In Google We Trust: Consumers' Perception of Search Engine Optimization and Its Potential Impact on Online Information Search

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Abstract

Search engine optimization (SEO), as a multi-million dollar business of search engine marketing, has seldom been studied from the consumers' perspective. This study aims to be the first step of researching consumers' reaction to SEO as a marketing practice and its potential impact on online search behaviors. Results showed that the general attitude towards the use of SEO was positive. However, after participants of this study learned about how SEO worked, their evaluations of search engines and the websites directed to by search engines decreased. Most of the participants' online search behaviors remained unchanged except for the number of different searches conducted. Theoretical and practical implications are discussed.

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Chapter One: Introduction

Imagine a consumer who intends to buy a flat-screen TV and decides to do some homework before making a purchase. He may, as the majority of consumers do, start with Google and first search for "flat-screen TV" to have a general idea of what are some of the flat screen TV brands. He can do so by simply looking at the search engine result page to see which brand names show up or he may look at the sponsored links part of the search engine result page (SERP) to see which brands are advertising there. He may then search for "Sony flat screen TV" and click on "image" to see what Sony flat screen TVs look like. Alternatively he may click on sony.com that showed up in the initial organic results to learn more about their offerings. He may then go on with yet another search for a particular model. Perhaps he will click on "shopping" to see who is selling the model and compare prices within Google Shopping. Then he may pick up a retailing website from either the sponsored or organic results. He may also come across a map showing local stores that carry the model and decide to make the purchase locally. Whichever route he takes, Google (or an equivalent search engine) is a valuable stop he has made in order to connect the different dots that lead to his final purchase.

Search engines have become an integral part of consumers' shopping cycle. Consumers use search engines to learn about brand and product information, to dig out professional and consumer reviews, to discover deals and coupons, to compare prices, to link to brand or retailing websites, to find store locations and to do just about everything that needs to be done to complete a purchase. Above all this is the fact that search engines have become a key way to acquire information. Whether you are looking for news on a

certain topic, information on a chronic disease, a recipe for a family dinner or even an academic paper, you are more likely than not to use a search engine at some point of the information search process. Even when people are not seeking any particular information, they'd still use Google to simply test whether their Internet connection is working well.

The importance of search engines as an information acquisition tool has been well established. Since the Pew Internet Project began measuring American adults' online activity in 2002, the use of search engines and emailing have consistently ranked as the top 2 most popular online activities. Their 2011report concluded that as many as 92% of online adults in the U.S. use search engines to find information on the Internet (Pew Research Center, 2011). Another report by them in 2012 showed that 73% of all Americans used search engines as of February 2012. This was an increase of 21 percentage points over the 52% of all Americans reported in January 2002. What's more, people's frequency of using search engines has jumped dramatically. On any given day in early 2012, 59% of adults using the internet had used a search engine (Pew Research Center, 2012). This is almost double the percentage in 2004 (30%).

More importantly, and more relevant to this study, search engines have become a key step in consumers' purchase decision-making process. According to an ongoing consumer tracking study by the e-tailing group BIA/Kelsey (2010), over 90% of consumers use search engines to research products or services before making a purchase, whether it is an online or offline purchase. Their *2010 Social Shopping Study* also revealed that 57% of shoppers surveyed stated that they had begun their product research with a search engine.

Not only are search engines a popular tool for information, shopping related or not, they are also a trusted source of information. The *Search Engine Use 2012* report by Pew revealed that 66% of search engine users viewed search engines as a fair and unbiased source of information. Much of the trust is directed to the organic listings returned by search engines. A survey by SEMPO (2004) showed that organic listings were chosen first by 70% of the people viewing search results. Another survey by ClickZ (2004) showed that 60.5% of all clicks occurred in search engines were on organic results. Results from several experimentally-controlled studies confirmed the same preference of organic links (Agichtein and Zheng, 2006; Jansen and Resnick, 2006; Jansen, Brown and Resnick, 2007).

However, such trust is not always based on knowledge. Consumers, in general, are not familiar with how search engines index and rank websites (Introna and Nissenbaum, 2000). A Pew Internet and American Life Project report (2005) found that only 38% of US internet users were aware of the distinction between sponsored links and organic links.

Much of the information shown in search engine result pages (SERPs) that is believed to be “fair and unbiased” is commercial in nature. As a pro-profit enterprise, search engines not only serve the interests of the public, but also that of various companies and brands. Search engine marketing (SEM) has become a dominant form of online marketing in recent years and an increasingly important part of a brand’s overall marketing strategy. By utilizing SEM, websites that wish to expose their content or

product to consumers can reach these potential customers when they search for specific keywords, providing invaluable targeting opportunities.

According to IAB (2010), SEM remained the largest online advertising revenue format, accounting for 47% of 2009 full year revenues. This is up from the 45% in 2008. A more recent SEM report by SEMPO (2011) predicted that the North American search engine marketing industry will grow by 16% in 2011 to a value of $19.3 billion, up from $16.6 billion in 2010. Most strikingly, a recent report by Statista (2012) showed that in the first six months of 2012, Google made $10.9 billion in ad revenue, more than the $10.5 billion ad dollars made by all print media in the U.S.

Unfortunately, the advertising success of leading search engines like Google has failed to attracted sufficient attention in academic research. Behind this increasingly important online advertising format is a fundamental yet less understood issue critical to both marketers and search engines: how do consumers perceive search engines as a marketing platform? Much research that attempted to answer this question focused on paid search, or sponsored links, a way of SEM that is not very different from buying placement in traditional media. With sponsored links, advertisers pay search engines to be listed in the sponsored results.

On the other hand, the other form of SEM, search engine optimazition (SEO), has received far less attention from search engine researchers. SEO is a collection of different actions that a website can take to improve its position on the organic result listings on a SERP by influencing the search engine's ranking algorithm. Though a seldom touched-upon topic in consumer marketing, one of the biggest advantages of using SEO,

ironically, is consumers' trust. Organic links are viewed by consumers as more relevant and trustworthy, and thus website may receive positive benefits from visitors clicking on them (Berman and Katona, 2011; Malecki, 2010). But what if consumers are aware of the nature of SEO and the fact that the use of SEO may potentially influence the "fairness" of the organic results they get from search engines? How will consumers perceive search engines after learning about the use of SEO practices? Will such knowledge influence how consumers conduct their searches? Will consumers' trust in search engines persist? The answers to all these questions require a deeper understanding of how consumers view and use search engines. This could potentially help marketers, as well as the search engines themselves, to make informed strategic decisions.

While SEO is gaining more and more attention in the online advertising industry, there has been very few published academic studies in this area, especially from the point of view of consumers. To address this gap, this study aims to understand consumers' general attitudes toward the use of SEO and the impact of SEO on search engine perceptions and search behaviors.

In this study, the general search engine Google is used to explain how search engines and search engine marketing work because its share of the global search engine market was over 92% as of February 2012. It is also the preferred information retrieval tool that consumers use to discover information and look for products to purchase on the web (StatCounter, 2012). In the following sections, I will first briefly introduce the background of search engines and how they work. Then, the two ways of doing search

engine marketing and their unique characteristics will be discussed. Subsequently, I will raise research questions and hypothesis for the study and lay out their rationales.

Chapter Two: Literature Review

2.1 Search Engines

Search engine is a generalized expression, comprising different kinds of tools to search for a variety of different types of information on the web. For example, there are general search engines like Google, Bing and Yahoo where all kinds of information on the web are indexed and are searchable. There are also specified search engines that focus on only one category of information such as Scirus for scientific information, Yummly for food and recipes, Google Patents for patent information, and CastTV for videos, etc.

All search engines respond to a keyword query with a list of rank-ordered results. Approximately 10-15 listings will appear on each page of the search engine results. The ranking reflects the search engines' estimated relevancy of different web pages to the query. Major search engines available to consumers such as Google, Bing and Yahoo each have their own ranking algorithm and different ways of displaying results. Typically, search results are selected by search engines through four steps: crawling, indexing, searching and ranking. Crawling is the process of extracting information from web pages by search engine programs called web spiders. Web spiders, or web crawlers, are computer programs that automatically search out and record information from the Internet. Indexing is the process of extracting important keywords from different parts of the crawled web pages such as URL, HTML codes and actual web page content. These keywords are usually stored in a database for later use. Searching is the process of matching keywords from web pages saved in the database with keywords entered by searchers in search engines. By doing so, the search engine is able to return a list of best-

matching web pages based on keywords. Last but not the least, ranking is the process of putting the matching list of results in rank order based on each search engines' unique ranking algorithm.

Take Google for instance, one key measure they use in their ranking algorithm is PageRank, a calculation based on the link structure of a web page. PageRank uses the number of links referring to a web page and the relative importance of the referring pages to proxy a web page's relevancy. The basic assumption is that a link to a web page is a vote for the page. But not all links are equal. Links from famous websites or websites that are also well-linked (both inbound and outbound) are considered to have stronger votes. The use of PageRank has been criticized by some researchers as equaling popularity with relevancy, and thereby not being able to best reflect searchers' information need (Hindman, Tsiotsioliklis and Johnson, 2003).

The entire list of measurements used by Google or any other major search engines in their ranking algorithms remain top secret, but that hasn't stopped marketers and advertisers from trying to figure out ways to make search engines work to their advantage. Web masters have been experimenting with different approaches of building more friendly and effective websites to improve their rankings in search engine results. The very first step is to learn what can be influenced on a SERP and what cannot.

2.2 Search Engines Result Pages

When doing product research on search engines, search engine result pages (SERPs) are where most of the attention and interaction occur. A typical Google SERP includes 3

major parts: the organic results, the sponsored results and the search tool bar (see Figure 1).

Insert Figure 1 about here

Organic results are links to other destinations on the Web in the order of the relevance of their content for a specific search query. They are always the major content on SERPs. They are called organic results because these links' relative positions on a SERP are determined by each search engine's own proprietary ranking algorithm. Sponsored results are typically displayed above and to the right of organic links on a SERP and look similar to organic links in format. They are called sponsored results because marketers pay for these links to be shown on a SERP. Sponsored links are usually clearly marked as advertisements by being shaded in light pink for easy differentiation from organic (non-sponsored) links, as shown above in Figure 1. A search tool bar is typically located to the left of the organic links on a SERP. They are there to help searchers more easily navigate the SERP.

On a single SEPR, there can be several different kinds of organic links. The most common kind is a simple outbound link. Such links often contain an underlined headline in blue, a detailed URL in green and a few lines of description of what the link is about in black. Typically, if any words in any of these parts correspond with the keyword entered by searchers, those words will be bold.

Insert Figure 2 about here

In addition, aggregated organic results are also commonly seen on Google SERPs. Aggregated organic results are places on a SERP where Google stacks several links of the same kind together and shows them as one united entry. There are four commonly-seen types of aggregated results. Aggregated news results show news articles that are relevant to the same search query. Aggregated image results show relevant images for the same search query. Aggregated shopping results show products pictures with prices or retail website links for the same commercial query. And aggregated local results show relevant locale store information such as website URL, address and phone number.

Insert Figure 3 about here

While providing organic results to consumers is a search engine's core business, selling sponsored links is the leading revenue stream for search engines. Sponsored links are typically auctioned to advertisers using keyword bidding. During the sales process, brands who wish to advertise their products or services submit advertisements based on keywords. A keyword is a single term, or a combination of terms, that best describe the service or product and are usually the actual words consumers are likely to use when they

search for certain information. For example, a website that sells table PCs may want to bid for keywords such as “tablet,” “tablet PC,” “tablet computer” and more so that whenever someone searches for these words, its site comes up in the sponsored links part of the returned SERP. The value of a keyword primarily depends on its popularity and frequency of use among consumers. Generally, the more generic the keyword is, the more expensive it becomes because a generic keyword like “tablet PC” is used by many more consumers than a more specific keyword phrase such as, “a tablet PC with a 64G memory.” Advertisers submit bids for the keywords that they want to associate with their websites in order to have their advertisements placed among sponsored links of a SERP. The general rule is that the highest bidders win the most visible position on the top of the sponsored links list. Subsequently, if consumers click on a sponsored link, the advertising brand pays the search engine the bid amount as a referring fee for the incoming traffic. Therefore, sponsored links are also called paid search, paid placement, or Pay-Per-Click (PPC).

A search tool bar is a relatively new addition to a SERP. Google introduced a vertical search tool bar on the left-hand side of its SERPs in 2010. They serve as navigation aids for consumes to more easily filter results by different content types.

2.3 Search Engine Marketing

Search engines are not only important information acquisition tools for consumers, but also an increasingly important marketing platform for advertisers through the use of search engine marketing (SEM). SEM is an advertising technique on the Web that uses

search systems to target advertisements to the appropriate audience. Unlike most advertisements in traditional mass media, SEM delivers relevant and targeted advertising that is part of consumers' search experience. With SEM, a link to a particular product or service only shows up when consumers enter a relevant keyword search. The objective of SEM is to increase both traffic to targeted websites and to increase consumers' awareness of such websites through exposure. In order to achieve these objectives, two main tactics are employed: paid search (sponsored links) and search engine optimization (SEO).

SEM is based on the premise that when searching for product or brand information online, consumers are more inclined to go and visit retailers' or brands' websites listed on search engine result pages (SERPs). For example, in 2011, Google started publishing a quarterly report based on data from hundreds of sites which voluntarily allowed Google to share their data with the public. According to the first volume of the Google Analytics Benchmarking Newsletter (2011), traffic from search engines accounted for about a third of all traffic to the sites that share data with Google. Direct traffic (arriving at a website by entering its URL directly in the browser) accounted for another third. A Citi report using data from comScore, a leading global digital analytics company, (2011) analyzed traffic source information for 35 top websites in six categories – retail, travel, finance, media, auto and health. They found that on average, Google was the No. 1 source of traffic for 75% of the websites. More specifically in retail, traffic from Google accounted for 70% of all traffic to retail websites.

Even if a link on SERPs doesn't lead to a click or to a later purchase, it has mere exposure effects and thus increases impression and memory of the brand or website, just

like banner ads do (Drèze and Hussherr 2003). For example, Teevan (2008) tested subjects' unaided recall after running a self-generated keyword search. The study found that result links that were clicked on were significantly more likely to be recalled. More interestingly, they found that higher-ranked results were more memorable; and that recalled results were much more likely to be remembered as having been ranked higher.

2.4 Paid Search

Paid search, or what's more commonly referred to as sponsored links, is an explicit advertising format where advertisers pay search engines to be listed in the sponsored results sections on SERPs. As discussed previously, sponsored links are the primary revenue source for search engines, and are oftentimes displayed above or to the right of organic links and clearly labeled as ads. The inclusion of sponsored links is determined through a keyword bidding process where the advertiser who pays the most for a certain keyword will be displayed on the SERP when a consumer searches for that particular keyword. For example, if advertiser A pays the highest bid for the keyword "suitcase", the next time a consumer enters "suitcase" in the search box and hit enter, a link to A's website will show up as the first link in the sponsored link part on the SERP. If the consumer clicks on the sponsored link, the advertiser then pays the bidding amount as a referring fee to the search engine. This is why sponsored links are also called Pay-Per-Click.

Sponsored links are important to both search engines and advertisers. For search engines, sponsored links are the primary, if not the only, source of revenue. For

advertisers, sponsored links provide reliable results with guaranteed placement, instant traffic and easy-to-calculate return on investment (ROI). Studies have shown that the use of sponsored links can significantly influence traffic and conversion rate for a website. In research by digital marketing firm, Atlas Institute, using real client data (2004), it was found that higher-ranked sponsored links lead to more traffic to the advertising website, and that the amount of traffic dropped significantly by sponsored placement rank. Another empirical study by Ghose and Yang (2008) reached similar conclusions. By modeling real-life sponsored link advertising data from a large national retail chain, they found that the higher the sponsored link ranked, the higher the click-through rate. More interestingly, they also found that sponsored links with brand name specific keywords in the description lead to higher conversion rates (the percentage of click-through that results in a behavior such as an actual purchase). These studies clearly show that the position of sponsored links on a SERP plays an important role in influencing website traffic. Advertisers have a higher chance of increasing the traffic to their website and even improving sales by bidding for better sponsored placement.

2.5 Search Engine Optimization (SEO)

There are also ways to influence placement position for organic links, although these are more indirect. Search engine optimization (SEO) is a process where advertisers try to work their way to the top of organic results by influencing search engines' ranking algorithm. SEO is divided into two main areas; on-page optimization and off-page optimization.

On-page optimization regards all modifications that are manageable directly by making changes to a website's content and HTML codes. One key part of on-page optimization is keyword management because frequency of keywords or keyword density is a criterion that major search engines like Google include in their ranking algorithm. To decide a website's relevancy, search engines extract corresponding keywords from different parts of a website to match with what is entered by searchers. Keywords usually need to be populated in both the actual content of a website and its HTML codes to achieve optimal effect. For example, with the keyword "electronics" in the URL http://www.bestbuy.com/site/Electronic, this descriptive URL can improve SEO effects compared to a URL such as http://www.bestbuy.com/site/abcat0100000.c?id=abcat010 with a series of meaningless codes that search engines cannot make sense of. Similarly, keywords also need to appear in meta tags, which are codes that quickly tell search engines what a certain section of a web page's HTML codes is about. For example, a series of codes like <meta name="description" content="Home electronics"/> can potentially make it much easier for search engines to index the page. Anchor text is the clickable blue hyperlink shown in SERPs that usually summarizes what the web page is about. The most optimal anchor texts are populated with keywords relevant to the web page. For example, an anchor text of "Burton Snowboards" conveys a much clearer idea to both search engines and consumers than an anchor text of "Burton" alone. In addition to HTML codes, a website's content is also an important target for on-page optimization. First and foremost, all content on a website needs to be written with a high proportion of relevant keywords that visitors may use to look for the site. Secondly, to be search-

friendly, a website needs to avoid featuring a large amount of non-indexable content such as flash or images.

Off-page optimization is also often referred to as link building, which in many cases can single-handedly determine the effectiveness of a SEO strategy. If a website is visualized as a node on the World Wide Web, its relative position on the web and its connectivity are considered by most search engines as an important parameter in their ranking algorithm. For example, the measure of PageRank by Google proxies a web page's importance by calculating the number of links referring to the web page and the relative importance of those referring pages. Link building is the art of link management. The relative influence and popularity of the websites to which a web page is linked partly determine the importance of this particular web page.

In recent years, SEO has become a more and more popular way of search engine marketing due to consumers' general aversion towards sponsored links and greater trust of organic links. According to a 2008 search engine marketing report by SEMPO, SEO accounted for over 11% of 2008 search marketing spending, In their 2011 report, over 86% of surveyed companies and agencies said they engaged in SEO. In fact, SEO has evolved beyond the world of commerce in recent years. It has now become important in political campaigns and even academia. There are even efforts to optimize papers for academic search engines such as Google Scholoar (Beel, Gipp and Wilde, 2010).

Successful SEO can be accomplished either by making a website more relevant for consumers or by investing in techniques that only affect the website's ranking without providing higher-quality content. These two types of SEO techniques are referred to as

white hat SEO and black hat SEO respectively. The difference is that white hat SEO improves the website's quality and thus increases visitor satisfaction. An example of a white hat SEO technique might be populating the site with more relevant content containing keywords as explained above. On the other hand, black hat SEO only improves the ranking of a website without changing its quality or value. Increasing the sheer number of links that the website is linked to would be an example of a black hat SEO technique. In extreme cases, websites can even buy links from the so-called link farms to boost their connectivity.

While white hat SEO practices can be viewed as an advertising or promotional investment, black hat SEO is often perceived of as cheating. Major search engines usually have very clear guidelines against illegitimate SEO practices and will punish those who violate their rules. For example, when J. C. Penney was reported to engage in black hat SEO practices by buying links from thousands of unrelated websites in February 2011, Google punished them by manually lowering the J.C. Penney website's organic ranking for months. In another case where BMW Germany was found to use spamming pages stuffed with keywords to skew search engine indexing in 2006, the brand's German website was deleted by Google from its search results for several months as a penalty.

2.6 The Relationship between Sponsored Links and SEO

As the only two kinds of result listings shown on SERPs, organic links and sponsored links are competing for searchers' attention. In a study of the interplay between organic

links and sponsored links, Mizil et al. (2010) found that for navigational searches where the user's intent was to find a particular web page, there was a clear competition between sponsored links and organic links for attention. On the other hand, for non-navigational searches (informational or transactional searches where the user's need is met by visiting multiple websites), sponsored and organic links together work to meet consumers' search needs better than either source alone. This is because during navigational searches where consumers' needs are often satisfied by top organic links, relevant sponsored links are very likely to be duplicative. However, for non-navigational searches, relevant sponsored links are more likely to have different information, which serve as a nice alternative if searchers choose to look outside organic links.

The dynamic between organic links and sponsored links lead to a series of studies on the interplay between sponsored links and SEO. Most marketers now need to deal with a balance of investing in SEO versus sponsored links. Similarly, companies' use of SEO and sponsored links also pose both opportunities and challenges to search engines themselves.

For marketers, reliable results and easy to calculate return on investment (ROI) are some of the most common reasons why companies invest in sponsored links rather than SEO. While click-through rates provide a clear-cut way to calculate ROI for sponsored links, it's much more difficult to explain whether a click on an organic click is due to SEO efforts or other random factors. Such ambiguity makes it difficult to report ROI for SEO efforts. Similarly, the effects of sponsored links pretty much depend on biding values. However, the effect of SEO depends on a large number of different elements,

many of which may be impossible for a brand or website to control. For example, a competitor may simply have a better web master. On the other hand, consumers have a bias toward, and greater trust in organic links. For this reason, organic links may potentially result in bigger and higher-quality traffic (Jansen and Resnick, 2006). These advantages of SEO have shifted many marketers from investing in sponsored links to investing in SEO.

But the relationship between SEO and sponsored links for marketers is far from a zero-sum game. Ghose and Yang (2010) used an equation-based model to empirically estimate the inter-dependence of organic links and sponsored links. By testing three months of real-life click-through data from a national retail chain who advertised on Google, they concluded that a higher number of clicks on organic listings was correlated with a higher number of clicks on sponsored listings of the same website. The results show that effective SEO efforts to boost a website's organic listing may have a positive influence on the website's click-through rate through sponsored links as well.

Search engines, too, are facing the SEO versus sponsored links dilemma. On one hand, search engines want to encourage a healthy level of white hat SEO to allow a bigger variety of websites the chance to show up in SERPs, which potentially brings better results to searchers. Search engines need to determine and manage the types of SEO practices they allow. On the other hand, the livelihood of search engines largely depends on revenue from selling sponsored link placements. In a sense, search engines are dealing with a tougher dilemma than marketers because sponsored placement sales depend on visitor volume, which in turn, depends on the quality of search results.

Research on the impact that the interplay between SEO and sponsored links has on search engines has reached no conclusive agreement. Some authors argued that although major search engines like Google are in a constant fight against black hat SEO to keep poor-quality websites in check, search engines may actually have an incentive to encourage and allow black hat SEO practices. Providing lower quality results in organic links that can occur through encouraging black hat SEO or through discouraging white hat practices can be good for search engines because it can help to maximize revenues from sponsored links (White, 2008; Xu et al., 2009). The logic behind this is that a brand which employs good SEO and always shows up among top results for relevant keywords won't bother to pay for sponsored links. As a result, search engines will lose a potentially valuable source of advertising revenue.

Some authors have gone even further in arguing that search engines can directly benefit from allowing black hat SEO (Berman and Katona, 2011). The explanation is that when black hat SEO causes websites to appear at the top of the organic results, their competitors have an increased incentive to put in higher bids to appear as top sponsored links in order to be seen and clicked on.

Other authors, however, have proposed an alternative view. While allowing the use of SEO may benefit search engines economically, it may hurt search engines' brand image and potentially put both consumers and websites at a disadvantage. In his research on search engine and privacy protection, Pasquale (2006) argued that the competition of top organic links among SEO web masters may lead to a destructive dynamic of gaming between the SEO industry and search engines. The sole job of a webmaster is to figure

out bits of information on how search engines rank websites and then use this to make their own websites one of the top sites. On the other hand, the mechanism of determining SEO fairness is kept secret by search engines. As a result, both consumers and websites are put into disadvantageous positions when the line between fair SEO (white hat) and unfair SEO (black hat) is at the sole discretion of search engines. In another paper, Mercadante (2008) called for greater search engine self-regulation. She argued that while Google claimed that their organic ranking process is free of human involvement, there are "deceptive practices (SEO)" misleading the public into thinking that the search results are based on relevance alone.

2.7 Trust in Organic Links

Trust is one cue that humans use to reduce the complexity of decision making (Luhmann, 1989). Search engines, through their ranking algorithms, retrieve information that they estimate can fulfill consumers' information need, and thus potentially reduce the cost of information acquisition. At the core of a search engine's business model is the consumers' trust in it to return relevant and useful organic results.

Trust in search engines and organic results are well documented. The *Search Engine Use 2012* report by Pew showed that 66% of search engine users in the U.S. said that search engines were a fair and unbiased source of information. This is likely why, in a survey study with 425 respondents, Hotchkiss (2004) found that more than 77% of respondents said they favored organic links over sponsored links.

Such bias is not surprising given consumers' increasing resistance to marketing messages, which is often referred to as "advertising avoidance" in the advertising literature (Yankelovich, 2005). Consumers still tend to consider the Internet as a task-performing medium and it is only natural for them to avoid or respond negatively to online advertising that is perceived to interfere with their tasks (Cho and Cheon, 2004). Accordingly, to perform a search through a search engine is a very goal-oriented behavior. The simple fact that sponsored links are ads can lead to aversion. In an ethnography research where Marable (2003) interviewed subjects about their everyday search habits, subjects reported that they ignored sponsored links simply because sponsored links were "advertisements that tried to sell." In another study where the researchers controlled for the content of organic and sponsored links (Jansen and Resnick, 2006), a significant bias against sponsored links was found, with respondents clicking on organic links 70% of the time.

This bias toward organic results makes search result ranking a common heuristic used by consumers when they need to decide on a link to click. Rational consumers should assess the description of each result link against their information need and click on the one that appear to be the most relevant. However, as Kammerer and Gerjets (2012) pointed out, consumers' click selection behavior is heavily influenced by the rank of a result on the SERP.

Indeed, there is much evidence showing consumers' widely existent bias toward top-ranking organic links over lower ranking ones. For example, Zheng and Agichtein (2006), after examining a randomly sampled 120,000 searches, concluded that consumers

are nearly twice as likely to click on the first organic link in a SERP than on the second. More interestingly, they also found that consumers' bias towards the top organic results was so strong that they may click on the top results even if they were less relevant than the results that came after these top links. Wang et al. (2003) confirmed the findings from previous research by demonstrating that approximately 90% of searchers never go beyond the first SERP. Therefore, being one of the top-listed organic links usually means a higher, if not the only, chance for a website to be seen and clicked on by consumers.

In an attempt to investigate how much consumers rely on Google's ranking to judge the relevance of a result link, Granka et al. (2007) showed subjects three versions of a SERP; the normal version with Google's original rank order; the swapped version in which the rank #1 result was swapped with rank #2; and the reversed version in which all result links were shown in reversed order. A bias toward the top organic links was found in all three conditions. More specifically, in the normal condition, subjects viewed the two top-ranked results with the highest frequency and clicked on the #1 ranked result most of the time. In the swapped condition, subjects clicked on what they perceived to be the #1 ranked result almost three times more often than the result that had truly been ranked #1 by Google. Most interestingly, in the reversed condition, subjects chose the top five results significantly more often than the bottom five. The results clearly show that subjects' clicking behaviors are heavily biased by a result's position on SERP.

The same results were also found by Keane et al. (2008). In a similar fashion, the researchers compared subjects' responses when they reviewed a SERP in its original order versus in the reverse order. The study found that when originally lower-ranked

results were positioned first and second in the SERP in the reversed condition, these results were chosen more often by users. When the originally highest-ranked results were positioned last in the result list in the reversed condition, they were chosen considerably less often. The researchers explained that the results might reflect people's implicit trust in search engines.

Another study by Guan and Cutrell (2007) partially confirmed the explanation given by Keane et al. Subjects in their research highly agreed with the statement "I expect the information I'm looking for to be in the top five results." This statement received a mean rating of 5.78 on a 7-point Likert scale. Additionally, the study by Guan and Cutrell showed that consumers' trust in search engine rankings may influence the quality of their searches. Guan and Cutrell tested different versions of a SERP in which the rank position of the best result varied for each version. Their results showed that subjects spent a longer time finishing the search tasks and achieved poorer accuracy when the target result was moved to lower positions. The click accuracy rate dropped from an average of 84% when the target was in the top 2 positions to about 11% when the target result was placed in the #8 position.

2.8 Summary

Finding product or service information online using search engines has become an indispensible part of consumers' purchase decision-making process. Visibility of a brand in the search engine results sometimes determines whether consumers will ever find the

brand. As a result, advertising on search engines has become an increasingly popular marketing strategy for many businesses.

Brands can either bid for sponsored results or try to boost the position of its website's organic listing. The advantage of sponsored links is that they provide guaranteed placement, and offer quick traffic and easy-to-calculate ROI. Investing in SEO, on the other hand, can potentially improve a website's placement in the organic results that consumers trust more than sponsored links and are, therefore, more likely to click on. Research has also found that organic links are viewed as more relevant (Jansen et al., 2007). However, consumers are biased toward viewing and clicking on only top-ranking organic links, even when these links are not as relevant as lower-ranking ones (Zheng and Agichtein, 2006).

Such bias toward top organic links may stem from an implicit trust in search engines. Consumers are found to use rank order generated by search engines as a heuristic cue to make click selection. But this bias toward top organic links doesn't always lead to optimal search outcomes. In fact, research has showed that such bias may cost clicks on less relevant results, longer search time and even inaccurate findings.

The very use of SEO as a marketing tool suggests that organic results in search engines are not always fair and unbiased. While consumers overwhelmingly favor organic links, they are also found to be lacking in knowledge about how search engines rank websites, let alone actual knowledge of SEO practices. A realization of the existence of SEO practices or general information on how search engines work may lead to more informed click selection and even a change of search strategy altogether. Therefore, an

investigation into consumers' reactions to the use of SEO practices can be helpful for the discussion of public policies and SEO regulations.

In addition, the investigation also has great business implications for both advertisers and search engines. Considering consumers' strong bias towards organic links and general aversion to online advertising, knowledge of SEO may influence how they perceive search engines and the companies that employ SEO. For example, if consumers are unhappy with the inclusion of SEO-influenced results in search engines, they may adjust their search behaviors or even keep away from certain search engines altogether. They may also become annoyed with companies who appear to gain top rankings through SEO without providing them with useful information. Such dissatisfaction can hurt both marketers and search engines. Alternatively, consumers may be okay with SEO practices. They may perceive white hat SEO as helping to improve the quality of search results. Such approval of SEO practices may provide incentive for marketers to invest in SEO and search engines to encourage white hat SEO.

While existing literature successfully identifies SEO as a valuable marketing tool, very little research has ever studied SEO from the perspective of consumers being on the receiving end of marketing messages. However, as discussed above, a study of SEO from the point of view of the consumers may have great implication for all parties involved in the search process: the consumers, the companies and the search engines. This study aims to be a first step in exploring consumers' reactions toward the use of SEO practices and how knowledge of SEO may impact consumers' search behaviors and perceptions of search engines. By using an online survey, this study will first investigate consumers'

general attitudes toward the use of SEO and the impact of SEO knowledge on search engine perceptions. Then by using eye-tracking and observing consumers' moment-to-moment search behaviors in two commercial search tasks, the study will further explore whether there are search behavior changes after learning about the use of SEO. Implications for marketers and search engines will be discussed.

Chapter Three: Research Questions and Hypotheses

The concept of attitude is central to the study of advertising. A generally accepted definition of attitude in advertising is ‘‘the audience member’s affective reaction to advertising in general’’ (Lutz, 1985). In terms of search engine marketing, previous studies have reported a generally negative attitude toward sponsored links. For example, Jansen et al. (2007) found that searchers considered sponsored links to be less relevant and, as a result, they chose organic links 82% of the time. However, given this bias towards organic links, it is surprising to see how little people actually know about search engines and their output.

The Pew Internet and American Life Project (2005) found that only 38% of US internet users were aware of the distinction between sponsored links and organic links. Less than 17% reported that they can always tell which results are sponsored and which are organic. If the distinction between sponsored links and organic links still requires substantial education, SEO is a concept that is likely to be even more alien to consumers. To explore consumers’ reactions to the use of SEO, it is necessary to first take a look at consumers’ general attitudes towards this marketing practice.

Given consumers’ general dislike of sponsored links and the fact that SEO may be thought of as a hidden way for marketers to influence search engine results (Mercadante, 2008), we may hypothesize that consumers will hold negative attitudes toward this practice. Alternatively, a positive level of SEO may be seen as improving search engine result quality and thus the satisfaction of consumers (Berman and Katona, 2011). This could lead consumers to have positive reactions toward the use of SEO. Given these

conflicting possibilities, consumers' attitude toward SEO is posed here as a research question:

RQ1: What are consumers' attitudes towards SEO practices after learning about them?

In a time when not all search engines were required to label sponsored links as ads, Marable (2003) conducted a research study where subjects were interviewed before and after they were informed that some of the links they clicked on during a search task were sponsored links (i.e., ads). While subjects reported that they trusted search engines to present only unbiased results before their knowledge of sponsored links, they expressed surprise at the fact that companies or websites used sponsored links as a way of search engine marketing. Many subjects expressed negative emotions towards companies that used sponsored links and search engines that included sponsored links in SERPs. There was a sense of betrayal by search engines. For example, one subject said, "My little fantasy world is wrecked." Subjects' biggest concern was potential information bias during information search, especially when it came to commercial information. The results clearly showed that when information of sponsored links was disclosed to consumers, the credibility and quality of search engine results were called into question.

SEO, is another major form of search engine marketing. Today, knowledge of SEO is as limited as knowledge of sponsored links was several years ago. When SEO tactics are disclosed to consumers, they may lead to similar decreased perceptions of search engines.

H1a: Evaluations of search engines will be more negative after consumers learn about SEO practices than before they are informed of this practice.

In the Marable (2003) research, many subjects expressed concerns that the mechanism of sponsored links may give companies that engaged in the practice an upper hand in competition because consumers may click on sponsored links without ever knowing that their placements on SERPS were paid. Similarly, in the case of SEO, if the knowledge of SEO was to lower evaluations of search engines, the negativity may also extend to the specific web pages listed by search engines since they are the ones that employ SEO:

H1b: Perceived relevancy of websites pointed to by search engines will be lower after consumers learn about SEO practices, compared to before.

Studies of attitudes conclude that they are an important predictor of behaviors. For example, McGuire's (1978) information process model and Ajzen's (1985) theory of planned behavior both assume that attitudes predict behavior. When it comes to information search in search engines, attitudinal variables have also been shown to significantly influence search behavior. Nahl (2004) found that attitudinal factors had a great impact on the strategy searchers employed during an online search, such as whether to give up or continue searching. Searchers who had higher self-efficacy and were optimistic about the expected outcome of their searches were found to be more motivated to keep searching until they found something relevant. Additionally, Nahl found that searchers with higher affective coping skills were significantly more positive in their search engine evaluation and satisfaction ratings and considered results more relevant than those with lower coping skills.

In another study, Kim (2009) explored the predictors of behavioral intentions in online information search and found that searchers who had more positive attitudes were more

likely to succeed in their search and had higher satisfaction with their search outcome. Finally, Marable (2003) also reported that after learning about the use of sponsored link, many subjects commented that they would be more mindful and keep a more critical eye when using search engines in the future.

Given these findings regarding sponsored links, it is reasonable to believe that when consumers are informed about the use of SEO as a marketing tactic, they will also adjust their search behaviors to safeguard potential influences of SEO practices. However, since no previous research has studied the impact of knowledge of SEO on specific search behaviors, this is simply posed here as a research question.

RQ2: How does the knowledge of SEO impact consumers' specific behaviors on SERPs during an online search using search engines?

Chapter Four: Methodology

4.1 Eye Tracking

Transaction log file analysis has been the most-frequently used method in studies of online information search with search engines (Xue et al., 2004, Agichtein, Brill & Dumais, 2006, Jansen, Spink & Saracevic, 2000; Silverstein, 1998). For a search engine, a transaction log is an electronic record of all interactions that have occurred during a search session. This includes information such as the number of search queries entered, the keywords used and the number of websites clicked. Transaction log file analysis is popular among search engine researchers because it allows for the collection of a large amount of real-life data from a sizable sample.

However, the analysis of transaction log files as a research method has also received a lot of criticism. For example, Kurth (1993) pointed out that transaction logs can only deal with the actions that the searcher takes but not his/her perceptions, emotions or background skills. Indeed, in a holistic model of online information search behaviors, transaction log data should only be seen as part of the process, depicting just the selections made by a searcher. The cognitive processes the searcher experiences during a search session and what leads to his or her selections need to be explained separately in order to gain greater insights into search behaviors. While perhaps not getting into the complete thought processes of the searcher, advances in the technology of eye-tracking devices provide a valuable opportunity to behaviorally look beyond transaction log data to gain greater insight into the search process.

The study of eye movements as a reflection of cognitive processes has been investigated in the field of psychology for a long time. It is generally believed that shifts in viewers' attention are reflected by changes in visual fixation (Hayhoe and Ballard, 2005). Eye-tracking is particularly promising in researching online information search behaviors because it allows for an investigation into what searchers actually view, skip or process in real time. Such moment-by-moment observations of consumers' attention can reveal insights unachievable by existing studies using transaction log data alone.

Fixation is one of the most commonly-used variables in eye-tracking studies. It is defined as a spatially stable gaze lasting for approximately 200- 300 milliseconds, during which visual attention is directed to a specific area of the visual display (Cutrell and Guan, 2007). Fixation occurrence is traditionally considered as an indication of searchers' attention and represents instances in which information acquisition and processing may be occurring (Rayner, 1998). In addition, based on existing literature, there is a close connection between the amount of fixation time (fixation duration) spent on certain items and the degree of cognitive processing and attention to these items (Fischer and Weber, 1993; Rayner, 1998).

Oftentimes, however, discrete fixations may not be useful to researchers. The short time span of a single fixation means that it can only cover a very tiny area of a visual display. For example, in this study, the visual display is a Google SERP that typically includes a top search box, a main body of organic links, a right hand side strip of sponsored links and a search tool bar on the left. Such a SERP may attract hundreds of scattered fixations. Analyzing each and every one of these fixations individually won't

tell much about how consumers interact with the SERP. In this case, it makes more sense to group fixations together based on which functional area they belong to in a stimuli (in this case, a SERP) and then analyze the resulting fixation groups. These fixation groups are called areas of interest (AOIs). In most eye-tracking research, the unit of analysis is an AOI, a collection of fixations on a specific region of a visual display. Most eye-tracking software allow researchers to define their own AOIs based on research interests. This is important to this study because the ability to define and analyze different AOIs makes it possible to individually compare the organic link area, the sponsored link area, and the search tool bar area as independent parts of a SERP.

One of the earliest studies using eye-tracking to investigate online information search behaviors in a search engine environment was conducted by Granka, Joachims and Gay (2004), who explored how searchers viewed and selected links during a search on search engines. Participants carried out a series of search tasks, either informational searches (where the user is seeking to learn about a topic, and where there may be several relevant links that offer an answer) or navigational searches (where the user is looking for a single correct resource to go to). With eye-tracking and the ability to define independent AOIs, the researchers were able to investigate how much attention was paid to the different parts of a search result link (title, link summary and URL). The results demonstrated that the type of search task influenced searchers' behaviors. For example, more link summaries in a SERP were viewed for informational searches than for navigational searches. Other factors also impacted search behaviors. For example, more summaries below the selected link were viewed for harder search tasks than for easier search tasks.

More interestingly, the study found that Google users have a bias toward top-ranking organic links (Granka, Joachims and Gay, 2004). The results were consistent with previous studies done using other methods. The study found that fixation time for results after the second result link dropped sharply. Moreover, the page break of a SERP was found to have a significant impact on searchers' attention. Usually 5 to 6 results are visible on a Google SERP without scrolling down. Result #6 was found to be a threshold of both attention and chance of being clicked. Compared with results coming before #6, results below #6 received significantly less viewing time and were much less likely to be clicked on. In addition, before result #6, the higher a result link ranked, the longer fixation time it received. But all result links after #6 received more or less the same amount of fixation time. The findings showed that after searchers started to scroll down a SERP, ranking became less of an influencer for attention, which reinforced the conclusion that search engine users have a bias toward top ranking organic links.

Klockner et al. (2004) took a bigger picture view of the search process. They used eye-tracking experiments to explore the search strategy employed by searchers. To do this they looked at the order in which searchers examined their search results before making a selection. They categorized two kinds of scanning strategies. One was the breadth-first strategy where searchers scanned through a range of results before clicking on any link. The other was the depth-first strategy where searchers examine each result in the list and decide immediately whether to click on the link or not. If not for eye-tracking, Klockner would not have been able to analyze the order in which searchers viewed search results and identified those two major search strategies.

Through the use of eye-tracking techniques, these studies were able to find nuances of how searchers interact with search engines that are otherwise impossible to detect. Based on the studies being reported here, there are two good ways to determine the impact of the knowledge of SEO on search behaviors. The first is to compare the eye-tracking and click through data from subjects with prior knowledge of SEO with the data from those without such knowledge. The second approach would be to observe any changes in real-time attention and clicking behavior from a search occurring before subjects learn about SEO to one occurring after subjects learn about SEO. In both cases, the outcome measures would depend on behavioral differences. This is important since search behavior changes due to the knowledge of SEO may be subtle and difficult for consumers to recognize and report.

4.2 Pre-test

A pre-test was conducted to help select appropriate product categories to use in the search tasks to be done by subjects in the primary study. Initially, 10 product categories were selected for the pre-test. They were camcorders, electronic grills, sunscreens, coffee makers, snowboards, mountain bikes, flat screen TVs, tablet PCs, an economic hotel chain and a GPS. These product categories were chosen because they were popular consumer product categories that were of interest to college students. Thirty students at a large Midwestern university volunteered to participate in the pre-test through a student subject pool set up by their department. Respondents were asked to rate the different

product categories in terms of familiarity and interest using two 7-point Linkert scales (1=Not familiar at all, 7=Very familiar; and 1=Not interested at all, 7=Very interested).

Two product categories that had moderate familiarity levels and similar interest levels were selected to be used in search tasks in the primary study. The selection of moderate levels of familiarity was desired to control for the potential influence of subjects' product domain knowledge on their search performance. If subjects know too much about a product category, they are less likely to do a thorough search on search engines to find additional information. If they know too little, their search may have many false trials and their search time may be too long to fit into one single experimental session. The decision to select products of similar interest levels was to control for the influence of involvement.

Based on subjects' ratings, the two product categories chosen were snowboard and tablet PC (see Table 1). Paired-sample t-tests showed that a tablet PC wasn't significantly different from a snowboard in terms of both familiarity ($t=1.6$, $p=.1$) and interest ($t=.58$, $p=.6$). To test whether these two product categories meet the criteria of moderate familiarity, one-sample t-tests were run. While the mean familiarity score for tablet PC was not significantly different from the mid-point of 4 on a 7-point scale ($t=-1.4$, $p=.2$), the mean familiarity score for snowboard was found to be significantly lower than 4 ($t=-2.7$, $p=.01$). However, 3 may still be considered to be a relatively moderate level on a 7-point scale. Additionally, a rating slightly below the mid-point on familiarity for both products was thought to be beneficial for the study because it may lead subjects to engage in longer and more thorough searches.

Insert Table 1 about here

4.3 Search Tasks

Martzoukou (2005) argued that one of the biggest problems of previous online information search studies has been the use of information search tasks that were imposed with a pre-defined correct answer (e.g., a search task where the subjects are asked to find out the founding year of Apple) and the use of augmented search environments (e.g., re-built copies of the first few Google SERPs from a search that the keyword had already been entered by the researcher. The Google SERPs and all result links are hosted on the researcher's server to control for content). To overcome these limitations, this study employed a general commercial search task that closely matches consumers' natural search needs and behaviors, and allowed subject to run free Google searches.

Jansen and Resnick (2006) categorized three types of commercial search tasks. The first is a general commercial search task where search queries used by consumers represent a desire for information about a class of products. The second type of commercial search is a specific search task where search queries represent a desire for information about a specific brand or item. Finally, a location specific search task represents a desire for information about a product in a specific geographical location. By combining the three types of most-commonly seen commercial search tasks, a commercial search task was created where subjects were ask to determine "the best value

brand to purchase" for each of the two product categories selected from the pre-test. For each search, participants were told to find relevant information about the product. Additionally, they were told that they needed to answer three questions through their searches. Each question represented one of Jansen and Resnick's commercial search task categories (general search, specific search and location). To reflect general search, subjects were asked to determine "What are the most important attributes of a tablet PC/snowboard that you would consider while making a purchase?" To reflect specific search, subjects were asked to "Please indicate 2 brands/models you would most likely consider buying. Which one do you think you would actually buy?" Finally, location specific search was represented by asking "Where would you go to buy it? Please specify a website or a store name." These questions were asked to ensure that the search tasks resembled a real-life search scenario, as well as to keep subjects involved in the search tasks.

Each subject performed a total of 2 search tasks, one with each of the two product categories selected from the pre-test. The order of the two search tasks was counterbalanced between subjects so that half of the subjects did the tablet PC search first and the other half did the snowboard search first.

4.4 SEO Knowledge

Knowledge of SEO practices was determined in two different ways. The first approach was to measure whether subjects had prior knowledge of, and experience with, SEO before the study. This was assessed using a yes-or-no question asking, "Have you

learned about or dealt with SEO before today?" The those who answered "Yes" to the question was further asked to rate their level of SEO knowledge on a 7-point Likert scale (1= "not familiar at all"; 7= "very familiar").

The second, and more important, way of treating SEO knowledge was via an experimental manipulation that provided everyone with this knowledge. In-between the two search tasks, subjects were instructed to read a two-page mock interview article with a fictional SEO manager (See appendix A). The article was constructed in a way that resembled a normal technology news interview and was written so that an average university student could understand it. The content was extracted from a general information source and was designed to introduce the basic concepts of SEO such as what SEO is, how it works and why it is important. Thus, subjects were provided with knowledge about SEO practices before their second search task. Since it was assumed that many people would lack at least some of this knowledge initially, the difference between responses in the first and second search tasks would indicate the effect of added SEO knowledge.

4.5 Participants

Subjects were 67 undergraduate students from a large Midwestern university, who volunteered to participate in the research through a subject pool system set up by their department. All subjects participating in the research were granted extra class credit for participation.

Of the 67 subjects, 25 were male and 42 were female. Their age ranged from 17 to 28 years old. The participants had an average of more than 9 years of experience using search engines, with many claiming that they've been using search engines since the technology was invented. When asked how frequently they used search engines for finding out about product and brand information before making a purchase, participants' mean response fell between "sometimes" and "very often" (giving an average rating of 3.7 on a 5-point scale with 1=Never; 2=Rarely; 3=Sometimes; 4=Very often; 5=Always). Although using university students as subjects in experiments has often been criticized, they were considered appropriate subjects for this study because, compared with general population, they are better informed about technology, more experienced with search engines and more likely to use search engines for commercial information.

All participating subjects finished a total of two search tasks in the main study. Thirty-five respondents did the search task for a snowboard as their first task, while 32 of them did the search task for a tablet PC first.

4.6 Procedure

When they arrived for the study, subjects were individually seated in front of a desk-top computer installed with an eye-tracking device, one at a time. An initial questionnaire was administrated before the first search task, which collected subjects' demographic information. Questions measuring their familiarity and interest in the two product categories used in the study were also included. These served to check that the pretest results used to select the products held for the study participants.

After completing the questionnaire, subjects were asked to conduct their first search task using the search engine Google. Subjects were told to select the brand that would have the best purchase value for a tablet PC or a snowboard. They were told that they should search to determine: “What are the most important attributes of a tablet PC/snowboard that you would consider while making a purchase?” “Two brands/models you would most likely consider buying. Which one do you think you would actually buy?” and “Where would you go to buy it? Please specify a website or a store name.”

The search task page started with the Google homepage and subject were allowed to do whatever they thought was necessary to successfully complete the task. They were told that they could take as long as they’d like to complete the search task. The elimination of any time constraint and the use of unstructured search further ensure that the experiment resembled a real-life search scenario. Immediately after the first search task was completed, subjects were given a brief survey asking about their evaluations and perceptions of their search experience.

Before proceeding to the second search task, subjects were told to read an article about SEO practices. To motivate involvement, they were told that they would be asked to answer questions on SEO after reading the article. Upon having finished reading the article, subjects were given a short questionnaire asking about their knowledge about SEO.

Subjects were then instructed to finish their second search task. Again, they were told to take as much time as they wanted to complete the task. Upon finishing, they were asked the same questions that they were asked after their first search task regarding their

evaluations and perceptions of their most recent search experience. These questions allowed for a comparison of attitudes towards the two searches to assess if there were any differences that might be accounted for by having learned about SEO procedures.

Another set of questions followed the survey regarding the second search. These questions were designed to measure subjects' general attitude toward SEO practices and towards the different parties involved in the use of SEO (companies, search engines and consumers).

Upon completion of the study, subjects were debriefed and told that the research was designed to find out consumers' reaction to SEO practices.

4.7 Measures

In previous research it was found that when consumers were informed about the nature of sponsored links, they responded negatively towards the use of sponsored links. Along the same line, the current study hypothesized that the evaluation of a search will be more negative when consumers learn about SEO practices. The evaluation of their search experience was measured by assessing perceived relevancy and satisfaction. To measure perceived relevancy and satisfaction, subjects were asked to rate their agreement along a 7-point scale (1= "strongly disagree"; 7= "strongly agree") with the following statements: "The search engine has returned relevant links for me to be able to finish the previous search task," "The search engine has returned satisfactory search results for me to be able to finish the previous search task."

Knowledge about SEO practices may impact not only attitudes toward the search engine itself, but also attitudes about the websites listed by the search engine. H1b was designed to test this hypothesis. The perceived relevancy of web pages listed by the search engine was examined by asking subjects to rate their agreement with the following statement, “The web pages identified by the search engine have provided me with relevant information to finish the search task.” Agreement with this statement was assessed on a 7-point scale ranging from 1= “strongly disagree” to 7= “strongly agree”.

To explore people’s general attitude towards SEO, subjects were first asked to rate their overall attitude towards the use of SEO. This was measured using a 7-point Likert scale where 1 meant “very negative” and 7 meant “very positive.” An open-ended question followed this rating, asking subjects to briefly summarize their thoughts regarding the use of SEO practices.

People’s evaluation of SEO may differ depending on the particular perspective they take. For example, people may consider SEO a good way of marketing for companies, but at the same time as a search engine user, they may view SEO as something that could potentially lower the quality of search results. Therefore, SEO may be seen positively from the perspective of the company, but more negatively from the standpoint of a consumer. To further tap into the nuances of people’s attitudes toward SEO, subjects were asked to rate their agreement with 3 statements on a 7-point Likert scale (1= “strongly disagree”; 7= “strongly agree”). The 3 statements probed whether the use of SEO is beneficial to: a) search engines; b) to the companies and brands that practice SEO; and c) to consumers.

Several top-line behavioral measures were calculated from eye-tracking and click-through data recorded during the search processes. These measures included: the total task time it took to finish a search task; the total number of different searches; the total number of Google sessions engaged in; and the average time spent per Google session.

Total task time measured the total time each subject took to complete a search task. This included time spent on Google SERPs and on all the links that were visited.

The total number of different searches represents the total number of distinct keyword queries a subject ran during a search task. For example, a search of “tablet PC” and “tablet PC review” would represent two different searches.

The total number of Google sessions represents the total number of times that a subject viewed Google SERPs during a search task. A single instance occurs when a subject views a SERP continually without clicking away during the search task. If a subject clicks away and goes back to the same SERP, it is counted as two separate Google sessions. This number thus represents the sum of times a subject visits SERPs before making a purchase decision.

The average time spent on Google SERPs was calculated by dividing the total time spent on Google SERPs during a search task (Google duration) by the total number of Google sessions. Google duration is the sum of all the time spent on Google SERPs during a search task regardless of the number of different Google sessions. This measurement describes, on average, how much time a subject spent for one single Google session.

In addition to top-line search behaviors, other eye-tracking and click through data were used to take a closer look at subjects' more detailed interaction with SERPs. These can be subdivided into measures involving organic links and sponsored links. They can also be separated into links viewed (as determined by eye-tracking) and links actually clicked on. More specifically, the following variables were calculated:

a. Percentage of organic clicks. This was calculated by dividing the total number of clicks on organic results on all SERPs visited by the total number of clicks on all SERPs visited.
b. Percentage of sponsored clicks. This was calculated by dividing the total number of clicks on sponsored results on all SERPs visited by the total number of clicks on all SERPs visited.
c. The top organic link clicked. This was the highest-ranked (smallest in number) organic result a subject clicked on during a search task.
d. The bottom organic link clicked. This was the lowest-ranked (biggest in number) organic result a subject clicked on during a search task.
e. The top organic link viewed. This was the highest-ranked (smallest in number) organic result a subject visually fixated on during a search task.
f. The bottom organic link viewed. This was the lowest-ranked (biggest in number) organic result a subject visually fixated on during a search task.

Chapter Five: Results

The study includes data from both questionnaires and recordings from two eye-tracking sessions, one before and one after respondents read about SEO practices. Both the questionnaire and eye-tracking data are used in the analyses presented here. First, subjects' general attitudes towards SEO practices are summarized using both close-ended and open-ended questions from the questionnaire. Then descriptive data from the eye-tracking sessions are reported to provide an overview of how subjects interact with SERPs. The next step in the analysis was hypothesis testing using attitudinal questions to determine if attitudes regarding search engines differed when respondents had knowledge of SEO practices versus when they did not. Finally, eye-tracking data was used to explore any actual differences in search behaviors that could be accounted for by respondents' knowledge of SEO practices.

A problem occurred with the recording of the eye-tracking data for one of the subjects. Therefore, all data for this respondent was excluded from further analysis. The data reported in this chapter, for both descriptive analyses and hypothesis testing, are based on the remaining 66 subjects. Of these respondents, 32 were given tablet PC as their first search task, while 34 did snowboard as their first search task.

5.1 General Attitudes towards SEO Practices

RQ1: What are consumers' attitudes towards SEO practices after learning about them?

Work by Marable (2003) found that 41% of those interviewed didn't have any knowledge of how search engines rank websites or what the difference is between

sponsored links and organic links. However, after subjects were informed about the existence of sponsored links, they responded negatively and reported feelings of "being betrayed."

In this study, when asked about whether they can distinguish between organic links and sponsored links, 98% of all subjects gave affirmative answers, saying that they can tell the difference between sponsored links and organic links. However, when asked whether they have learned about or dealt with SEO before this study, only 45% claimed to have prior knowledge and experience with SEO practices. Even among those who claimed to have prior knowledge of SEO, the knowledge level was relatively low. Subjects gave an average score of 3.4 on a 7-point Likert scale where 1 was "not familiar at all" and 7 was "very familiar."

In the middle of this study, all subjects, regardless of their prior SEO knowledge, were asked to read an article that provided a brief introduction of SEO practices during this study. After subjects read the article on SEO and finished their second search task, they were asked to rate their general evaluation of the use of SEO practices using a 7-point Likert scale where 1 meant "Very negative" and 7 meant "Very positive." Somewhat surprisingly, even after being informed of SEO practices, subjects' general attitude towards companies' use of SEO was slightly positive, with an average rating of 4.76. Eighty-eight percent of all subjects gave the use of SEO a rating of 4 or above (See Table 2). As can be seen in this table, only a small minority of respondents (12%) gave a negative rating to SEO.

Insert Table 2 about here

In addition to general attitude towards the use of SEO, subjects were also asked to rate their degree of agreement with three statements. The statements were intended to test whether respondents differed in the degree to which they see SEO as having a beneficial influence on: a) search engines; b) companies/brands; and c) consumers. Not surprisingly, subjects viewed SEO practices as much more beneficial to the companies that use SEO than to either the search engines or consumers. On a 7-point Likert scale where 1 meant "strongly disagree" and 7 meant "strongly agree," subjects gave an average rating of 6.08 to the statement "SEO practices are beneficial to companies and brands." The average rating for the statement "SEO practices are beneficial to search engines" was 4.88, and the mean rating for the statement "SEO practices are beneficial to consumers" was 4.53. A paired-samples t-test revealed that subjects thought that SEO practices bring significantly more benefits to companies than to either consumers ($t=11.42$, $p=.000$) or to search engines ($t=7.86$, $p=.000$). However, even in regard to the benefits of SEO to search engines and consumers, the mean scores were on the positive side of the scale.

Insert Table 3 about here

Closely following the close-ended questions, an open-ended question was asked to further explore the nuances behind subjects' attitudes towards the use of SEO practices. This question asked, "What do you think about the use of SEO practices? Please summarize your opinions briefly." Most subjects thought that the use of SEO was a good thing, or, at least, that it had some positive aspects. Only positive comments were made by 50% of the respondents, 23% thought that there were both positive and negative aspects of SEO, and 17% saw the use of SEO as solely negative. Eleven percent didn't report a clear-cut opinion about SEO by making comments that were unrelated to the use of SEO.

Among the 50% who thought SEO was solely a good thing, most indicated that SEO is "smart marketing" for a company and can be "helpful and beneficial" to consumers. For instance, SEO was seen as "very helpful in marketing products" and "a smart way to make sure your company is advertised as the most popular." From the consumer perspective, these respondents thought that, "for people who are in a rush, it is helpful to get fast results." Similarly, another respondent in this category indicated that "consumers can search and find what they are looking for faster through SEO." More interestingly, a few subjects made an association between investment in SEO and product quality. They assumed that brands or companies that invested in SEO in order to show up as one of the first results listed "must care about their reputations," and thus are more likely to make an effort to "keep their products or services at high standards."

While SEO is generally thought to be able to create a somewhat win-win situation between companies and consumers, it's not without concerns. Among the 23% who

didn't give a definite positive or negative response, most held an "it-depends" view. First, some of the respondents in this group felt that it depended on whether it's a "fair" SEO or a black hat SEO. Black hat SEO is what most subjects had problems with, and they saw these practices as undesirable. For example, one respondent said, "It's obvious that there will always be some type of marketing behind search engines. I think SEO is good and helpful to users, but needs to figure out a way to diminish black hat SEOs." Another participant stated, "If they have a way to stop black hat, the practice will be fool proof and highly effective way to organize search engines."

To tackle the problem, many called for better regulation. Comments reflecting this opinion included: "I wish there was a better way to monitor the use of it because I do not agree with the use of the black hat tactic," and "I believe we need a policy to keep black hat SEO from happening."

Some respondents who saw both pluses and minuses to SEO thought that it depended on which perspective was being considered – that of the companies or that of the consumers. While the use of SEO is obviously beneficial to bigger companies with substantial SEO investments, it could be disadvantageous to smaller companies or deceptive to consumers. For example, as one respondent indicated, "From a company stand point, it is a competitive advantage, but for consumers, it limits their choices." SEO was seen as "useful" for companies but "sometimes hard for consumers who don't know what to buy to find what they want." Likewise, respondents felt that SEO is "a very good marketing method" but can be "manipulated easily" and "deceive consumers at times."

Those who were classified as holding neutral views of SEO also tended to see SEO as just another form of marketing that companies engage in. It is similar to the many advertisements and various other persuasion techniques that consumers encounter every day. As one respondent stated, “I think as long as they do it fairly it is just another form of advertising.” Another indicated a similar view, “I'm so used to marketing schemes that it doesn't upset me.”

More interestingly, some subjects expressed the view that in order for consumers to make smart shopping decisions, they need to be aware of the use of SEO. As long as people know that SEO is occurring, they can avoid being unduly influenced by it. As one respondent stated, “being aware of the SEO is important in a search so that you will scroll down the page to other items, not only those from the richest companies.”

For the 17% who made only negative comments about the use of SEO practices, their major concern was that SEO seems unfair to “smaller companies” and to consumers without any knowledge of SEO practices. For example, one person replied that “the companies that have larger budgets are unfair to those smaller companies because it’s more likely that they will get their product out there.” Another respondent seemed to feel even more strongly, suggesting, “It is cheating people out of knowledge they should get to know.”

Subjects’ open-ended responses further confirm the findings of the close-ended questions. Most believed that the use of SEO is positive, whether it is from the viewpoint of the companies using SEO or from the consumers’ perspective. Additionally, subjects

were able to evaluate SEO differently depending on the perspective of the different parties involved such as large companies, smaller companies or consumers.

5.2 Behavioral Examination of Searching: A Description of Eye-Tracking and Clicking Behaviors

In an everyday search scenario on Google, searchers usually go through several steps before concluding that they've found what they need. To start, one must enter a keyword query in Google to initiate a search. Then the person needs to go over results on the SERP and click on a link to go to one of the listed websites. From here, the person either finds the information he needs or continues his search process. He may go back to the same SERP to look for new links to click on or enter a new keyword search and repeat previous steps until he finds what he needs.

In this process, two key aspects are worth examining. First and foremost is how Google (or some other search engine) is used in the search task. The way in which the search engine is used can be examined by looking at things such as the time spent on Google SEPRs, the number of separate Google sessions run, and the number of different keyword searches conducted. Secondly, to get a more complete picture of search activity, it is necessary to examine what consumers look at and what they click on from SERPs. In the following section, behavioral data from eye-tracking recordings and click-through data are used to summarize information regarding these two aspects of search behavior observed in this study. This descriptive data includes results from all of the search tasks

done by the 66 subjects in the study. Thus it is based on the outcome of 132 searches (66 x 2).

In general, subjects spent most of their time on the web pages they were directed to by Google and used Google SERPs mainly as a pathway to these information sources. Subjects spent an average of 7 minutes to finish a search task. Approximately 2 minutes (21%) of that total time was spent on Google SERPs and most of the rest of the time was spent looking at the various web pages that respondents were directed to by Google.

Perhaps due to the relatively low cost of clicking on a link to check out a website, subjects tended to run a number of Google sessions but spent only a limited amount of time looking at SERPs during each session. The number of separate Google sessions to complete a task ranged from 1 to 27, with the mean number of sessions being 5.02 (median = 4). Each Google session lasted an average of about 20 seconds.

However, the average number of different Google searches conducted was 3.64 (median = 3), nearly half of the average number of separate Google sessions (5.02). What this indicates is that while subjects sometimes went back to the same Google SERP for more links to click on, a lot of the time they simply changed their keyword query and started a new search without going back to consider other links from the previous Google session.

Subjects averaged 4.96 clicks across all Google SERPs. Considering the fact that an average of 3.64 different Google searches was run, subjects made an average of just over one click on a listed result link for each individual Google search. A bias towards organic links was clearly demonstrated in the choice of results that were clicked. Organic links

were far preferred over sponsored links with 84% of all the clicks on Google SERPs being on organic links. Thus, an average of 4.2 organic link clicks was made per subject before s/he concluded that s/he had found a satisfactory answer to the search task.

Previous research had concluded that people have a bias toward higher listed organic links (Jansen 2006; 2007). This was confirmed by the data examined here. First, it was found that subjects seldom clicked on links below the page break of the first SERP. Furthermore, while a Google SERP page typically features about 12-14 organic results, the average position of the lowest organic link clicked was 5.45 and the median was 4. The furthest down anyone went to click on a link was to the 18th listed link. What's also noteworthy is that based on the eye-tracking data, the average position of the lowest organic link viewed was 9.52 with a median of 10. The furthest down any respondent looked at was to the 27th listed link. Taken together, these results indicate that respondents tended to look somewhat lower down on the result list than they actually clicked. Perhaps this was a way of confirming that there was nothing more that seemed to be of value to them. This search style might also be indicative of what Aula et al. (2005) called an exhaustive searching strategy where searchers prefer to assess multiple options before clicking on a SERP link.

5.3 Attitudinal and Behavioral Impact of Learning about SEO

An important goal of this study was to determine the impact that learning about SEO practices had on consumers' perceptions of search engines and of companies that use SEO. To examine this issue, two analyses were conducted. The first compared the

evaluations and search behaviors of consumers who claimed to be aware of SEO practices before this study versus those respondents without such prior knowledge of SEO. Since all subjects read about SEO practices between completing their first and second search, this analysis just examined the first search the subjects did. This ensured that only prior SEO knowledge was responsible for differences in the data. However, to better examine the impact of actual SEO knowledge, a second analysis was done to compare search behaviors and attitudes between the search done prior to reading about SEO practices and the search done after reading about SEO.

5.3.1 Manipulation check

Two product categories, tablet PC and snowboard, with similarly moderate familiarity levels and similar interest levels were selected from the pre-test to use as search tasks in the main study. Before starting the first search task, each participant in the main study was asked to rate their familiarity and interest in these two product categories. Results confirmed the pretest results. The interest scores (on a 7-point Likert scale where 1 mean "not interested at all" and 7 means "very interest") for tablet PC and snowboard were 3.86 and 3.7 respectively and these scores were not significantly different from each other ($t=.75$, $p=.46$).

The familiarity scores (on a 7-point Likert scale where 1 means "not familiar at all" and 7 means "very familiar") for tablet PC and snowboard were 3.05 and 3.29 respectively. Once again, these scores were not significantly different from each other ($t=-1.22$, $p=.23$). To further gauge if these numbers meet the criteria of moderate

familiarity, one-sample t-tests were run for both product categories. Although both means were significantly lower than the scale mid-point of 4 (both p's < .001), the fact that both means were above 3 may still qualify them as being at a relatively moderate level on a 7-point scale. Since a familiarity level a little below the midpoint may be useful for prompting subjects to do a more intensive and thorough search, the use of these two products was considered to be appropriate.

Insert Table 4 about here

5.3.2 Hypothesis testing

Two independent variables were used to test the stated hypotheses regarding the impact of SEO knowledge. The first independent variable was a self-reported measure of prior SEO knowledge (respondents indicated they either did know about it or they didn't). Forty-five percent of the subjects said they have learned about or dealt with SEO before the day of the study. The other independent variable used a repeated measures design to compare results from a search that occurred before subjects were informed about SEO practices in the experiment with a search occurring after they were informed. Three dependent variables (relevancy of search engine results, satisfaction of search engine results and relevancy of web pages directed to by search engine) were examined. Hypothesis tests used separate analyses for each of the dependent variables. Independent-sample t-tests were run for the self-reported measure and paired-sample t-tests were

conducted to compare differences across the 2 search tasks done before versus after SEO information was provided.

H1a: Evaluations of search engines will be more negative after consumers learn about SEO practices than before they are informed of this practice.

An initial analysis looked to see if there was any effect of prior knowledge of SEO on either perceived relevancy of, or satisfaction with, search engine results. Only data from the first search task that occurred before subjects read the article about SEO practices were used. The results from independent-samples t-tests indicated that neither relevancy of search engine results (t=.23, p=.82), nor satisfaction with search engine results (t=-.8, p=.43), was significantly different between subjects with prior knowledge of SEO and those without such knowledge.

Insert Table 5 about here

However, a more critical test of the impact of SEO knowledge came from comparing data before or after reading the SEO stimulus material. This examined the impact of actual knowledge provided during the study rather than depending on respondents' claims of having prior knowledge of SEO before the study. Though subjects stated that they held generally positive attitudes towards SEO practices after they were told about how SEO works, the knowledge of SEO may still influence their evaluation of the outcome of a particular search task.

Paired-sample t-tests showed significant differences for both dependent variables. The perceived relevancy of search engine results between pre- versus post- SEO searches was significantly different (t=3.1, p=.003). The means were in the predicted direction with the evaluation of perceived relevancy of search engine results being lower in the second search task after subjects learned about SEO practices (see figure 1). The difference in satisfaction with search results was also significant (t=2.5, p=.02). Again, the means were in the predicted direction with satisfaction with search engine results being lower after subjects leaned about SEO practices (See Figure 2). Since only experiment-induced SEO knowledge was found to have significant results, H1a is partly supported.

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Insert Table 6 about here

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Insert Figure 4 about here

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Insert Figure 5 about here

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H1b: Perceived relevancy of <u>websites</u> pointed to by search engines decrease after consumers learn about SEO practices, compared to before.

It was believed that learning about how SEO works would not only influence evaluations of the search process, but also evaluations of the websites people were

directed to by search engines because these websites are the ones that actually employ SEO practices. In examining the impact of SEO knowledge on websites, only perceived relevance was assessed since satisfaction with the website may be based on factors unrelated to the search engine. To test this, we first looked at the effect of prior knowledge of SEO respondents claim to have before the study. Only data from the first search task was included in this analysis. Again, self-reported prior SEO knowledge didn't have any significant effect on perceived website relevancy (t=.67, p=.5).

We then looked to see if experiment-induced SEO knowledge made a difference in evaluating websites. Here, the impact of SEO knowledge was significant (t=2.5, p=.02). As was the case for search engine relevancy, an analysis of means showed that evaluation of website relevancy was lower after subjects learned about SEO practices.

Insert Table 7 about here

Insert Figure 6 about here

5.3.3 Search Behavior Changes after Receiving Knowledge about SEO

RQ2: How does the knowledge of SEO impact consumers' specific behaviors on SERPs during an online search using search engines?

It's long been established that attitudes are important influencers of behaviors. So it follows that when consumers are informed about the use of SEO, their search behaviors will be subsequently influenced.

To explore potential search behavior changes, independent paired-sample t-tests were run for each of 7 search behavior dependent variables. These dependent variables were: a) total task time; b) average time spent per Google session; c) number of Google sessions; d) number of different searches; e) percentage of organic clicks; f) bottom (farthest down) organic link clicked; and g) bottom (farthest down) organic link viewed. Similarly to what has been done in checking attitudinal changes, two comparisons were looked at. One compared the data from the first search task between subjects with prior SEO knowledge and those without prior SEO knowledge. The other compared results from the first versus the second search task (before versus after reading about SEO content).

Independent-sample t-tests revealed no significant impact of self-reported prior SEO knowledge on any of the 7 dependent variables ($p > .05$) (See Table 8).

Insert Table 8 about here

Test of the impact of experiment-induced SEO knowledge did, however, show significant influence on one of the 7 dependent variables. The number of different searches showed a significant difference before and after SEO content ($t=-2.4$, $p=.02$). An

examination of the means showed that subjects ran significantly more different searches after learning about SEO (4.11) than before reading the article on SEO (3.18).

Two other variables, total task time (t=-1.9, p=.06) and number of Google sessions (t=-1.9, p=.06) approached, but didn't reach significance in 2-tailed t-tests. An analysis of means shows that subjects spent a longer time finishing their second search tasks after reading the SEO content (463531.77 milliseconds) than for their first search tasks (394959.89 milliseconds). Similarly, subjects ran more Google sessions after they read the SEO article (5.42) than before (4.61). Differences on the other 4 dependent variables (average amount of time spent on per Google session, the lowest link viewed and the lowest link clicked on) did not differ significantly between the first and second search task.

Insert Table 9 about here

Chapter Six: Discussion

Much research in search engine marketing has focused on sponsored links and its impact on businesses, search engines and consumers. However, SEO, a multi-million dollar business and an increasingly popular way to conduct search engine marketing, has received little attention from academia. The concept has remained a relatively under-examined way of marketing to consumers. While sponsored links are now clearly labeled as ads, less than half of the subjects in the study (45%) said they have learned about or dealt with SEO prior to the day of the study. Give the fact that they are journalism and mass communication students from a big Midwest university who are more tech-savvy than the general public and who may have had classes that talked about online marketing strategies, the awareness rate among the general public is likely to be much lower. Even among those subjects who said they were aware of SEO, their self-perceived knowledge level was relatively low. Subjects gave an average score of 3.4 on a 7-point Likert scale where 1 was “not familiar at all” and 7 was “very familiar.”

Opposite to the widely-reported negative responses people have to sponsored links as a marketing tactic (Hotchkiss, 2004; Jansen and Resnick, 2006; Marable, 2003), this study found that the general attitudes toward the use of SEO were favorable. This was true even after subjects read an informational article about SEO practices during the experiment. More interestingly, further analysis in this study revealed that the general positive attitude toward SEO varies depending on the different parties involved in the process. Although ratings were generally positive from all three perspectives, SEO was

rated as being significantly more beneficial to companies or brands than to the search engines or to consumers.

Verbatim responses further confirmed the general favorability toward SEO. Overall, 50% of the subjects saw the use of SEO in a purely positive light, and 23% thought SEO had both positive and negatives aspects. Only 17% considered the use of SEO as solely negative. Many subjects described SEO as a "smart" and "necessary" way of marketing and something that can help them "more quickly" find "what they need." Some even associated investment in SEO with better-quality products or services. They assumed that brands that make an effort to be the top-listed website in a search are more likely to produce high-quality products to keep up with their reputation.

However, the use of SEO was not without drawbacks. Many respondents expressed concerns that the use of SEO may pose disadvantages to smaller companies who didn't have sufficient resources to invest in SEO and to consumers who were not aware of the existence of such practices. In extreme cases, the use of SEO was called "cheating" the consumers. Subjects also called for search engines to better regulate SEO practices.

The generally positive attitude toward SEO may be partly due to the fact that both search tasks used in the study were commercial ones where subjects were asked to find relevant product and brand information in order to make the "best value" purchase decision. Previous research in advertising avoidance has concluded that perceived goal impediment was the most significant predictor of resistance towards marketing (Cho and Cheon, 2004). In this study, the use of SEO was seen as facilitating, rather than hindering, subjects' goal to find useful information to finish the search tasks, even though

companies may have manipulated the order in which their own site appeared. For example, many subjects may have wanted to get a general idea of what brands of snowboards were available on the market; and the top links in SERPs were all major snowboard brand websites. While some brands may have used SEO to boost their placement, as a whole, SEO did not drastically affect the subjects' objective of learning about available brands of snowboards. In this case, SEO actually provided an added value to consumers by helping them combat information overload and filter out non-popular links during a commercial search.

The results may have useful implications for marketers and search engines, both of which face the dilemma of balancing between the use of SEO and sponsored links. For marketers, both sponsored links and SEO have their own merits. Sponsored links provide guaranteed SERP positions and easy-to-measure ROI (return on investment), while SEO ensures organic, and thus potentially more-trusted, positions on SERPs. The generally positive attitudes toward SEO found in this study potentially showed more advantage of SEO. Compared with consumers' aversion toward sponsored links as advertising, subjects saw the use of SEO as "smart" marketing, and in some cases, even an indicator of quality products or services. More importantly, as some subjects pointed out, SEO provides value to consumers during commercial searches where they actively seek product or brand information. In a time when the visibility of a company or brand largely depends on its position on SERPs, SEO may be the best way to provide effective search engine marketing.

However, as consumers gain greater knowledge of SEO practices, it may alter their attitudes and reliance on organic link results. Hypothesis 1 showed that both the perceived relevancy of, and the satisfaction with, search engine results decreased after subjects read a detailed article on SEO practices. Test of the impact of prior knowledge of SEO on search engine evaluations yielded no significant results. However, when it comes to experiment-induced SEO knowledge, results showed that subjects rated search engine results as significantly less relevant in search task 2 (after subjects read about SEO practices) compared to their ratings from search task 1 (before reading about SEO). . Their satisfaction with search engine results also significantly decreased after reading about SEO.

Further analysis, however, revealed that the significant impact of experiment-induced SEO knowledge on search engine evaluations might actually be an interaction between prior SEO knowledge and experiment-induced SEO knowledge. In a follow-up analysis, the group of subjects who claimed they have learned about or dealt with SEO before and those subjects who were without prior SEO knowledge were tested separately. For the group with prior SEO knowledge, paired-sample t-tests showed that both perceived relevancy of ($t=3.70$, $p= .00$), and satisfaction with ($t=2.64$, $p=.01$), search engines results decreased significantly after they read the article on SEO, compared with before. For the group without prior SEO knowledge, neither the perceived relevancy of ($t=.93$, $p=.36$), nor the satisfaction with ($t=1.17$, $p=.25$) search engine results was significantly different between search task 1 when they hadn't read the SEO article and search task 2 after they read the SEO article.

To further test the relationship between prior SEO knowledge and experiment-induced SEO knowledge, another analysis was run to compare search task 1 data from subjects with prior SEO knowledge with search task 1 data from subjects without prior SEO knowledge. This analysis can shed light on whether the two groups' perceptions of search engines were different before reading about SEO in the experiment. Independent-sample t-tests showed no significant differences in either perceived relevancy of search engine results ($t=.24$, $p=.4$), or satisfaction with search engine results ($t=-.8$, $p=.21$). Putting together the results from the follow-up analysis, it follows that the knowledge of SEO may have an impact on consumers' perceptions of search engines only when consumers who already had some awareness of the existence of SEO were reminded or given more details regarding SEO.

The fact that a combination of prior SEO knowledge and experiment-induced SEO knowledge generates a significant influence on search engine evaluations may mean that those who said they've had previous experiences with SEO may not be as knowledgeable as they claimed. Indeed, among the 45% of subjects who said they were aware of SEO before the study, the knowledge level was relatively low, with an average familiarity score of 3.4 on a 7-point Likert scale where 1 was "not familiar at all" and 7 was "very familiar." Their low to moderate level of familiarity with SEO may mean that their self-claimed prior SEO knowledge may be too vague or general to have any significant effect on their perceptions of search engines. However, after they read the SEO article in the experiment and learned more about SEO and how it works in more detail, their newly acquired SEO knowledge reinforced the impact of their prior knowledge, and thus led to

significant changes in their perceptions of search engines. For those without prior knowledge, the content of the article may not have been sufficient to affect their attitude toward a subsequent search. It may require multiple attempts to impart knowledge of SEO practices until such information is fully understood enough to influence attitudes and behaviors.

A deeper look at potential differences between those who indicated that they were extremely familiar with SEO (6 and 7 ratings) and those who were only a little familiar (1 and 2 ratings) may give better insights on the interplay of prior SEO knowledge and experiment-induced SEO knowledge and how they impact search engine perceptions. Due to limited subjects, such analysis is not practical to run in the current study. But it's highly recommended that future studies take a closer look at the independent impact of both prior SEO knowledge and experiment-induced SEO knowledge, as well as the relationship between the two. Such studies will be very helpful in exploring whether the impact of the knowledge of SEO on search engine perceptions is a long-term one that is likely to influence multiple searches over time or a short-term one that only takes effect when consumers are primed with accurate SEO knowledge at the time of a particular search.

Regardless of whether it's self-reported prior SEO knowledge, experiment-induced SEO knowledge or the combination of the two that has an impact, the results clearly showed that there is a need to better educate consumers on what contributes to a top-ranking website's position on SERPs and how search engines decide which SEO practices to encourage and which ones to punish. Like some subjects argued, consumers

without proper knowledge of SEO are put at a disadvantageous position and such knowledge can empower consumers to make smarter choices during search. For example, a consumer who is aware that brands can influence search engine result rankings through SEO may run more searches to look for different results and spend longer time on assessing different options before making a decision. Eye-tracking and click-through data from this study proved that such changes in search strategies after learning about SEO are indeed possible.

Research question 2 explored potential changes in search behaviors after knowledge of SEO. Since no hypotheses had been stated prior to the analysis, 2-tailed tests were run to test behavior changes. It was found that subjects ran significantly more distinct keyword searches after reading the article on SEO, compared with before. Total task time and the number of Google sessions approached significance and the direction of the means were also consistent with what would have been expected given that the additional knowledge of SEO made consumers more skeptical. Subjects ran more Google sessions and spent a longer time finishing their second search task after reading the SEO article. Although this study has to conclude that there isn't a difference in these two search behaviors, the fact that the difference approach significance, and would have been significant if 1-tailed tests were used, suggests that future researchers shouldn't dismiss the potential effect. Thus it is recommended that these findings be revisited in future research.

Despite the decreased perceived relevancy of, and satisfaction with, search engines, consumers' bias toward top-ranking organic results remained unchanged. Both click-

through and eye-tracking data confirmed the existence of a bias toward top organic links. In this study, each subject made at least one click during each distinct Google search; and 84% of all clicks made on Google SERPs were on organic links. Furthermore, subject seldom clicked on links below the page break of the first SERP. While a Google SERP typically shows about 12 to 14 organic listings, the average rank of the lowest organic link clicked was 5.45 with a median of 4. Two-tailed t-tests also revealed that there was no difference in the percentage of organic link clicked, the lowest organic link clicked or viewed before and after subject read about SEO. The results indicate that knowledge of SEO may prompt consumers to spend a longer time running more searches using various keywords, but once they go to a SERP, they still interact with the result links in the same way as they had been doing.

These clicks on top-ranking organic links are, more often than not, the only clicks consumers make on a SERP. It was found that when subjects went back to the previous SERP after a click, they were more likely to start a new search with a new keyword query than to review or click on other links from the same SERP. This type of search strategy means that after an initial click, other links on the same SERP were omitted from consumers' consideration set for further exploration. To have a chance of being clicked, a lower ranked link would have to appear higher up on a SERP through another keyword search.

These results are somewhat surprising. If, as the attitude results showed, the knowledge of SEO lowered consumers' perceived relevancy of, and satisfaction with, search engine results, one might expect the behavioral impact of SEO knowledge should

be on how consumers select and use the organic links on a SERP, not on the number of different searches conducted. One possible explanation is that old habits die hard – the bias toward top organic links is so deeply rooted that when consumers are faced with less satisfying results, they would rather choose to conduct a new query search than to review and click on lower-ranked results on the same SERP. In their study that varied the order of SERP listings, Cutrell and Guan (2007) found that when subjects could not find a desired choice among the top listed results, they either selected the first result link or conducted a new search. Thus, the finding here that subjects run more searches after learning about SEO is consistent with what has been found to happen when there is less perceived relevance in search engine results.

This persistent bias toward top organic results even when there is low perceived relevancy in search engine results may be indicative a new definition of relevance by consumers when it comes to online search. When consumers search for relevant results, what they may be truly looking for is satisfying results. In many cases, people may turn to search engines without a clear idea of what they are looking for, or what a relevant result would look like. Moreover, the purpose of a search engine is to provide a "one-size-fits-all" result for everybody who enters a keyword in a search. Therefore, it is impossible determine relevance in any absolute terms. Instead, consumers are just looking for results that are considered good enough to satisfy or meet their basic information needs. When this occurs, consumers will consider the results as being "relevant".

Another possibility is that the cognitive cost of starting a new search is much lower than evaluating more links from an existing search. Previous research has argued that the bias toward top-ranking organic results is due to an implicit trust in search engines (Kammerer and Gerjets, 2012; Cutrell and Guan, 2007). As a result, consumers are very likely to depend on the rank of a result link, instead of making an independent evaluation, to determine the relevance of the result link (Granka, et al., 2007; Keane, et al., 2008). Compared with reviewing lower-ranked results from a previous search one by one and then making a choice, it may be much easier and more cost-effective to start a new search and let the search engine decide for them. Similarly, reviewing 10 to 12 entries on a SERP may seem to be choice overload and debilitating to consumers. Only looking at 1 or 2 entries on each of 3 or 4 different searches may be perceived as an easier and less taxing task. Testing the cognitive load or the perceived effort of starting a new search versus considering lower-ranked result links when top results cannot provide satisfactory information may be an interesting question for further research.

The eye-tracking data also indicated a searching strategy where searchers prefer to assess multiple options before making a click (Aula et al., 2005). Before clicking on a result link, subjects usually looked lower down on the SERP, possibly to assess more links before clicking on one. However, the end of the first SERP was usually as far as subjects were willing to go. The average position of the lowest organic link viewed before making a click was 9.52 with a median of 10. Given this type of search strategy, it makes sense for marketers to employ SEO and fight for a top position because top organic links have the highest chance of being viewed and clicked by consumers. This

type of searching style suggests a potential strategy for smaller companies that don't have as many SEO resources or as large a budget as bigger companies do. For these small companies, it may make sense to set their SEO goal as being on the first SERP, instead of achieving the top placement. Consumers' typical search strategy may ensure that being somewhere between the 4th and 8th or 9th listing on the first SERP will get the link noticed. Though such exposure may not lead to an actual click, mere exposure may be enough to put these lower-ranking results into consumers' consideration sets (Shapiro, MacInnis and Heckler, 1997).

6.1 Limitations

There are several limitations in this study. First, subjects are college students, who are not only experienced users of search engines, but may also be more tolerant of advertisings, especially in an online environment. Having more online experience may mean that they have a more established routine for doing searches, which may be less likely to have major changes in an experimental setting. Having greater tolerance for online advertising may also lower their sensitivity to SEO practices. More specifically, this study recruited subjects from a subject pool within the school of journalism and mass communication whose students may have inherent interest in learning about new ways of marketing. Subjects' interest in, and appreciation of, SEO as a marketing tactic may have contributed to their positive response to the use of SEO and to their view of SEO as being a smart marketing tactic. A sample of adults or people who are less familiar with search

engines and less adapt to marketing messages may make the results of this study more generalizable.

Another potential limitation is the use of two different product categories to create the search tasks. A repeated measure design was used to compare data before and after knowledge of SEO was provided. Two different products with moderate level of familiarity and similar level of interest were selected from a pre-test for the two tasks. Although a manipulation check confirmed that the two products were not significantly different in terms of familiarity and interest, they did yield some differences in search behaviors. Product type (tablet PC vs. snowboard) was found to have significantly impacted how far down the organic result list of a SERP respondents viewed or clicked. Subjects looked at and clicked on lower-ranked organic links when searching for a tablet PC than when search for a snowboard.

One possible explanation for this finding is that when subjects ran tablet PC searches on Google, many of the top organic links on returned SERPs were links to review sites or news sites that introduced new technologies or new products in the category. Subjects who were looking for specific brand or product information to make a purchase had to go further down the SEPRs for branded websites or retailing sites. Most top organic links on the returned SERPs for snowboards, on the other hand, were brand or retail websites that offered information about brands and prices. Therefore, there was less need to look further down to find relevant results. Although order was counter-balanced for the most part, this still may have introduced some error into the analysis. Future research may want to look at different product categories.

The use of commercial search tasks in which subjects were motivated to actively seek marketing messages is another potential limitation of this study. Aversion towards advertising typically arises when advertising is perceived as hindering the ability of people to realize their goals. However, in this study, subjects' goals were aided by promotional messages. Therefore, the positive evaluation of SEO may be somewhat inflated because SEO might have been seen as being helpful to subjects in their completing the search tasks. Future research examining different uses of search engines, such as for informational searches instead of commercial searches, may yield less positive evaluations of SEO. For the current study, which was an initial look at how consumers react to SEO, the choice of commercial search tasks made sense because SEO is most often used by brand and retail sites. However, any generalizations regarding evaluations of SEO should wait until more types of searches are tested.

6.2 Contributions

Despite the limitations of this study, it is important for both search engines and marketers to pay attention to how SEO, as an increasing popular way of marketing, is perceived by consumers. With search engines becoming the place where a large proportion of consumers do product research before making a purchase, more and more marketers are interested in how to game the system and improve placement on search engines result pages. Within the realm of online marketing, the findings of this study are particularly applicable. Most forms of online marketing such as banners and sponsored links receive somewhat negative responses from consumers. Therefore, the findings of

this study showing that SEO is seen as positive and helpful are intriguing. Marketers, who are deciding between investing promotional dollars in sponsored links versus SEO or those who are trying to convince senior level management to put money into SEO budgets, now have one more argument in favor of investing in SEO.

The finding that consumers run more searches on Google when they are told about SEO practices is also important information to marketers. As search engines become an indispensable part of consumers' information acquisition process, it's likely that more and more consumers will grow increasingly knowledgeable about the ins and outs of how different search engine marketing tactics work. A consumer interested in digital cameras may have made a purchase decision after only one search of "digital camera" on Google five year ago, but now he or she may want to run more searches with different keywords before reaching a decision. To marketers, that means there is a need to purchase more keywords for sponsored links and to populate their websites with a bigger variety of keywords so that their websites will show up in various searches.

The possibility that greater knowledge of SEO may reduce the perceived relevancy of and satisfaction with search engines is also important. The backbone of the search engine industry is consumers' trust in their services to provide relevant, useful and unbiased results. It's not uncommon to see cases where companies, even very famous ones, use black hat or illegitimate forms of SEO to gain advantages over competitors. The findings that subjects rated search engines results as being less relevant and less satisfactory after learning about SEO may provide both search engines and companies with greater

incentive to monitor and regulate the use of SEO, not only for the benefits of consumers but also for their own good.

Since its invention, search engines have already become an important part of modern life. The simple fact that google is now used as a verb is enough to show the prevalence and importance of search engines. Research on consumers' search behaviors and what lead to such behaviors have important implications for the study of information acquisition. More importantly, in addition to being an information retrieval tool, search engines are also commercial platforms open to advertisements. At a time when most people turn to search engines for reliable information, it's of particular importance to study the implications of the inclusion of paid and marketing-influenced results to consumers. Consumers use search engines because they have a need to "know," but the more important question to human society as a whole is "how consumers know what they know."

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Tables and Figures

Table 1 – Pre-test Results

	Tablet PC	Snowboard
Familiarity	3.5	3
Interest	4.03	4.23

Table 2 - General Attitude towards SEO Practices

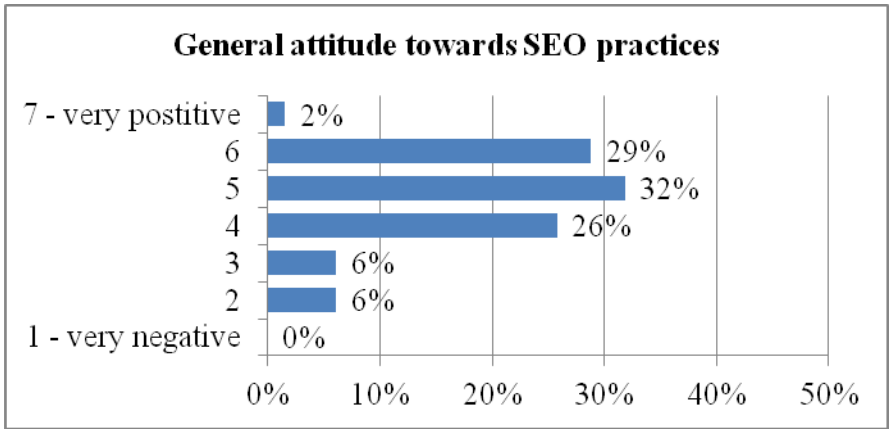


Table 3 - Paired Samples T-Test: SEO Evaluations

Paired Samples Test

		Paired Differences					t	df	Sig. (2-tailed)
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference Lower	Upper			
Pair 1	Benefit_brands_SEO - Benefit_consumer_SEO	1.545	1.555	.135	1.278	1.813	11.419	131	.000
Pair 2	Benefit_brands_SEO - Benefit_SE_SEO	1.197	1.749	.152	.896	1.498	7.861	131	.000

Table 4 – Manipulation Check

Paired Samples Test

		Paired Differences					t	df	Sig. (2-tailed)
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference Lower	Upper			
Pair 1	Product familarity_T - Product familarity_S	-.242	2.292	.200	-.637	.152	-1.215	131	.226
Pair 2	Product interest_T - Product interest_S	.167	2.554	.222	-.273	.606	.750	131	.455

Table 5 - Independent Samples T-Test: Evaluations of Search Engine by Self-Claimed SEO Knowledge

Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means						
									95% Confidence Interval of the Difference	
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Lower	Upper
Relevancy_SE	Equal variances assumed	.010	.919	.235	64	.815	.061	.261	-.459	.582
	Equal variances not assumed			.235	62.322	.815	.061	.260	-.459	.581
Satisfaction_SE	Equal variances assumed	8.571	.005	-.803	64	.425	-.217	.270	-.756	.322
	Equal variances not assumed			-.783	52.858	.437	-.217	.277	-.772	.339

Table 6 - Paired Samples T-Test: Evaluations of Search Engine by Experiment-Induced SEO Knowledge

Paired Samples Test

		Paired Differences					t	df	Sig. (2-tailed)
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference Lower	Upper			
Pair 1	Relevancy_SE_pre - Relevancy_SE_post	.485	1.280	.158	.170	.799	3.077	65	.003
Pair 2	Satisfaction_SE_pre - Satisfaction_SE_post	.394	1.288	.158	.077	.710	2.486	65	.016

Table 7 - Paired Samples T-Test: Perceived Relevancy of Websites

Paired Samples Test

		Paired Differences					t	df	Sig. (2-tailed)
					95% Confidence Interval of the Difference				
		Mean	Std. Deviation	Std. Error Mean	Lower	Upper			
Pair 1	Rlevancy_webpage_pre - Rlevancy_webpage_post	.394	1.276	.157	.080	.708	2.509	65	.015

Table 8 - Independent Samples T-Test: Search Behaviors by Self-Claimed SEO Knowledge

Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means						
									95% Confidence Interval of the Difference	
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Lower	Upper
Total task time	Equal variances assumed	.639	.427	.352	64	.726	20083.628	57116.870	-94020.437	134187.693
	Equal variances not assumed			.359	63.902	.721	20083.628	55963.872	-91720.350	131887.605
Avg Google time	Equal variances assumed	1.589	.212	.950	64	.346	2947.412233	3102.454689	-3250.453499	9145.277966
	Equal variances not assumed			.920	50.429	.362	2947.412233	3202.975494	-3484.596882	9379.421349
Number of google sessions	Equal variances assumed	5.235	.025	-.652	64	.517	-.561	.861	-2.281	1.159
	Equal variances not assumed			-.687	54.246	.495	-.561	.816	-2.197	1.075
Number of different searches	Equal variances assumed	1.075	.304	-.045	64	.964	-.028	.618	-1.262	1.207
	Equal variances not assumed			-.047	61.339	.963	-.028	.596	-1.220	1.165
%org_click	Equal variances assumed	3.122	.082	.952	64	.344	.0474650322	.0498331284	-.0520880861	.1470181506
	Equal variances not assumed			.983	62.371	.330	.0474650322	.0483033777	-.0490806209	.1440106853
Bottom organic clicked	Equal variances assumed	.204	.653	-.376	64	.708	-.394	1.048	-2.489	1.700
	Equal variances not assumed			-.378	62.672	.707	-.394	1.045	-2.482	1.693
Bottom organic viewed	Equal variances assumed	2.076	.154	.548	64	.585	.639	1.165	-1.689	2.967
	Equal variances not assumed			.537	55.366	.593	.639	1.189	-1.743	3.021

Table 9 – Paired Samples T-Test: Search Behaviors by Experiment-Induced SEO Knowledge

Paired Samples Test

		Paired Differences					t	df	Sig. (2-tailed)
					95% Confidence Interval of the Difference				
		Mean	Std. Deviation	Std. Error Mean	Lower	Upper			
Pair 1	Total task time1 - Total task time2	-69371.879	296876.432	36542.963	-142353.215	3609.457	-1.898	65	.062
Pair 2	Avg Google time1 - Avg Google time2	1446.769004	13290.17360	1635.907284	-1820.363447	4713.901456	.884	65	.380
Pair 3	Number of google sessions1 - Number of google sessions2	-.818	3.486	.429	-1.675	.039	-1.907	65	.061
Pair 4	Number of different searches1 - Number of different searches2	-.924	3.085	.380	-1.683	-.166	-2.434	65	.018
Pair 5	%org_click1 - % org_click2	.0470017	.2705834	.0333065	-.0195160	.1135193	1.411	65	.163
Pair 6	Bottom organic clicked1 - Bottom organic clicked2	-.530	5.201	.640	-1.809	.748	-.828	65	.411
Pair 7	Bottom organic viewed1 - Bottom organic viewed2	-1.061	5.951	.732	-2.523	.402	-1.448	65	.152

Figure 1 - Google Search Engine Result Page

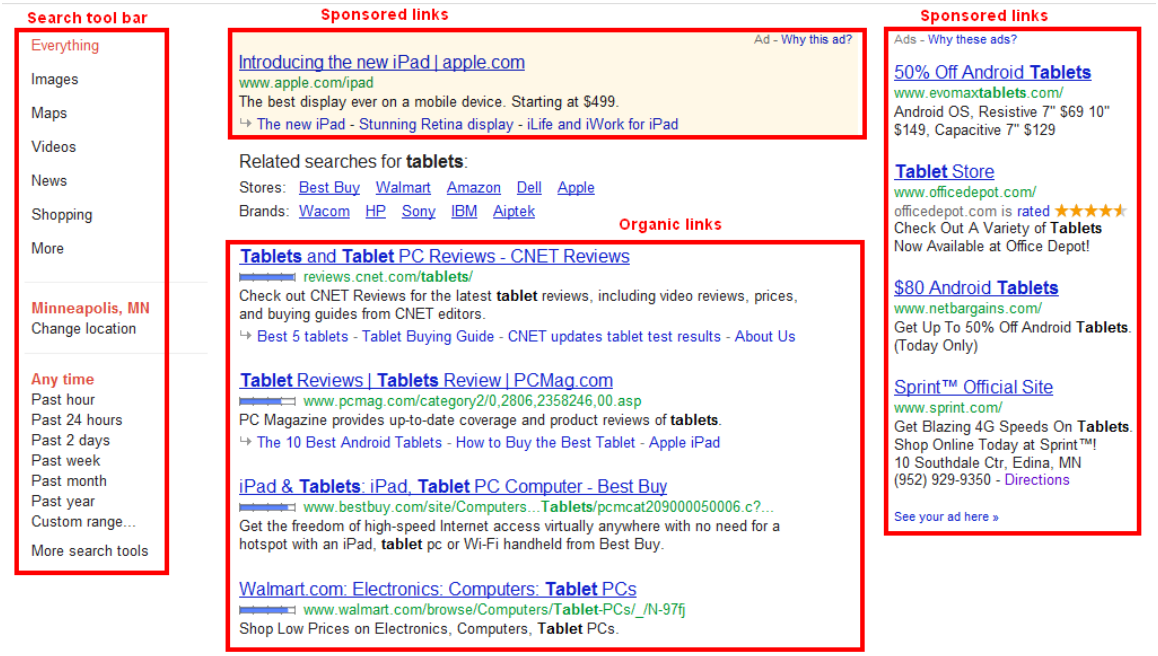


Figure 2 – A Simple Outbound Link

Figure 3 – Aggregated Results

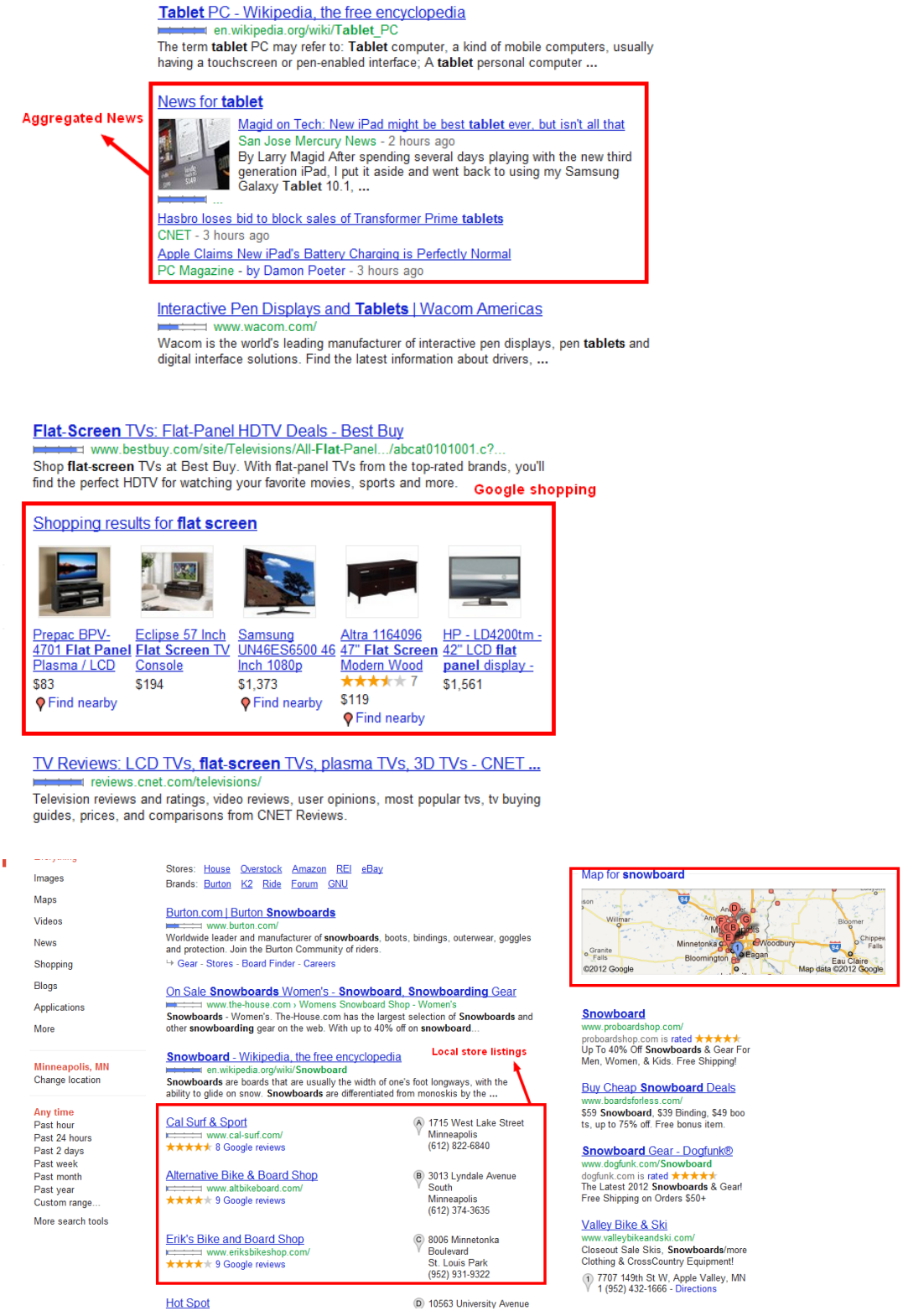


Figure 4 - Means of Perceived Relevancy of Search Engine

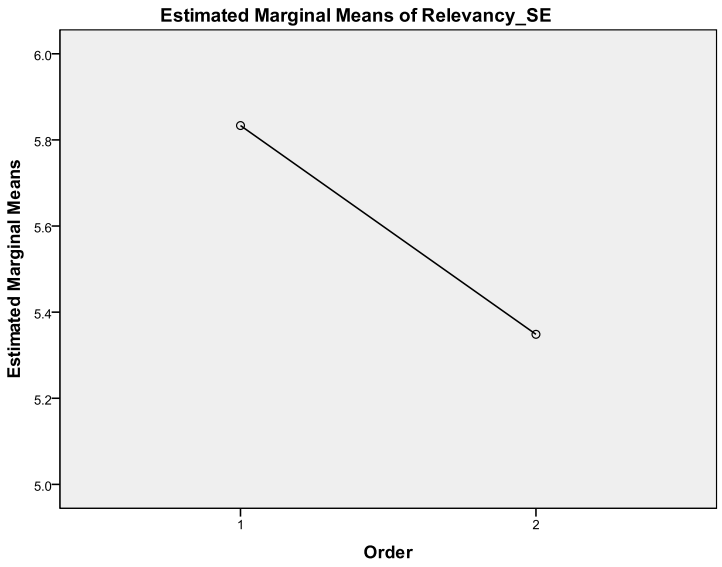


Figure 5 - Means of Satisfaction with Search Engine

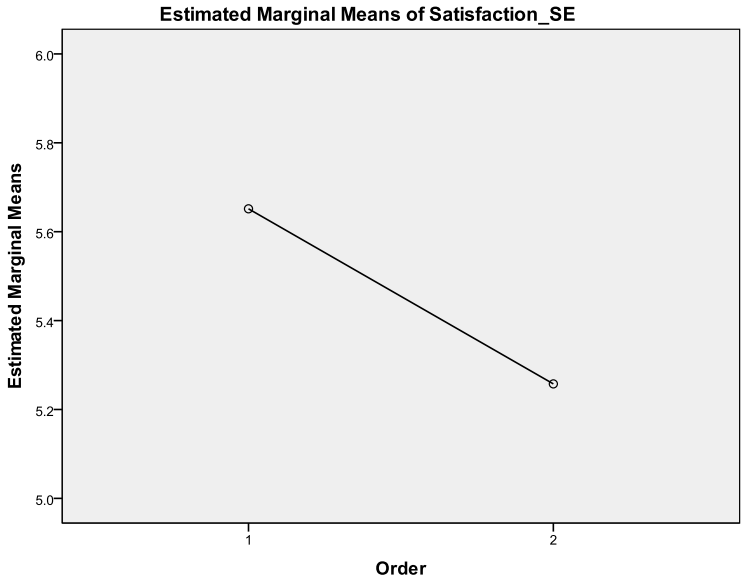
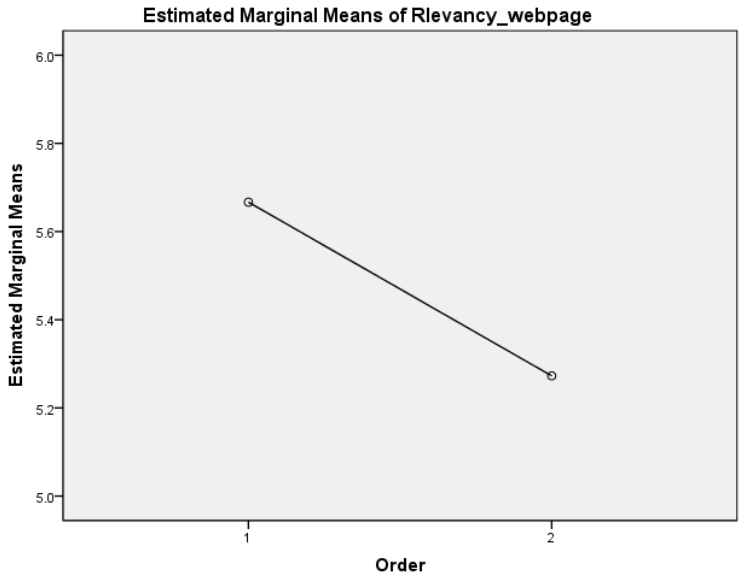


Figure 6 - Means of Perceived Relevancy of Websites



Appendix A

SEO Stimulus

Read the following article on search engine optimization (SEO) and answer the questions on the next page.

David Alan is a SEO veteran who holds a position at Hersheys as their search engine optimization manager. Currently, he manages and executes large-scale SEO campaigns that affect Hersheys' natural search engine placement. Today he will give us a brief SEO 101.

Q: What is SEO?

A: Whenever you type something in a search engine and hit "enter", you get a list of results that contain the term you entered. If you have ever wondered why some of these websites rank better than the others, you must know that it is because of a powerful web marketing technique called search engine optimization (SEO). It is the process of improving the rank of a website or a web page in the "natural" or un-paid ("organic" or "algorithmic") search results in search engines. There is also search engine marketing (SEM) which refers to the "sponsored links" or paid listings you see on Google search result pages.

Q: Why do websites want to do SEO?

A: In general, the earlier (or higher on the page), and more frequently a site appears in search engine result pages, the more visitors it will receive from the search engine. People normally tend to visit websites that are at the top of the search result list as they perceive those to be more relevant. SEO helps search engines find and rank your site

higher than the millions of other sites in response to certain search keywords, and thus helps you get more traffic from search engines.

Q: How does SEO work?

A: Successful SEO campaigns involve very complicated processes and require the work of pros plus a budget of $5000 to $10,000 per month at least. But to put it simple: keywords and link building are the two most important things in SEO. Keywords refer to the process of populating your website with keywords or phrases that are used by consumers in searches. This process covers everything in a website, from web address (URL), web page content to HTML codes. It makes perfect sense to do detailed research about your target audience when choosing keywords – keywords that people would specifically use when looking to retain your services or buy your goods.

Link building is the process of requesting other sites to link to your website. The search engine ranking of any given website is heavily influenced by the number and quality of other websites that link to it. Links acquired from trusted authority sites within the same field are considered to be “a vote” for your site and thus help to raise the search engine ranking of your site. But even links that have nothing to do with your site can bolster your ranking if you site is barnacled with enough of them.

Q: What are the pros and cons of doing SEO?

A: SEO is beneficial both for site owners and visitors. For users looking for a specific item on the internet, all they have to do is to type in a keyword and they're given a list of sites that contain the information they need. SEO helps them avoid wasting time in

browsing sites that hold no relevant data. For site owners, SEO allows them to promote their sites and give unique content to visitors.

SEO also has negative effects on the entire internet industry. While SEO is really aimed at bringing relevant results to users, it can also be manipulated and exploited by unscrupulous practitioners of the trade, the so called black hat SEO. A SEO tactic is considered black hat if it attempts to improve rankings in ways that search engines consider tantamount to cheating, or involve deception, such as overusing the same keywords at the cost of content quality and relevancy, or paying to have thousands of links placed in hundreds of irrelevant sites scattered around the web, etc. Black hat SEO degrades both the relevance of search results and the user-experience of search engines.

Unfortunately, since it is difficult for the search engine alone to distinguish when black hat SEO is applied, such practices are not uncommon in the field. The sadder truth is that company with the biggest SEO budget always ranks the highest. If not paying for black hat SEO, you are losing to rivals with less compunction. And it is true for both small and big companies. Just recently, JCPenny has been caught practicing black hat SEO. It paid hundreds of small sites to place links directly leading to JCPenney.com and achieved top rankings for hundreds of keywords for months. During the period, JCPenney even beat out the sites of manufacturers in searches for the products of those manufacturers. Type in “Samsonite carry-on luggage,” for instance, and Penney for months was first on the list, ahead of Samsonite.com.