



# Performance analysis of keyword advertising campaign using gender-brand effect of search queries



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## ABSTRACT

In this research, we analyze the relationship among (1) the performance metrics of a sponsored search campaign, (2) the gender orientation of queries, and (3) the occurrence of branded terms in queries. The aim of this research is to investigate the effectiveness of increased personalization of search engine advertising in order to improve the consumer's online experience. We segregate keyphrases from a dataset covering thirty-three consecutive months from a major US retailer consisting of 7 million daily records of a real time keyword advertising campaign into three gender categories (*male*, *female* and *neutral*) each with two groups (*branded* and *unbranded*) term usage. Using ANOVA, we analyze the effect of gender and brand keyphrases on critical sponsored search performance metrics of impressions, clicks, cost-per-clicks, sales revenue, orders, items purchased and return on advertising. Research findings show that the combination of brand focus with the gender-orientation of keyphrases is a significant factor in predicting sponsored search performance and behavior. There are statistically significant variations in consumer behavior as measured by sponsored search metrics among the gender categories. Specifically, females are more attracted to the use of branded terms than males, perhaps due to the trust and customer loyalty generated by brand image. Our results establishes that positive brand reputation creates dramatic influence on consumer's loyalty over the brand and hence strongly affects their interests, activities and purchasing behavior in e-commerce environment.

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## 1. Introduction

In the business-to-consumer (B2C) online commerce environment, the web is the major marketing medium (Constantinides 2002). Search engines play a pivotal role in online shopping and also are the primary medium to promote online advertising. Keyword advertising (sponsored search or pay-per-click advertising) has become the most popular form of online advertising (Lieber and Syverson 2012). In order to leverage the web as the medium of commerce, retailers with brick and mortar stores have gone online, and the numbers of online only businesses has grown significantly (Roggio 2013).

Much of this online economy is driven by consumer search queries and the advertisements served by the search engines in response to these queries, which can be quite profitable for online businesses, as they direct consumers to their websites. Retailers optimize their search engine advertising strategies based on

keyphrases. Two major issues marketers face when optimizing their marketing strategies are understanding the search behavior of the consumers (Constantinides 2004) and the attitude of the consumers towards the brand (Wang et al. 2002). Prior research on the role of branding and web demographics (Esch et al. 2006, Weber and Castillo 2010) illustrates the increased attention in addressing these issues. The research on web demographics in electronic commerce highlights that gender is a key predictor of purchase intent, and the notion of positive brand image enhances the business and helps retailers to withstand marketplace competition (Koças 2005).

In this research, we use real life search engine marketing data of a major US retailer to analyze the relationship among the gender specificity of terms in keyphrases, the branding focus of the keyphrases, and the resulting online consumer behavior. Our research question examines if there are differences in sponsored search performance based on gender orientation and the brand orientation of search queries.

The online shopping behavior of the consumer is measured by accepted industry standard metrics (the number of user clicks, the revenue generated by online sales, number of orders placed,

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number of items purchased, number of impressions generated, the ratio of clicks to impressions (CTR), cost that each click incurs or cost-per-click (CPC), return on advertising (ROA), etc.) that determine the performance of sponsored search. The research motivation is to investigate whether the combination of gender orientation and brand mention of the keyphrases has an effect on these performance metrics. In our research, we analyze whether the online marketers should consider the gender-brand effect as a factor for personalizing search advertising campaigns. Highlighting the implications for ecommerce, information regarding interaction between the gender of potential customers and brand effect of keyword advertisement will help retailers better formulate and optimize their marketing strategies.

We first review prior work concerning branding and gender orientation in online searching. The next section presents the research question and associated hypotheses. The research design section describes the data and the methodology for evaluation of the hypotheses. The result section presents the findings and effect size analysis. The discussion and implications section is followed by the conclusion with highlights and future research.

## 2. Literature review

We begin with a short overview of sponsored search, and we then discuss the prior work on brands and gender in online searching and ecommerce.

### 2.1. Sponsored search

In sponsored search campaigns on the major search engines, advertisers bid on keyphrases that relate to a product or service that they are providing and that they believe searchers will submit to the search engine. These keyphrases provide the linkage between the results provided from the advertiser and the queries submitted by potential customers, who are the searchers on the Web search engines. When searchers submit queries to the search engines that match a key phrase, the corresponding set of results is displayed on the search engine results page (SERP). Although published data is sparse, reports are that about 15% of search engine clicks occur on these keyword advertisements (Jansen and Spink 2009).

The cost of the keyword for the advertiser is determined via online auctions. The exact cost can be in continual flux, as the amount that an advertiser *must* bid to get an ad to display depends on the overall demand for that keyphrase at a given time. The amount that an advertiser is *willing* to bid depends generally on the perceived possible value of the customer converting (take some desired action like purchasing a product). Multiple advertisers are typically bidding on the same keyphrases simultaneously, so the online auction and bid price can be quite dynamic. The search engines provide advertisers an assortment of tools to effectively manage their bids, control risk, and maximize opportunity.

The sponsored results on the SERP are usually shown above the organic results listing (the north position), to the right of the organic results listing (the east position), and below the organic results listing (the south position). The exact display method depends on the search engine, as some engines may not use all three positions. The sponsored result's rank within each listing depends on the bid price, the other bids in the auction, and a quality score (determined by several factors including bid amount, click through history and landing page relevance to the ad, although this formula varies by search engine). Given these factors, the sponsored search process is an interesting and complex integration of business processes, information technology, and information processing, making it an exciting area for multi-disciplinary study.

The sponsored search results are usually textual in nature and normally consist of a short headline, two diminutive lines of text describing the product or service, and a hyperlink that points to the advertiser's landing page (an advertiser designated Webpage). The predominant keyword advertising model is pay-per-click (PPC), where an advertiser only pays the search engine if a searcher clicks on the displayed ad hyperlink. So, the impression of an ad does not monetarily cost the advertiser.

The entire sponsored search process can be extremely complex, and this brief overview cannot do it justice. The interested reader is referred to review articles (Fain and Pedersen 2006, Jansen and Mullen 2008) of the sponsored search process.

### 2.2. Branding

Branding has three components that may influence consumers in the e-commerce domain. These components are: (1) brand awareness, (2) brand image, and (3) brand relationship (Esch et al. 2006). The first component emphasizes the consumer's ability to memorize and recognize the brand under different market conditions (Percy and Rossiter 1992). Brand image deals with whether or not the brand can make a mark in the consumer's memory (Keller 1993). Brand relationship is the component that represents the customer's satisfaction over that brand (Esch et al. 2006), including that of search engines (Jansen et al. 2009, 2012; Zhang et al. 2012).

Prior research has studied the brand effects as the antecedents of online trust relating to the company, its website, and the product (Schultz 2004), along with the search engine and search process (Jansen et al. 2009, 2012; Zhang et al. 2012). A brand can distinguish an organization or a product from its competitors. Positive branding can have a dramatic effect on consumer reactions as affirmative brand attitude leads to emergence of customer loyalty towards the brand. The brand components are strongly interconnected and portray different aspects of a consumer's perception and trust concerning the brand (Sicilia et al. 2006). Ha and Perks (2005) studied the kinship between brand familiarity, customer satisfaction, brand experience, and trust in online environment. Their findings assert that search for information, association, and customer's observation precede the customer's trust of the brand. Online reviews about the brand will also affect the consumer's trust of the brand and hence their buying behavior (Corbitt et al. 2003, Lee et al. 2008). So, brand knowledge has a direct and positive effect on consumers' willingness to support an online retailer in keyword advertising (Chen and He 2003). Based on this prior work, it seems reasonable that companies may want to leverage this brand knowledge directly in their keyword advertising campaigns. It is reported that among advertisers, brand awareness is one of the top objective of large company's sponsored search campaigns (Rutz and Bucklin 2008), as the reputation of a company can have a profound influence on online sales (Lee et al. 2009).

However, limited research has measured the effect of keyphrases with branded terms on the performance metrics of sponsored search. Amblee and Bui (2008) suggest that brand reputation has a correlation with online product reviews. Other studies (Ghose and Yang 2007, 2008) reported that brand terms have an effect on SEM performance where retailer specific brands achieve high CTR. Researchers (Jansen et al. 2011) investigated the influence of brand effect on SEM performance with a large dataset from a real time keyword advertising campaign and infer that the brand term in keyphrases has a dramatic effect in performance of sponsored search. They show that the combination of branded phrase and branded advertisement generates 15 times more sales revenue than any other combination. Their findings imply that mentioning the brand term in keyphrases increases sponsored search

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