

The Brand Effect of Queries and Advertisements in Keyword Advertising

Bernard J. Jansen

College of Information Sciences and Technology
The Pennsylvania State University
jjansen@acm.org

Kate Sobel

Smeal College of Business Administration
The Pennsylvania State University
kate.sobel@yahoo.com

Mimi Zhang

College of Information Sciences and Technology
The Pennsylvania State University
ms.mimizhang@gmail.com

ABSTRACT

In this paper, we analyze the relationship between performance and the use of brand terms in queries and advertisement in keyword advertising campaigns. We use data comprised of more than 2,500,000 daily records from a keyword advertising campaign of a major US retailer. The campaign spanned nearly four years, involved approximately eight million US dollars in advertising cost, and generated more than twenty-three million US dollars in sales. We categorize keyphrases and advertisements as either brand focused or nonbrand focused. Using ANOVA in a 2x2 design, we analyze the use of branded terms on the critical keyword advertising metrics of number of clicks, cost per click, sales revenue generated, number of orders, number of items ordered, and return on advertising cost, as well as impressions triggered by these keyphrases. Therefore, we investigate a significant spectrum of user actions and consumer behaviors of a sponsored search campaign. Our findings show that there is a significant advantage by matching branding terms in keyphrases and advertisements relative to any other combination of query or ad for all metrics examined. A combination of a branded phrase and a branded ad generated 15 times higher sales revenue than any other category. Therefore, a focus by keyword advertisers on branded terms for search engine ads could be quite beneficial for both the effectiveness and efficiency of keyword advertising. The implications for online advertising and keyword search in the ecommerce domain, especially for large retailers, is that brand mentions in both queries and advertisements correlate with higher conversions.

Keywords: *Sponsored search, keyword advertising, pay-per-click, PPC, online advertising, search engine marketing, brands, branding.*

INTRODUCTION

Approximately half of all purchases in the business-to-consumer e-commerce category are preceded by a Web search [39], indicating the importance that search engines play in online shopping and sales. In this ecommerce environment [71], online advertising on search engines has blossomed. The most popular form of online marketing is keyword advertising (a.k.a., sponsored search, pay-per-click, and search engine advertising) [61]. Therefore, search engine advertising is becoming increasingly important, with some companies spending large amounts of money so that potential customers using search engines can see their ads.

Emerging in 1998 [16], sponsored search, has rapidly become the central business model of the major search engines, of which the pay-per-click model is the most prevalent [45]. Financed by advertising revenue, sponsored search generated billions for Google [25], by far the major source of profits for the company, as well as revenue for other search engines. Online advertising finances the free searching that is now an integral aspect of daily life for many people and other free services (i.e., email, office productivity suites, navigation, chat, etc.) provided by the major search engines. As such, keyword advertising has helped shape the nature of the Web today, is increasingly a concern for businesses [68], and is, therefore, an area of critical research importance.

More specifically, keyword advertising is a type of online advertising that companies use to promote their products and services on search engine results pages (SERP), as well as other Internet locations and services. Prior work has shown that searchers experience certain searching costs (i.e., locating a seller, locating price information, and locating product information) [67], all of which sponsored ads can address. Not only are search engine ads useful for increasing traffic to the company Website, they might enhance a company's brand image and market reach. At its most general, a brand is the intangible sum of an organization's attributes, which can reflect an organization's name, history, reputation, and advertisement [60]. Keyword advertising offers a unique opportunity for businesses and organizations to measure the effect or value of their brands by leveraging the brand, such as including brand names in keyword advertisements. Providing relevant content and service can also enhance a company's brand image [29].

Given that companies are motivated to develop a positive brand image [14], it seems reasonable that these same companies might want to leverage this brand directly in their keyword advertising campaigns. However, there has been little published research investigating this important linkage between keyword advertising and brand effect, especially concerning the wording of these keyword advertisements [47]. Consequently, we currently have limited insight into how searchers, as potential consumers, interact with branded keyword advertisements or what could be the possible causes of such behaviors.

Therefore, there are several open questions. Can a company leverage their brand in keyword advertising to increase sales? Does a brand positively influence the potential customer to take action? Do consumers search for brands, and what does it mean if they do? What are the possible causes of any brand effect in keyword advertising? What is the effect of brands on a company's bottom line? These are some of the questions motivating our research.

In the research reported here, we investigate the effect of using brand terms in keyword advertising. Specifically, we investigate the interplay between branded terms in the keyphrases, correlated with the queries that users submit to Web search engines, and in the advertisements displayed on search engine results pages (SERPs).

With the next section, we begin with a literature review, outlining the some of the prior work in branding on search and online purchasing. We then present our research questions and associated hypotheses, along with justifications. We present a brief overview of sponsored search, followed by a description of our data and methods of analysis. We then discuss results and implications for advertisers, online advertising platforms, and consumers. We end with areas for future research.

REVIEW OF LITERATURE

Brand and Branding

The advertisements on SERP can contain branding elements. A brand can distinguish an organization or a product from its competitors. Therefore, a positive attitude toward a brand can result in

customer loyalty and positive image of a business's products and services. Positive branding can have a dramatic effect on consumer reactions even when no product or service difference exists. To illustrate the value of a positive brand, in a study focusing on children's perspectives of food products, results showed that study participants ranked McDonald's branded milk and carrots as tasting better than identical products with non-MacDonald's branding [55]. Therefore, branding can have a dramatic affective influence on a consumer's perception of a product, service, or experience.

Brands plays a large role in search engine marketing, with branding being a major focus of the Search Engine Marketing Professional Organization (SEMPO) [13]. Where a brand is a unique attribute, name, term design, or symbol, branding is making consumers aware of a company's goods or services by seeing the 'brand' and presenting an idea of what that brand means [60], and a company's online reputation can effect online sales [43]. SEMPO reports that, among advertisers, brand awareness is a top objective of sponsored search campaigns, especially for larger firms [59]. The survey found that 56 - 71% of firms use sponsored search campaigns to enhance brand awareness [59]. The effects of branding are measured through the return on marketing investments [46, p. 18]; therefore, it is extremely important for a company to have a good branding strategy in the keyword advertising space and to measure the value of that brand in this area.

Branding efforts have several subcomponents that may affect the keyword advertising area. These include brand awareness, brand image, and brand relationship. Brand awareness is related to the strength of the brand in memory, as reflected by consumers' ability to identify the brand under different conditions [51]. Brand image is the perception about a brand based on the brand associations held in the customer's memory [37]. Brand relationship is the exchange and communal aspects, which are represented by brand satisfaction and brand trust [14]. A positive brand image can aid a business in withstanding price competitions [41].

These brand effects have been studied as antecedents of online trust relating to the vendor, to the Website, and the product, as well as a means to communicate the trustworthiness of an e-vendor [for an extensive analysis, see 58]. These brand concepts are strongly interrelated and represent various stages and aspects of an individual's brand perception and processing, along with brand trust [26, 63]. Ha and Perks [26] examined the relationship of brand experience, brand familiarity, customer satisfaction, and brand trust in the online environment. They report that the search for information, familiarity and customer experience are antecedents to brand trust. In another study, Esch, Langner, Schmitt, and Geus [15] proposed and tested a conceptual model to relate perceptual variables (brand awareness and brand image) and relationship variables (brand satisfaction, brand trust, and brand attachment) to current and future purchasing behavior. Researchers have also done work on a search engines' effect on Webpage browsing for products and services [10, 17, 50]. Pan, Litvin, and O'Donnell [49] found that searchers commonly type brand information into a search engine to find specific hotel Websites, which would be a navigational use of a search engine [56].

However, studies examining the effect of brand in sponsored search results are very limited. Related work in print advertisements debated whether or not using a branded term had much effect on reader's attention; however, the use of branded terms appear to have a slight influence on increasing the readership of an ad [52]. The Interactive Advertising Bureau (IAB) and Nielsen Ratings studied Internet search brand effectiveness, finding that SERP branding is stronger in consumer awareness than contextual ads, especially when the company has the top position of the SERP listing [48], but this study did not investigate consumer interactions with the SERP or advertisements. Previous research has shown that brand image, positive or negative, is correlated with online product reviews [1]. In a series of articles, Ghose and Yang [20-24] use an aggregate data log of a keyword advertising campaign from the first 13 weeks of 2007 containing weekly statistics for 1,799 keywords with 5,147 records. They report

that the use of brand terms, retail terms, and ad rank have an effect on campaign performance. They show that queries with retailer-specific brand information tended to have higher click-through rates. Due to the small size of the dataset, the researcher had to populate the null fields of the data set with simulated data. However, this prior work does indicate the potential fruitfulness of this stream of research.

Aside from these works, there are limited investigations concerning the role of branding in sponsored search, including the effects of branded advertisements on consumer interactions with search engines. Additionally, there has been little to no work in actually measuring the brand effect on SERPs. Therefore, we have little insight into the measurable metrics of online brand value (i.e. the bottom line effect of a brand). Sriram, Balachander and Kalwani [66] advocated incorporating the utilization of sales data into an overall methodology for determining brand value, which we do in this research by utilizing revenue and order figures.

Keyword Advertising

Prior to introducing our research question, we first describe the keyword advertising process and important metrics. In keyword advertising campaigns on the major search engines, advertisers typically bid on keyphrases they believe relate to some product or service they are providing. These keyphrases link ads from the advertiser to queries submitted by potential customers, who are the searchers on the Web search engines. Reports indicate that about 15% of search engine clicks are on these keyword advertisements [33].

When a searcher enters a query that matches a keyphrase, a set of ads is displayed on the SERP. The amount that an advertiser *must* bid to get an ad to display depends on the overall demand for that keyphrase. The amount that an advertiser is *willing* to bid depends on the perceived value of the visitor and the cost of the acquisition.

Ads on the SERP are typically shown above the organic results listing (i.e., the north position), to the right of the organic results listing (i.e., the east position), or below the organic results listing (i.e., the south position) depending on the search engine. The rank of the ad depends on the bid price and a quality score (i.e., determined by several factors including click through history and landing page relationship to the ad).

These advertisements typically consist of a short headline, two short lines of text describing the product or service, and a hyperlink that points to the advertiser's landing page (i.e., an advertiser designated Webpage). In the pay-per-click (PPC) arrangement, an advertiser only pays the search engine if a searcher actually clicks on the displayed ad hyperlink.

There are several key sponsored search terms that those in the industry commonly use, which one must have a base functioning knowledge of in order to follow the research presented in this paper. When an advertisement is displayed on a SERP in response to a query that matches a given keyphrase, this is called an *impression*. When a searcher clicks on the ad's hyperlink pointing to an advertiser's landing page, this is a *click*. The search engine bills the advertiser for this click, an amount known as the *cost-per-click* (CPC), which is capped at the advertiser's bid on the keyphrase. Once at the landing page, if the consumer takes some measureable action, as defined by the advertiser, this act is known as a *conversion*. Typical a conversion is a purchase (a.k.a., an *order*), although it can be any other consumer action. An order can be composed of one or more *items*. The *sales revenue* generated from this conversion defines the value of that customer. The effectiveness of the keyword advertising campaign is measured by revenue generated less the advertising cost.

This is a brief overview of a very complex process. For further discussions of the keyword advertising, see [16, 30], which is part of a small but growing body of literature on keyword advertising.

Jansen and Resnick [31] report that searchers have a bias against sponsored results, but introducing searchers to relevant sponsored links overcome this bias (i.e., becomes positive). Brooks [6, 7] also shows how the ad rank affects clicks and conversions, following a curve linear function of the ad's rank. Sen, Bandyopadhyay, Hess, and Jaisingh [62] present situations for optimal ad pricing for the search engine. Jansen and Spink [33] report that the click through rate on sponsored links is about 15% percent. Brooks [8] show that searchers repeat visits to search engines and click on similar ads during these visits, although Bruner and Kumar [9] state that more experienced searchers become desensitized to ad stimuli. Kalczynski, Senecal, and Nantel [36] use click stream data to model task completion. Fulgoni and Mörn [18] show that multiple sponsored ads exposure has a positive impact on consumer intent to purchase. However, none of these works addresses the effect of branded terms on the sponsored search process.

After a review of literature, we see there has been little empirical evaluation of the actual effect of a brand on consumer behavior on the search engine or on company's bottom line in the online marketplace, with prior work focusing primarily on cognitive and affective aspects of consumer reaction to brands. In fact, with the exception of the work by Ghose and Yang [20-24], there have been limited, published empirical studies of keyword advertising campaigns using real-world datasets at all. Addressing this lack of research could have profound impacts on understanding the effectiveness of sponsored search services and campaigns for both consumers and advertisers.

RESEARCH QUESTION

Our research question is *does mentioning a brand term in advertisements or keyphrases impact the performance of a sponsored search campaign?*

It is generally accepted that branding has an effect on consumer behavior [15]; therefore, we would expect that brand mentions might have some effect on sponsored search campaigns, although what the effect might be is not clear. Understanding the relationship between brand mentions (in ads and keyphrases) and consumer behavior provides an opportunity for online businesses to optimize their search engine marketing strategies by leveraging their brand awareness, brand image and brand relationship. Additionally, the metrics of keyword advertising provide a vehicle for companies to measure brand value in the online marketplace. Results from this research can serve a variety of purposes, including ad creation recommendations, valuable query indications (i.e., justification for higher bids), and the use of more advanced targeted marketing methods by the sponsored search platforms.

The theoretical foundation of this research question is signaling theory [65], which postulates that certain signals are more reliable and trusting than others, with significant research into signals such as quality and price [19, 40]. Given that positive brand image can evoke affirmative consumer responses [14], signaling theory would indicate that brand mentions in advertisements would be primary signals for consumers. Specifically, in the area of Web search, signaling theory has been investigate in the context of information foraging theory [53], and specifically information scent [54]. As explained by information foraging theory, searchers choose information sources that are the most likely to contain rich content. Individual searcher actions are determined by the information scent of a particular information objective, such as the textual clues of an individual listing on a SERP. Therefore, information foraging theory would again indicate that brand ads, with associated brand queries, might be good information scent for searchers.

To investigate our research question, we developed two classifications for keyphrases (i.e., these are phrases on which advertisers bid in order to trigger the ads) and two for advertisements (i.e., ads created to show on SERP in response to a user query), which are:

- *Brand focused keyphrases*: Keyphrases that contain a mention of a brand name.
- *Nonbrand focused keyphrases*: Keyphrases that contain no mention of a brand name.
- *Brand focused key advertisements*: Advertisements that contain a mention of a brand name.
- *Nonbrand focused key advertisements*: Advertisements that contain no mention of a brand name.

We implemented this classification via a straightforward keyword matching methodology. With these four classifications, we investigated four phrase-advertisement combinations as shown in the 2 x 2 matrix in Table 1.

Table 1. 2x2 of Ads and Keyphrase Combination

	<i>Brand focused phrase</i>	<i>Nonbrand focused phrase</i>
<i>Brand focused ad</i>	Combination of a brand focused phrase and brand focused ad	Combination of a nonbrand focused phrase and brand focused ad
<i>Nonbrand focused ad</i>	Combination of a brand focused phrase and nonbrand focused ad	Combination of a nonbrand focused phrase and nonbrand focused ad

Based on our research question and prior work in the branding area, as outlined above, our hypotheses are:

Hypothesis 01: There will be a significant difference among the number of clicks based on the brand focus of the keyphrase and advertisement combination.

The click through rate is one of the most important measures of sponsored search success and the effectiveness of an ad. It is also a critical user behavior in many aspects of online searching. The goal of most keyword advertising campaigns is to get potential consumers to click on a given advertisement and go to the businesses' Website. Therefore, the click is a commonly used measure of potential interest in a search engine result and has been used as a surrogate for relevance judgments by users [35]. As such, any brand differences on click through would shed important light on the branding effect in both keyword advertising and user behavior.

Hypothesis 02: There will be a significant difference in the cost per click based on the brand focus of the keyphrase and advertisement combination.

Advertisers must bid different amounts for different keyphrases depending on the value that the advertiser places on those keyphrases as well as on the competition from other advertisers. One would expect keyphrases that advertisers anticipate to get higher sales would also be the most expensive. Therefore, higher cost-per-click for certain keyphrases classified along branding lines would indicate preferences of those phrases by online advertisers, being a sign of an expectation of brand value. The rule of thumb in keyword advertising is that it is better to bid on branded keywords than not. The justification of this is that if you do not bid on them, your competitors will. Prior work [57] has shown that this does occur, with the overall rate being low but varying by industry. Bidding on branded keywords is also encouraged in order to take up screen real estate on the search engine results page, the thought being that one's own ad will push another ad off the page.

Hypothesis 03: There will be a significant difference among the average sales revenue based on the brand focus of the keyphrase and advertisement combination.

Most online advertisements for retailers have the aim of generating a sale. Naturally, branding differences in keyphrases and ads in terms of sales revenue would provide insight into the receptiveness

of these searchers to online brand image and relationship. Sales revenue is a measure of the profitability of these searchers for online advertisers and a concrete measurement of brand value online.

Hypothesis 04: There will be a significant difference in the number of orders based on the brand focus of the keyphrase and advertisement combination.

Correlated with sales revenue, companies track the number of orders placed for a given set of keywords. Any differences in number of orders among the brand focus categories would be an indication of differences in online shopping behaviors associated with the brand, such as willingness to purchase, trust association, perceived risk, etc.

Hypothesis 05: There will be a significant difference in the number of items purchased based on the brand focus of the keyphrase and advertisement combination.

Associated with orders, number of items purchased per order is a key metric of online sales. Cross-selling (i.e., enticing consumers who come to an online store for potentially only one set of products to purchase related products) [3] is a familiar retail practice. Moreover, consumers that purchase multiple items may be more valuable than consumers who purchase only a single item. Therefore, any branding differences would be of profound importance to online retailers.

Hypothesis 06 There will be a significant difference in the return on advertising based on the brand focus of the keyphrase and advertisement combination.

While a particular keyphrase or advertisement may generate sales, the final evaluation of any advertising effort, in terms of effectiveness, is how much profit the effort generates, which is referred to as the return on advertising (ROA). The ROA equals the gross sales of a particular advertising effort divided by the cost of that advertising effort. If the ROA is positive, the advertising effort is effective. If the ROA is negative, the effort is ineffective, as it costs more to run the campaign than the campaign is generating in revenue. Therefore, ROA is of critical importance for advertisers.

RESEARCH DESIGN

Data

The data file used for this research contains daily information on a sponsored search campaign from a large nationwide retailer, with both brick-and-mortar stores and online sales presence. With several hundred stores and an active online presence, the retailer offers a variety of novel products covering a wide price range, from a few dollars to several hundred dollars. Given the national presence, the combination of both real and virtual stores, and range of products, we consider the retailer to be an excellent data collection site for the study of branding and keyword advertising.

The data in the log is a record of the search engine marketing campaign by the company during a 33-month period, spanning 4 calendar years, from 30 September 2005 to 09 June 2008. The log contains a rich data set in that it includes the keyphrase that triggered the ad, the ad, the searcher responses, such as clicks, and sales information. Given the four years of data collection and the relative stability of the sponsored search platforms during this period, we believe that the data provides insights into current online ecommerce web searching, in addition to providing findings concerning keyword advertising solely during the data collection period.

The log file contains in excess of two and half million records from nearly 40,000 keyphrases and more than 45,000 advertisements. The data log holds a record for every day during the 33 months of the campaign in which one of the keyphrases triggered an ad. There is a unique record for each keyphrase on a given day. Each record in the data log has a variety of information associated with keyphrases for

that day. Each record includes the keyphrase that triggered the ad, the number of impressions for that phrase on that day, the number of clicks, the total cost of that keyphrase for that day, number of conversions (i.e., orders), the total sales revenues, and the total number of items ordered. On a given day, a phrase may trigger one or more impressions but no clicks. If there is a click, there may or may not be a conversion. If the customer places an order, the order may be composed of one or more items. The total cost of the order is the sales revenue generated. One can calculate the ROA using sales revenue minus advertising cost.

Table 2 shows applicable fields in the log used for the research reported here.

Table 2. Fields from Keyword Advertising Log

Field	Description
Ad Number	Unique identifier for the advertisement
Advertisement	Heading, Line 1 and Line 2 of the advertisement
Keyphrase	The keyphrase that triggered the advertisement
Day	Date of data collection
Impressions	The total number of impressions for that day for the given advertisement with the given keyphrase
Clicks	The number of clicks on the advertisement for that day for a given keyphrase
Cost	The total cost for the day for a given keyphrase for a given advertisement
Sales	The revenue generated from that advertisement on that day for a given keyphrase
Orders	The number of orders from the advertisement for that day for a given keyphrase
Items	Number of items purchased within the order for a given day, advertisement and keyphrase. One order could have one or more items.

Given the limited research published examining customer behavior in the keyword advertising area, we believe this dataset can shed needed insight into this important area and provide us with the required data in which to investigate our research question and associated hypotheses into the effect of branding in the sponsored search area.

Categorizing Ad and Query

To address our research question and associated hypotheses, we categorized 45,688 sponsored search ads and 39,748 keyphrases from our keyword advertising campaign of this major retailer into brand focused or nonbrand focused categories, as presented in Table 3.

Table 3. Example of a Sponsored Search Advertisement and Keyphrase with Brand Mention

Ad Component	Ad Content	Brand Focused
Headline	<i>Branded Term</i> Canine Supplies	1
Line Number 2	Pet toys	0
Line Number 3	gadgets and grooming item	0
	Keyphrase	Brand Focused
	<i>Branded Term</i> foldaway elliptical	1
	Personal alarm clocks	0

We analyzed the headline, line 2, and line 3 in the 45,688 ads for occurrence of branded terms. If a branded term appeared in any of the ad components, we classified the ad as brand focused. In the ad

shown in Table 3, the company name is mentioned in the headline; therefore, it is a branded advertisement. We categorized the 39,748 keyphrases in the same manner, as also shown in Table 3.

Data Analysis

Of the 45,688 advertisements, there were 27,488 brand focused ads and 18,240 nonbrand focused ads, as shown in Figure 1.

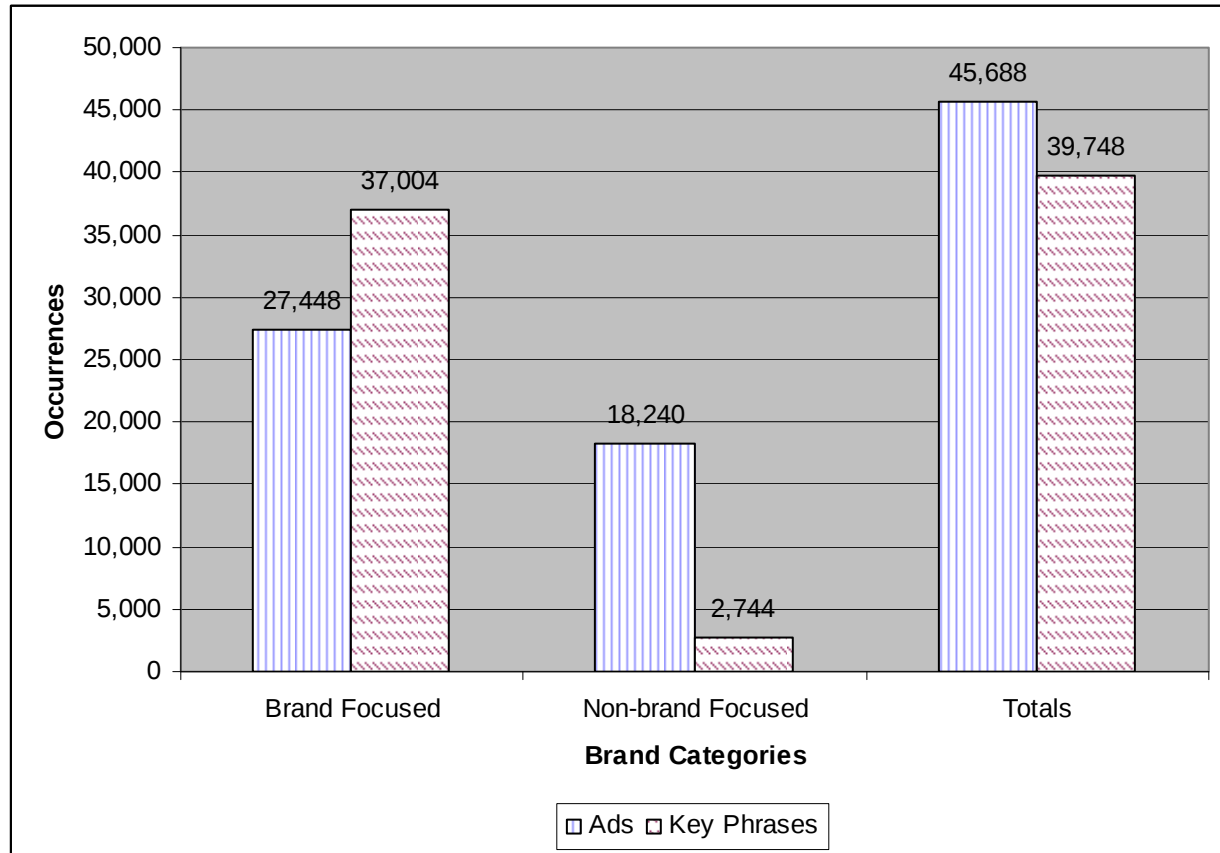


Figure 1. Ad and Keyphrase Brand Categories.

As Figure 1 shows, slightly more than 60% of the ads were brand focused, with just less than 40% of the ads being nonbrand focused. With 50.5% more brand focused ads than nonbrand focused ones, this retailer adhered to accepted brand awareness and image concepts [15] of promoting one's brand to online consumers.

Of the 39,748 keyphrases, there were 37,004 brand focused phrases and 2,744 nonbrand focused keyphrases, as shown in Figure 1. We see that 93% of the keyphrases were brand focused.

Once we classified each unique keyphrase and ad, we used this set of phrases and ads to classify automatically the phrases and ads in the 2,570,771 records in the complete dataset. After this, we linked keyphrase – ad combinations, now classified with one of the brand focused categories, to the associated user behavior and sales data in that record. With this consumer behavior data, we could then examine each keyphrase and ad category based on our research question and hypotheses. Table 4 shows a snippet from the two and half million record data log with applicable fields used for this research.

Table 4. Snippet From Data Log Showing Applicable Fields

Ad Brand Classification	Keyphrase Brand Classification	Brand Focused Category Groups	Impressions	Clicks	CPC	Sales Revenue	Orders	Items Ordered
0	0	1	5	1	0.20	39.97	2	1
1	0	4	37	3	0.45	29.34	1	3
0	1	3	10	5	0.26	7.59	3	5
1	1	2	2	1	0.30	43.20	3	6

Once we processed all the information, we imported the data into SPSS, which we used to run the ANOVA tests to investigate differences among the means among the brand focus categories. However, our data is not multivariate normal; instead, it has a power law distribution. We transformed the data via the Box-Cox power transformation [5] by using $\lg(\text{variable}+1)$. After employing the Box-Cox power transformation, we plotted our data to check for normalize. The data were successfully normalized, although the distributions were skewed to the left (i.e., weighted toward lower cost click, lower sales, lower number of items ordered, etc.), which would be reasonable given the type of data. Although skewed, several prior works have noted that the ANOVA method is remarkably robust to deviations from normality [c.f., 4, 28, 44]. The use of the power transformation, along with other measures (discussed later), ensured our statistical approach was valid.

RESULTS

Prior to investigating our specific hypotheses, we provide some aggregate results from our data analysis. We first present overall statistics for the data set of 2,570,834 records, as shown in Table 5.

Table 5: Aggregate Statistics from the Dataset

	Total	Average (by day)	Standard Deviation
Impressions	150,063,317	58.37	971.14
Clicks	3,896,310	1.51	41.35
Advertising Cost	\$8,484,855	\$1.24	\$19.68
Sales	\$23,075,796	\$8.98	\$440.04
Orders	142,256	0.06	2.83
Items	270,567	0.11	5.66

From Table 5, we see that this was a substantial marketing effort generating more than \$23 million in sales and moving more than 270,000 items. Table 5 also presents the average figures per day, with the standard deviations. The standard deviations are high due to the nature of retailing since there are substantial sales during the holiday buying season, typically October through early January.

Brand Focus Categories

Using the 45,688 ads and 39,748 keyphrases, we automatically categorized the entire data set of approximately two and half million records, with findings presented in Table 6.

Table 6. Occurrence for Each Category in Overall Dataset

Brand Focused Categories	Occurrences	%
Nonbranded Ad and Nonbranded Phrase	1,517,144	59.0%
Branded Ad and Branded Phrase	68,951	2.7%
Nonbranded Ad and Branded Phrase	6,887	0.3%
Branded Ad and Nonbranded Phrase	977,789	38.0%
Overall	2,570,771	100.0%

Comparing Table 6 (i.e., ads and keyphrases occurrence in the complete dataset) with the data in Figure 1 (i.e. number of unique ads and keyphrases), we see a striking difference between the advertiser focus on branded phrases (93%) versus what people are actually searching for nonbranded phrases (slightly more than 59%). This would indicate that there is considerable searching by potential consumers for more generic terms, perhaps reflecting broader commerce needs. Since the sample sizes are uneven, this could confound our analysis. Therefore, we use the weighted means for the samples in the data analysis [11, p. 249], which addresses the confounding issue in our ANOVA methods. Additional, we employed the Welsh equality of means [70], which does not assume equal sample sizes or equal variance, to verify our results. Given these precautions, we believe our statistical approach to be sound.

We investigated the specific number of impressions generated by each category of keyphrase, as shown in Table 7.

Table 7. Example of Customer Query and Brand Mentions

Brand Focused Phrase Categories	Sum of Impressions	Percentage
Nonbrand Focused Phrases	141,838,245	94.5%
Brand Focused Phrases	8,225,072	5.5%
All Phrases	150,063,317	100.0%

From Table 7, we see that nearly 95% of the impressions were generated by nonbrand focused phrases, indicating that the majority of Web searchers do not come to the search engine with a particular brand in mind or, at least, they do not express it when searching. This is inline with research in the Web searching area, showing that most searchers use short, generic queries [64, 69], deferring to the search engine to provide focused results. With this grounding of the data, we now address our research question and associated hypotheses.

Research Question Evaluation

We first evaluate our overall research question (*does mentioning a brand term in advertisements or keyphrases impact the performance of a sponsored search campaign?*) using confirmatory factor analysis (CFA), which is a methodological approach that examines whether underlying constructs influence one or more measure responses. As CFA is commonly used to establish the validity of a given model, it is a suitable method to evaluate the appropriateness of the use of branding terms proposed in our research question. For the factors, we used the category of brand phrase and ad (i.e., independent variables), number of clicks, CPC, sales revenue, number of orders, number of items ordered, and ROA (i.e., dependent variables).

The CFA results show that 0.77 of the variance is due to the underlying factors ($p < 0.01$), which indicates that factor analysis would be a useful modeling technique for the data. All extraction values

were good, with most approaching 1.0. Therefore, there was good fit with all factors. Two factors (*brand focus* and *clicks*) had eigenvalues greater than one, together accounting for 85.2% of the variance in the other factors. The *brand focus* factor by itself explained 69.2% of the variance, with *clicks* explaining 16.0%. One would expect number of clicks to have an impact on the other factors, as they are dependent on a click occurring.

With these findings from our CFA, we were confident that our research question had merit.

Hypotheses Testing

In evaluating our six hypotheses, we ran two-way ANOVA tests to compare means among different brand focused categories. For all ANOVA tests presented, the critical value of P was 0.05. We also used Tamhane's T2 Test as the post-hoc analysis to uncover the exact differences among the groups, which does not assume equal variance among samples.

Concerning hypothesis 01 (*There will be a significant difference among the number of clicks based on the brand focus of the keyphrase and advertisement combination.*), the ANOVA results indicate that there is a significant interaction between branded ads and branded phrases ($F(1, 2.6 \times 10^6) = 16830.39$, $p < 0.01$). Both branded ad and branded phrase were significant ($p < 0.01$). The post-hoc analysis (Table 8) shows a significant difference among all four of brand classifications groups.

Table 8. Post-hoc Analysis for Clicks by Phrase – Ad

Branded Ad	Branded Phrase	Level*				Mean	SD
Yes	Yes				D	24.37	0.16
Yes	No			C		1.18	0.04
No	Yes		B			1.43	0.50
No	No	A				0.69	0.03
Overall						6.92	0.18

- Levels not connected by same letter are significantly different. Highest mean is **bolded**.
- For clarity, we report the actual means and standard deviation, rather than the log values

Combined with the higher rate of impression for nonbranded phrases (as shown in Table 7), this would also indicate that branded keyphrases are a much more focused and a worthwhile target for attracting potential online consumers to one's Website. While more searchers submit generic phrases, this group does not appear to contain the most potentially convertible customers.

However, notice that the combination of a branded phrase and a nonbranded ad did not lead to the same level of click through, with a mean 1.43 number of clicks. Although the second highest, it is still significantly lower than the combination of a branded ad with the branded phrase.

Given the significantly higher level of click through with both the branded ad and the branded keyphrases relative to the other categories, it would appear that the dual branding in both the phrase and the ad has a significant impact on click through, with a mean of 24.37. The post-hoc analysis tells us there is a brand lift (i.e., increase in some measure related to a positive brand image) or either the phrase or the ad, but a branded ad and branded phrase performs the best.

For hypothesis 02 (*There will be a significant difference in the cost per click based on the brand focus of the keyphrase and advertisement combination.*), the results indicate that there is a significant interaction between branded ad and branded phrase ($F(1, 485,943) = 990.423$, $p < 0.01$). Both branded ad and branded phrase were significant ($p < 0.01$). The post-hoc analysis (Table 9) shows a significant difference among all four of the brand classifications. Therefore, hypothesis 02 is fully supported.

Table 9. Post-hoc Analysis for CPC by Phrase – Ad

Branded Ad	Branded Phrase	Level				Mean	SD
Yes	Yes				D	0.46	0.54
Yes	No			C		0.48	0.17
No	Yes		B			0.59	1.58
No	No	A				0.70	0.15
Overall						0.56	0.61

- Levels not connected by same letter are significantly different. Highest mean is **bolded**.
- For clarity, we report the actual means and standard deviation, rather than the log values

From Table 9, the nonbranded ad and nonbranded phrase category has the highest mean CPC (0.70), and the other three categories are substantially lower. Although, we saw earlier that the branded ad and branded phrase category generated more clicks, the CPC is higher for the nonbranded ad and nonbranded phrase category relative to other categories. The mean CPC for the nonbranded ad and branded phrase category is also relatively higher than just the branded ads categories. Advertisers engaged in sponsored search campaigns have an incentive to bid higher on the keyphrases that they believe convert more customers. Therefore, these higher CPC would indicate that, regardless of the number of impressions, the advertisers consider these potential customers (i.e., those searching with nonbranded keyphrases) of higher value, which is reflected in the higher CPC for these nonbrand categories.

Moving to hypothesis 03 (*There will be a significant difference among the average sales revenue based on the brand focus of the keyphrase and advertisement combination.*), the results indicate that there is a significant interaction between branded ad and branded phrase ($F(1, 2.6 \times 10^6) = 52129.31, p < 0.01$). Both branded ad and branded phrase were significant ($p < 0.01$). The post-hoc analysis (Table 10) shows a significant difference between the branded ad and branded phrase classification and the other three brand classifications. Therefore, hypothesis 03 is supported.

Table 10. Post-hoc Analysis for Revenue by Phrase – Ad

Branded Ad	Branded Phrase	Level				Mean	SD
Yes	Yes				D	247.88	1.67
Yes	No			C		2.13	0.44
No	Yes		B			15.51	5.29
No	No	A				2.50	0.36
Overall						0.56	67.01

- Levels not connected by same letter are significantly different. Highest mean is **bolded**.
- For clarity, we report the actual means and standard deviation, rather than the log values

We see from Table 10 that the branded ad and branded phrase category generated, by far, more average sales revenue (\$247.88) than any other category, followed by the nonbranded ad and branded phrase category (\$15.51). This would indicate that, based on sales revenue, the higher CPCs for the nonbranded ad and nonbranded phrases are not justified in terms of revenue generation, as the branded ad and branded phrase category generate nearly 15 times higher sales revenue. However, we have to caveat this by noting that the nonbranded phrases receive more searcher traffic. Results also show that a brand phrase will generate more sales revenue, regardless of the type of ad.

Regarding hypothesis 04 (*There will be a significant difference in the number of orders based on the brand focus of the keyphrase and advertisement combination.*), the ANOVA results indicate that there is a significant interaction between branded ad and branded phrase ($F(1, 2.6 \times 10^6) = 74815.18$, $p < 0.01$). Both branded ad and branded phrase were significant ($p < 0.01$). The post-hoc analysis (see Table 11) shows a significant difference among all brand categories. Therefore, hypothesis 04 is supported.

Table 11. Post-hoc Analysis for Orders by Phrase – Ad

Branded Ad	Branded Phrase	Level				Mean	SD
Yes	Yes				D	1.61	0.01
Yes	No			C		0.01	0.00
No	Yes		B			0.06	0.03
No	No	A				0.01	0.00
Overall						0.56	0.42

- Levels not connected by same letter are significantly different. Highest mean is **bolded**.
- For clarity, we report the actual means and standard deviation, rather than the log values

From Table 11, the highest mean was, again, the branded ad and branded phrase category, with a mean orders of 1.61. Nonbranded ad and branded phrase category follows with a mean of 0.06. If one compared the difference in mean sales revenue with the difference in mean orders, one sees that brand phrase categories are not only generating more orders, but the orders are for a higher amount relative to the nonbranded phrase categories. Overall, though, there again appears to be a significant advantage of combining branded phrases with branded advertisements, with a mean that is 25 times higher than the second highest order number generated by nonbranded ad and branded phrase.

As to hypothesis 05 (*There will be a significant difference in the number of items purchased based on the brand focus of the keyphrase and advertisement combination.*), the results indicate that there is a significant interaction between branded ad and branded phrase ($F(1, 2.6 \times 10^6) = 70059.23$, $p < 0.01$). Both branded ad and branded phrase were significant ($p < 0.01$). The post-hoc analysis (Table 12) again shows a significant difference among all categories. Therefore, hypothesis 05 is supported.

Table 12. Post-hoc Analysis for Items Sold by Phrase – Ad

Branded Ad	Branded Phrase	Level				Mean	SD
Yes	Yes				D	3.09	0.02
Yes	No			C		0.03	0.01
No	Yes		B			0.11	0.07
No	No	A				0.02	0.00
Overall						0.56	0.81

- Levels not connected by same letter are significantly different. Highest mean is **bolded**.
- For clarity, we report the actual means and standard deviation, rather than the log values

From Table 12, we see that the branded ad and branded phrase category had the highest mean number of items sold (3.09), again followed with nonbranded ad and branded phrase category (0.11). This results enhances findings by Ghose and Yang [20], who focused on 166 keywords and reported that queries containing brand products offered the potential for cross-selling in other product categories. Our findings show that the advertisement, in conjunction with query terms, has a significant effect on items ordered.

This would indicate that not only does a branded phrase – ad combination lead to higher rates of orders and sales revenue, but this demographic of searchers order a wider array of products relative to demographics targeted by other phrase – ad brand categories. The post-hoc analysis shows that branded ads and branded phrases are associated with selling the highest number of items, with a mean that is 27 times higher than the second highest category using nonbranded ads and branded phrases.

Finally, for hypothesis 06 (*There will be a significant difference in the return on advertising purchased based on the brand focus of the keyphrase and advertisement combination.*), the results indicate that there is a significant interaction between branded ad and branded phrase ($F(1, 2.6 \times 10^6) = 16830.39$, $p < 0.01$). Both branded ad and branded phrase were significant ($p < 0.01$). The post-hoc analysis (Table 13) shows a significant difference among all brand ad and brand phrase classifications. Therefore, hypothesis 06 is supported.

Table 13. Post-hoc Analysis for ROA by Phrase – Ad

Branded Ad	Branded Phrase	Level				Mean	SD
Yes	Yes				D	233.98	51.31
Yes	No			C		1.01	64.63
No	Yes		B			12.96	93.11
No	No	A				1.31	51.31
Overall						7.47	430.73

- Levels not connected by same letter are significantly different. Highest mean is **bolded**.
- For clarity, we report the actual means and standard deviation, rather than the log values

From Table 13, we see that branded ads and brand phrases generated more than ten times the nearest other category (of nonbranded ads – branded keyphrase), with a mean of \$233.98. This would indicate that, in conjunction with other findings, that the use of branded terms in both phrases and ads is the most profitable for the advertiser, factoring in both revenue and costs.

Effect Size

Although there were statistically significant differences in our brand groupings, a portion of this difference can be attributed to the large sample sizes. We performed an additional analysis to ensure that the observed differences among the brand groupings were meaningful. We used Cohen's d tests to determine the effect size of each between group [12]. Table 19 shows the obtained d -values.

Table 19. Cohen's d Results to Account for Effect Sizes

Clicks				
Brand Focused Categories	1	2	3	4
Nonbranded Ad and Nonbranded Phrase (1)		0.61**	0.48*	0.12
Branded Ad and Branded Phrase (2)			0.11	0.46*
Nonbranded Ad and Branded Phrase (3)				0.28*
Branded Ad and Nonbranded Phrase (4)				
CPC				
Brand Focused Categories	1	2	3	4
Nonbranded Ad and Nonbranded Phrase (1)		0.06	0.26*	0.01
Branded Ad and Branded Phrase (2)			0.24*	0.08
Nonbranded Ad and Branded Phrase (3)				0.08

Branded Ad and Nonbranded Phrase (4)				
Sales				
Brand Focused Categories	1	2	3	4
Nonbranded Ad and Nonbranded Phrase (1)		0.83***	0.46*	0.01
Branded Ad and Branded Phrase (2)			0.24*	0.41*
Nonbranded Ad and Branded Phrase (3)				0.25*
Branded Ad and Nonbranded Phrase (4)				
Orders				
Brand Focused Categories	1	2	3	4
Nonbranded Ad and Nonbranded Phrase (1)		0.90***	1.00***	0.02
Branded Ad and Branded Phrase (2)			0.26*	0.36*
Nonbranded Ad and Branded Phrase (3)				0.22*
Branded Ad and Nonbranded Phrase (4)				
Items				
Brand Focused Categories	1	2	3	4
Nonbranded Ad and Nonbranded Phrase (1)		0.85***	0.39*	0.02
Branded Ad and Branded Phrase (2)			0.30*	0.37*
Nonbranded Ad and Branded Phrase (3)				0.21*
Branded Ad and Nonbranded Phrase (4)				
ROA				
Brand Focused Categories	1	2	3	4
Nonbranded Ad and Nonbranded Phrase (1)		0.61**	0.48*	0.12
Branded Ad and Branded Phrase (2)			0.12	0.30*
Nonbranded Ad and Branded Phrase (3)				0.26*
Branded Ad and Nonbranded Phrase (4)				

Note: * - small effect; ** - moderate effect; *** - **large effect**

From Table 19, we see that most of the effect size analyses indicate a small effect (53% of the comparisons), with 6% of the comparisons indicating a moderate effect, and 11% indicating a large effect. There were 31% of the comparisons showing a negligible effect, meaning that although the results were statistically significant, the outcome on keyword advertising metrics are of limited practical significance. From an analysis of the Cohen's d results, it is clear that the nonbranded ad and nonbranded phrase categories were most different, especially when compared to the branded ad and branded phrase, which is where the most occurrences of large and moderate effect sizes occurred. Most metrics showed this strong differential, with one exception, the CPC. For this metrics, the effect sizes were negligible. This indicates that brand keyphrases are especially effective, as they produce significantly most sales (in practical terms) but are generally the same cost as nonbranded terms.

DISCUSSION AND IMPLICATIONS

Discussion of Results

In this research, we investigated the effect of a brand mention on user behavior in a keyword advertising campaign. To address this research aim, we designed a study that segmented the various categories of brand mention in both keyphrases and ad text. We investigated a keyword advertising campaign from a major US retailer composed of more than two and half million daily records of Web search advertising interactions and sales. This study offers important insights about search engine advertising for companies that sell multiple products, while being a brand themselves. There are several

examples of these types of retailers, including stores such as Wal-mart, Target, Best Buy, Sharper Image, and Radio Shack. The results reported here show that focusing on brand image in both the keyphrase and advertisement produces more clicks, sales, orders, and items sold relative to other combinations of phrases and ads, including a brand mention in just keyphrase or ad alone.

The data shows how a strong and positive brand image is important for a company in the online ecommerce area, resulting in more customer engagement with advertising and more revenue for the bottom line. When consumers submit a query containing a brand term, they are more likely to make a purchase when that query is associated with an ad that also mentions the same brand. By advertising on search engines with ads that prominently show a brand name, a company can generate higher sales revenue.

Theoretical Implications

There are several theoretical implications of this research. In noting that brands may be one of an organization's most valuable intangible assets, Keller and Lehmann [38] report that there are a variety of branding aspects that a business considers, including positioning, integration, and growth, and that branding can spotlight either on the customer or the company. The research reported in this paper focuses primarily on the customer perspective of branding, relating it to the company advertising strategy. With the tracking and measurement, inherent in keyword advertising, one can specifically measure the value of a brand (e.g., in terms of interest, sales, orders, items, etc.) or the brand awareness (e.g., impressions or clicks relative to nonbranded product searches).

Determining brand value in concrete measureable terms has previously been a challenge. However, keyword advertising offers a methodology to measure the value of a brand via three main statistics. First, impressions or the number of times a brand term is searched is an indication of brand awareness. Second, clicks or the number of times potential consumers click on a branded ad is an indication of brand image. Third, the number of converts or number of times a visitor who clicked on a branded ad makes a purchase is an indication of brand relationship.

These findings also provide theoretical underpinning to prior empirical research concerning the effect of search engine results text on the evaluation of those results. For example, Jansen, Zhang, and Schultz [34] propose that branding on Web searching is a multi-stage process, with one element being the branding aspects of the individual links on the SERP of a particular search engine for a given query. The user evaluation of the link is influenced both by the search engine and by user's perception of the entire SERP. This influences the evaluation of a given link as relevant or not relevant.

However, the link snippet moderates the perception of relevance as well. The title, the summary, and the URL all affect how users view a particular result on the SERP. This appears to confirm prior work examining aspects of the link snippet. Hotchkiss [27] has noted that slight variations in how the individual links are displayed on the SERP can effect user evaluation. There is also an element of trust in terms of whether or not the link is sponsored or not, as shown by Jansen and Resnick [31]. The researchers [31] have shown the interplay of title and result summary as determinants of relevance and non-relevance for a given result. Koufaris and Hampton-Sosa [42] show that perceived company reputation and willingness to customize products and services can significantly affect initial trust. The mention of specific companies in ads in this research seems to conform to this multi-stage model of online branding in the search area.

The research presented here, combined with prior research, shows the beginning of a possible framework for describing the user's evaluation of SERPs and links in ecommerce-related searching. It appears that certain brand terms in the search engine results have a profound effect on a searcher's

inclination to click on a result's link and subsequent purchase at the landing page. User behavioral tendencies when these terms appear indicate that brand awareness, brand image, and brand relationship are important factors in online commercial searching and evaluation of search results. These branding concepts link keyword advertising to the core marketing efforts involved in brand management.

Practical Implications

Even though our findings were statistically significant, one must ask, “Are these differences of practical significance?” From a review of the data presented in Tables 1 through 19, along with the accompanying figures, it would appear that the findings do have substantial practical implications for keyword advertisers, search engines, and consumers, as shown by the effect size results in Table 19.

The implication for advertisers is clear – do not ignore the extremely high pay-off area of brand focused keyphrases in a keyword advertising campaign ad and pair these phrases with branded ads. These focused branded phrases combined with ads containing branded terms appear highly relevant to potential consumers and can be the high performers in an overall keyword advertising effort.

Although there is a small higher cost associated with unbranded ad and phrase category relative to the branded ad and phrase, the branded ad and phrase category generated higher mean sales. Therefore, companies that employ keyword advertising efforts should include relatively niche, long-tail [2] keyphrases common in branded queries, along with the more generic phrases common with nonbranded queries. Used effectively, this approach could save a company costs while generating higher revenue.

The essential factor in this effort is the overall impact or efficiency. Note that although the branded ad and branded phrase category had a 1,503% higher mean number of clicks, this category resulted in 2,653% more sales revenue. This would indicate that the branded ad and branded phrase category is even more effective in generating sales than it is in generating clicks (i.e., more of the users who clicked on the ads converted).

This premise holds true, and is even more impactful, if we examine the sum of both cost and revenue for the keyword advertising campaign in our dataset, as shown in Figure 2.

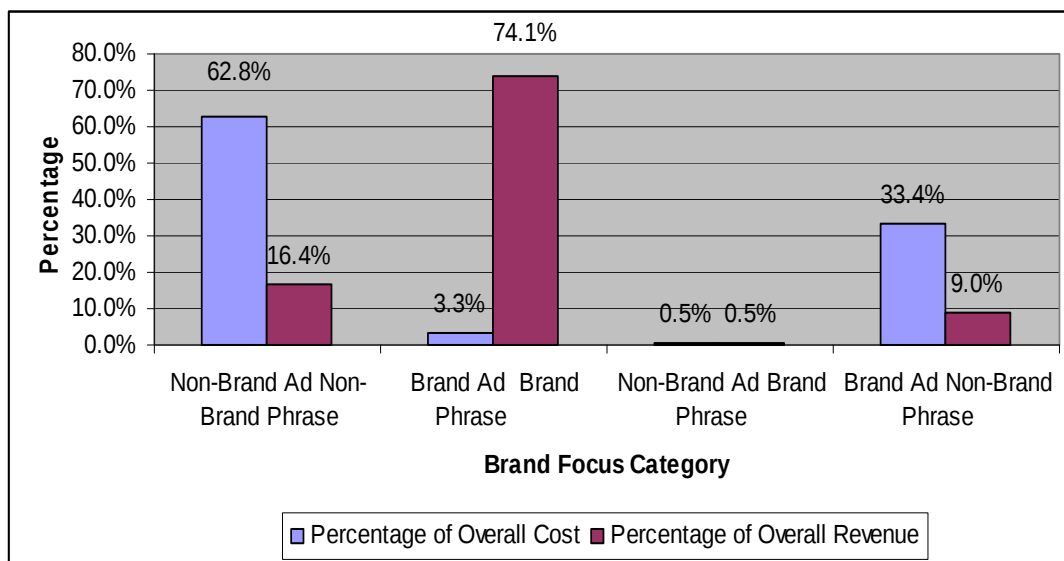


Figure 2. Percentage of Overall Cost and Revenue by Brand Focus Categories.

The brand ad and brand phrase category generated 74.1% of the total sales revenue during the 33-month campaign, followed by 16% for nonbrand ad and nonbrand category, compared to 9% for brand ad and nonbrand phrase category. However, the brand ad and brand phrase category generated only 3% of the cost compared to 62% for the nonbrand ad and nonbrand phrase category (with only 16% of revenue). The brand ad and nonbrand phrase category (with only 9% of revenue) generate 33% of the cost. Hence, there is a potentially higher cost associated with the less focused nonbrand ad and nonbrand phrase and the brand ad and nonbrand phrase categories.

Therefore, for keyword advertising campaigns, the brand ad and brand phrase category is the most effective (in generating revenue) and the most efficient (in generating this revenue at the cheapest cost). The nonbrand ad and nonbrand phrase and other relatively generic categories cannot be included wholesale to be profitable for an advertiser. Nonbranded and related phrases that generate impressions and clicks but few converts, should be candidates for removal, as they generate a lot of overall cost with little revenue generation.

This recommendation of course is based on the total attribution of the conversion going to a single phrase – advertisement combination. If we assume that this final phrase – ad combination is a branded pair, we are ignoring any possible information searching and gathering during the entire information seeking process. Consumers might view several advertisements before making the conversion. If we assume that this earlier advertisements are nonbranded phrase – advertisement pairs, our assigning the total attribution to the final ad might be discounting important information provisioning that is occurring earlier in the consumer search process. However, Jansen and Simone [32] has shown that many consumers do not adhere to this rational view of a consumer search process.

Limitations and Strengths

There are limitations to our study, as with any research. First, the data set is from the keyword advertising campaign of just one retail company, although the dataset is quite large in terms of the number of records and temporal span. Also, with one retailer, the brand image of this retailer might have an effect on the consumer reaction to ads and with subsequent conversions. Others large retailers with a different brand image, either more positive or more negative, might have produced in different results. Additional research using data from other companies in other market verticals is needed in order to generalize the results to other areas and companies. In addition, given that this retailer is nation-wide, additional research would be needed to see if the findings translate to local or small-to-medium size enterprises. However, we believe that the research findings reported in this study provide valuable insight toward the empirical research of brand usage in the keyword advertising area, with its effect on searching and consumer behaviors.

As a second limitation, the dataset used in this research does not contain the customer behaviors on the landing pages nor does it contain the offline behaviors of the searchers. Customers may be using Web search engines for some aspects of the searching and purchasing process (i.e., just information gathering or just purchasing), and then using other information systems or sources for other portions of the process. For example, a searcher may begin a product seeking on a search engine by submitting a query, clicking on a displayed advertisement, and browsing the landing page. However, the customer may make the actual purchase in a brick and mortar store or via the telephone. Nevertheless, at least for the searching and purchasing behaviors on the search engine, the findings reported here seem to support that there are brand focused behavioral differences in phrases and advertisements, even if the consumers are conducting other activities in other mediums.

This research also has several strengths. Based on the significance of the findings, we believe that the research results presented here make valuable contributions to the currently limited but growing body of research concerning searcher and customer behavior in the important sponsored search area. Given the substantial impact that sponsored search technology and its accompanying business process have had on the development, growth, and use of the Web for online commerce (along with other areas), sponsored search is an area that deserves substantial investigation.

Specifically, the data set was quite large, and the data collection was longitudinal. The data consisted of more than two and half million records of searching and purchasing behavior and had a lengthy data collection period (i.e., 33 months spanning four calendar years). The dataset also includes a varied and rich set of search and consumer behavior and interactions (e.g., impressions, clicks, orders placed, items ordered, and money spent), along with the actual ad. Therefore, the research findings provide important insights into searcher and customer behavior in the real world, within the online commercial domain.

CONCLUSION

A company that employs sponsored search has a great deal of information at their disposal for evaluating campaign performance. By using data collected during the online interactions, companies can track everything from what terms users searched for, what ads they clicked on, and which visits resulted in a sale. From an analysis of these measures, the resulting insight can aid companies in spending their online advertising dollars more effectively.

The results of the research reported here also conclude that the combination of brand focused keyphrases and advertisements generate the most sales and are relatively cheaper than nonbrand phrases. Therefore, it is generally beneficial for online advertisers to devote advertising resources targeting these brand focused keyphrases and matching them with brand focused ads. It also indicates that continued marketing efforts to manage positive brand image, awareness, and relationship have a direct affect on keyword advertising performance, and thereby the financial performance of the company.

For future work, investigations on brand perception of online advertisements could lead, perhaps, to better advertisement creation. This could increase the receptiveness of the ads and in turn enhance the overall effectiveness of a campaign and improved sponsored search platforms. Another interesting research area would be an analysis of the entire SERP, both organic and sponsored results, in order to gauge the interplay of these two listing in the branded search arena. Also, we have analyzed sponsored search ads in general. It would be a worthwhile study to conduct an analysis of the effect of ad position on the SERP (i.e., north, east, and south) and ad rank in each of these positions on impressions, CTR, CPC, sales, orders, items orders, and ROA. Finally, a really interesting study would be to take secondary data about this company's brand image over time and correlate the keyword advertising performance to fluctuations in brand image.

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