The Memory Recall Of Pop-Up Advertisements Amongst Experienced Internet Users

Sinead Cochrane

Dissertation submitted as a requirement for the degree of BSc Psychology applied to Information Technology, Dun Laoghaire Institute of Art, Design and Technology, 2006.

__Acknowledgments__

Contents

Abstract

The aim of this study was to examine the relationship between Internet experience and memory retention of pop-up advertisements. Seventy participants (39 males, 31 females) between the ages of 18 and 60 (M=22.24, SD=6.45) completed an online survey about their Internet experience, during which a pop-up advertisement appeared. Participants then completed a paper-pencil test examining their recall of the pop-up. Results found no relationship between experience and memory retention (yet, low recall rates were observed), and the more experienced a user becomes online the more likely they are to use pop-up blocking software. Implications of this research suggest that pop-ups are ineffective, and online advertisers should focus on alternative forms of advertising.

Human computer interaction and usability studies have attempted to improve a users experience with technology, however the results of these studies and subsequent guidelines that are published tend to be overlooked by some web designers who would rather compromise their design in an attempt to gain additional revenue, with disregard for their users' online experience. Forms of advertising that are misleading or perceived to be annoying, such as pop-up advertisements, are used online, and statistical information with regards to these forms of advertising are both conflicting and disingenuous.

There is a general consensus that intrusive forms of advertising, like pop-ups, are ignored by users. Statements such as "Many users have learned to ignore these ads" (Lee & Benbasat, 2003) have been included in studies that investigate the Internet or online advertising (Kahng 2001; Lee & Benbasat, 2003; Moe, 2003) and have appeared in technology news articles (Kane, 2003; Goldhaber 1997). However, these declarations are based on common knowledge rather than from studies with scientific credibility. This study attempts to produce empirical evidence to back up or discredit these statements.

If a person's attitude to online advertising can change with experience (Previte & Forrest, 1998) it is reasonable to assume that not only do people learn to have negative attitudes towards pop-ups, but also learn to ignore them. This study is mainly interested in the effectiveness of pop-ups on users with long term Internet experience.

Online Advertising

Advertising online has seen a positive growth in the last 2 years, so much so that spending on online advertising has exceeded the figures reported at the height of the dot-com boom. $8.1 billion was spent on advertising online, after the dot-com bust this dropped significantly (eMarketer, 2004) but figures show that in 2004 expenditure on advertising online was $9.6 billion and this has increased to an estimated $12 billion in 2005 (Olsen, 2005). It is predicted that these billion dollar figures will increase in 2006 and 2007 (eMarketer, 2004), indicating that the Internet has recovered from the dot-com bust of 2000 and that online advertising is once again a profitable business.

Pop-Up Advertisements

Pop-up advertisements are a form of advertising on the Internet. Generally their purpose is to increase web traffic, directing users to a website where a product can be purchased or a commercial website viewed. These advertisements work when a website opens a new web browser

window (without user input) to display a solitary advertisement; they are small windows that appear on top of the website being viewed. Pop-ups can be timed to occur or can be initiated when a user clicks on a link to another page. Usually a pop-up can be removed by clicking the x in the top right hand corner. Pop-up advertisements cause a change in the visual field which leads to a higher degree of visual stimulation when compared to other forms of online advertising (Diao & Sundar, 2004). Viewing some websites will cause numerous pop-up advertisements to appear.

Pop-ups are sold as being successful online advertising tools, and are claimed to be more effective than static banner advertisements (an image embedded into a web page). Numerous online sources claim that pop-ups have a much higher click rate (when a user clicks on the advertisement) than other forms of online advertising such as web banner advertisements. Brian Morrissey of Clickz.com wrote in 2003 "According to an Advertising.com analysis, pop-up advertisements generate a click-through 13 times that of the standard 468 x 60 pixels banner". Yet "some researchers estimate that they garner three to six times greater click-through rates than standard banners or display ads on the Web" (Olsen, 2002).

The most popular websites online do not use pop-ups. Based on Alexa.com's Global Top 500 list of most visited websites (as of January 2006) the top 5 websites (Yahoo!, MSN, Google, Yahoo! Japan and Baidu.com) do not contain pop-up advertisements. However, 4 out of the top 20 websites online use either pop-ups (excessive pop-ups appear after immediately opening these websites) or pop-unders. Pop-unders are a variation on the pop-up window, which also open in a new browser window, but behind the active window rather than on top.

According to figures from researcher Nielsen/NetRatings in 2002 less than 10% of Internet Advertisers used pop-up advertisements despite their seemingly ubiquitous presence. 11.3 billion pop-up advertisements were launched in the first seven months of 2002 – this is just 2% of the online advertising market (Bumatay, 2002). However, figures from Nielsen/NetRatings show that pop-up and pop-under advertising comprised 6 percent of the total online ad impressions in September 2004 (Olsen, 2004), indicating that the presence of pop-up advertisements online are on the increase.

Pop-Up Blockers

Pop-ups may have had a higher click-rate than other forms of online advertising in the past, however, more recently trends are developing where traditional pop-ups are being "blocked" (the new browser window does not open) by software an Internet user can install. Pop-ups have spawned an entire market of products intended to block them. Entering the search term "pop ups" into Google.com will display thousands of hits for pop-up blocking software. The Google Toolbar when installed will "block annoying pop-ups" (Google, 2005) and The Yahoo! Toolbar will

"eliminate annoying pop-ups" (Yahoo, 2005). Even Microsoft has attempted to eliminate pop-ups, in Microsoft's Windows XP Service Pack 2 (an update for Windows XP) "Windows XP Service Pack 2 enhances your Web browsing and e-mail experience with new security technologies designed to reduce unwanted content and downloads" (Microsoft, 2005) some of the unwanted content being referred to are pop-ups. Consequently, an Internet user now has the option to view these pop-ups or not.

In an attempt to counteract these new trends, some advertisers online have began designing websites that force their pop-up advertisements to appear on the users screen and due to the difficulty involved when deploying a pop-up upon a user that has a pop-up blocker, advertising companies have also increased the cost per impression (how many users see the advertisement) by as much as 30 percent (Olsen, 2004). Other advertisers have recreated the traditional pop-up using Flash animation technology, turning them into media-heavy advertisements (animations and sound) that float across a website instead.

Consumer Attitudes

Studies show that the perceived intrusiveness of pop-ups lead the user to associate negative feelings with this form of advertising and negative feelings towards the company that uses them. A survey of Internet users conducted in the U.K, in 2004 by Bunnyfoot Universality, aimed to research the role of pop-ups in advertising, attitudes and opinions and the perception of the website and advertiser. Results of testing 36 individuals from the United Kingdom conducting tasks on two comparable websites indicated a strong and intense dislike for pop-up advertisements, resulting in negative attitude towards the website and the brand owner. 50% of advertisements were closed before the advertisement finished loading. 35% of pop-up advertisements were ignored completely. The average time from a pop-up advertisement frame appearing and the clicking of the close button was 2.5 seconds. The survey found that as many as 9 out of 10 users who clicked on a popular pop-up advertisement were really just trying to get rid of them and clicked through by accident "because the close button was so difficult to find." (Chan, Dodd, & Stevens, 2004).

A study that measured general consumer attitudes towards online advertising and perceptions of the different forms of online advertising found that only 6% of respondents had positive feelings towards intrusive advertising formats like pop-ups (Safran, 2001). However, 72% felt some pop-ups are appropriate. Consumers will accept a limited number of pop-ups (approximately 3 per hour) to access preferred/free online content (Safran, 2001). Similar advice is outlined in the 2002 study by Edwards, Li and Lee, however, this advice is not taken into account where some users are still bombarded by pop-ups and forced to view cluttered websites. Users are still overwhelmed with pop-ups due to the perception that higher click-through rates equate to

advertising success.

Based on click-through rates alone it could be claimed that pop-ups are a successful medium in which to advertise online, however, in a study conducted by researchers from technology analysts Gartner, 78% of participants said they found pop-ups "very annoying", in comparison to 49% of participants that found banner advertisements "very annoying" (Kane, 2003). Although participants claimed to have negative attitude towards pop-ups, this study also found that the click-through rate for pop-ups was almost twice that of banner advertisements. Gartner analyst Denise Garcia (Kane, 2003) believes that the high response rate is due to Internet users being unaware of how to close pop-up windows and predicted that once users learned how to close the windows that the response rate would decrease. Surveys such as this highlight consumer attitudes to pop-ups but also discredit claims that click-through rates alone are a good indicator of the effectiveness of an online advertisement.

In 1998 Previte and Forrest conducted a study that focused on Internet users' belief and attitudes about Internet advertising. The study found that Internet users with "one year or less" experience have a less negative attitude to advertising on the Internet than users with four or more years experience. Differences are apparent between new and experienced users on issues concerning advertising's function and role in providing product information, social role and image of advertising, and like or dislike of Internet advertising.

Psychological Effects of Pop-Ups

Even if an Internet user wishes to eradicate these pop-ups from their surfing experience, some online advertisers continue to force their pop-up advertisements on the user. This makes the user feel imposed as there is no choice but to act in order to remove the advertisement (Benitez, 2002). Users become frustrated with advertisements like pop-ups which obstruct information, and are an unwanted interruption (Chan et al., 2004). Internet users are goal-oriented and perceive advertisements to be even more intrusive than when they are viewed in other media (Edwards et al., 2002).

A study investigated Internet surfers' reactions when they are forced to view advertising (Edwards et al., 2002). This causes a perception of intrusiveness (an interruption), the result of which is a retreat away from the source of irritation, or "ad avoidance" (Edwards et al., 2002). The aim of the study was to further understand how users come to define advertisements as irritating and decide to avoid them. Irritation can result from exposure to more stimuli that do not contribute to the task (McCoy, Galletta, Everard, & Polak 2004), when consumers are irritated by advertisements, they are more likely to avoid them (Li, Edwards, & Lee, 2002). The study by Edwards et al. (2002) found that the variables found to limit perceptions of intrusiveness involve:

targeting viewers when their cognitive effort is low, increasing the relevancy of the advertising, and providing value to viewers. Strategies that seek to minimise the interruption of viewers' current activities are likely to meet with less resistance. The study concluded that users should be exposed to pop-up advertisements only at breaks in content (Edwards et al., 2002), but with regards to pop-ups, this is not currently a trend online.

"Banner blindness" research supports the idea that people do ignore online advertisements; however similar research has not been conducted with regards to pop-up advertisements. Jan Benway and David Lane coined the phrase "banner blindness", the term, does not apply only to advertising banners. The term "banner" is broadly defined to mean anything that is intended to stand out from other items on a webpage and attract attention (Benway, 1998). However, as pop-up advertisements are independent windows that are not embedded within a webpage "banner blindness" research does not apply to this form of advertising.

Cognitive Effects of Pop-Ups

A study by McCoy, Galletta, Everard, and Polak (2004) found that retention of both site content and advertisement content was higher when pop-up advertisements were not used, McCoy et al. found that pop-up advertisements reduce a person's retention of both site and advertisement content more severely than in-line advertisements (banner advertisements). The study also found that a users intention to return to a website was higher when the website had no (or a perceived minimum of) advertisements. This study found that pop-ups distracted the users from the content the user was attempting to view.

Although pop-ups are distracting to the user, a study found that there was no significant difference between the memory recall of pop-ups and the recall of banner advertisements when both forms of advertising are viewed by the user (Diao & Sundar, 2002). The study was interested in the direct and combined effects of animation and pop-ups on online users' attention to online advertisements, as indicated by orienting response (or) and memory. The term "orienting response" was coined by Ivan Pavlov, it is the reflex that causes an organism to respond immediately to a change in its environment (Pavlov, 1927). The study found that participants exhibited stronger orienting responses with the sudden onset of pop-up windows than with the onset of banner advertisements; however, as mentioned there was no significant difference in memory recall (Diao & Sundar, 2002). Although the participants reacted more strongly to the pop-up advertisements, these were not remembered more than the banner advertisements.

On the Internet, at any moment in time, a user is surrounded by far more than can be attended to. When a user tries to focus on just one of the surrounding stimuli or events, the remaining ones are distractions that have to be eliminated or ignored. If a user is viewing a web-

page and a pop-up appears, the user will be focused on the content of the web-page, and consequently will ignore the content of the distraction. The mental process of eliminating those distractions is called filtering or selecting (Broadbent, 1957). The Filter Model suggests that human senses have a limited "channel capacity" and that people easily become "overwhelmed" by too much information. The filter model states that attention determines what information reaches the pattern recognition stage, the ability to correctly understand obscure sensory information (Broadbent, 1957). Even if advertisers force their pop-ups on a user, some users may simply continue to eliminate these distractions, but cognitively, rather than technologically.

Broadbent's theory was challenged by Neisser in 1967. Neisser argued for a constructive view of cognition in which perception is shaped by existing knowledge and that attention is influenced by experience. He proposed that people could learn to cope with more than one form of stimulus, and argued that attention was a skill, which could be learned. An Internet user could therefore learn to focus attention on desired information rather than the distractions appearing on the screen. A user that has been exposed repeatedly to distracting stimuli will learn to attend to which information is most important.

Conclusion

If both online advertising spending and the use of pop-ups continue to increase, Internet users will be exposed to more pop-up advertisements online despite how unpopular pop-ups are perceived to be, and how they affect both the user and the brand.

Pop-ups cause too much stimuli online, thus causing the user stress (Berlyne, 1960). Pop-ups are irritating (McCoy et al., 2004; Edwards et al., 2002), annoying (Kane, 2003), distracting (McCoy et al., 2004) and create negative attitudes (Chan et al., 2004; Safran, 2001; Previte & Forrest, 1998). For new users of the Internet or persons that are not experienced online, the online environment is likely to be more stressful compared to an experienced user. If it takes time for a user to learn to ignore pop-ups, some users (such as older users) may not reach this stage of experience (due to sporadic usage), thus making the Internet a less than hospitable environment for inexperienced users. With the rise in popularity of the Internet, it is important that it be as accessible to as many people as possible. Removing or reducing negative stimuli, such as pop-up advertisements, that have been shown to be cognitively damaging (McCoy et al., 2004) and psychologically damaging (Benitez, 2002; Chan et al., 2004; Edwards et al., 2002) will increase the accessibility and amiableness of the Internet for everyone.

<u>Research Questions</u>

The aim of this study is to investigate the effects of long term experience online, on the memory recall of pop-up advertisements. The primary hypothesis suggests as a user becomes more experienced, they learn to focus their attention online, thus learning to filter out the distraction of pop-up advertisements, based on the research by Broadbent (1957) and Neisser (1967).

Primary Hypothesis: *The memory recall of pop-up advertisements is higher in inexperienced Internet users when compared to experienced Internet users.*

The existence of pop-up blocking software and the support that industry leaders have for this type of software suggests that a large number of Internet users use pop-up blocking software (Google Toolbar, 2005; Yahoo! Toolbar, 2005; Internet Explorer Home, 2005). The secondary hypotheses suggests that the more experienced a user is online (and thus the more exposed they have been to pop-up advertisements) the more likely they are to use pop-up blocking software.

Secondary Hypothesis: *Experienced Internet users are more likely to use pop-up blocking software.*

Studies have found that an Internet users' belief and attitudes about Internet advertising changes with experience (Previte & Forrest, 1998). The following hypothesis suggests that the reason these attitudes change is due to negative experiences with pop-up advertisements.

Tertiary Hypothesis*: Experienced Internet users are more likely to have had negative past experiences with pop-ups.*

Method

Design

This study was single-blind – as there was a level of deception involved, in order to test the participants memory recall, without any biases. The study was conducted in a computer laboratory. The independent variable was the users' experience. The dependent variables, with regards to each hypothesis, were: if they remembered the product being advertised in the pop-up, if they used pop-up blocking software and if their prior experience with pop-ups was positive.

Participants

There was a sample size of 70 subjects in total. A convenience sample of undergraduate Irish students participated in this study, participants came from a variety of ethnic and socio-economic backgrounds, and all participants spoke English as a first language. Table 1 describes the frequency of males and females, 55.7% of the participants were male and 44.3% were female. Figure 1 describes the raw figures of 39 male participants and 31 female participants.

Table 1: Gender of participants.

	Frequency	Percent
Male	39	55.7
Female	31	44.3
Total	70	100
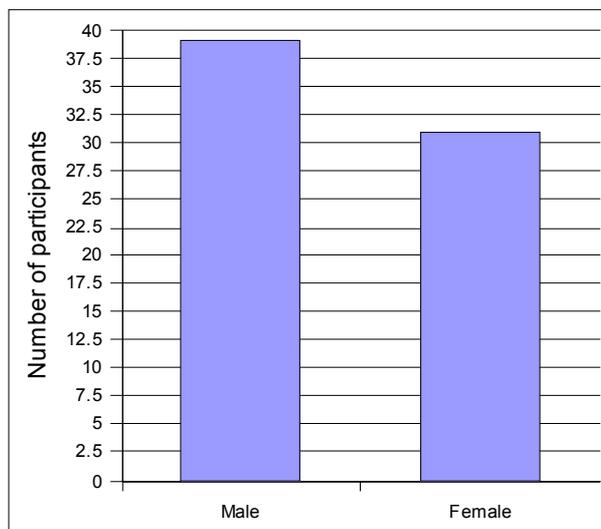
Figure 1: Gender of participants.

The age range varied from 18 to 60. Table 2 describes the mean and the standard deviation. The mean age for males was 22.17, and the mean age for females was 22.32. The total mean age was 22.24 and the standard deviation was 6.45.

Table 2: Age of participants.

	Mean	Std. Deviation
Male	22.17	6.65
Female	22.32	6.3
Total	22.24	6.45

There were two participant groups – the "Experienced" group and the "Inexperienced" group. Subjects were placed in each group based on their answers to the following questions:

1. How long have you been using the Internet for?
2. On a rating of 1 to 5, how skilled are you at using the Internet?

Participants that answered "4 years to 6 years" or "7 years or more" to the first question listed, and answered in the high range of the Likert scale to question 2, were placed in the "Experienced" group. The remaining participants were placed in the "Inexperienced" group.

Table 3 and Figure 2 describe the placement of participants into the two groups. There were 36 participants in the inexperienced group and 34 participants in the experienced group. 51.4% of the participants were grouped into the inexperienced group and the remaining 48.6% were placed in the experienced group.

Table 4 and Figure 3 describes the breakdown of male and females in each group. There were 17 males in the inexperienced group and 19 females. There were 22 males in the experienced group and 12 females.

Table 5 describes the mean ages of each group. The mean age for the inexperienced group was 21 with a standard deviation of 3.65. The mean age of the experienced group was 23.5 with a standard deviation of 8.33.
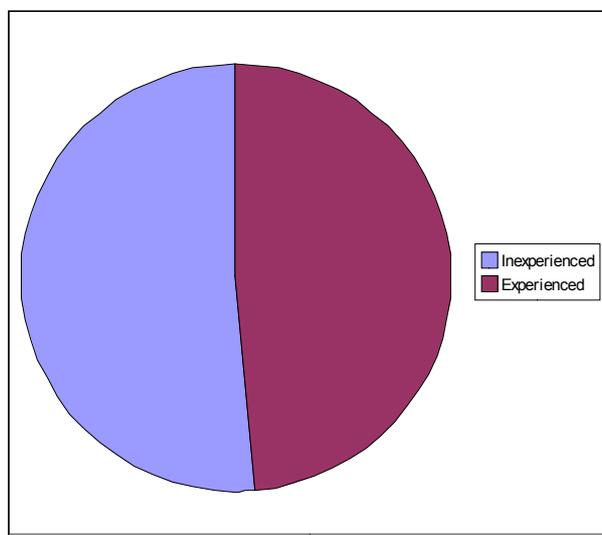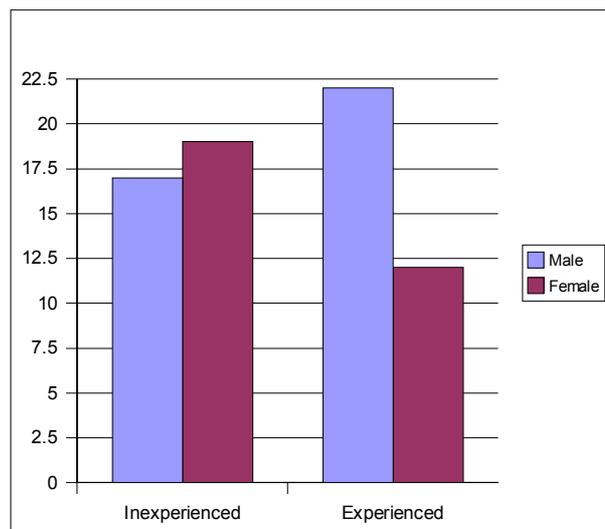
Figure 2: Number of participants in each group.

Table 3: Number of participants in each group.

	Frequency	Percent
Inexperienced	36	51.4
Experienced	34	48.6
Total	70	100.0

Table 4: Number of males and females in each group.

	Male	Female	Total
Inexperienced	17	19	36
Experienced	22	12	34
Total	39	31	70

Figure 3: Number of males and females in each group.

Table 5: Ages of participants in each group.

	Mean	Std. Deviation
Inexperienced	21	3.65
Experienced	23.5	8.33
Total	22.24	6.45

Materials

Paper-pencil survey:

The paper-pencil survey consisted of 11 questions. These questions were related to pop-up advertisements (Appendix A). For example:

1. During the online survey a Pop-Up Advertisement appeared. Do you remember seeing this Pop-Up Advertisement?
2. Do you use Pop-Up blocking software? Or a web browser that blocks Pop-Ups?

Consent form:

The consent form indicated to the participant that their data would remain anonymous and that they could remove themselves from the study at any time (Appendix B).

Online survey:

The online survey was created by a web developer/designer under the supervision of the researcher. An industrial strength survey software called UCCASSv1.8.1. was used. The online survey consisted of 8 questions. These questions were related to "Internet Usage" and key demographic information (Appendix C). For example:

1. How often do you use the Internet?
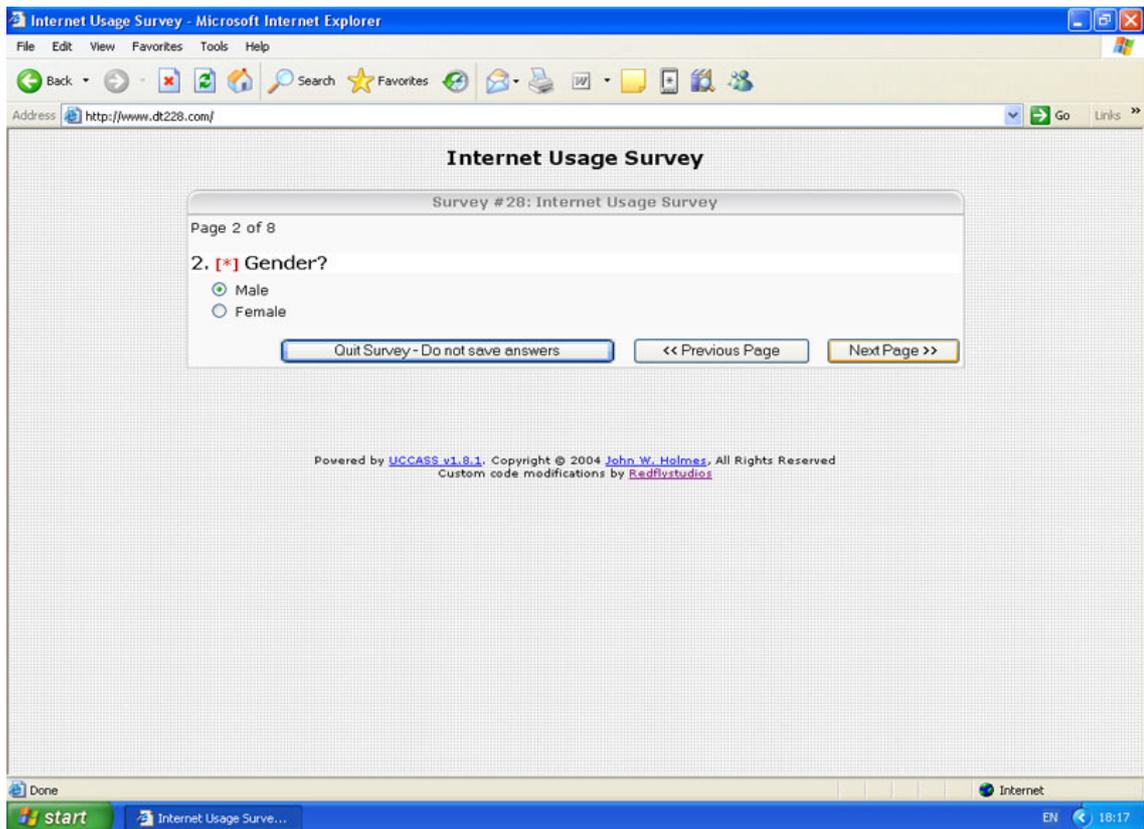2. On a rating of 1 to 5, how skilled are you at using the Internet?
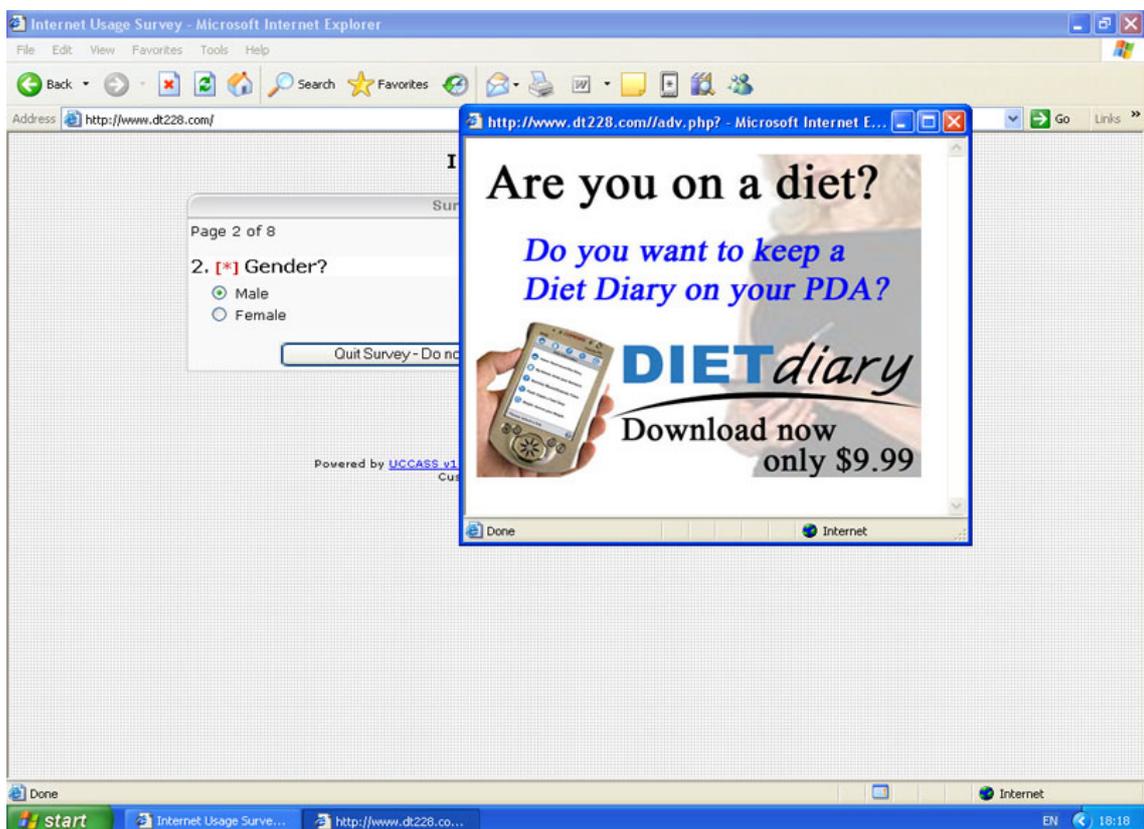
Figure 4.1: A screen-shot of the online survey.

Figure 4.2: A screen-shot of the online survey with the pop-up advertisement.

A pop-up advertisement:

Figure 5: The pop-up advertisement.

The pop-up advertisement was advertising a fictional product – a piece of software for a mobile computing device. Two main images were used – a PDA and a faded image of a woman in the background. 4 main bodies of text were used - "Are you on a diet", "Do you want to keep a Diet Diary on your PDA?", "Diet Diary", "Download now, only $9.99".

Procedure

Pilot Study:

A pilot study was conducted with 10 participants of varied age and experience, both male and female. Conclusions from the pilot study were that the questionnaires did not require any changes, the pop-up was a realistic interpretation of a real pop-up advertisement, and that the online survey worked adequately.

The Study:

As the participants were to complete an online survey, the settings were altered on each computer each participant was to use. As a precaution any pop-up blocking software was disabled completely and the Internet cache was emptied.

Participants completed the online survey which focused firstly on their demographics and secondly on their Internet experience and frequency of use. During this survey a pop-up window

14

displaying an advertisement appeared - 20 seconds into the online survey.

After the survey was completed the participants completed a pencil paper test – with questions relating to the pop-up advertisement that appeared, questions on their attitudes/experience of pop-ups and questions related to pop-up blocking software.

After completing both surveys the participants were debriefed.

Results

The raw data was collated, tabulated, and analysed using SPSS Version 14. A number of Chi Squared tests were used to examine the data with regard to the hypotheses, and other data, that were unrelated to the hypotheses.
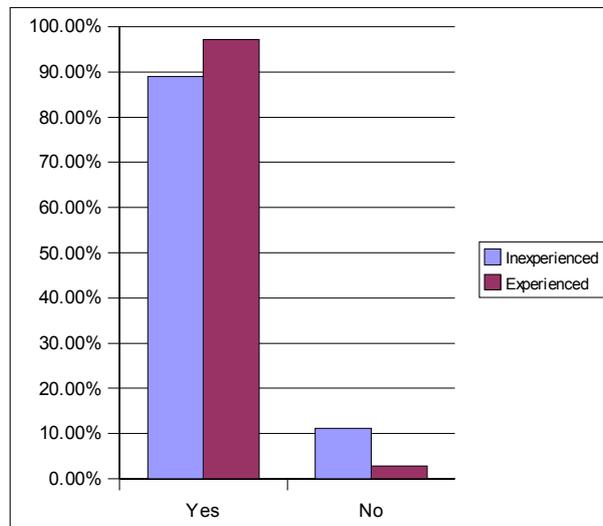
Results Related to the Hypotheses

When questioned "Do you remember seeing this Pop-Up Advertisement?", 92.9% of participants answered "Yes" (see Table 6). 88.9% of the inexperienced group and 97.1% of the experienced group answered "Yes" to this question (see Figure 6).

A chi-square test was used to investigate if there was a relationship between how the participant answered this question and how experienced they were online. In the results, 2 cells (50%) had expected count less than 5, thus Fisher's Exact Test was used. A high significance value (>0.05) of 0.197 was found, which indicates that there is no relationship between the two variables (the participant answer and their level of experience online).

Table 6: Do you remember seeing this Pop-Up Advertisement?

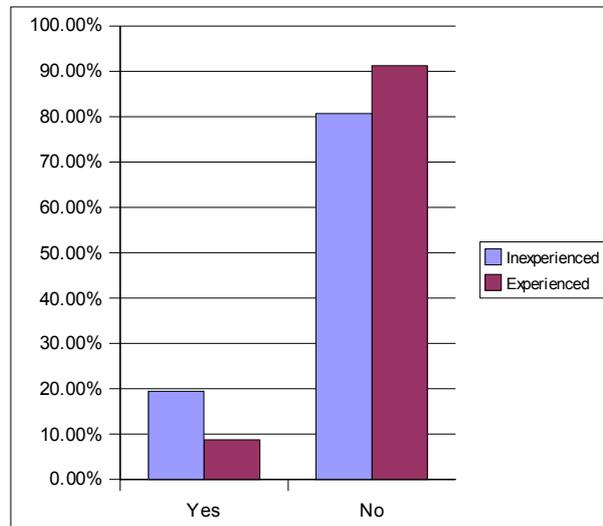|	Yes	No
Inexperienced	88.9%	11.1%
Experienced	97.1%	2.9%
Total	92.9%	7.1%

Figure 6: Do you remember seeing this Pop-Up Advertisement?

When questioned "Do you remember what this Pop-Up was advertising?", 85.7% of participants were unable to correctly identify the product being advertised (see Table 7), 80.6% of the inexperienced group and 85.7% of the experienced group answered "Yes" to this question (see Figure 7).

A chi-square test was used to investigate if there was a relationship between how the participant answered this question and how experienced they were online. In the results 1 cell (25%) had expected count less than 5, thus Fisher's Exact Test was used. A high significance value (>0.05) of 0.177 was found, which indicates that there is no relationship between the two variables (the participant answer and their level of experience online).

Table 7: Do you remember what this Pop-Up was advertising?

	Yes	**No**
Inexperienced	19.4%	80.6%
Experienced	8.8%	91.2%
Total	14.3%	85.7%

**Figure 7: Do you remember what this Pop-Up was advertising?**

When questioned "Do you remember anything about the Pop-Up that appeared?", 44.3% of participants were able to correctly identify a textual or graphical element of the pop-up advertisement (see Table 8), this compromised of 47.2% of the inexperienced group and 41.2% of the experienced group (see Figure 8).

A chi-square test was used to investigate if their was a relationship between how the

participant answered this question and how experienced they were online. In the results 0 cells had expected count less than 5, thus Pearson Chi-Square was used. There was a high significance value (>0.05) of 0.611, which indicates that there is no relationship between the two variables (the participant answer and their level of experience online).

Table 8: Do you remember anything about the Pop-Up that appeared?

|	Yes	No
Inexperienced	47.2%	52.8%
Experienced	41.2%	58.8%
Total	44.3%	55.7%
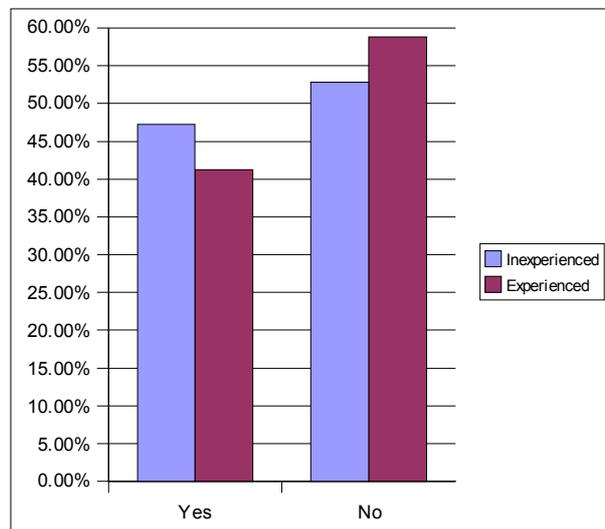
Figure 8: Do you remember anything about the Pop-Up that appeared?

When questioned "Do you use Pop-Up blocking software? Or a web browser that blocks Pop-Ups?" 54.3% of participants answered "Yes" (see Table 9). 36.1% of the inexperienced group and 73.5% of the experienced group answered "Yes" to this question (see Figure 9).

A chi-square test was used to investigate if their was a relationship between how the participant answered this question and how experienced they were online. In the results 0 cells (0%) had expected count less than 5, thus Pearson Chi-Square was used. There was a low significance value (<0.05) of 0.002, which indicates that there is a relationship between the two variables (the participant answer and their level of experience online).

Table 9: Do you use Pop-Up blocking software? Or a web browser that blocks Pop-Ups?

|	Yes	No or Unsure
Inexperienced	36.10%	63.90%
Experienced	73.50%	26.50%
Total	54.30%	45.70%
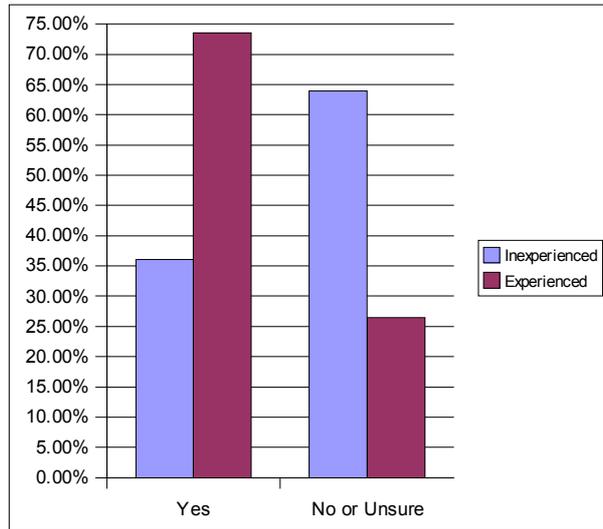
Figure 9: Do you use Pop-Up blocking software? Or a web browser that blocks Pop-Ups?

When questioned "Have your past experiences with Pop-Up Advertisements been positive?", 8.8% of participants answered "Yes" (see Table 10). 8.6% of the inexperienced group and 9.1% of the experienced group answered "Yes" (see Figure 10).

A chi-square test was used to investigate if there was a relationship between how the participant answered this question and how experienced they were online. In the results 2 cells (50%) had expected count less than 5. Thus Fisher's Exact Test was used. There was a high significance value (>0.05) of 0.635, which indicates that there is no relationship between the two variables (the participant answer and their level of experience online).

Table 10: Have your past experiences with Pop-Up Advertisements been positive?

|	Yes	No
Inexperienced	8.6%	91.4%
Experienced	9.1%	90.9%
Total	8.8%	91.2%
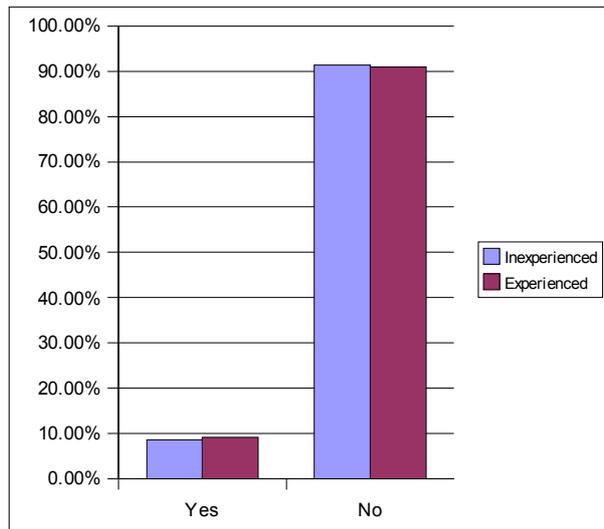
Figure 10: Have your past experiences with Pop-Up Advertisements been positive?

Additional Results

When asked "Are you familiar with Pop-Up Advertisements online?", 95.7% of participants answered "Yes" (see Figure 11).

When asked "Do you think Pop-Ups are effective as advertising tools?" 32% of participants answered "Yes" (see Figure 11), 33% of the inexperienced group and 29% of the experienced group (see Figure 12). A chi-square test was used. There was a high significance value (>0.05) of 0.462, which indicates that there is no relationship between the two variables (the participant answer and their level of experience online).

When asked "Have you ever purchased a product after clicking on a Pop-Up Advertisement?", 3% of participants answered "Yes" (see Figure 11), 5% of the inexperienced group and 0% of the experienced group (see Figure 12). A chi-square test was used. There was a high significance value (>0.05) of 0.261, which indicates that there is no relationship between the two variables (the participant answer and their level of experience online).
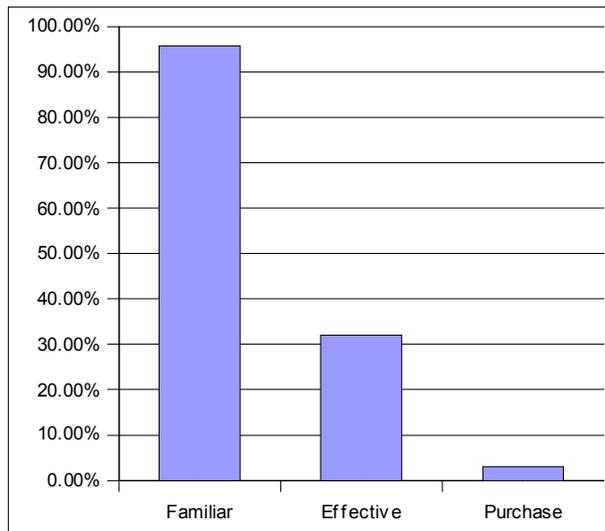
**Figure 11: Familiarity, effectiveness and purchase?**
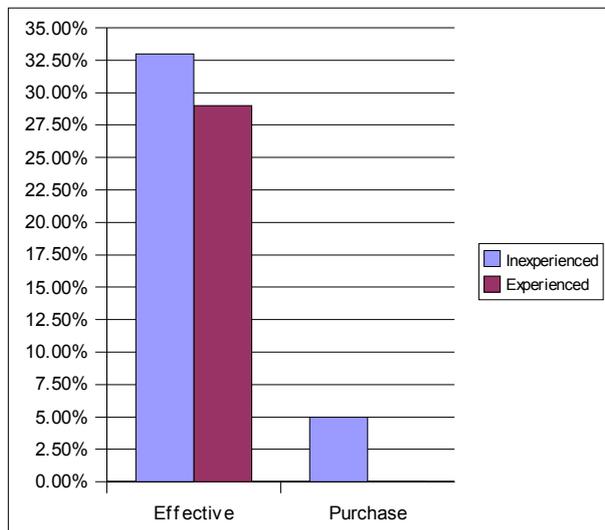
**Figure 12: Effective and purchase? Comparative between the two groups.**

When asked "Have you ever visited a website after clicking on a Pop-Up Advertisement?", 52% of participants answered "Yes" (see Figure 13), 38% of the inexperienced group and 67% of the experienced group (see Figure 14). A chi-square test was used. There was a low significance value (>0.05) of 0.016, which indicates that there is relationship between the two variables (the participant answer and their level of experience online).

When asked "Did you click on this Pop-Up on purpose?", only 33% of this group answered "Yes" (See Figure 13), 21% of the inexperienced group and 39% of the experienced group that answered "Yes" to "Have you ever visited a website after clicking on a Pop-Up Advertisement?" (see Figure 14). A chi-square test was used. There was a high significance value (>0.05) of 0.228, which indicates that there is no relationship between the two variables (the participant answer and

their level of experience online).
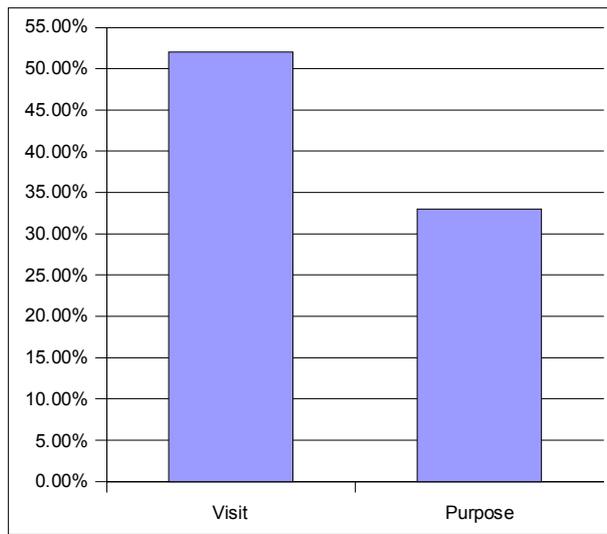
Figure 13: Visit and purpose?
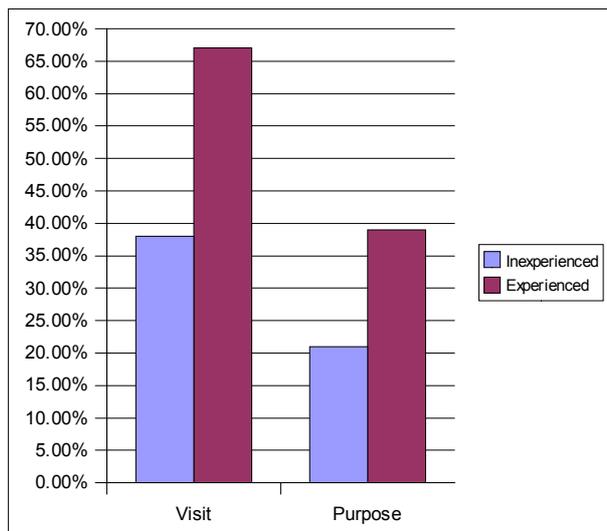
Figure 14: Visit and purpose? Comparative between the two groups.

Discussion

Summary of Findings

The expected results were that both the inexperienced group and experienced group would notice the pop-up that had appeared on their screen, and the results did indicate that the majority of both groups remembered seeing the pop-up advertisement. Although both groups remember seeing the pop-up, the majority of both groups did not remember the actual product being advertised. However, approximately half of both groups did retain some information from the advertisement. The results found that there was no significant difference in the memory retention of the pop-up advertisement between the two groups.

Both groups were questioned on whether their past experiences with pop-ups had been positive. It was expected that the experienced group would have less positive experiences with pop-ups, however, the results indicate that the majority of both groups have had no positive past experiences with pop-up advertisements. There was no significant difference found between the two groups' past experiences.

Both groups were questioned on whether they use pop-up blocking software. It was expected that a larger proportion of the experienced group would answer "Yes" to this question. The results indicate that a large majority of the experienced group use pop-up blocking software and that a large majority of the inexperienced group did not use pop-up blocking software or were unsure to whether they did or not. The results indicated that there is a relationship between how experienced a user is and how likely they are to use pop-up blocking software.

Additional Findings

Only a third of participants believed that pop-ups were effective as advertising tools, and a small minority had purchased a product after clicking on a pop-up advertisement, this minority were in the inexperienced group only.

Over half of the participants had previously visited a website after clicking on a pop-up advertisement; however, only a third of this group had clicked on this pop-up on purpose. A higher number of participants in the experienced group (when compared to the inexperienced group) had visited a website after clicking on a pop-up, and the results indicated that there is a relationship between experience, and how likely the Internet user is to have ever clicked on a pop-up advertisement. However, there was no relationship found between experience and how likely the Internet user is to have clicked this pop-up advertisement on purpose or not.

Research Questions

Primary Hypothesis: *The memory recall of pop-up advertisements is higher in inexperienced Internet users when compared to experienced Internet users.*

The primary hypothesis was not supported. The results indicated no difference in the memory recall between the two groups, but the results did indicate low memory recall in both groups.

Secondary Hypothesis: *Experienced Internet users are more likely to use pop-up blocking software.*

The secondary hypothesis was supported. The results indicated a relationship between how experienced a user is and how likely they are to use pop-up blocking software.

Tertiary Hypothesis: *Experienced Internet users are more likely to have had negative past experiences with pop-ups.*

The tertiary hypothesis was not supported. The results indicated that there was no significant difference found between the two groups' past experiences. However, the majority of both groups were found to have had no positive past experiences with pop-up advertisements.

<u>Implications of Findings</u>

The implications of these findings suggests that both inexperienced users of the Internet and experienced users of the Internet notice pop-ups online, but do not fully attend to the information contained within them. These findings support the studies by McCoy et al (2004) that found that retention of advertisement content was higher when pop-up advertisements were not used, and by Diao and Sundar (2002) that found that participants exhibited orienting responses with the sudden onset of a pop-up window. This study and the studies by McCoy et al (2004) and Diao and Sundar (2002) indicate that although Internet users may respond to a pop-up window, they do not remember their content. These findings suggest that pop-ups are ineffective tools for advertising online.

The results of this study also indicates that no matter how experienced a user is online they have a familiarity with pop-up advertisements and have had no positive experiences with them. These findings are similar to those by Safran (2001) who found that a small minority of respondents

had positive feelings towards intrusive advertising formats like pop-ups. However, this study is dissimilar to the study by Previte and Forrest (1998) that found differences between new and experienced users on issues concerning Internet advertising.

The results of this study indicate that there is a relationship between how experienced a user is online, and how likely they are to have clicked on a pop-up advertisement. The results also suggest that experienced users use pop-up blocking software, therefore, as a user becomes more experienced online (and more experienced with actually clicking on pop-up advertisements) the more likely they are to start using pop-up blocking software. Statements such as "Many users have learned to ignore these ads" (Garcia, 2003; Goldhaber 1997; Kahng 2001; Lee & Benbasat, 2003; Moe, 2003) should perhaps be replaced by a statement such as the following: "Many users have learned to install pop-up blocking software."

The implications of these findings suggest that both inexperienced users of the Internet and experienced users of the Internet notice pop-ups online, but do not fully attend to the information contained within them. Approximately half of the participants in each group remembered only partial content from the pop-up. For instance, some participants were able to correctly state the price of the product but were unable to remember the actual product being advertised. Other participants were able to recall the word "Diet" or that the product was in some way related to "Dieting". This suggests partial memory recall of the pop-up. This indicates that the memory recall of a product being advertised in a pop-up advertisement may be higher if a minimum amount of information is contained within the pop-up. Users may recall the product being advertised if the name of the product is the only information being given to them.

However, if an experienced user of the Internet is being targeted by advertisers using pop-ups it is less likely that this demographic will even see the pop-up. The experienced group was questioned on whether they use pop-up blocking software, and a large majority answered "Yes". This may be due to the fact that the majority of this group indicated that they have had no positive past experiences with pop-up advertisements. These findings suggest that experienced Internet users actively attempt to remove pop-ups from their Online experience due to past negative experiences with pop-up advertisements online.

Design Limitations

This study was interested in users with long term experience using the Internet. A flaw in the design of the research was separating the participants into only two groups. The groups could have been separated into three groups: beginners, novice and advanced. This would have compensated for the users that had a high skill level but had been using the Internet for three years or less. These users may have been novice users, rather than actually inexperienced users of the Internet. The

results may have been affected by this as some participants placed in the inexperienced group may have been highly skilled users of the Internet. Separating the participants into beginners, novice and advanced would have allowed for a comparison across three groups, although, a significantly larger sample size would have been needed.

In order to group individuals based on their level of experience online a more accurate assessment than a self-assessment is needed to be developed. There are obvious flaws with regards to participants self-assessing their own level of ability, for example, in the online questionnaire (Appendix C) participants were asked to place themselves in either the inexperienced group or experienced group. However, a large majority of participants initially placed themselves in the experienced group, even participants that had scored 2 or less (self assessed on the Likert scale) on their skill level online. Thus, this self-assessment question was disregarded during the analysis of the raw data.

The experiment that was conducted introduced the participant to an online environment in which they had a goal, so they were orientated towards achieving that goal, thus, their attention was focused on their task. A more realistic environment would have had the switching between being goal-orientated and browsing. For a more accurate assessment of the participants memory recall they should have been tested under these two conditions, rather than just one.

Follow up research must be conducted to achieve a more accurate assessment, in which participants must be tested under two conditions, as it is naive to assume that Internet users are continually goal-orientated when online. This follow-up research would form a more accurate assessment of an Internet users memory recall of pop-up advertisements.

Future Research

Originally the online survey was designed to capture demographic information and to test the amount of time it took for a participant to close the pop-up window. However, the timer was unable to supply the time it took for the participant to remove the pop-up window by simply clicking on the main survey window (instead of closing it by clicking the X in the upper right hand corner). The data that was collected on how long it took for the participant to close the window was disregarded because of this, however, given more time the web designer/developer would have been able to compensate for this flaw in the online survey design. Future research could investigate how quickly a user closes the pop-up and what variables are involved in speeding up or slowing down this process.

Future research could involve testing a participant's memory retention of pop-ups while browsing the Internet and then comparing their memory retention while they are goal orientated. This study could also involve using multiple pop-up advertisements. A study such as this could also

test a participants stress levels while browsing the Internet under two conditions: with a pop-up blocker, and without a pop-up blocker.

Other future research should investigate what variables contribute to an Internet user installing pop-up blocking software on their computer.

Conclusions

The results of this study suggest that both inexperienced users of the Internet and experienced users of the Internet notice pop-ups online, but do not fully attend to the information contained within them. The findings of this study suggest that users do not learn to ignore pop-ups, but that they learn to install pop-up blocking software. This research suggests that pop-up advertisements are not effective upon users that are goal-orientated. Future research needs to investigate users when they are browsing the Internet without a specific goal.

The overall conclusion of this study is that pop-ups are unnecessary cognitive and psychologically damaging distractions to Internet users and are ineffective as advertising tools online, and that online advertisers should focus on alternative and more effective forms of advertising.

References

Alexa.com (2006) Global Top 500 Websites. Retrieved January 1st, 2006, from
http://www.alexa.com/site/ds/top_sites?ts_mode=global&lang=none

Benway, J. P. (1998). Banner blindness: The irony of attention grabbing on the World Wide Web.
Proceedings of the Human Factors and Ergonomics Society 42nd Annual Meeting, 1, 463-467.

Benitez, T. (2002). Pop-ups fizzle in a flash. *Incentive, 176, 11,* 14.

Broadbent, D. E. (1957). A mechanical model for human attention and immediate memory.
Psychological Review, 64, 205-215.

Bumatay, M. (2002). Few Advertisers Employ the Technology, Despite Ubiquity of Pop-Up and
Pop-Under Ads. Retrieved January 30th, 2006 from http://phx.corporate-ir.net/phoenix.zhtml?c=82037&p=irol-newsArticle&ID=538965&highlight=

Chan, A., Dodd, J., & Stevens, R. (2004) The efficacy of pop-ups and the resulting effect
on brands. Retrieved 10th October 2005 from
http://www.bunnyfoot.com/bunnyfoot_popup.pdf

Diao, F. & Sundar, S.S. (2004). Orienting Response and Memory for Web Advertisements.
Communication Research, 31(5), 537-567.

Edwards, S., Li, H., & Lee, J.E. (2002). Forced exposure and psychological reactance: Antecedents
and consequences of the perceived intrusiveness of pop-up ads. *Journal of Advertising, Fall 2002.*

eMarketer. (2004). Industry stats and data by eMarketer. Retrieved January 30th, 2006 from
http://www.iab.net/resources/industrystats.asp

Goldhaber, H.M. (1997). Attention Shoppers! Retrieved October 10th, 2005, from
http://www.wired.com/wired/archive/5.12/es_attention.html

Google, Inc. (2005). Google Toolbar. Retrieved October 10th, 2005, from http://toolbar.google.com

Kahng, J. (2001). *Evaluating Web Browser Security Interfaces for a More Meaningful Design.* Unpublished undergraduate thesis. Presented to The Faculty of the School of Engineering and Applied Science, University of Virginia.

Kane, M. (2003). Pop-ups are annoying, but effective. Retrieved October 10th, 2005 from http://news.zdnet.co.uk/business/0,39020645,2128735,00.htm

Microsoft, Inc. (2005). Internet Explorer Home. Retrieved October 2nd, 2005 from http://www.microsoft.com/windows/ie/default.mspx

James, W. (1950) *The Principles of Psychology.* New York: Dover.

Kane, M. (2003). Pop-ups: unpopular, but effective. Retrieved October 10th, 2005 from http://news.zdnet.co.uk/business/0,39020645,2128735,00.htm

Lee, W. & Benbasat, I. (2003). Designing an electronic commerce interface: attention and product memory as elicited by web design. *Electronic Commerce Research and Applications, (2) 2003,* 240-253.

Li, H., Edwards, S.M., and Lee, J.H. (2002). Measuring the intrusiveness of advertisements: Scale development and validation. *Journal of Advertising, 31:2,* 37-47.

McCoy, S., Galletta, D., Everard, A., & Polak, P. (2004). A Study of the Effects of Online Advertising: A Focus on Pop-Up and In-Line Ads. *Proceedings of the Third Annual Workshop on HCI Research in MIS, Washington, D.C., December 10-11, 2004.* Retrieved November 28th, 2005, from http://mis.temple.edu/research/documents/GallettaPopupAdStudy.pdf

Moe, W.W. (2003). Should We Wait to Promote?: The Effect of Timing on Response to Pop-Up Promotions. Retrieved October 10th, 2005 from http://interruptions.net/literature/Moe-MS-Submitted.pdf

Morissey, B. (2003) Pop-Ups Work. Retrieved October 2nd, 2005 from http://www.clickz.com/news/article.php/2213101

Neisser, U. (1967). *Cognitive Psychology.* New York: Appleton-Century-Croft.

Olsen, S. (2002). Taking the air out of pop-ups. Retrieved January 28th, 2006 from
    http://news.com.com/2100-1023-947732.html

Olsen, S. (2004). Revenge of the pop-ups. Retrieved January 30th, 2006 from
    http://news.com.com/Revenge+of+the+pop-ups/2100-1024_3-5408453.html?tag=nefd.top

Olsen, S. (2005). Web ad sales hit another record high. Retrieved January 30th, 2006 from
    http://news.com.com/Web+ad+sales+hit+another+record+high/2100-1024_3-
    5965012.html?tag=nl

Pavlov, I. (1927). *Conditioned reflexes: an investigation.* Dover: New York.

Previte, J., & Forrest, Ed. (1998). Internet Advertising: An Assessment of Consumer Attitudes to
    Advertising On the Internet. Retrieved October 24th, 2005 from
    http://130.195.95.71:8081/www/ANZMAC1998/Cd_rom/Previte19.pdf

Safran, D. (2001). Beyond The Click: Ad Reaction Study. Retrieved October 25th, 2005 from
    http://www.dynamiclogic.com/advertising_reaction-execsumm1.pdf

Yahoo Inc. (2005). Yahoo Toolbar. Retrieved October 10th, 2005 from
    http://toolbar.yahoo.com/config/slv4_page?.p=featureindex&.cpdl=net06

Appendix A

Page 1

Dear Student,

Thank you for agreeing to participate in this Internet Usage study. **The following questionnaire/survey is anonymous**, your name will not be taken, and you may withdraw yourself from this study at anytime. If you agree to participant in this study please sign the consent form that accompanies this handout.

        The questionnaire/survey should only take 5 – 10 minutes to complete. Please bear in mind that the more candid and accurate you are in your responses the more useful the information gathered through this questionnaire will be. When you have completed the questionnaire/survey, you can keep Page 1 and Page 4 of this handout.

<div align="right">

Yours,
Sinead Cochrane
e: sineadcochrane@gmail.com

</div>

Instructions*:*

(Please read the following information/instructions carefully)

3. The Internet Usage Survey will be conducted online.

4. Before beginning the survey you will be asked for your username and password.

5. **Your USERNAME and PASSWORD is:**   <Title>

6. When you have completed the online survey please go to Page 2 of this handout.

7. When you are ready, please open **Internet Explorer** and go to the website address:

    http://www.dt228.com

Please complete the online survey before going to Page 2 of this handout.

1. During the online survey a Pop-Up Advertisement appeared.

      a. Do you remember seeing this Pop-Up Advertisement?

          1. Yes ____

          2. No ____

      b. Do you remember what this Pop-Up was advertising?

          3. Yes ____ (if so, please give a brief description of the product being advertised)

       _____

       _____

          4. No ____ dasdasdad

      c. Do you remember anything about the Pop-Up that appeared?

          5. Yes ____ (if so, please give a brief description)

       _____

       _____

          6. No ____

2. Are you familiar with Pop-Up Advertisements online?

          7. Yes ____

          8. No ____

3. Have you ever purchased a product after clicking on a Pop-Up Advertisement?

          9. Yes ____

          10. No ____

4.

      a. Have you ever visited a website after clicking on a Pop-Up Advertisement?

          11. Yes ____ (if yes, please answer part b of this question)

          12. No ____

      b. Did you click on this Pop-Up on purpose?

          13. Yes ____

          14. No ____

5. Have your past experiences with Pop-Up Advertisements been positive?

       15. Yes ____

       16. No ____

6. Do you think Pop-Ups are effective as advertising tools?

       17. Yes ____

       18. No ____

7. Do you know what Pop-Up blocking software is?

       19. Yes ____

       20. No ____ (if so, please skip the remaining questions)

8. Do you use Pop-Up blocking software? Or a web browser that blocks Pop-Ups?

       21. Yes ____

       22. No ____ (if so, please skip the remaining questions)

       23. Unsure ____ (if so, please skip the remaining questions)

9. What type of Pop-Up blocker do you use? If you know the name of the software, please include it in your answer.

       24. Pop-Up Blocking Toolbar ____ name: _____

       25. A web browser that blocks Pop-Ups ____ name: _____

       26. Other ____ name: _____

10. Why do you block Pop-Ups? (please give a brief description)

_____

_____

11. Do you have any other comments to add, in relation to pop-ups?

_____

_____

_____

_____

Page 4

Dear Student,

Thank you for participating in this study.

For the purpose of this study you were originally informed that this study was interested in Internet Usage, as you have probably already noticed the actual purpose of this study was to investigate the memory recall of Internet Pop-Up advertisements. If you have an interest in this study, please do not hesitate to contact me for further information. You may also withdraw your information at any time until the end of February 2006.

Yours,
Sinead Cochrane
e: sineadcochrane@gmail.com

Appendix B

Consent Form

I agree to participate in this study and understand that the information gathered here will remain anonymous, that my name will not be taken (this form will remain separate from the information given). I understand that I may withdraw myself from this study at any time.

Signed:_____

Date:_____

Appendix C

Online Survey Questions

Age: _____

Gender:
3. Male
8. Female

How often do you use the Internet:
3. More than once a day.
4. Once a day.
5. At least once a week.
6. At least once a month.
7. At least once a year.
8. Never.

How long have you been using the Internet for:
    Less than 6 months.
    6 to 12 months.
    1 to 3 years.
    4 to 6 years.
    7 years or more.

On a rating of 1 to 5, how comfortable are you using the Internet?
- 1
- 2
- 3
- 4
- 5

Where do you have access to the internet? (Tick all that are appropriate)
    Your own computer
    A shared computer at home
    In college
    At work
    Other

On a rating of 1 to 5, how skilled are you at using the Internet?
- 1
- 2
- 3
- 4
- 5

Would you consider yourself:
- An inexperienced Internet user
    OR
- An experienced Internet user