

# WEB ADVERTISING: WHAT DO WE KNOW ABOUT ITS ACCEPTANCE AND IMPACTS? - A META-ANALYSIS OF THE LITERATURE

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## Abstract

*Internet advertising market has grown rapidly over the past decade. Its annual revenue has reached around 21.1 billion in 2007, and more than half of Internet advertising is related to Web advertising. Web advertising affects the majority if not all web viewers who would encounter some Web ads at one time or the other when they are using the Web. With such a magnitude on investment and in influence, however, our understanding of Web ads is limited and fragmented. This study aims to provide a comprehensive picture of the state of research on Web advertising, especially its interaction with individual viewers. In this meta-analysis of more than sixty empirical research articles published from 1996 to 2007, we develop a framework of Web advertising research that can be used to demonstrate the research foci so far. Both dependent and independent variables can be classified with the framework. Our findings indicate that (1) empirical studies on Web advertising have considered features of four components and their interactions: viewer, Web Ad, ad host, and product/service being advertised. The impacts of Web ads have been found to be on viewers and viewers' interactions with ads, hosts, and products/services. (2) The number of empirical research of Web advertising has increased gradually in different academic disciplines; however, the number is very insignificant compared to the growing Web advertising market and the broad influence of Web ads. (3) The study efforts are scattered and the findings are inconsistent and inconclusive. We conclude the existing studies and point out future research directions in this area.*

*Keywords: Internet, Web, Advertising, meta-analysis, acceptance, reaction, impact*

# 1 INTRODUCTION

Internet advertising market has grown rapidly during the last decade since the appearance of the first Internet advertisement in 1994 (Hollis 2005). According to a recent report from the Interactive Advertising Bureau (IAB) and PricewaterhouseCoopers (PwC), Internet advertising revenues for 2007 are estimated to grow to \$21.1 billion, a 25 percent increase over the previous revenue record of nearly \$16.9 billion for year 2006 (IAB 2008). Also, the Kelsey Group recently provided an estimate of \$45 billion for Internet advertising globally, and predicted Internet advertisement revenues to reach \$147 billion globally by 2012 (Pacheco 2008). As more and more people spend time on the Internet, marketers believe that Internet advertising would be a goldmine. From the viewers' perspective, Internet advertising can be considered a special kind of Internet services. It is one of the many ways to get to know in a relatively quick fashion many things being advertised. It is also a convenient and quick way of finding information we need about products, services, businesses, etc. Thus Internet advertising can bring benefits to viewers. On the other hand, Internet advertising also received complains as being annoying or intrusive, and is considered to have negative effects such as affecting people's task performance (Zhang 2000). How do viewers react to Internet advertising and how does Internet advertising affects viewers are thus of great interest to researchers, marketers, designers, and even policy makers.

This research focuses on Web advertisements or Web ads. A Web ad is an advertisement that is presented to the targeted viewers through the World Wide Web. Web ads are usually known as banner ads or display ads on the Internet. Web ads' market share is estimated to be more than half of the whole Internet advertising market (IAB 2007). With the increase of Web ads on the Internet, empirical studies on the effectiveness of Web ads have appeared during the last 10 years. To this date, however, our understanding of how viewers react to Web ads and how Web ads affect viewers is still limited. Few studies have provided an overview of this important research area. The objective of this study is thus to fill in this gap to provide a comprehensive view of the state of empirical research on various factors that influence viewers' reactions to Web ads and factors that influence Web ads' impacts on viewers. Specifically, we conduct a qualitative meta-analysis to illustrate the coverage and findings of the existing studies. We then point out directions for future research efforts, and implications for researchers, marketers, and Web sites and/or Web ads designers. In addition to considering viewers and Web ads as two important components in the study, we also consider other important components that can contribute to the final outcomes of viewers' reactions and Web ads' impacts. Two of such components are identified: features about Web ads' hosts, normally the websites where Web ads are carried or displayed, and features about products and/or services that are being advertised. Such a broad and more balanced consideration help make our findings more relevant and convincing to various stakeholders such as viewers, providers of products or services, marketing agencies, owners and designers of hosts, and public information service policy makers.

## 2 RESEARCH METHOD

### 2.1 Article Selection

Scientifically conducted empirical research articles on Web ads that include any of the four components mentioned early were searched through various online databases. Since Web advertising research is largely interdisciplinary, we broadened our search to include many different academic disciplines. The online databases we used include ACM Digital Library, PsycINFO (EBSCOhost), Communication & Mass Media Complete (EBSCOhost), Communication Studies: A SAGE Full-Text Collection (CSA), Business Source Elite (EBSCOhost), Emerald Fulltext (Emerald Insight), Library Literature and Information Science Full Text (H.W. Wilson), Library, and Information Science &

Technology Abstracts (EBSCOhost). Both title and abstract fields were searched with a list of keywords and their combinations. The keyword list include: 'advertisement,' 'advertising,' 'online,' 'Internet,' and 'Web.' We filtered thousands of articles by reviewing their abstracts and research method parts with the following criteria: (1) used empirical research methods such as survey, interview, and experiment; and (2) covered any of the four components: viewers, Web ads, hosts, and products/service. The search yielded a total of 67 articles to be analyzed in this study. These articles are from diverse academic journals including *ACM CHI*, *ACM SIGIR*, *Communications of ACM*, *Information Systems Research*, *Journal of Associations for Information Systems*, *Journal of Mass Communication Quarterly*, *Communication Research*, *Journal of Advertising Research*, *Journal of Advertising*, *International Journal of Advertising*, *Journal of Interactive Marketing*, *Journal of Marketing Research*, *Journal of Marketing Communications*, *Industrial Management & Data Systems*, *Journal of the American Society for Information Science and Technology*, and several academic conference proceedings and books.

## **2.2 The Research Framework**

Since this research is a meta-data analysis based on previous Web ads studies, a research framework can be very useful for synthesizing existing studies, and thus for making sense of the empirical evidence and demonstrating gaps and future directions (Li et al. 2006). The framework consists of the four components (represented by rectangles) and their interactions (represented by diamonds). It is intended that such a framework can organize all the factors or variables studied in the collected articles, including input variables (independent and moderating variables) as shown in Figure 1 and output variables (mediating and dependent variables) as shown in Figure 2. Details of Figures 1 and 2 will be discussed next.

The Viewer component represents any human factors or characteristics that are studied in the collection. For example, some studies consider viewers' gender or age when examining Web ads design and impacts. The Web Ad component represents the features or characteristics of Web ads that may be of interest to the researchers. For example, a good number of studies examined the effect of animation, which is about the movement feature of Web ads. The Host component is about any attributes of the hosting entities (normally websites) that may be contributing to the Web ads studies. For example, some studies investigated Web ads that appeared in B2C websites. The Product/Service component represents the features about the products/services being advertised.

In addition to the four components, their interactions can have certain characteristics that may contribute to the outcomes of the studies, or being the outcomes of the studies. The Viewer-Ad interaction is about viewers' reactions to ads. The Viewer-Product interaction concerns about viewers' reactions to the products or services being advertised. The Viewer-Host interaction represents viewers' reactions to the hosts. Finally, the Host-Product interaction can represent any relations these two components may have. For example, the advertised product/services may be highly related to the websites' contents and such a situation may affect viewers' reactions to the ads.

We coded each study in an Excel sheet with title, author names, journal, year of publication, factors (independent and moderating variables) and their effects (mediating and dependent variables), research methods, and sample size. The factors and effects parts were guided by the framework at a global level. The specific factors and effects then fulfilled the content of each component and each interaction of the framework, as shown in Figures 1 and 2.

## **2.3 Classifications of the Variables**

Variables that can be considered as inputs to a study were grouped with the framework, and then classified into more specific categories (Figure 1). The majority of the collected studies focused on Web ads features that can be classified into six categories: movement (for example, animation or static), content message (emotional, personal), onset timing (in relation to a task on hand, such as at

the middle of a task), place location (left/right side of the screen, pop-up), exposure (repeated exposure, forced exposure), and other design elements (color, size, media). Viewers' factors included psychology (states) and demographic. The View-Ad interaction had variables such as the ad is congruent with the task on hand, or there were incentives for viewers to act upon ads. The Viewer-Host interaction included variables such as viewers' experience or habit with a website and their search strategies on the website. The View-Product interaction included variables such as personal involvement and familiarity with the advertised products/services. The Ad-Product interaction variable was about the purpose of an ad, which can be branding (to cause awareness) or directional (to support information needs). Finally, the Ad-Host interaction contained congruity between the ads and the contents of the host. The one interaction that had not been covered by this collection of studies is Host-Product.

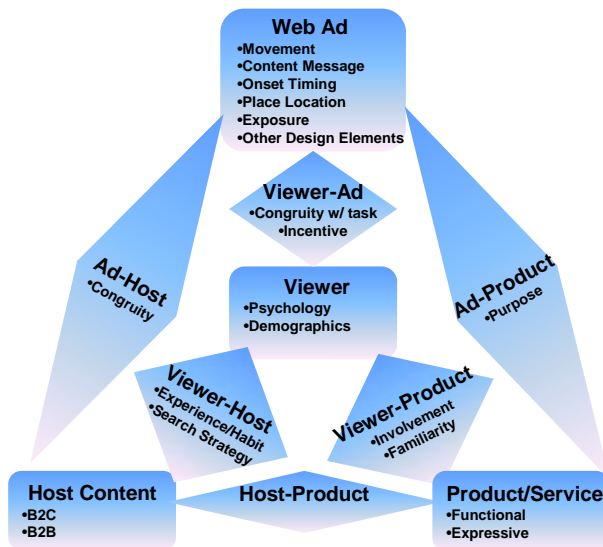


Figure 1. Input Variable Categories

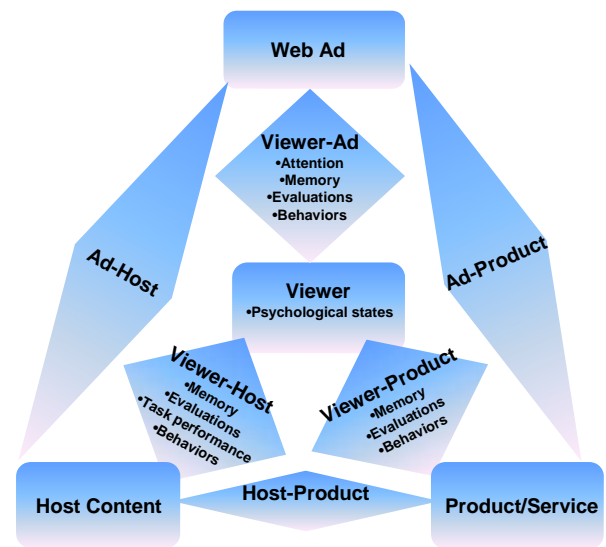


Figure 2. Output Variable Categories

Variables that can be considered as outputs of a study were grouped with the framework, and then classified into more specific categories (Figure 2). Collectively, the output variables were on viewers and their relationships with the other three components: Web ad, host, and product/service. More than half of the studies investigated viewers' reactions to Web ads, which can be classified into four categories: attention on ads (for example, reaction time, awareness), memory of ads (recall, retention of ads), evaluations of ads (beliefs/perceptions, attitude), and behaviors toward ads (click-through). Viewers' reactions to the hosts included four categories: memory for host content (recall and retention of website content), evaluations of host content (beliefs/perceptions, attitude), task performance (speed, accuracy, workload), and behaviors toward host content (length of visit, visiting frequency). Viewers' reactions to products/services being advertised had three categories: memory for products/services (recall and retention), evaluations (credibility, attitude), and behaviors toward products/services (loyalty). Finally, a few studies investigate viewers' psychological states (arousal, heartbeat) as their research outputs.

### 3 EMPIRICAL FINDINGS FROM THE COLLECTION

About half of the articles (39 out of 67) focused on Web ads' various features and their effectiveness, and the rest of the studies (28 out of 67) concentrated on diverse factors and their relationships. Compared to more traditional ads such as printed ads and TV ads, Web ads were found to be both effective (Dahlen et al. 2004; Risdien et al. 1998; Sundar et al. 1998) and less effective (Zhang et al. 2005). Here we organize the findings by input variable categories and their effects on output variables.

### **3.1 Web Ad**

#### *3.1.1 Movement.*

A good number of studies focused on the relationship between animation and its effectiveness. In a series of lab controlled experiments, Zhang et al. found that animation grabbed viewers attention even if viewers wanted to ignore them; and animation generated negative attitude (Zhang 1999, 2000, 2006). Li and Bukovac reported that animated banner ads facilitated quicker reaction times and generate better recall than still banner ads (Li et al. 1999). However, Bayles found that there were no significant relationships between the use of animation and the ability to recall and recognize banner ads (Bayles 2002). Diao and Sundar also mentioned that there was no significant animation effect in Web ads recognition (Diao et al. 2004). On the other hand, a research between animation and click-through rate showed that animated color, text, and graphics had significant effects to the click-through rate (Tsang et al. 2005). Yet it was reported that recalls of ads were especially bad for highly animated banners (Burke et al. 2004; Yoo et al. 2005). Yoo and Kim found inverted U-shaped relationships between the level of animation and both recognition rates and attitude toward Web ads, and suggested that the existence of unintended negative effects of highly animated Web ads (Yoo et al. 2005). Regarding viewers' psychological states, Day et al. found that flash banners appeared to elevate the general level of arousal of the participants (Day et al. 2006). Regarding task performance, Burke reported that flashing text banner increased viewers' workload (Burke et al. 2005).

#### *3.1.2 Content Message.*

Content message includes the use of credibility, emotional appeals, and interactivity. Greer reported that Web ad was not significantly tied to participants' ratings of the story on a website (Greer 2003). Lohtia et al. found that the presence of emotion and animation increased the click-through rate for especially business-to-customer banner advertisements and decreased the click-through rate for business-to-banner advertisements (Lohtia et al. 2003). Lohtia et al. also found that the presence of interactivity lowered the click-through rate of banner advertisements (Lohtia et al. 2003).

#### *3.1.3 Onset Timing.*

Onset timing means when a Web ad would appear on the screen in relation to a viewer's task on the Web. Zhang found that animation that appeared in the middle or toward the end of an information seeking task had the worse effect on attention than animation that appeared at the beginning of the task (Zhang 2001, 2006).

#### *3.1.4 Place Location.*

The ads location can be defined into two categories: one is two-dimensional location on the display screen, and the other is vertical location of ads such as in-line, pop-up, and pop-under. Zhang found that animation on the left side of the screen was more disturbing than the one on the right side (Zhang 2001) and this effect was true over several years of the continued experiments (Zhang 2006). In regards to vertical location, Denes found that users had better feeling about ads and companies in banner ads compared to pop-up ads (Denes 2001). Edwards et al. reported that pop-up ads were perceived as irritating and annoying (Edwards et al. 2002). Chan et al. reported that pop-ups indicated a strong and intense dislike for pop-up ads, resulting in a negative attitude towards the site itself and the brand (Chan et al. 2004). It was found that ads recognition was lower whereas ads recall was higher for pop-up ads compared to banner ads (in-line ads), and that pop-up ads elicited orienting responses by measuring subjects' heartbeats (Diao et al. 2004). In an extensive research regarding ads location and its effectiveness, McCoy found that in-line ads permitted both site and ad content to be

remembered more clearly than pop-ups and pop-unders because advertisements interfered with retention of site content in retaining both site and ads content (McCoy et al. 2007).

### *3.1.5 Exposure.*

Briggs and Hollis found that banner exposure increased in consumers' awareness and their loyalty scores (Briggs et al. 1997). Similarly, Cho et al. reported that the banner ads presented in the format of highest forced-exposure level yielded the most desirable advertising effects such as positive perception, favorable attitude toward the ads, favorable attitude toward the brand, high click-through rate, and high purchase intention (Cho et al. 2001). According to Danaher and Mullarkey, the longer a person was exposed to a Web page containing a banner advertisement, the more likely they were to remember that banner ad (Danaher et al. 2003). Two different studies found that the number of exposures and number of pages regarding Web ads had a positive effect on purchasing probabilities (Hollis 2005; Manchanda et al. 2006). Yoon and Lee found that the exposure effect of a banner ad such as memory for ads and attitude toward ads existed even when the banner was not clicked (Yoon et al. 2007).

### *3.1.6 Other Design Elements.*

These include color scheme, banner size, and media components. The media components include text, image, graphics, flash, video, and sound. Li and Bukovac found that larger banner ads enhanced reaction time and triggered more click-through rate than small banner ads (Li et al. 1999). Zhang et al. found that bright colored animation had stronger effect than dull colored animation in grabbing viewers' attention (Zhang 1999, 2000). Lohtia et al. reported that medium level of color had better click-through rate than low or high levels of color for business-to-business and business-to-customer advertisements (Lohtia et al. 2003).

## **3.2 Viewer**

Jin and Jun found that people's perception to Web ads were influenced by cognitive styles, personalities, communication problems, and negative experiences, when they responded to Web ads on the Internet (Jin et al. 2004). Burnett studied demographic factors and found that disabled consumers had more negative attitude toward Web advertising than non-disabled consumers (Burnett 2006). Yang and Oliver found that among light Internet users, the inclusion of advertisements resulted in significantly lower perceived news value of hard news stories (Yang et al. 2004). Dahlen found that novice users were more affected by banner ads than expert users (Dahlen 2001).

## **3.3 Product/Service**

According to Dahlen and Bergendahl, banner ads worked better as transporters to target ads for functional products, whereas banner ads for expressive products worked better through ad impressions (branding) (Dahlen et al. 2001). It was also found that functional product banner advertisements had higher initial click-throughs and expressive products needed time to wear in as both click-through rates and positive brand attitudes (Dahlen 2002).

## **3.4 Host**

The website context also affects the effects of Web ads. For example, it was found that B2B banner ads had higher click-through rates than B2C banner ads (Lohtia et al. 2003). Yang reported that a humanlike navigation interface led to more favorable attitudes toward the ad, the advertised product, and better product information recall (Yang 2006).

### **3.5 Ad-Host**

The congruity between Web ads and website content was found both non-important and important for the effectiveness of Web ads. Danaher and Mullarkey found that Web page context factors had no effect on advertising recall and recognition (Danaher et al. 2003). Newman et al. reported that high congruity resulted in high overall attitude toward ads and low congruity resulted in low overall attitude toward ads (Newman et al. 2004). Similarly, Moore found that congruity had more favorable effects on customers' attitudes toward ads but a less favorable effect on people's recall and recognition (Moore et al. 2005). McCoy et al. found that retention of website information was higher when ads were not congruent (rather than congruent) with website content (McCoy et al. 2004). Border et al. argued that the relevance between Web ads and their surrounding content was one of the main success factors for contextual ads (Broder et al. 2007).

### **3.6 Viewer-Host**

Viewers' search strategies on a host website were found to be a significant factor. Several studies agreed that users who browsed websites aimlessly tended to recognize and recall more Web ads than goal-directed users. According to Pagendam and Schaumburg, people from the aimless browsing group performed significantly better than subjects from the information search group in recall and recognition of banner (Pagendam et al. 2001). Danaher and Mullarkey found that Web users in a goal-directed mode were much less likely to recall and recognize banner advertisements than users who were surfing a site (Danaher et al. 2003). Edwards et al. found focused viewers perceived interruptions as more severe than non-focused viewers (Edwards et al. 2002). Hong et al. reported that the negative effects of animation on task performance were greater in browsing tasks than in searching tasks (Hong et al. 2007).

Also, users' previous experience or habit was found to be an important factor. Dahlen et al. found that the mean number of clicks were significantly lower for repeat visits than for first time-visits (Dahlen et al. 2003). In the same report, Dahlen reported that the mean length of visit was significantly lower for repeat visits than for first-time visits (Dahlen et al. 2003).

### **3.7 Viewer-Product**

Viewers' product involvement was found to be one of the important factors. Dahlen et al. found that Web ads and print ads performed equally well for high-involvement products, and Web ads outperformed print ads for low-involvement products (Dahlen et al. 2004). Dahlen, Ekborn, and Morne reported that more Internet users clicked on banner ads for high involvement products than on banner ads for low involvement products (Dahlen et al. 2002). Interestingly, Dahlen, Ekborn, and Morne found that those who had clicked on banner ads for high involvement products showed an increase in positive brand attitude and brand purchase intention, whereas those who had clicked on banner ads for low involvement products had neither a more favorable brand attitude nor a higher level of purchase intention. (Dahlen et al. 2002). Cho also found that people who were highly involved with a product were more likely to click a banner ad than those with low product involvement (Cho 2003a). Dahlen et al. found that visits to high-involvement-product websites were longer and generated more clicks than visits to low-involvement-product websites (Dahlen et al. 2003).

In addition to product involvement factor, brand familiarity between human and product also was studied. According to Dahlen, advertisements of familiar brands tended to wear out quickly, whereas banner ads for unfamiliar brands needed multiple exposures to wear in (Dahlen 2001).

### **3.8 Viewer-Ad**

Lohtia et al. reported that the presence of incentives lowered the click-through rates of banner advertisements (Lohtia et al. 2003). However, Xie and colleagues found that providing incentives in banner ads was effective in soliciting click-through, and that positive emotions in banner ads enhanced the effectiveness of incentives (Xie et al. 2004).

## **4 CONCLUSION**

### **4.1 Summary of the Key Findings on Web Ads Research**

Our research provides a comprehensive picture of empirical research on Web ads. The most studied areas are Web ads features and their effects on viewers' reactions to Web ads. In a nutshell, these empirical studies suggested that highly animated banners do not necessarily attract viewers' attention any more; however, moderate use of animation in Web ads might help attract attention. When a banner size is large, viewers tend to pay attention and click it. Highly color-decorated banner may not attract viewers' click-through any more; instead, moderate color may give viewers better impression. Regarding content, incentive and emotional content and interactivity will increase viewers' click-through rates. However, if viewers think that the Web ads are not reliable, they do not response to the banners even though the banners may have good incentive, emotional appeal, and interactivity. We also found that pop-up and pop-under ads do not work well any more for awareness, memory, attitude, and behavior. Even though pop-up affects memory for ads positively, attitude toward the ads is reported negatively. In-line banners might be a better option in terms of banner location. Finally, long time or frequent exposure to Web ads may have positive effect on awareness, memory, evaluation, and behavior.

This research also reveals several other related factors influencing viewers' reactions to Web ads and Web ads' effects. Regarding viewers' Internet experience, novice users are easily affected by Web ads than expert users are. Also, functional product Web ads have higher initial click-throughs, and expressive products need time to wear in as both click-through rates and positive brand attitudes. In addition, humanlike navigation interface leads to more favorable attitudes toward the Internet advertisement, the advertised product, and better product information recall. Furthermore, interaction factors are also important. Viewers who browse websites aimlessly tend to recognize and recall more Web ads than goal-directed viewers. Internet viewers also click on banner ads for high involvement products than on banner ads for low involvement products. However, even though there are increasing studies in the area of congruity between Web ads and host website content, there are no certain agreements regarding the Web ads effectiveness of congruent or incongruent website contents.

### **4.2 Directions for Future Research**

One observation from this meta-analysis is that the number of scientifically conducted empirical studies on Web advertising is scant, and the findings are scattered and inconclusive. There are a good number of factors that are not covered, indicating many holes and gaps. In addition, some of the existing studies showed conflicting results with each other. This observation a sharp contrast to the fast growing and largely invested Web advertising market and to the huge number of Web users that are affected by Web ads. This situation is also observed by other scholars (Calisir et al. 2004). Thus the entire Web ads area is wide open and there are many opportunities for interested researchers to conduct research in this important area to fill the gaps and to clean up the inconsistent findings.

Another observation has to do with study sample diversity. The majority of the collection used college students as samples. Only eight studies used general people, and one study used middle school students. Limited samples can affect the generalizability of the findings.

### **4.3 Conclusion**

Although there is much hype about the effectiveness of Web ads due to large investment and their broad impact on millions of Web viewers, and their benefits for viewers as Internet based services, our understanding of their acceptance by intended viewers and their actual impacts on the viewers is very limited. Multiple disciplinary studies do exist over the past decade but the number of such studies is so insignificant to the magnitude of Web ads, and the findings are inconsistent and inconclusive. There is a great need for future research in this important area.

This research yields several useful research tools for future research. The Web ads framework is proven to be helpful in organizing various factors and their relationships; thus is able to depict all variables studied in the collected empirical studies. It is also helpful to illustrate the comprehensiveness of research effort, thus can make suggestions for future efforts. The specific classifications for each component in the framework can be expanded to be inclusive in future research. Our framework considers more than just viewers and Web ads. In a more balanced view, we consider ad hosts and ad related products and services. We suggest future researchers to take this balanced view as well. This will ensure that the research findings can be more relevant and convincing to various stakeholders such as viewers, providers of products or services, marketing agencies, and owners and designers of hosts.

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