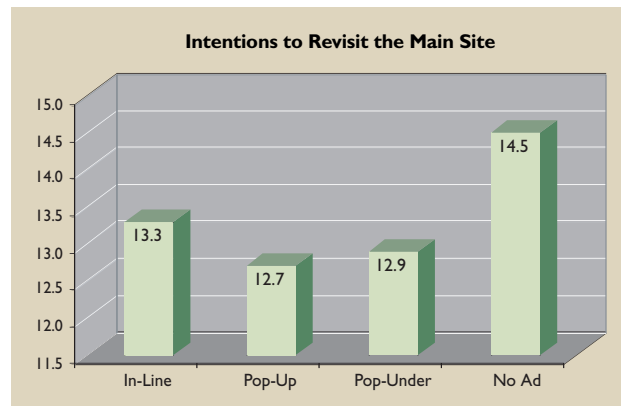congruent ads were not found to be significantly more irritated by the ad as those exposed to congruent ads. That is, the difference failed to reach significance.

DISCUSSION

This study provides clear support for an assertion that users will adopt more negative intentions when a site displays advertisements than when the site does not. It is also clear that advertisements interfere with retention of site content and that features of advertisements also have important effects on retaining both site and ad content. In-line ads permit both site and ad content to be remembered more clearly than pop-ups and pop-unders, a finding that is most interesting because it suggests the action of closing the advertisement window distracts users from the site, and further, it is visible for a shorter time. When ads are markedly different from the content of the site, they theoretically stimulate more effort as users work toward an important goal, and users remember more about both the Web site and the advertisement. It is interesting to note that while these effects might on the surface appear small, they are quite consistent and highly significant. Extrapolating to millions of site visitors, even small differences can amount to an urgent problem for management.

Finally, it is also clear that pop-ups and pop-unders are considered to be more intrusive than in-line ads. Users seem to prefer not to have to divert their attention from their searching task or take additional steps to close the pop-up or pop-under windows.

CONCLUSION

Our findings suggest that advertisements do have significant effects on retention of the site. Also, advertising content that is non-congruent with the site's content seems to lead to greater effort in reconciling the differing content, and ultimately greater memory of both the Web site and the advertisement.

Intrusiveness is also important for both Web site designers and advertisers. Pop-ups and pop-unders seem to be more intrusive than in-line ads, implying that users should not be interrupted from their online tasks to close the extraneous windows.

This article is a first step toward a deeper understanding of Web advertising, providing a controlled study to isolate a variety of factors and outcomes. Such understanding would enable researchers to design future studies using different ad types and different locations on the page. Designers should realize the magnitude of ill effects caused by advertising.

Although some of the differences were not large in magnitude, reducing the likelihood of a person's return by 11% might be a cost that is too great for a site host to bear. Discovering that pop-up and in-line ads differ greatly in measures of intrusiveness, a host might play it safe and make use of in-line ads. As theory and practice begin to converge in this area, perhaps what has been described so often as a wild new frontier might finally take a few steps toward being tamed. **C**

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