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Website Adaptive Navigation Effects on User Experiences

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on User Experiences

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ABSTRACT

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The information search process within a website can often be frustrating and confusing for website visitors. Navigational structures are often complex and multitiered, hiding links with several layers of navigation that user's might be interested in. Poor navigation causes user frustration. Adaptive navigation can be used to improve the user's navigational experience by flattening the navigational structure and reducing the number of accessible links to only those that the user would be interested in. This examines the effects on a user's navigational experience, of using adaptive navigation as the main navigational structure on a website. This study measured these effects by gathering survey responses from over 1,000 users. The survey recorded users' perceptions of navigational effectiveness and efficiency as well as user satisfaction and efficacy. Users were assigned into nine treatment groups that provided variations in navigational change frequency and the order of navigational links. Surveys were used to identify the effects of navigational change frequency and navigational link ordering on the user's navigational experience. The survey found that adaptive navigation works best when change occurs on a page-by-page basis and links are ordered alphabetically.

Keywords: adaptive navigation, user experience, personalization, web, link order, change frequency

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1 INTRODUCTION

The larger a website gets, the harder it is for users to find the information they are seeking. Navigation becomes increasingly complex, requiring some form of organization so that users can find the information they are seeking. A popular navigational structure is the hierarchical navigation (Huizingh, 2000). In a hierarchical structure, links are categorized into menus and submenus. Links that are placed within submenus are hidden until the website visitor elects to expand and explore those submenus. Hiding links with submenus can improve the user experience as it reduces information overload that could be accompanied by exposure to all links simultaneously. Hiding links within submenus effectively reduces the number of selections from which the visitor must make a choice at any one time. It is easier for visitors to make several decisions from smaller sets of choices than it is to make one decision from a larger set of choices (Iyengar, 2011).

There are also disadvantages inherent to the hierarchical navigational structure. Because links are hidden within submenus, a user does not know which links reside within a submenu without taking the effort to explore the submenu. Additionally, how the website administrator chooses to categorize information within menus and submenus is critical to users finding the information they need. Yet, how users would search for the links within the menus and submenus may be different than how the website administrator organized the links – causing a

categorization dilemma (Billingsley, 1982). The categorization dilemma becomes increasingly severe as the total number of links increases and as submenus within submenus grow.

These disadvantages often cause users to experience more confusion, frustration, and information overload, which negate the advantages of using hierarchical navigation structures. For example, users may perceive a site as being poorly organized or not containing the information they are seeking. They may also find the site navigation difficult to traverse, which slows them down and wastes their time. Consequently, users lose confidence in the website, and abandon their task – possibly going to another website or a competitor's website to find the information they seek.

In more recent years, websites have begun to use *adaptive navigation techniques* to improve the user's navigational experience. Adaptive navigation is different than traditional navigation in that it can be modified by forces other than the website developer. Two types of adaptive navigation exist: *customization*, which allows a user to organize their navigation manually; and *personalization*, which occurs when the system tries to automatically provide the user with links they are most likely to use (Nielsen Norman, 2010). Amazon.com is a highly successful website that uses automated data gathering and adaptive navigation techniques to identify products that the user may be interested in and then personalizes the links the user sees. Although some websites use adaptive navigational techniques within secondary menus to supplement the main navigation menu (like the Amazon.com website), there are other websites that have begun to implement adaptive navigation techniques within the primary hierarchical navigation menus, one such example being the Brigham Young University One Stop website.

1.1 Research Purpose

What is not known at this point is how using adaptive navigation techniques within the primary navigational structure affects and changes the users' website experience compared to a static hierarchical structure. Surprisingly, little research has been done on adaptive navigation techniques and how they affect the user experience despite their increasingly common use.

One unanswered question is: how frequently should an adaptive navigation menu change when used as the main navigation menu? For example, if the navigation structure adapts to the user, should it adapt each time a different page is loaded, or only once per visit to the site? One of the benefits of adapting the navigation to the user more frequently is that it displays the links that are most relevant to the user. On the negative side, each time the navigation menu changes a visitor needs to take a moment to reorient their mental model to the available links.

A second unanswered question is: what is the order in which navigation links should be placed in a menu or submenu when using adaptive navigation techniques? Some common ways of ordering navigation include: alphabetical, most popular first, and most recent first (Knight, 2011; Park, Han, Park, & Cho, 2007; Spencer, 2010). While using adaptive navigation is it better to use alphabetical ordering of links or popular ordering of links?

Several methods have been proposed and prototyped that adapt website navigation to their users, for example: data mining techniques, hyperlink based personalization, personalized navigation of link topology and structure, link personalization of information in links, recommender systems, etc. (Arora & Kant, 2012). What is lacking in the papers written about these techniques are experiments or case studies comparing how these techniques affect user experience. Human computer interaction (HCI) and user experience (UX) research literature is

abundant in techniques and methods for evaluating software and websites. However, there is little to no research comparing navigation techniques using user experience methods.

This thesis proposes the use of user experience measures and metrics to evaluate adaptive navigation techniques. This thesis studies two overarching hypotheses based on adaptive navigation and user experience literature:

- H1: Change Frequency: The advantages of less frequently adapting navigation links will significantly outweigh the advantages of more frequent changes in the navigation links.
- H2: Link Ordering: The advantages of using more familiar link ordering (e.g. alphabetical) will significantly outweigh the benefits of less familiar link ordering (e.g. popular).

A designed experiment gathers survey data on different aspects of users' website navigational experience: effectiveness, efficiency, satisfaction, information-seeking efficacy. These data for this study are collected from the admissions website of a large private university that serves over 20,000 website visitors per month.

1.2 Summary and Thesis Format

This thesis studies the effects of changing order and frequency of navigation menu structure in order to improve the user experience for people performing information seeking tasks. The study collected data from the admissions website of a large private university. The data are statistically analyzed, discussed, and presented with recommendations for further research.

This thesis discusses literature related to adaptive navigation systems and user experience engineering of websites in chapter two. Chapter three will present the research methodology and

chapter four will present the results of this research. Discussion of these results and their implications in the literature are found in chapter five. Chapter six completes this thesis by summarizing the conclusions and presenting recommendations for future research. The appendix that follows contains details supporting what is presented in these chapters.

2 LITERATURE REVIEW

This chapter reviews the literature on adaptive website navigation techniques, as well as user experience methods related to websites. This thesis is specifically concerned with literature related to the comparison of static and adaptive navigation performing information seeking tasks from a user experience standpoint.

2.1 The Information Search Process on the World Wide Web

Although the World Wide Web provides resources toward various ends, most commonly it is used to provide information. Since its inception the web has grown substantially and it continues to grow roughly 35% yearly (Saleh & Simmons, 2011). With this substantial increase in available information on the web it is important to continually improve upon web based search and navigation that will aid in the information search process.

The *Information Search Process* (ISP) is a cognitive and affective model that describes a series of six stages that users encounter when searching for information. A study by Kahlthau (2003) on information seeking in complex information seeking scenarios explains these six stages in detail as follows:

Stage one begins with recognition of a need for information. During this stage users feel uncertainty and apprehension as they try and determine the best way to find the relative information, pulling upon past experiences and knowledge to start the search process. During

this stage the user might seek to form a search query in their head that would yield helpful results.

Stage two begins when the user begins to identify possible sources to resolve their task. It could be that a search engine like ‘Google’ will yield the results, or perhaps a more specific site like ‘Wikipedia’ or ‘Dictionary.com’ will provide the best results. It could also be that the user knows the website that would contain the information being sought but doesn’t know where the information resides within that site. In that case the user may identify possible links in the main navigation that will lead to the information. During this stage the user experiences optimism.

During stage three, users explore the results that were returned through their initial method of search. If the user is looking at the results from a search engine there may be a large series of links to select from; if the user is navigating a site via its main navigation then the exploration would include analyzing the content of the currently displayed page. Initially this stage causes the user to feel confusion, frustration, and doubt, each of which makes this a critical point in the ISP where the user may choose to abandon the search.

Users who continue to stage four overcomethe feelings of confusion, frustration, and doubt as a focus is gained. The focus occurs as the users reevaluate their initial search in light of the potential results found. An example of when this may occur is when a user is expecting to find results using a specific terminology, but find that actual results are using a different terminology. This new terminology helps the users to identify that they should be looking at to obtain the relevant information in their search. It is during this stage of focus that a user begins to feel hope and clarity of direction in the search process.

The fifth stage involves compiling information and analyzing it for value. This stage would occur as a user visits several web pages, scans the contents, and identifies to what degree

the contents fulfill the information search through cross referencing similar pages or previous experience. During this stage users begin to fill confidence that the ISP will end successfully.

The sixth and final stage occurs when the search is complete. During the stage, depending on whether the users were able to satisfactorily come up with results or not, the users will either feel relief or disappointment.

As previously mentioned, the third stage is the most dangerous part of the ISP where the user may abandon a search, feeling confusion, frustration, and doubt. It is therefore essential to identify what causes these feelings within the third stage and to eliminate or reduce those causes so that more users can successfully continue the ISP.

2.2 User Experience: Frustration During the Information Search Process

Sigmund Freud introduced frustration as a concept that was both external and internal in nature and related to the concept of goal attainment. According to Freud, a person experiences frustration when their goals are impeded or hindered in such a way that the goal is threatened from being realized (Lazar, Jones, & Shneiderman, 2006). In the case of the *Information Search Process* (ISP), frustration can prevent the user from gaining the information they seek.

Lazar, Jones, and Shneiderman (2006) investigated the causes of user frustration with computers and found that users reported that 42 – 43% of their time on a computer was wasted due to frustrating experiences. They also found that use of the web was one of the most frustrating of these user experiences. Some studies have looked into what it is the causes frustration on the web and the results of their studies follow:

Ceaparu and Lazar (2004) found that time delays on the web are one frustration that users experience. Time delays on the web while a page loads may cause users to feel that the content of the page is less interesting (Ramsay, Barbesi, & Preece, 1998) and of lower quality (Jacko,

Sears, & Borellam, 2000). Time delays may also cause the user to forget what they are doing (Shubin & Meehan, 1997) or to believe that an error has occurred (Lazar, Meiselwitz, & Norcio, 2004; Lazar & Norcio, 2000).

Unfamiliar or irrelevant terminology in content, links, and headings also hinder the ISP by causing user frustration. (Ceaparu et al., 2004; Juvina & van Oostendorp, 2008). If unfamiliar terms are used then users will not associate the items with the goal they are trying to accomplish. Even though the user may have found the information they were looking for, they will not recognize it and will instead continue to seek it until they abandon their search due to too much frustration.

2.3 Navigation Menus Cause User Frustration

Frustration also comes from website navigational menus that are poorly organized or overly complex (Baecker, Booth, Jovicic, McGrenere, & Moore, 2000; Rosenfeld & Morville, 1998). As an example of poorly organized or overly complex navigation, think of a grocery store website that groups links for vegetables and paper towels together. In such a case, were the links just poorly grouped or were they grouped based on a shared nature that is not readily apparent to the user, like the fact the paper towels are a byproduct of plants whereas vegetables are a type of plant.

Gwizdka and Spence (2007) have identified that navigational menus with too many links can also cause cognitive overload or disorientation to occur, leading to frustration in the ISP. Iyengar (2011) explains that when too many choices are present, users are at least six times less likely to make a choice. The alternative to making a choice would be to abandon the search.

The above-mentioned causes of frustration, including those mentioned in section 2.2 are only a sample of the many possible causes of frustration within a website navigational menu.

Frustration with website navigation can come from many sources: inability to find the information they seek, too much time spent searching for the information they want, etc. With so many causes of frustration it is no surprise that many people shy away from using the web or even avoid it altogether, even in situations where Internet access is available in their home. (Rainie et al., 2003).

This thesis does not aim to study all of the issues that cause frustration on the web. Instead, this thesis focuses on studying how adaptive navigation change frequency and link ordering affects the user experience.

2.4 User Experience Literature Defines Factors that Describe this Frustration

The above references discuss different aspects of frustration, within the user experience, while using website navigation. This pointed the research to Human Computer Interaction (HCI) and User Experience (UX) research literature. As described above, frustration with website navigation can come from many sources: inability to find the information they seek, too much time spent searching for the information they want, etc. In HCI and UX literature these refer to specific factors studied by researchers. These factors include the following:

- *Effectiveness* – e.g., finding the information they are seeking.
- *Efficiency* – e.g., the length of time to complete the task.
- *Efficacy* – confidence in their ability to find the information, e.g. many users tend to blame themselves rather than the system for their frustration (McMullen, 2001).

- *Satisfaction* / Satisficing – how well the experience fulfilled the expectations of the user, with satisficing referring to whether the experience met minimum satisfaction expectations.

Although a lot has been researched about user experience on the web and navigation is inherent in that research, no research was found that compares adaptive navigation techniques in the HCI and UX literature.

2.5 Website Navigation Structures are Intended to Improve the User Experience

The purpose of navigational structures is to make navigating a website easier, but using a navigational structure on a website does not guarantee that it will make the site easy or easier to navigate. Each navigational structure also has its own drawbacks as previously been mentioned for the hierarchical navigation structure. Adaptive navigation can be used to help alleviate some of the shortcomings of static hierarchical structures, but it also introduces new challenges and drawbacks.

2.5.1 Hierarchical Navigation in the Information Search Process

Navigation menus can be organized in several formats, some of which are: hierarchy, linear, linear multipath, matrix, and web (Farkas & Farkas, 2000). The *hierarchal navigation menu* has an organizational structure that allows links to be grouped into menus and related links into submenus (Figure 1). For example, if a navigation menu existed for a grocery store website there could be many links for each of the food items sold in the store. In the case of a hierarchal navigation menu those links would be grouped by similarities. “Produce” could be one category, with the subcategories of “fruits” and “vegetables” which would each contain their own respective links.

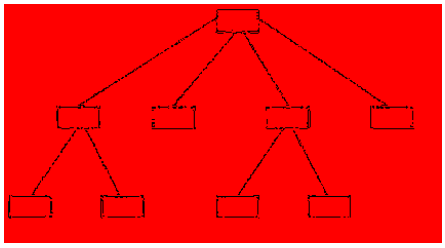

Figure 2-1: Hierarchical Navigation Structure (Farkas & Farkas, 2000)

Within hierarchical navigation menu and submenus links are often ordered either alphabetically or by popularity (Knight, 2011; Park et al., 2007; Spencer, 2010). An example of both alphabetical and popular ordering can be found on the NewEgg.com website. Figure 2 shows the submenu for "Software" that is sorted alphabetically. Figure 3 shows the submenu "Gaming" that is sorted (presumably) by popularity. A portion of this thesis compares alphabetical and popular link ordering to see if one generally has an advantage over the other.

Figure 2-2: NewEgg.com Alphabetical Link Ordering (NewEgg.com, 2012)

Figure 2-3: NewEgg.com Popular Link Ordering (NewEgg.com, 2012)

2.5.2 User Experience Advantages and Disadvantages of Hierarchical Navigation

An advantage afforded by an hierarchical navigation menu when it comes to the Information Search Process (ISP) is that it simplifies the decision making process by helping the visitor to make multiple smaller decisions on categories and subcategories instead of on one big decision between all of the links. Using the grocery store website example again, imagine that the navigation menu contained a total number of twenty-five links. Making a decision on a single link from twenty-five choices is a difficult task. If instead those links were equally distributed and grouped into five categories with five links each then it is easier for the user to make the decision first on which category (a choice of one in five) to explore, after which they will have to

make a second choice of one in five links to choose from again. Reducing the number of options when making a choice reduces frustration while making it easier for users to process and make a decision than it is for users to process fifteen links all at once (Iyengar, 2011).

One disadvantage of hierarchical navigation is that its effectiveness is limited by how well links can be categorized within submenu headings (Billingsley, 1982). If the words used to categorize a submenu within the hierarchy have various meanings or mean different things to different users then the menu becomes confusing (Furnas, Landauer, Gomez, & Dumais, 1987). Confusion in traversing the hierarchy leads to user frustration.

2.5.3 Adaptive Navigation: Customized vs. Personalized

Adaptive navigation is not a navigational structure; it is an approach for organizing navigational structures. Traditionally a navigational structure has links that change only when a web developer manually makes those changes. Adaptive navigation is non-traditional in the sense that the links in the navigational structure can change without the aid of a web developer.

There are two main types of adaptive navigation. One type of adaptive navigation, termed customized adaptive navigation, allows visitors to manually modify the navigational organization of links. The other form of adaptive navigation is called personalized adaptive navigation and it uses automated data gathering to determine the needs of the visitor and then to automatically derive the navigational organization of links that will best fulfill the visitor's needs. (Nielsen Norman, 2010; Shahabi & Banaei-Kashani, 2003). Personalized navigation can improve navigation by consistently providing visitors with only the most relevant links (Jenamani, Mohapatra, & Ghose, 2006).

With adaptive navigation the number of link choices in a navigation menu are reduced to a manageable level as the system determines automatically which links the visitor will be most

interested in. The links that are determined to be of greater interest gain prominence in the adaptive navigation menu while hiding the links that are less likely to help the visitor. Because it is the system that is making the choice of which links to show the visitor or hide from them, the system needs a way to analyze what that most relevant information will be.

2.5.4 Techniques for Deriving Adaptive Navigation

There are many techniques for deriving adaptive navigation (Arora & Kant, 2012; Brusilovsky, 2007; Goldberg, Nichols, Oki, & Terry, 1992; Sarwar, Karypis, Konstan, & Riedl, 2001). Some techniques are active, requiring explicit input from the website visitor in the form of ratings and feedback, while other techniques passively gather information without requiring additional user feedback. Arora and Kant (2012) list several techniques for gathering and generating adaptive navigation, including but not limited to: data mining, customization, hyperlink search, path prediction, link personalization, recommender systems, collaborative filtering systems, and content based recommender systems. Brusilovsky (2007) lists adaptive navigation techniques as falling under one of three categories: history based, trigger based, or progress based. Brusilovsky also lists several ways of adapting the personalized navigation, mentioning direct guidance, link ordering, link hiding, link annotation, and link generation.

Each of these techniques often requires explicit user feedback, but this research uses some of these adaptive navigation techniques through historical and passive observation of website visitors' actions. This research will adapt its navigation through link ordering and link hiding, periodically updating the availability of links based on a trigger.

This study will test link ordering in three formats: alphabetically ascending, popularity descending, and random ordering. Only the most popular links will be shown (link hiding). The links will change based on two triggers, the first of which is the audience type selected, never

listing links that are not relevant to the audience type. The second trigger will affect how often the links change: first page of first site visit, first page of any site visit, or any page load.

2.6 Uses for Personalized Adaptive Navigation

Personalized adaptive navigation is used today for various reasons. One reason is to provide customized education to a user. Through assessing the user's knowledge and skills, the navigation can be adapted to provide the user with links that will be most beneficial to their learning (Brusilovsky, 2012). Amazon.com and Netflix both use recommender systems to entice users to partake in more of their product (Ekstrand, Riedl, & Konstan, 2011). Facebook, LinkedIn, Twitter, and other social networks often use adaptive navigation to make recommendations on connections to other people. This study uses adaptive navigation to establish item-item relationships between web pages.

2.7 Adaptive Navigation Related to this Research

2.7.1 Types of Navigation

There are many different forms of web navigation, some of which include: classification path, content embedded links, hierarchical, linear, and web. Classification path navigation (also known as breadcrumbs) provides navigational context to the user on where the page they are currently viewing resides within the website structure. Content embedded links are simply links that exist within the content of the website as part of the content. Hierarchical navigation menus categorize links. Details on this form of navigation were discussed in section 2.5. Linear navigation provides little option to the website user on where they will navigate to, generally offering the option to go to the next page, or go back to the previous. Web navigation is

inconsistent from page to page, often providing links to pages that are related to the current web page (Charlotte, 2009; Farkas & Farkas, 2000).

Table 2-1: Common Navigation Types with Pros and Cons

Navigation Type	*Pros*	*Cons*
Classification Path	Provides navigational context to the user, identifying the current page location in relationship to the site structure. Links allow the user to easily broaden topic area.	Limited navigational choices. Navigation is one directional (upward).
Content Embedded Links	Links are presented to the user at moments where the user may have gained interest in the link.	Links are difficult to find out of context.
Linear	Few navigational choices, simplified decision making.	The lack of navigational choices prevents the user from exploring outside of the predetermined path.
Hierarchical	Categorized links allow users to make several small decisions instead of one large decision.	Imperfect categorization of links contributes to user lostness and confusion.
Web	Links that are considered most relevant are provided on the page, reducing the number of link choices and simplifying decision making.	The links the user is interested in may not always appear on a page.

Each of these forms of navigation may be static (never changing unless changed specifically by the website owner) or adaptive (changing without the aid of the website owner). Adaptive navigation may be personalized – changing automatically for the user, or customized – allowing the user to specify the changes to the navigation. Navigation personalization may be based on item-item relationships or user-user relationships (Arora & Kant, 2012; Barla, 2011; Findlater & McGrenere, 2004; Sarwar et al., 2001).

Table 2-2: Static and Adaptive Navigation Pros and Cons

Navigation Type	*Pros*	*Cons*
Static Navigation	Each time the user visits a webpage the navigation for that page will be the same.	Navigation does not change to fit the user's needs.
Customized Adaptive Navigation	The user can organize the navigation exactly as they would like.	Requires that the user take the time to configure the navigation.
Personalized Adaptive Navigation	Navigation is automatically adjusted to fit the perceived needs of the user, potentially making the navigation easier to use.	Navigation may not adjust in a way that fits the user's needs. Changing navigation may contribute to user frustration, confusion, and lostness.

2.7.2 Adaptive Navigation Methods

The findings in this study are related specifically to hierarchical navigation menus that use item to item relationships to build personalized adaptive navigation. The items used are web pages and the relationships between those pages are their most frequent navigation paths from one page to the next.

Item to item relationships are commonly built based on user ratings. An alternative to this is to make item to item relationships is by comparing webpage content. A third alternative, which this study uses, is to establish relationships between web pages by common navigation paths (Gavalas & Kenteris, 2011; Pham & Jung, 2012; Poblete & Baeza-Yates, 2006; Wang & Lee, 2011).

Studies on adaptive navigation more often evaluate the accuracy of the adaptive navigation algorithms than how the adaptive navigation has affected the user (Herlocker, Konstan, Terveen, & Riedl, 2004). This study focuses on the latter, specifically identifying how the frequency of change in adaptive navigation and the order of links affect the user.

2.7.3 Other Adaptive Navigation Studies

Many studies in adaptive personalized navigation deal with improving the personalization by making it more accurate, but almost no research was found that experimentally compares adaptive navigation techniques to UX outcomes. For example, one study looked into improving collaborative filtering algorithms for Movielens, Film Affinity, and Netflix using genetic algorithms. Genetic algorithms are capable of evolution and when trained using existing user ratings from these three services was capable of producing more accurate recommendations (Bobadilla, Ortega, Hernando, & Alcalá, 2011). Wang and Lee (2011) looked into the effectiveness and efficiency of data mining for adaptive navigation systems. The study found that by building a path traversal graph that it could efficiently predict potential user paths. It also found that mining user's surfing paths was an effective way to determine what paths other users would take in the future. However, these studies were focused on developing adaptive navigation methods and not on studying the effects of adaptive navigation on the user experience.

But Chiou and Tseng (2012) is a rare example of research relating adaptive navigation to UX outcomes. The study recognized that learners fit into four groups: transforming learner, performing learner, conforming learner, and resistant learner. This study tested three forms of adaptive navigation within a learning environment and compared user satisfaction with the each of the forms of adaptive navigation. What the study found was that the best adaptive navigation model (of those tested) varied from group to group.

Users may experience frustration while using the web. Slow page loads (Ceaparu et al., 2004), unfamiliar navigation terminology (Ceaparu et al., 2004; Juvina & van Oostendorp, 2008), poor navigational organization (Baecker et al., 2000; Rosenfeld & Morville, 1998), and too many navigational links (Gwizdka & Spence, 2007) are all potential causes for user

frustration. This study did not attempt to address these potential sources of user frustration in the information search process (Kuhlthau, 2003).

Several navigational structures that have also been used to improve the information search process but each has advantages and disadvantages (see Table 2-1) (Billingsley, 1982; Farkas & Farkas, 2000). To improve upon those structures adaptive navigation has been introduced, personalizing navigation to fit the user's needs (Jenamani et al., 2006; Nielsen Norman, 2010; Shahabi & Banaei-Kashani, 2003). Many techniques exist for deriving personalized adaptive navigation (Arora & Kant, 2012; Brusilovsky, 2007; Goldberg et al., 1992; Sarwar et al., 2001). This study did not seek to compare different navigation structures, adaptive navigation algorithms, or adaptive navigation implementations.

2.7.4 Assumptions

Learning takes time. The first time a user loads a webpage they will need to learn the organization of the navigation before it can be used. If the navigation for that page changes then the user must relearn the navigation. Because of that, websites with consistent navigation for all pages have the benefit of reducing the learning time dedicated to the navigation menu. The more often the navigation changes, the more time the user must dedicate to learning the new navigation, lengthening the time it takes the user to find the information they are looking for.

If the user knows or has an idea of the name of a link in a navigational menu then links that are ordered alphabetically are easier to sort through than links that are otherwise ordered. A user seeking a link that falls later in the alphabet will be able to jump past earlier links. If links are not ordered alphabetically, the user must scan all links individually, lengthening the time it takes to find the information they are looking for.

More frequent changes in navigation and links that are not ordered alphabetically take longer for a user to process than those which do not change and are ordered alphabetically (Klein, 2008).

2.8 Summary

This chapter discussed information seeking as its related to the web and identifies the consequences and causes of user frustration that this research is designed to address. User experience literature provides methods, factors, and measures to study this user frustration. Adaptive navigation techniques have been suggested and are proposed to simplify information seeking and improve user experience on the web. In chapter three, we will detail how we set up the experiment to assess this.

3 RESEARCH METHODOLOGY

The purpose of this research was to experimentally test factors important to adaptive navigation structures on websites. This study evaluated whether changes in navigation frequency and link order significantly impact outcomes related to website users' experiences. A 3^2 multivariate experimental design was used to collect survey data from visitors to an admissions website from a large private university. These data were analyzed using appropriate multivariate statistics. The results are presented and discussed in chapters four and five. This chapter will begin by describing the details of the research methodology used to accomplish this study.

3.1 Variables Used in this Study

This study used an experimental design based on two independent variables: the frequency the navigation menu changes (change frequency) and the ordering of the more popular links in the navigation (link order). Each of these variables were randomly assigned at one of three states for each participant in this experiment. Change frequency occurs: Never (analogous to the static hierarchical navigation structure – meaning users get the navigation once and it stays that way for all subsequent visits), Per Visit (meaning that personalization occurs as a user first arrives at the site and stays the same throughout the site visit but changes on subsequent visits to the site), or Per Page (meaning personalization of links changes on every page load). Link order

was assigned as: Alphabetical (ascending alphabetically), Popular (descending by popularity), or Random (no discernible ordering of links).

The dependent variables evaluated in this study were: user information seeking effectiveness, user information seeking efficiency, user satisfaction, and user information seeking efficacy. Information seeking effectiveness evaluated how well the user was able to find the information they were looking for. Information seeking efficiency asks the user to evaluate how efficient the website was at helping them find the information they were looking for. User satisfaction asked the user to evaluate how well the website fulfilled their expectations, demands, and needs (Dictionary.com). User information seeking efficacy evaluated how confident the user is in their ability to find admissions information after using the website. These variables were chosen based on UX literature and the desires of the admissions office. The dependent variables were measured through an online survey that is discussed in section 3.4.

3.2 Research Hypotheses

Since no previous experimental studies were found that evaluated adaptive navigation change frequency and link order, hypotheses for this study were based on practical experience and expectations.

3.2.1 Change Frequency

What are the effects on a website users experience as the navigation menu changes more frequently? The human mind prefers consistency so that it doesn't have to allocate cognitive resources as often thus reducing cognitive load (Klein, 2008). Therefore it was expected that users would prefer that navigation menus not change; so that the more they use the website they would experience increased information seeking effectiveness, efficiency, satisfaction, and

efficacy. Thus, it was expected that static menu that do not change would produce the best user experiences. Menus that change per visit were expected to produce the next best user experience, because users may or may not remember the navigation between separate visits. Navigation changes per page are expected to produce the worst user experience outcomes because it would force the user to concentrate and reread the menus on each page.

- Hypothesis 1: Effectiveness increases significantly as navigation changes less often.
- Hypothesis 2: Efficiency increases significantly as navigation changes occur less often.
- Hypothesis 3: Satisfaction increases significantly as navigation changes occur less often.
- Hypothesis 4: Efficacy increases significantly as navigation changes occur less often.

3.2.2 Link Order

What are the effects on a website users experience as the link ordering is more familiar? It was expected that alphabetical ordering is familiar to most people as it is a societal norm, and popular ordering would be less familiar. Random ordering of links was expected to be the least familiar and most confusing to users. Random ordering of links was added as a state of this variable to create a baseline by which to compare alphabetical and popular ordering.

- Hypothesis 5: Effectiveness is increased significantly when ordering is more familiar.

- Hypothesis 6: Efficiency is increased significantly when navigation ordering is more familiar.
- Hypothesis 7: Satisfaction is increased significantly when navigation ordering is more familiar.
- Hypothesis 8: Efficacy is increased significantly when navigation ordering is more familiar.

3.2.3 Change Frequency and Link Order

Continuing with similar reasoning as described above, the more static the navigation remains, meaning the fewer the changes in link ordering and change frequency, the better the expected user experience.

- Hypothesis 9: Effectiveness is increased significantly as changes occur less often and ordering is more familiar.
- Hypothesis 10: Efficiency is increased significantly as changes occur less often and ordering is more familiar.
- Hypothesis 11: Satisfaction is increased significantly as changes occur less often and ordering is more familiar.
- Hypothesis 12: Efficacy is increased significantly as changes occur less often and ordering is more familiar.

3.3 Experimental Design

The experimental design selected for this study was a 3^2 type III with unequal cell sizes. This design tests the main effects and interactions between the three states of both factors tested:

change frequency (never, per visit, per page load) and link order (alphabetical, popular, random). The states of the specific cells in this experimental design are shown in table 3-1.

Table 3-1: Experimental Design Cell Details

	Change Frequency (C_X)		
Link Order (O_X)	O_{Random} x C_{Never}	O_{Random} x $C_{PerVisit}$	O_{Random} x $C_{PerPage}$
	O_{Alpha} x C_{Never}	O_{Alpha} x $C_{PerVisit}$	O_{Alpha} x $C_{PerPage}$
	$O_{Popular}$ x C_{Never}	$O_{Popular}$ x $C_{PerVisit}$	$O_{Popular}$ x $C_{PerPage}$

The treatment assignment was balanced by sequentially assigning each website visitor one of the nine treatment options, providing a near perfect distribution of treatments to website visitors. All website visitors who reach the desired number of page and site visits were given the option to take the survey. A near equal distribution of surveys per treatment was expected but not assured.

Website visitors who received the survey all received the same questions. The first two questions asked for demographic information about the user. These questions were used to eliminate survey results that came from users that did not fit the target audience. The last question of the survey always asked for other comments. The other questions consisted of two efficacy questions, five effective questions, four efficient questions, and three satisfice questions. Those 14 questions were randomized in the survey in such a way that no two questions from the same grouping were side by side; i.e. no two effective questions were side by side, no two efficient questions were side by side, etc. Questions were randomized for two purposes: 1) to focus website visitors' attention on answering each question independent of the previous or next question in order to minimize the correlation of the answers between questions, 2) website

visitors who returned enough times to the website received the survey again, labeled as a follow-up survey, and randomization of the questions implied to the visitor that the follow-up survey is not the same as the initial survey.

3.4 Data Collection

To study these questions, this research collected data from the admissions website of a large private university that serves over 20,000 website visitors per month. The admissions website contains a large number of webpages to provide the large variety of admissions information users may need. Many of the links are not useful to all users. As an example, the weeks before the admissions deadline the pages relating to the admissions application become more popular, so it makes sense that those pages would be more accessible at that time then pages related to admissions deferments. Thus, adaptively limiting unnecessary links and providing more relevant links should optimize the user experience and improve their impression of the university, making this website ideal to study adaptive navigation structures.

Using web analytics, the admissions office was able to determine that 80% of users were looking at 20% of the information. The most popular topics change throughout the year, but 80% of students are still searching for 20% of the total information. The web analytics also determined that the average number of pages visited per visit over the last two years is roughly 3 1/3 pages. The average number of pages visited per site visit was used to decide when surveys would be given to users, which was on the third page load of the first and third visits to the website.

Due to the changing demand for specific web pages, the admissions office decided to reduce the complexity of their main navigation menu by doing several things:

- First, all links were organized within five static categories: Why Attend, How to Get In, How to Pay for it, Where to Live, and New Admits.
- Second, as visitors arrive at the site, they must select one of several audience types. The audience they select filters the links to pages they can view to only those that apply to their audience type by removing irrelevant links and content.
- Finally, the adaptive navigation structure was programmed to further limit the number of visible links within the five static categories by continuously monitoring the trending most popular links.

3.4.1 Data Collection Instruments

Instruments used to collect data for this experiment were website program code and an online survey. The code used to gather data is detailed in the appendix and includes code that uniquely identifies each user, identifies the pages they visit, tracks their progress during a visit, and tracks their progress on subsequent visits. The code also assigns one of the factor combinations from the experimental design to each user on their first visit to the site since the test began, and maintains that assignment on subsequent visits for each user for the duration of the test. The assignment is stored in a browser cookie.

Users were invited to participate by taking an online survey after they have made sufficient progress according to the data collection procedure. (See Appendix A for a list of all questions.) The survey asked participants to evaluate questions assessing the dependent variables selected for this study and collected some demographic information. Each dependent variable was evaluated by multiple questions by using a slider to select their relative strength on a scale of zero to 100 with 50 as the default value. The data collected can be justified as continuous data and analyzed using parametric statistics using a normal distribution. The survey questions were

designed specifically for this study. No evaluation of the understandability of the questions was made.

3.4.2 Data Collection Procedure

When a website visitor first arrived on the site the top links were derived and presented in the navigation menu. Using historical data the admissions website knows the popularity of each page at any given time. That information is used to provide a list of the top four most popular links for each of the five categories.

As users navigated the site, the admissions website automatically tracked how many pages a user loaded during a visit (number of pages visited), which pages the user visited, and the total number of separate visits (number of visits) the user made to the website. Users received an online survey asking them for limited demographic information and asking them to evaluate the information seeking effectiveness, efficiency, satisfaction, and efficacy of their visit to the admissions website. The first time a user loaded their third page on a single site visit the user received a survey. (The choice to use three pages was selected based on the average number of pages a user loads on each visit.) Users also received a second follow-up survey on their third page load that was two or more visits after having taken the first survey. Users who opted out of the first survey were never prompted to take a second survey.

Survey data was gathered for seven weeks and was used for the statistical analysis of this study. Data will continue to be gathered for future analysis and publications after this thesis. Note that some visitors to the site after the experiment begins will have had prior exposure to the site, but the questions in the survey are phrased to emphasize the current site visit.

3.4.3 Estimated Degrees of Freedom and Resulting Sample Sizes

A limited review of statistical literature revealed lack of recommendations for determining power in multivariate data (Lipsey, 1990). A minimum of n=100 participant surveys per treatment cell will provide more than enough statistical power to detect significant effects. Table 3-2 shows the degrees of freedom (df) computations for this experiment based on a minimum of 100 participants per treatment cell.

Table 3-2: Degrees of Freedom for Minimum Desired Number of Participants

Sources of Variation	*df*	*df**
Between Subjects	abn-1	(3)(3)(100)-1 = 899
A = Change Frequency	a-1	3-1 = 2
B = Link Order	b-1	3-1 = 2
AB	(a-1)(b-1)	(3-1)(3-1) = 4
Subjects between groups (error between)	ab(n-1)	(3)(3)(100-1) = 891
Overall	abn-1	(3)(3)(100)-1 = 899

*a=3, b=3, n=100 minimum

Due to the nature of participants opting in to take the online survey, it is impossible to assure an equal number of participants across treatment cells – even though the website is programmed to offer an equal number of surveys. This means statistical analyses of unequal cell sizes would be used.

3.5 Analysis Methods

3.5.1 Multivariate Dataset Requires Multivariate Preliminary Analyses

Due to the way survey data were collected (using continuous sliders instead of Likert-type scales), the data collected for this study is assumed to be continuous, parametric data. This data was tested for normality and follows a normal distribution. This means that parametric statistical analyses were expected to be appropriate to apply to these data.

This study seeks to analyze multiple independent factors in relation to multiple dependent variables. This means that using and interpreting univariate statistical analyses are not appropriate without additional multivariate tests, because they may not produce valid results. (Rencher, 2001, pp. 112-113) discusses four arguments for a multivariate approach to hypothesis testing as opposed to a univariate approach:

1. The use of p univariate tests inflate the Type I error rate, α, whereas the multivariate tests preserves the exact α-level.
2. Univariate tests completely ignore the correlations among the variables, whereas the multivariate tests make direct use of the correlations.
3. Multivariate test is more powerful in many cases. In some cases, all p of the univariate tests fail to reach significance, but the multivariate test is significant because small effects on some of the variables combine to jointly indicate significance.
4. Many multivariate tests that involve comparing group means have, as a byproduct, the construction of linear combinations of variables revealing more about how the variables combine to reject the hypothesis.

The probability of rejecting one or more of univariate tests on p variables when H_0: $\mu_1 = \mu_2 = \mu_3 = ...\mu_X$ is true is called the overall α or experiment wise error rate. If only univariate tests are performed on individual variables, without using multivariate hypothesis tests, then the overall error rate is overinflated. Yet, when the same testing is performed only after the multivariate tests reject H_0, the error rates of individual variable tests are close to the nominal rate.

Thus, when testing multivariate data, multivariate hypothesis tests should be conducted before any univariate tests. When univariate tests are conducted only after rejection of the overall multivariate tests, the experiment wise error rate is close to the desired α-level. When the probability of rejection for the tests on individual variables is reduced, these tests become more conservative. (cf. Rencher, 2001, pp. 112-117, 126-128, 168-170, 183-185).

The multivariate nature of these data requires several preliminary analyses be performed to test the underlying assumptions that permit valid parametric statistical analyses of this dataset (Rencher, 2001). Several preliminary statistical analyses are required to test the underlying assumptions that permit parametric statistical analyses of this dataset, including the following:

Normality. For ANOVAs, the dependent variables are normally distributed within each group. For MANOVAs, the assumption is that the dependent variables (collectively) have multivariate normality within groups (see Section 4.3 for results). Multivariate normality is a prerequisite for most of the univariate and multivariate statistical analyses used in this study. Normality is evaluated most effectively by plotting histograms of the data and visually evaluating it. Skewness and Kurtosis results also help determine normality (cf. Field, 2005; Rencher, 2001).

Homogeneity of Variance/Covariance. Because this multivariate dataset has unequal cell sizes across groups, the data may not be robust to violations of homogeneity of variance. Consequently, homogeneity of variance assumptions are used to test for sphericity (see Section 4.3). For ANOVAs, the required assumption is that variances are equal across groups. For MANOVAs, the requirement is that there is homogeneity across covariance matrices. This means that the homogeneity of variance assumption holds for each dependent variable and that the correlation between any two dependent variables is the same in all groups. Levene's and Box's tests are used to evaluate this assumption. Box's test evaluates the null hypothesis that the observed covariance matrices of the dependent variables are equal across groups, and has added robustness compared to Levene's test. Lastly, sphericity is used to test that variances are equal across repeated measures data taken from the same participant. Barlett's and Mauchly's tests are used to test the sphericity. Significant results for any of these results indicate a violation of this assumption. If these assumptions are violated, there are corrections that can sometimes be made to the analyses to give more reliable results (cf. Field, 2005; Rencher, 2001). See Appendix F for results.

Tests of Independence: Dependent variable results in the dataset should be statistically independent. Since this is a multivariate dataset, it is likely there is a high correlation between the dependent variables. Therefore, in order to protect the validity of the results, these data require multivariate hypothesis testing procedures be conducted to test for independence of the dependent variables prior to conducting univariate statistical analyses. These multivariate hypothesis tests protect against inflation in the overall experimentwise error rate and subsequent misinterpretations of univariate analyses when results for a variable are significant at the $p < 0.05$

level of significance. When a multivariate hypothesis test is non-significant, i.e., the null hypothesis is true:

$$H_0 : \mu_{Efficacy1} = \mu_{Efficacy2} = \mu_{Effectiveness1} = \mu_{Effectiveness2} = \mu_{Effectiveness3} = \mu_{Efficiency1} = \mu_{Efficiency2} = \mu_{Satisfaction1} = \mu_{Satisfaction2} = \mu_{Satisfaction3} \quad (3\text{-}1)$$

any subsequent analytic results are highly suspicious because any significant result must be a Type I error.

It is important to perform four multivariate hypothesis tests prior to performing univariate statistical analyses. These four multivariate test statistics include: the Wilk's Lambda (Λ), Roy's Largest Root (θ), Pillai Statistic ($V^{(s)}$), and the Lawley-Hotelling test statistic ($U^{(s)}$). However, the four tests are not equivalent. In any given sample, they may lead to different conclusions, even when H_0 is true and some tests reject H_0 while other tests accept H_0. Four different multivariate test statistics are needed because different situations make one test statistic more powerful than another. As a result, there is a considerable amount of disagreement in the statistics community as to which statistic is best.

According to Rencher (2001), this disagreement is primarily a result of many statisticians not understanding the increased complexities of multivariate statistics. Because of this debate, the most reliable conclusion is obtained when all four tests agree on the independent variable being tested. When all four tests agree, the multivariate dataset clearly meets the requirements of multivariate independence, and, therefore, significant statistical results in further analyses can be trusted because the overall experimentwise error rates are preserved. Using all four tests helps identify potential problems and lends reliability and validity to further statistical analyses on the data (see Rencher (2001, pp. 176-179) for further discussion).

3.5.2 Analyses used to Answer Hypotheses

A MANOVA is recommended for data analysis for this experiment because the independent variables are both fixed and categorical (Rencher, 2001). The between-subjects portion of a Multivariate Analysis of Variance (MANOVA) was used to test the hypotheses related to the main effects and interactions for each of the dependent variables in this study. The interpretation of the direction of significant statistical results was determined using plots of the estimated means of the treatment cells. (See Section 4.3.2 for these results.)

Hypothesis 1: Effectiveness increases significantly as navigation changes less often

Hypothesis 2: Efficiency increases significantly as navigation changes occur less often.

Hypothesis 3: Satisfaction increases significantly as navigation changes occur less often.

Hypothesis 4: Efficacy increases significantly as navigation changes occur less often.

Hypothesis 5: Effectiveness is increased significantly when ordering is more familiar.

Hypothesis 6: Efficiency is increased significantly when navigation ordering is more familiar.

Hypothesis 7: Satisfaction is increased significantly when navigation ordering is more familiar.

Hypothesis 8: Efficacy is increased significantly when navigation ordering is more familiar.

Hypothesis 9: Effectiveness is increased significantly as changes occur less often and ordering is more familiar.

Hypothesis 10: Efficiency is increased significantly as changes occur less often and ordering is more familiar.

Hypothesis 11: Satisfaction is increased significantly as changes occur less often and ordering is more familiar.

Hypothesis 12: Efficacy is increased significantly as changes occur less often and ordering is more familiar.

3.6 Summary

This methodology tested the effectiveness, efficiency, satisfaction, and efficacy of the experiences of visitors to the admissions website of a large private university. The data collected based on the experimental design is analyzed and presented in chapter four.

4 RESEARCH RESULTS

4.1 Introduction

Research methodology and data collection proceeded as per chapter 3, but statistical analysis had to change slightly based on the number and types of surveys that were collected. Of the data that was collected, the original dataset included a total of 1260 surveys taken. That dataset was reduced to 1175 surveys after eliminating invalid survey results (see section 4.2). As of the release of this thesis, data collection is ongoing but the data for these results was collected from July 6 2012 at 8:30 pm to August 23 2012 at 8:00 am.

4.2 Data Processing

Data were collected over the summer of 2012 during the months of July and August for a total of fifty-one days. The original data set contained surveys from 1257 participants, three of which also took a second survey resulting in a total of 1260 surveys.

Table 4-1: Survey Offers and Participation

Survey	*Participation*	*Offers*	*Response Rate*
First Survey	*1257*	*18663*	*6.72%*
Second Survey	*3*	*106*	*2.83%*
Totals	***1260***	***18769***	***6.71%***

4.2.1 Second Survey

Only 106 second surveys were offered for the reason that to qualify for a second survey a user had to have taken the first survey and had to return for enough site visits and pages loads (as described in section 3.4.2). Additionally, the response rate for second surveys was 57.89% lower than the response rate on the first survey. Because there were only three second surveys, it was determined that not enough data existed within the second surveys to provide meaningful data. All second surveys were thrown out of the final dataset.

4.2.2 Change Frequency Treatment Reduction

The sparcity in the number of second surveys taken was unanticipated and had the effect of joining two change frequency treatment groups, effectively changing the experimental design. Table 4-2 shows the updated experimental design.

Table 4-2: Updated Experimental Design

	Change Frequency (C_X)		
Link Order (O_X)	O_{Random} x C_{Never}	~~O_{Random} x $C_{PerVisit}$~~	O_{Random} x $C_{PerPage}$
	O_{Alpha} x C_{Never}	~~O_{Alpha} x $C_{PerVisit}$~~	O_{Alpha} x $C_{PerPage}$
	$O_{Popular}$ x C_{Never}	~~$O_{Popular}$ x $C_{PerVisit}$~~	$O_{Popular}$ x $C_{PerPage}$

As table 4-2 shows, all treatment groups that contained a change frequency of change occurring once per visit ($C_{PerVisit}$) had to be removed from the experimental design because not enough second surveys occurred. The second survey, which was offered on the third visit to the site was essential for the $C_{PerVisit}$ change frequency group because by the time that group took the first survey they would have had the same treatment experience as the C_{Never} change frequency

group. Due to the identicalness of the two change frequency sets for the first survey it was decided that all $C_{PerVist}$ treatments would be treated as C_{Never} treatments.

4.2.3 Demographics

This goal of this study is to collect data from users that were determined to find the information they were seeking. Because the admissions website used was unique, there were no other websites where visitors could find reliable information outside of this website. Users who were truly seeking information on admissions would need to use this website prolonging their information search within the site over a visitor who just happened to stumble onto the website.

There were a total of fifteen users who indicated on the survey that they had just happened to visit the site with no real purpose in mind. These fifteen surveys were eliminated from the final survey results so as to not potentially contaminate the survey answers.

4.2.4 Partial Surveys

Several surveys were only partially completed. As per the survey presentation methodology described in Chapter 3: the survey questions were randomized to focus participants attention and help eliminate bias due correlation between question answers, the initial setting on the slider was set to a neutral rating of 50 on a scale of one to 100, and participants were forced to click on the slider to submit the score and progress to the next question.

As a result of the randomization of questions and the initial value of the sliders, the survey results were difficult to interpret as to whether participants meant to click on and choose "50" or if they simply clicked "50" to proceed in the survey, essentially not finishing the survey as it was intended. Because partial surveys would corrupt the final survey results, partially completed surveys were eliminated from the final dataset.

To determine which surveys would be considered partial, a set of guidelines was developed. Surveys would be considered partial if they met one of the following two conditions:

1. The survey had more than three "50" ratings.
2. Any factor surveyed (effectiveness, efficiency, efficacy, satisfaction) had more than one rating of "50".

These guidelines would be applied unless one of the following conditions were met:

1. Other survey ratings for the same participant were also close to 50 (e.g. 48, 51, etc.) indicating the participant probably meant to rate the questions at 50
2. If the qualitative comments for the participant indicated that the person thoughtfully considered their answers to the survey questions.

4.2.5 Final Dataset

The final data set contained 1075 surveys and used the treatments outlined by table 4-3. All analyses were performed using SPSS v20.0. Most analyses were generated by selecting options listed under the General Linear Model – Multivariate menu. The type of model included two factors (change frequency at two treatments: never and per page, and link order at three treatments: alphabetical, popular, and random), It was analyzed using a full factorial Type III experimental design with main effects and interactions.

Table 4-3: Final Dataset Treatment Cell Sizes

		Number of Treatments
Order	*Alphabetical*	386
	Popular	394
	Random	395
Change	*Never*	755
	Page	420

4.3 Multivariate Pre-test Analyses Results

Figures 4-1 and 4-2 are typical of all of the dependent variables, but full list of all eight dependent variable histograms with the normal distributions are included in Appendix F. The dataset appears to be multivariate normally distributed.

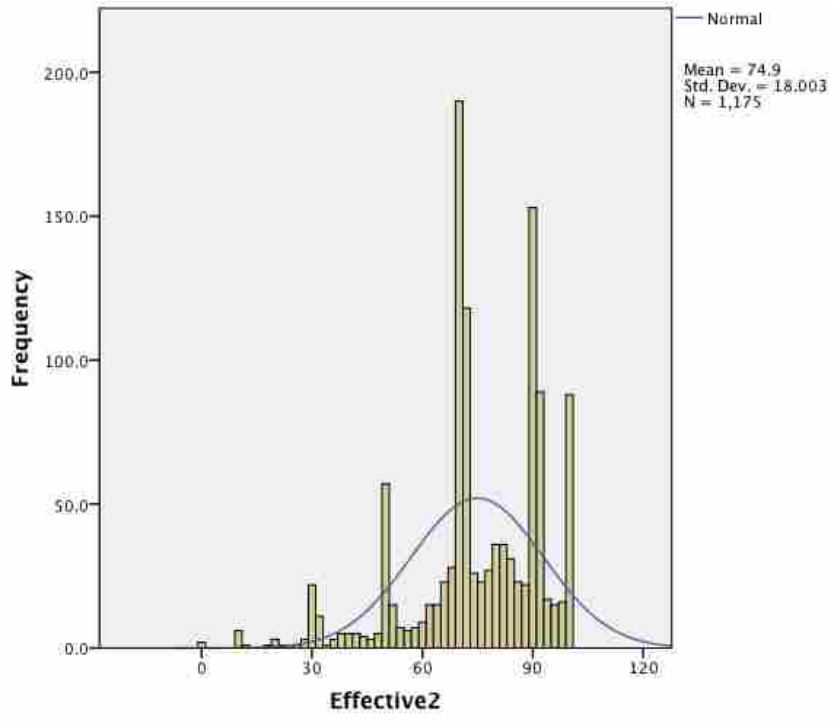

Figure 4-1: Normal Distribution for Effective2 vs. Change Frequency

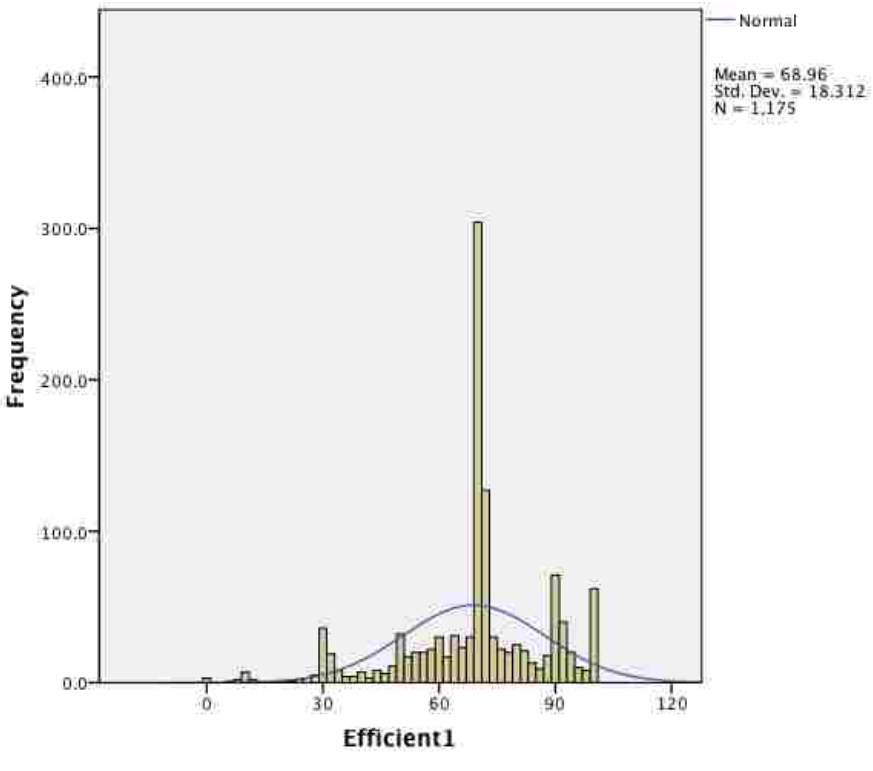

Figure 4-2: Normal Distribution for Efficient1 vs. Change Frequency

4.3.1 Multivariate Tests of Variance/Covariance

Several statistical tests were run on the collected data to check for validity. Box's test of equality of covariance for multivariate data was highly significant (p=0.00; Box M=845.46; F=1.863). This means that the observed covariance matrices of the dependent variables are not equal; helping to justify that we can trust further univariate statistical analyses results. Levene's test of variance shows none of the dependent variables as having significant results. This signifies that there is no evidence that the data collected did not come from random sampling. It also proves the null hypothesis that the error variance of the dependent variable is equal across groups. Furthermore, Bartlett's test of sphericity is used to test the null hypothesis that the variables in the population correlation matrix are uncorrelated. The observed significance level for Bartlett's test with these data is .0000, a small enough value to reject the hypothesis. It is

concluded that the strength of the relationship among variables is strong. It is a good idea to proceed to a factor analysis for the data.

Table 4-4: Levene's Test of Equality of Error Variances

	F	*df1*	*df2*	*Sig.*
Efficacy1	*.168*	*5*	*1169*	*.975*
Efficacy2	.089	5	1169	.994
Effective1	.634	5	1169	.674
Effective2	.300	5	1169	.913
Effective3	.190	5	1169	.966
Efficient1	.613	5	1169	.690
Efficient2	1.501	5	1169	.187
Satisfice1	.150	5	1169	.980
Satisfice2	.880	5	1169	.493
Satisfice3	.470	5	1169	.799

Table 4-5: Multivariate Tests of Independence

Effect		*Value*	*F*	*Hypothesis df*	*Error df*	*Sig.*	*Observed Power*
Intercept	*Pillai's Trace*	.970	3707.595	10.000	1160.000	.000	1.000
	Wilks' Lambda	.030	3707.595	10.000	1160.000	.000	1.000
	Hotelling's Trace	31.962	3707.595	10.000	1160.000	.000	1.000
	Roy's Largest Root	31.962	3707.595	10.000	1160.000	.000	1.000
Order	*Pillai's Trace*	.016	.914	20.000	2322.000	.569	.721
	Wilks' Lambda	.984	.914	20.000	2320.000	.569	.721
	Hotelling's Trace	.016	.914	20.000	2318.000	.570	.721
	Roy's Largest Root	.011	1.321	10.000	1161.000	.214	.688
Change2	*Pillai's Trace*	.005	.526	10.000	1160.000	.872	.280
	Wilks' Lambda	.995	.526	10.000	1160.000	.872	.280
	Hotelling's Trace	.005	.526	10.000	1160.000	.872	.280
	Roy's Largest Root	.005	.526	10.000	1160.000	.872	.280
*Order * Change2*	*Pillai's Trace*	.029	1.687	20.000	2322.000	**.029**	.968
	Wilks' Lambda	.971	1.690	20.000	2320.000	**.028**	.969
	Hotelling's Trace	.029	1.693	20.000	2318.000	**.028**	.969
	Roy's Largest Root	.023	2.724	10.000	1161.000	**.003**	.970

4.3.2 Multivariate Analysis of Variance (MANOVA) Results

Multivariate pre-test data reveal that the only MANOVA results that are statistically significant are those for the Order X Change interaction. Thus the MANOVA results for only the Order X Change interaction are shown in Table 4-6. (The complete MANOVA Table is presented in Appendix F.2).

Table 4-6: MANOVA Results for Order X Change2 Using Univariate ANOVA Tests of Between-Subjects Effects

Dependent Variable	Type III Sum of Squares	df	Mean Square	F	Sig.	Observed Power
Efficacy1	681.363	2	340.682	1.228	.293	.269
Efficacy2	1149.960	2	574.980	2.068	.127	.427
Effective1	3660.952	2	1830.476	5.871	**.003**	.875
Effective2	937.429	2	468.715	1.449	.235	.311
Effective3	299.929	2	149.965	.486	.615	.130
Efficient1	2177.524	2	1088.762	3.252	**.039**	.620
Efficient2	225.790	2	112.895	.317	.728	.101
Satisfice1	226.603	2	113.302	.331	.718	.103
Satisfice2	1558.969	2	779.485	2.378	.093	.482
Satisfice3	130.071	2	65.035	.205	.815	.082

Figure 4-3 displays the results of Order X Change2 for the highly significant Effective1 dependent variable. There is little difference in participants' perceptions of navigation menu effectiveness when navigation is ordered randomly or by popularity, whether change occurs on every page or never. However, participants' perception of the effectiveness of the navigation menus was significantly better when menus were organized alphabetically and the navigation changes per page. The figure also shows that participants were more effective when the website used popular (and even random) ordering on navigation pages that never changed. This dichotomy suggests interesting implications for the use of adaptive web navigation in terms of user effectiveness related to this specific question.

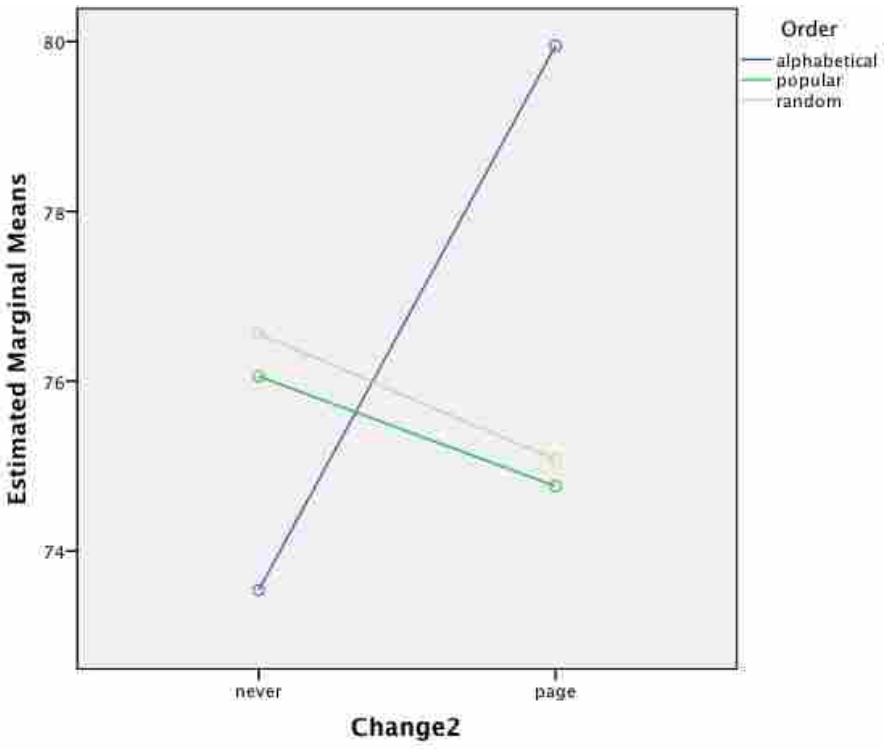

Figure 4-3: Effective1 of Change2 X Order

Figure 4-4 illustrates the clear interaction between these factors in terms of participants' perceptions for efficiency question 1. Using popular ordering of navigation links is perceived as clearly more efficient than alphabetical ordering when the menu never changes. However, alphabetical ordering is perceived as clearly more efficient for participants when the links change on each page.

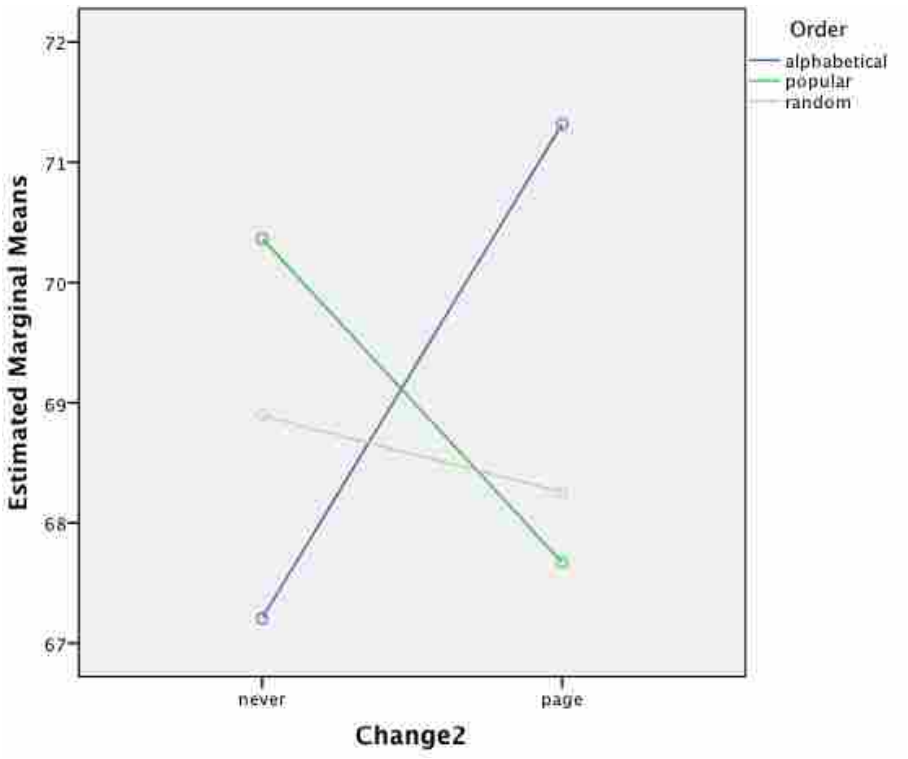

Figure 4-4: Efficient1 of Change2 X Order

Referring back to table 4-6, two other dependent variables were also significant at a p=0.10 level or close to the level, namely: Satisfice2 with p=0.093 and Efficacy2 with p=0.127. Because these results are not considered significant enough to draw conclusions on they would not normally be commented on, but due to the substantial difference in treatment cell sizes (Table 4-3) it was decided to reanalyze these data with relatively equivalent cell sizes to see if the unequal cell sizes could be masking significant results.

To more closely align the sizes of each treatment, the data that had the navigation change per page was duplicated, doubling the size of the change per page treatment group. Doubling this treatment does not affect the change per page data as the means, standard deviations, etc. are all the same. What duplicating the treatment does is allow the same data to be analyzed with approximate equal treatment cell sizes (Table 4-7).

Table 4-7: Hypothetically Approximately Equal Cell Sizes

		Original Number of Treatments	*Number of Treatments with Change per Page Duplicated*
Order	*Alphabetical*	*386*	*531*
	Popular	*394*	*525*
	Random	*395*	*539*
Change	*Never*	*755*	*755*
	Page	*420*	*840*

As expected, the Multivariate pre-test analyses came up with the same results as described earlier. Order and Change factors individually did not come up as justifiable to trust further analyses, but the interaction effects between Order X Change2 was highly significant (Table 4-8). The MANOVA results of approximately equal treatment cell sizes confirmed the results for Effective1 and Efficient1, showing both high significance and high power.

Table 4-8: Hypothetical MANOVA Results for Order X Change2 Using Univariate ANOVA Tests of Between-Subjects Effects

Dependent Variable	*Type III Sum of Squares*	*df*	*Mean Square*	*F*	*Sig.*	*Observed Power*
Efficacy1	1003.901	2	501.951	1.771	.170	.372
Efficacy2	1699.893	2	849.946	3.013	**.049**	.585
Effective1	5356.280	2	2678.140	8.563	**.000**	.967
Effective2	1382.324	2	691.162	2.122	.120	.437
Effective3	442.619	2	221.309	.721	.487	.173
Efficient1	3202.972	2	1601.486	4.828	**.008**	.800
Efficient2	331.278	2	165.639	.456	.634	.125
Satisfice1	331.535	2	165.768	.481	.618	.129
Satisfice2	2276.886	2	1138.443	3.487	**.031**	.653
Satisfice3	191.161	2	95.580	.304	.738	.099

Table 4-8 shows that if participant results for the change per page treatment continues similar to the previous n=420 surveys, it is highly likely that Satisfice2 and Efficacy2 results would be highly significant at the p=0.05 level. Effectiveness2 is also approaching the p=0.10 significance level. Note that the specific p-value for these results is not important as these results come from hypothetical data. Yet, similar results are extremely likely if the experiment were to continue to gather data to the point where equal cell sizes are the result, because of the high number of previous surveys already gathered that have produced these patterns. One of the only ways that the data would change is if there were to be a change in the conditions of this experiment such as an environmental special cause that occurs during data collection.

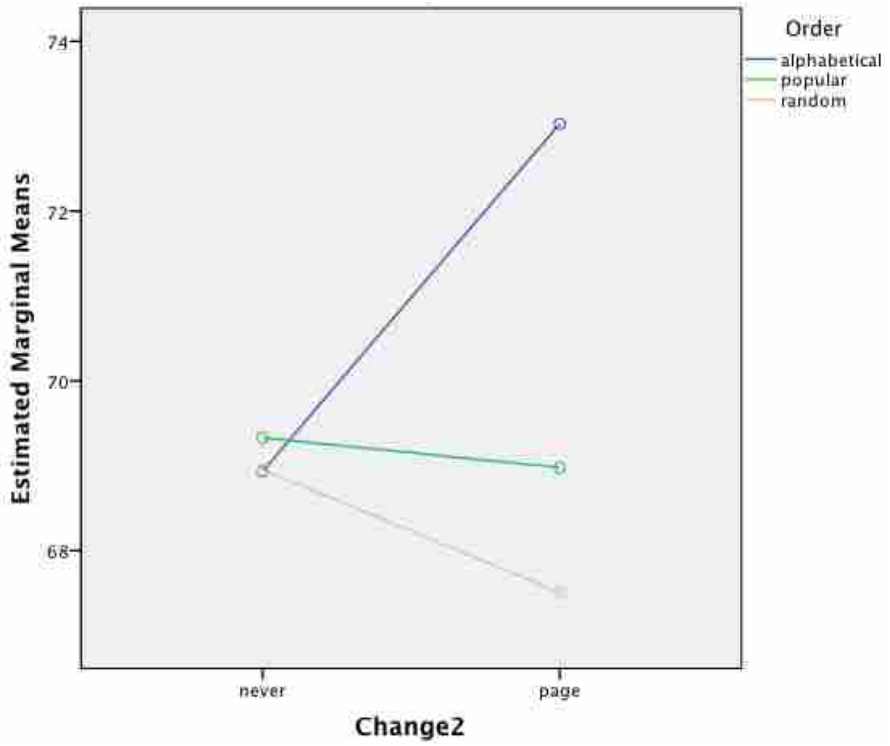

Figure 4-5: Satisfice2 for Change2 X Order

Figure 4-5 shows the clear interaction between link ordering by change frequency. When the change frequency is never then satisfaction of users is similar regardless of the link order treatment. For the change per page frequency, alphabetical ordering is significantly more satisficing than the other two link ordering options.

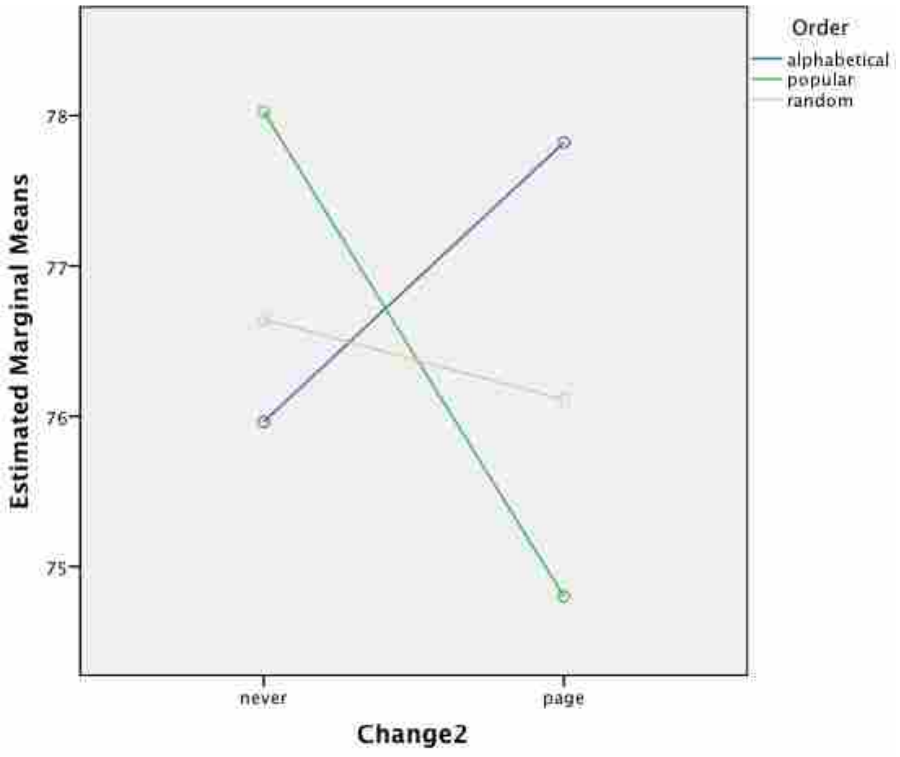

Figure 4-6: Efficacy2 for Change2 X Order

Figure 4-6 illustrates the clear interaction between these factors in terms of participants' perceptions for Efficacy2. Using popular ordering of navigation links users feel more efficacy than alphabetical ordering when the menu never changes. However, alphabetical ordering is perceived as producing clearly more efficacy for participants when the links change on each page.

No other dependent variables were found to have significant impacts. Table 4-9 summarizes these results for the four significant (or potentially significant) dependent variables. Alphabetical ordering is perceived as significantly better clearly when the navigation links adapt to the user on each page. Popular ordering is perceived as clearly better when the navigation never changes. It is also interesting to note that each of the four factors had one question that was

significant. This suggests that these dependent variables may be different aspects of one or more underlying relationships between these variables.

Table 4-9: Summary of Best Combinations of Factors

Navigation Change Frequency	*Effective1*	*Efficient1*	*Satisfice1*	*Efficacy2*
Never	Popular	Popular	None	Popular
Per Page	Alphabetical	Alphabetical	Alphabetical	Alphabetical

4.4 Post hoc Factor Analysis Results

Post hoc factor analyses were conducted looking for potential underlying relationships between the dependent variables. Since there is no clear cut way to identify the correct number of underlying factors, multiple tests and plots must be conducted, which if they clearly agree, it increases the justification that these underlying factors exist (Rencher, 2001). Bartlett's Test of Sphericity result suggests that there are underlying factor relationships. Because the null hypothesis was significantly not supported (p=0.000) the residual covariance matrix is different from the identity matrix (Table 4-10). The initial eigenvalues explain more than 70% of the variation in the dataset with two factors (Table 4-11). The Scree plot of these eigenvalues show a clear break after two factors below eigenvalues of 1.0 without explaining much more of the variance in the data.

Table 4-10: Bartlett's Test of Sphericity

Likelihood Ratio	0.000
Approx. Chi-Square	7246.665
df	54
Sig.	0.000

Table 4-11: Total Variances Explained

Factor	*Initial Eigenvalues*			*Extraction Sums of Squared Loadings*			*Rotation Sums of Squared Loadings*		
	Total	*% of Variance*	*Cumula-tive %*	*Total*	*% of Variance*	*Cumula-tive %*	*Total*	*% of Variance*	*Cumula-tive %*
1	5.906	59.064	59.064	5.497	54.971	54.971	4.700	46.996	46.996
2	1.161	11.608	70.672	.983	9.834	64.804	1.781	17.809	64.804
3	.615	6.152	76.824						
4	.429	4.290	81.114						
5	.392	3.917	85.031						
6	.365	3.647	88.678						
7	.300	3.000	91.678						
8	.292	2.924	94.602						
9	.282	2.816	97.418						
10	.258	2.582	100.000						

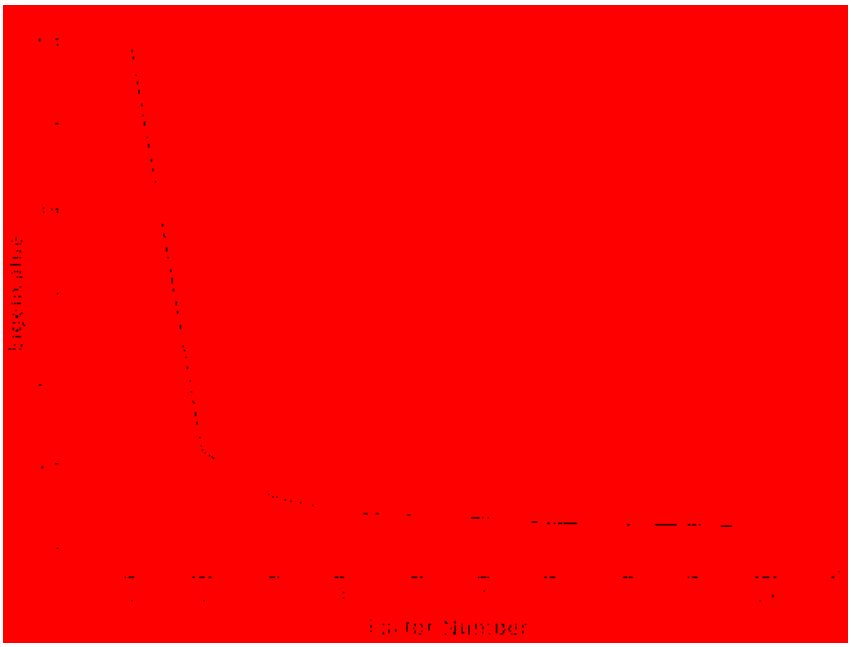

Figure 4-7: Scree Plot

Table 4-10 shows the factor matrix, rotated to better fit the factors to the variance in the dataset. This table shows all dependent variables clearly load on two factors with each variable explaining a high level of the variation in that variable (above 66% and most explaining 70-91% of the variation). Further analysis is needed to identify what these two factors actually represent.

However, looking at the loadings, both information-seeking self-efficacy question results (e.g., self-confidence in their abilities to find information on this website after using it) clearly represent a different underlying factor than the other variables. This factor explains almost 12% of the variation in the data (Table 4-12). This may be due to the way survey questions were worded, where survey questions regarding self-efficacy were worded generally to all websites and survey questions for the other factors were worded specifically to this website. Additionally the second factor may show that self-efficacy is a separate and important factor to evaluate that impacts a user's experience when performing information-seeking tasks involving adaptive web navigation.

The other interesting finding is that all the other variables load cleanly and highly on one underlying factor that explains almost 60% of the data (see Table 4-11), even though the multivariate tests showed that the dependent variables for the factor interaction could be interpreted separately. It is not clear what this factor represents without further analyses and data collection. What is does suggest is that effectiveness, efficiency, and satisfaction are different aspects of the same factor, whatever that factor is determined to be – at least in relation to adaptive web navigation for university admissions information-seeking tasks.

Looking at these two factors, it appears that the largest factor has to do with participants' external perception of the website. The smaller factor, representing self-efficacy variables, represents a user's internal perception of themselves.

Table 4-12: Rotated Factor Matrix

	Factor	
	1	*2*
Satisfice3	.816	.249
Effective3	.812	.254
Satisfice1	.802	.224
Efficient2	.770	.233
Efficient1	.745	.250
Satisfice2	.717	.183
Effective1	.704	.273
Effective2	.668	.244
Efficacy1	.187	.914
Efficacy2	.303	.696

4.5 Qualitative Results

A full list of all qualitative results can be found in Appendix C. The majority of the qualitative responses were unrelated to any of the factors of interest for this study, although some trends were identified within the comments. Comments that clearly articulated the theme of those trends are listed in the following sections.

4.5.1 Effective4

Question Effective4 asked, "In what ways did the navigation help you to find what you were looking for (page or information)?" One hundred fifty-four responses were recorded, sixty of which responded to the question, and three of which indicated that the survey came too early. Table 4-13 displays some of the more helpful comments.

Table 4-13: Insightful Comments for Question Effective4

Survey Number	*Comment*
253	Short, to the point navigatlon list in the order I need to read the pages.
448	It led me to the page that contained the information that I was searching for.
465	The nevigation exhibits all the choices that I assumed it should have.
524	Each section was clearly organized and had correct sub-groups. The layout is also clean, simple, easy to use, modern, and updated.
578	It helped me in finding the information i need super quick.
618	I'm sorry, but after using the site several times I find [university] navigation to be one of the most difficult I've encountered, and I'm usually pretty good at navigation. It is challenging to find anything!
715	too many options...
753	It was very easy to find all the links to what I wanted to find.

4.5.2 Effective5

Question Effective5 asks, “In what ways did the navigation hinder or not help you to find what you were looking for (page or information)?” One hundred fifty-four responses were recorded, fifty-seven of which responded to the question, and two of which indicated that the survey came too early. Table 4-14 displays some of the more helpful recorded comments.

Table 4-14: Insightful Comments for Question Effective5

Survey Number	*Comment*
95	It was easier than it used to be because there weren't too many choices in each drop down.
136	is a good website it does not take much time to find what you're looking for
968	The organization was far clearer on this website than on many college websites--UNC Chapel Hill, for instance.

4.5.3 Efficient3

Question Efficient3 asks, “In what ways did the navigation help you to make a decision quickly on which link to click (page or information)?” One hundred forty-six responses were recorded, sixty-four of which answered the question, and one of which indicated that the survey came too early. Table 4-15 displays some of the more helpful recorded comments.

Table 4-15: Insightful Comments for Question Efficient3

Survey Number	*Comment*
226	The links were titled well. It would be nice to see a whole navigation tree at once.
253	Easy to read, fun format, good order of pages.
271	The homepage is well organized and contains all the links that I was expecting to find. The information is also well organized (at least the information I had the opportunity to check).
474	This website's general topics is followed by the sub topics that I am looking for.
563	It is a wonderful help especially for me, I am not very good following the computer instructions. thanks !
612	They were all there when I needed them.
627	It was easy to find which links I needed in order to make my decision because they were there for me in broad daylight, and I didn't need to go searching for it.
866	not blasted with information all at once

4.5.4 Efficient4

Efficient question 4 asks, “In what ways did the navigation hinder or not help you to make a decision quickly on which link to click (page or information)?” One hundred forty-two responses were recorded, forty-one of which answered the question, and five of which indicated that the survey came too early. Table 4-16 displays some of the more helpful recorded comments.

Table 4-16: Insightful Comments for Question Efficient4

Survey Number	*Comment*
253	It seemed fine. Gave exactly the pages I needed in a sensible order.
456	It directed me to specific things I wanted was looking for.
522	muchas veces no muestra las paginas que son importantes (Translation: many times it doesn't show the pages that are important.)
575	la navegación me permite tomar una desicion rápidamente (Translation: the navigation helps me to make a decision quickly.)

4.6 Summary

This chapter summarized the results for this study. The original dataset and final analyses are included in the Appendix. The multivariate pre-test analyses justified further MANOVA for the Change2 X Order factor interaction, but not individually for the Change2 and Order factors. Pre-tests also identified the likelihood that there were underlying factors at work behind the dependent variable results.

MANOVA results identified two highly significant results for Effective1 and Efficiency1. Also, hypothetical MANOVA results that reduced the unequal treatment cell size bias showed that two more variables are also significant due to the Satisfaction2 and Efficacy2 interaction.

Summarizing these results, alphabetical ordering of the navigation menu links resulted in more positive results when the navigation menu changed on every page. However, when the adaptive navigation menu didn't change, participants perceived popular ordering more positively. Factor analysis also revealed two, clear underlying factors: one representing all dependent variables except self-efficacy (explaining 60% of the variation in the data), and a

second variable containing the two self-efficacy dependent variables (explaining 11% of the variation in the data).

Chapter 5 discusses these results as related to each of the hypotheses in this study. It discusses the implications of these results as well as practical and research recommendations for further research.

5 DISCUSSION OF RESULTS

5.1 Introduction

Chapter 4 explained the results of the research. Two of the ten quantitative questions used in the survey provided highly significant results. Two other quantitative questions likely would have also provided highly significant results had the treatment cell sizes been closer in size. This chapter will define the space in existing literature where these results best fit. It will also discuss the implications of those four quantitative results. Finally, this chapter will also evaluate the qualitative results obtained from the surveys and draw implications and conclusions from those.

5.2 Quantitative Results Implications

Understanding the implications of these results requires an understanding of the advantages provided by the different link orderings and change frequencies.

An advantage provided by more familiar navigation is the ability to more quickly process the available links (Klein, 2008). Alphabetical ordering is more familiar than popular ordering, but popular ordering may have the advantage over alphabetical ordering in the case where the link the visitor is looking for appears near or at the top of the list of links. Random ordering is not familiar and is being used as a control group, mimicking the effect of popular ordering (which to the user may appear random) but generally not providing the most needed links first.

The advantage provided by never changing navigation is that a user who is seeking a link may already know where it exists within the navigation. The advantage of changing navigation per page is that the adaptive navigation links listed are the more likely to be the links the user is interested in, potentially reducing the frequency that the user would have to delve deeper into the navigation structure to find the link of interest.

5.3 Insignificant Result Sets

According to Table 4-5, link ordering alone and change frequency alone did not have a significant effect on website visitor's perception of the factors: effectiveness, efficiency, satisfaction, and efficacy. These results contradicts hypotheses one through eight which each state that there would be a significant effect for each of the factors.

Potentially these factors alone were not significant because the number of links in each category was limited to four links at most. The advantages provided by more familiar link ordering or less frequently changing navigation could be harder to measure due to the number of visible links being limited to four per category. With four links, the amount of time it would take for a user to scan and process the links in each category could be small enough to blur the effect of the advantages of more familiar link ordering and less frequent navigation changes.

Due to the lack of significant results for link ordering alone, hypotheses one through four cannot be proven or disproven. Additionally, the lack of significant results for change frequency alone do not allow hypotheses five through eight to be proven or disproven. This provides opportunity for a future study. Had the adaptive navigation been returned in larger sets of links (more than four links) then perhaps the significance of link ordering and change frequency would increase to a highly significant level for the factors effectiveness, efficiency, satisfaction, and efficacy.

5.4 Significant Result Sets

After doubling the treatment size of the change per page treatment group as discussed in section 4.3.2 and table 4-7, four questions from the survey showed significant results. The four significant results were for Effective1 (Figure 4-3), Efficient1 (Figure 4-4), Satisfice2 (Figure 4-5), and Efficacy2 (Figure 4-6). All four results show the following trends:

1. Both popular ordering and random ordering perform as well or better than alphabetical ordering when navigation never changes.

2. Alphabetical ordering performs noticeably better than popular or random ordering when navigation changes on each page.

3. Alphabetical ordering performs noticeably better when navigation changes on each page than it does when navigation does not change.

4. Both popular ordering and random ordering perform better when navigation does not change than when it changes per page.

Hypotheses nine through twelve each state that their respective factors (efficiency, effectiveness, satisfaction, and efficacy) would perform best when navigation changed less frequently and link ordering was more familiar. The results obtained from the surveys disprove these four hypotheses.

Results Effective1, Efficient1, and Satisfice1 show that effectiveness, efficiency, and satisfaction is better when link ordering is more familiar and navigation changes more frequently. The fact that these three factors perform best when change happened more frequently is surprising considering that with less change users should have been better able to find the links of interest within the navigation improving the four factors. On the other hand, because the navigation is adapting to more closely fit the user's perceived needs with each page change, that can account for the improved efficiency, effectiveness, and satisfaction.

Efficacy2 show that the user's self-perceived efficacy is best when navigation never changes and link ordering is popular. There are many factors that could account for how a user perceives their own efficacy. However because the popular ordering would appear random to a user of the site and yet the adaptively provided links may have fit the user's needs, it could be that the user feels greater efficacy having been able to successfully use navigation which is seemingly random. Efficacy2 is nearly as good when it is ordered alphabetically and changes on a page by page basis. The causes for high efficacy for alphabetically ordered changing page by page navigation can probably be attributed to the same reasons as stated for the other three factors in the preceding paragraph.

One unexpected finding from the results is that alphabetical ordering on navigation that does not change does poorly for effectiveness, efficiency, satisfaction, and efficacy. There is no speculation as to why that is, but further research should be invested into that finding, particularly considering that many existing websites use alphabetical non-adaptive navigation.

5.5 Discussion of Qualitative Results

One finding from the qualitative results is that some people did feel that the survey came too early. This could have been rectified if users were given the option to take the survey on their third page load, but they did not actually take the survey until after they were done browsing the website. This approach would have likely provided more significant results as well.

Several comments shared the theme that the navigation was both efficient and effective because there were not too many links to choose from and those links that appeared were the links they were interested in. Few comments indicated that more links should have been visible.

No comments were made on the order of the available links. No comments were made on the navigation changing from page to page. This finding may indicate that those factors did not consciously affect the navigational effectiveness and efficiency for the users.

From these results, it appears that the adaptive navigation was successful in providing the correct links, but no information could be gleaned from these comments directing how change or link ordering affected the user's navigational experience.

5.6 Limitations

This study was conducted on a website with relatively few return visitors (compared to MSN.com, yahoo.com, and Amazon.com), with a relatively small number of webpages (compared to MSN.com, yahoo.com, and Amazon.com), and with a very specific audience (unlike MSN.com, yahoo.com, and Amazon.com). These results may not extend to all websites that might use adaptive navigation, and as such future studies for websites that are more frequently visited, have a larger navigational menu, and are less specific in their audiences should be conducted.

Another limitation of this study is that although the results in figures 4-3 to 4-6 are significant there is not a dramatic difference between the treatment groups for each factor. Future studies could be conducted that try to increase those differences by testing more adaptive navigation links within each category (this study limited the number of adaptive navigation links per category to four) and by allowing users to receive more exposure to the adaptive navigation before taking the survey.

Other areas for further research regarding this study would include:

- Testing how the experience varies for users with different learner types (Chiou & Tseng, 2012).

- Identifying the relationship of the survey questions into the two factor groups and splitting them out into four factors (Table 4-12).
- Testing the accuracy of the recommender algorithm used for deriving adaptive navigation.

5.7 Relevance to Prior Research

In chapter 2, many research claims were found regarding navigation, decision making, and information searching, although few studies dealt with adaptive navigation. Of those studies that looked at adaptive navigation, few related to the user's experience with adaptive navigation. The following are some claims that were made in prior research and how these research results apply to those claims.

Baecker (2000) and Rosenfeld (1998) state that frustration goes up when navigation menus are poorly organized or overly complex. This study found that users were less satisfied when the navigation menus changed more frequently and link ordering was non alphabetical (Figure 4-5). Although Baecker and Rosenfeld did not discuss adaptive navigation, this study would suggest that to avoid poor navigational organization that links should be organized by popularity when navigation does not change and they should be ordered alphabetically when navigation does change regularly. However for this study users were only presented with a limited number of links, so although the results of this study were statistically significant, further research needs to be done to more fully validate these results.

Gwizdka (2007) states that having too many link choices can cause cognitive overload and add to user frustration. This study did not test that there were too many links, but it did find that when pages changed frequently people were less effective and less satisfied unless links were organized alphabetically. Therefore, this study suggests that cognitive overload is reduced

through popular ordering with less frequent changes in navigation and through alphabetically ordered with more frequent navigation changes (Figure 4-9).

Iyengar (2011) explains that it is easier to make a choice from fewer options than it is to make a choice from more options. This study did not directly test the effects of differing numbers of navigational links on the user's ability to make a decision. This study did simplify decision making by identifying information that the users most likely want and it measured user effectiveness and efficiency of decision making on those reduced link sets. Although only one effectiveness variable was statistically significant there did appear to be a trend that popular ordering simplified decision making when changes never occur and alphabetical ordering simplify decision making when changes occur more frequently. One caveat of this finding is that due to the limited number of links to choose from further research should be done to identify how varying numbers of adaptive navigation links affect the user experience.

Chiou (2012) identified that users fit into several learner groups and that each learner group learns differently. This study did not seek to identify learner groups and how each group learns with adaptive navigation, although for the general population it was able to identify that users are better able to use the navigation when it does not change and is ordered by popularity or when it does change and is ordered alphabetically.

5.8 Relevance to Industry

As reviewed in Chapter 2, ideally, web navigation should provide a user with only the links that the user is interested in and those links should be organized in a manner that is easy for the user to process (Brusilovsky, 2007). Because the links that users are interested in often vary from user to user, traditional static navigation is unlikely to accomplish this, thus personalized adaptive navigation must be used to provide a better navigational experience to a user.

This study sought only to identify how adaptive navigation link ordering and link change frequency affected the user's navigational experience. This study is significant because no other research was found to measure the effects of adaptive navigation on user frustration.

For websites where users are seeking specific information, assuming that the user has a good idea of terminology used for the site navigation, adapting navigation more frequently and in alphabetical order provides the best adaptive navigation experience. These same results may not apply to a site or system where users are browsing without a specific goal in mind. For example, ordering Netflix movie recommendations by title may be worse for the user experience than other ordering alternatives.

This study has also found that for websites where users are seeking for specific information, assuming again that the user has a good idea of terminology used for the site navigation, that if links are not ordered alphabetically then change should occur less often.

6 CONCLUSIONS AND SUMMARY

Searching for relevant information within a website can be hindered by a poor navigational structure. Some websites have many pages and many links which lead to complex navigational structures, generally hierarchical in nature, which hides many links within submenus and often submenus within submenus. Intelligently adapting the navigation to fit the perceived needs of the user can improve the user's experience on the website, aiding them in the information search process, improving navigation effectiveness and efficiency while simultaneously improving user satisfaction and efficacy.

The admissions website of a private university sought to simplify their website by replacing their traditional non-adaptive navigation with adaptive navigation, partially because the webpages that their users were interested in changed seasonally and partially because their hierarchical navigation structure was three levels deep, hiding many links. The admissions office wanted to know if their navigation was truly beneficial to user's in its current state, but no studies could be found that measured the effects on users of using adaptive navigation structures in place of traditional non adaptive navigation structures for the main navigation of a website. As a result, this study was conducted to test the effects caused by changing navigation and ordering links in several formats.

What this study found was that navigation improves the user experience when it adapts to user's perceived needs on a page by page basis and links are ordered alphabetically. The page by

page change in navigation, which was originally thought to be a hindrance in the use of adaptive navigation, proved to be positive so long as navigation was ordered alphabetically.

A limitation of this study is that the admission's website limited it's adaptive navigation to five categories which showed at most four links at a time. Because only four adaptive links existed at a time within each category it was difficult to obtain significant results for effectiveness, efficiency, satisfaction, and efficacy on navigational change frequency alone and link ordering alone. Significant results were found for these four factors when change frequency was crossed with link ordering.

Further study is necessary to determine how these results might vary when more than four navigational links are provided in each navigational category. It is predicted that with more navigational links per category that the effects of adaptive navigation on effectiveness, efficiency, satisfaction, and efficacy would become more significant.

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APPENDICES

APPENDIX A SURVEY QUESTIONS

This appendix outlines the survey questions that were given in both the initial survey and the follow up survey. Each survey given contained seventeen questions: two demographic, two effective, two efficient, two satisficing, two efficacies, and one other. Each survey started with the two demographic questions and ended with the other question. All other questions were randomly ordered in such a format that two of the same category of question were not asked side by side.

Demographic Questions

Question	*Answer Type*	*Answer Values*
What is your age?	Multiple choice	Less than 15 16-19 20-24 25-29 30-39 40-49 50-59 60-69 70 or older
What is your purpose or goal for trying to find information on this web site?	Multiple choice	I will be applying to [university] I am thinking of applying to [university] I am looking up information about applying to [university] for someone else who is THINKING of applying to BYU I am looking up information about applying to [university] for someone else who is GOING TO apply to [university] I am just looking up information about [university] admissions in general I was not looking for [university] admissions information and starting browsing through [university] admissions information

Efficacy Questions

Question	*Answer Type*	*Answer Values*
In general, how comfortable are you at looking for information within web sites?	Slider	Any value from 0 to 100
In general how comfortable are you using navigation on web sites?	Slider	Any value from 0 to 100

Effective Questions

Question	*Answer Type*	*Answer Values*
How confident are you that you found the web page you wanted?	Slider	Any value from 0 to 100
How confident are you that this web page contains the information you are looking for?	Slider	Any value from 0 to 100
How helpful were the links in helping you make a decision on finding the information you wanted?	Slider	Any value from 0 to 100
In what ways did the navigation help you to find what you were looking for (page or information)?	Qualitative	
In what ways did the navigation hinder or not help you to find what you were looking for (page or information)?	Qualitative	

Efficient Questions

Question	*Answer Type*	*Answer Values*
How quickly did the link help you decide on the link to the next page you wanted?	Slider	Any value from 0 to 100
How confident are you that this web page contains the information you are looking for?	Slider	Any value from 0 to 100
In what ways did the navigation help you to make a decision quickly on which link to click (page or information)?	Qualitative	
In what ways did the navigation hinder or not help you to make a decision quickly on which link to click (page or information)?	Qualitative	

Satisfice Questions

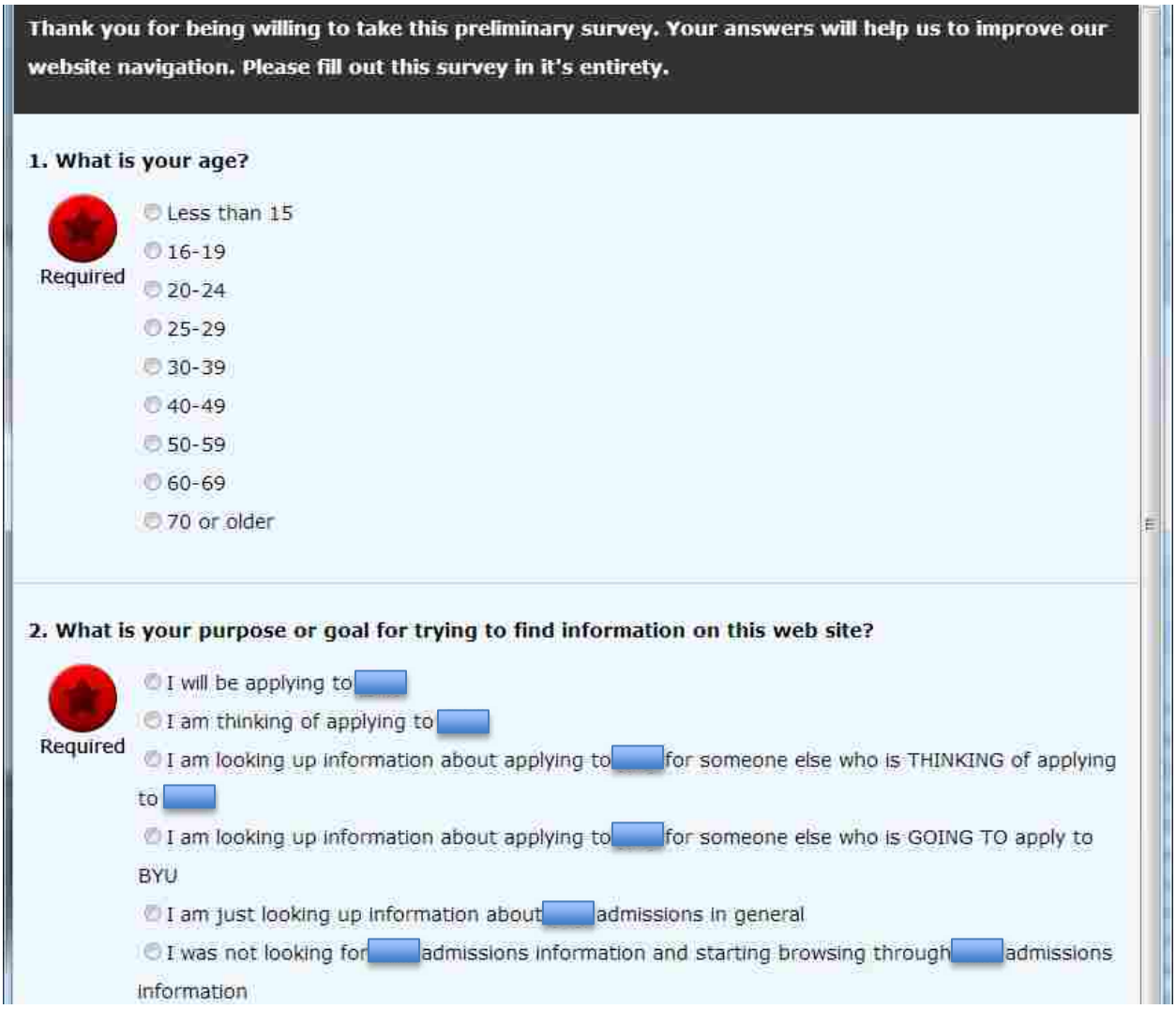
Question	*Answer Type*	*Answer Values*
Using the links how satisfying was it to find what you were looking for?	Slider	Any value from 0 to 100
How much did you like the navigation on this site compared to other websites?	Slider	Any value from 0 to 100
Was the navigation good enough to find the pages you were looking for?	Slider	Any value from 0 to 100

Other Question

Question	*Answer Type*	*Answer Values*
Do you have any other comments on navigation?	Qualitative	

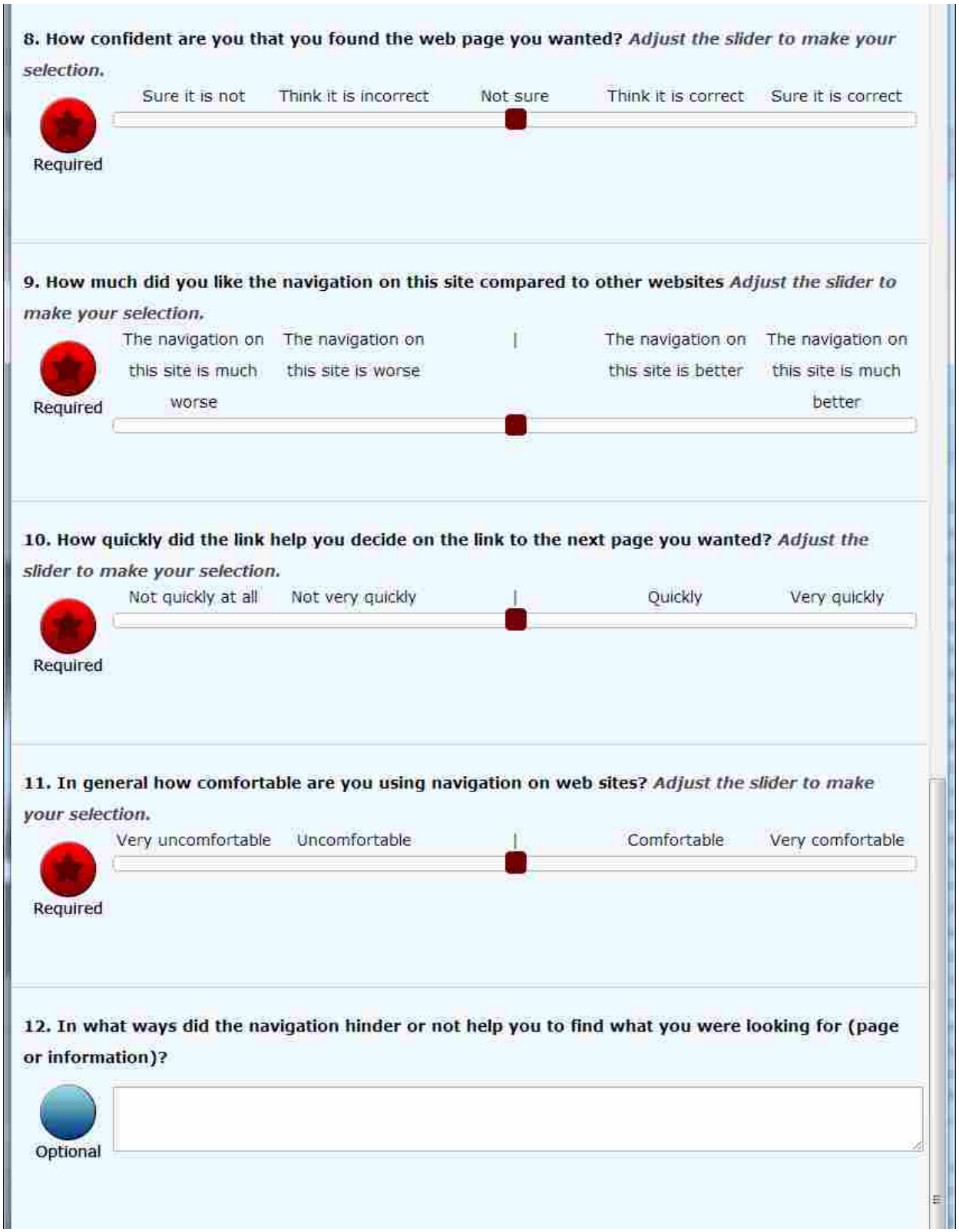
APPENDIX B SURVEY SCREEN CAPTURES

The following four figures show the first survey as it was displayed on most web browsers. Questions one, two, and seventeen always stayed in their respective orders, but questions three through sixteen were randomly ordered. The name of the school has been blotted out from these images.

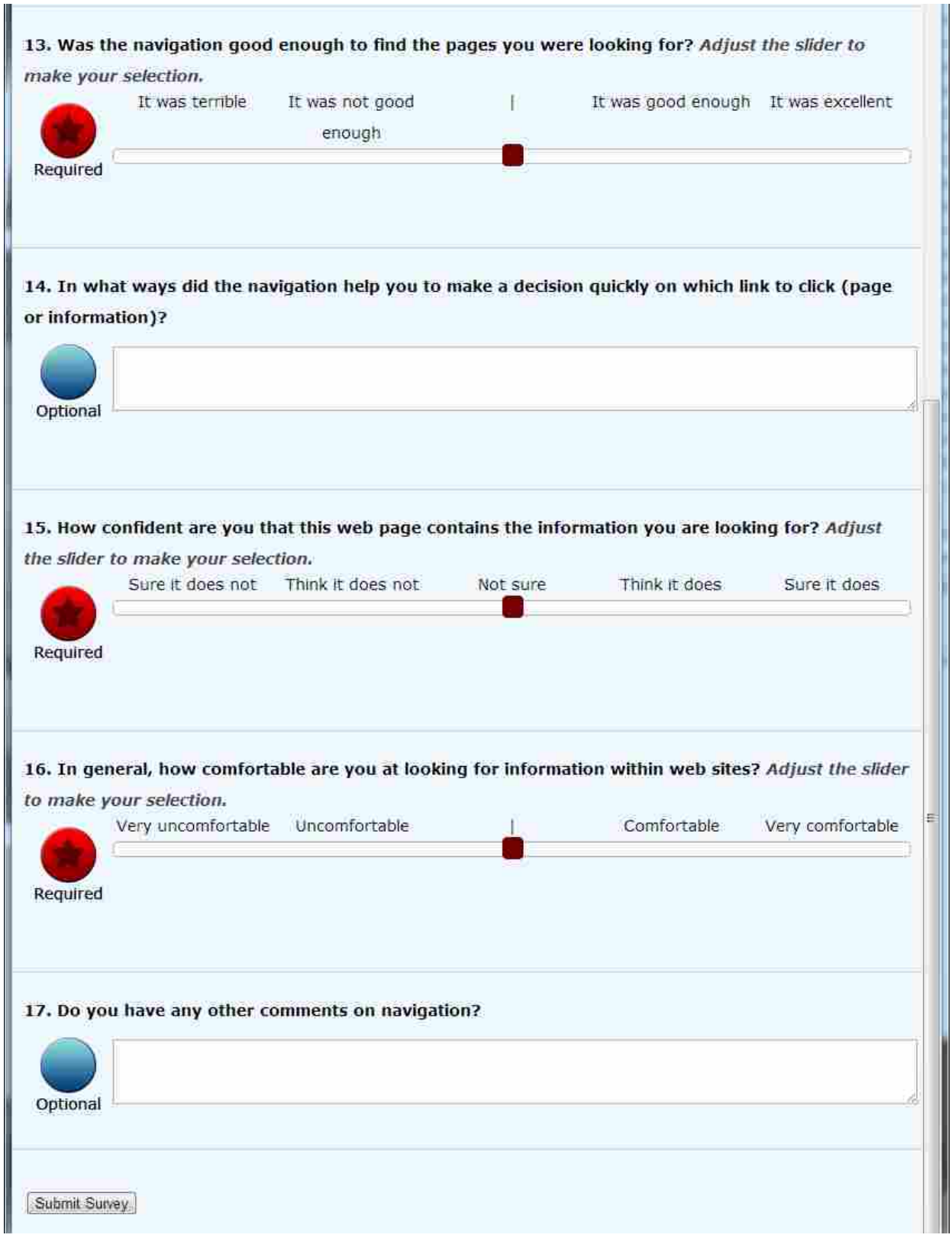


Survey Questions 1 and 2

Survey Questions 3 through 7 (Randomized)



Survey Questions 8 through 12 (Randomized)



Survey Questions 13 through 16 (Randomized) and Survey Question 17

APPENDIX C FINAL SURVEY DATA

Columns for Survey Number, Link Ordering, Change Frequency, and Demographics

Survey Number	*Survey*	*Order*	*Change1*	*Change2*	*Audience*	*Age*	*Purpose*
2	first	popular	page	page	International Student	20-24	i-apply
3	first	popular	page	page	New Freshman	16-19	i-apply
4	first	alphabetical	visit	never	New Freshman	16-19	i-apply
5	first	popular	page	page	Transfer Student	16-19	think-apply
6	first	random	visit	never	New Freshman	16-19	i-apply
7	first	popular	page	page	New Freshman	16-19	i-apply
8	first	alphabetical	page	page	International Student	20-24	i-apply
9	first	alphabetical	visit	never	New Freshman	16-19	i-apply
10	first	alphabetical	visit	never	New Freshman	50-59	info
12	first	popular	visit	never	New Freshman	16-19	i-apply
13	first	alphabetical	page	page	Transfer Student	16-19	i-apply
14	first	popular	visit	never	New Freshman	16-19	info
15	first	popular	visit	never	New Freshman	16-19	info
16	first	popular	never	never	International Student	20-24	think-apply
17	first	popular	page	page	International Student	30-39	info
18	first	random	never	never	Postbaccalaureate	70+	i-apply
19	first	alphabetical	never	never	New Freshman	50-59	other-think-apply
22	first	random	page	page	New Freshman	16-19	think-apply
23	first	alphabetical	never	never	Transfer Student	16-19	i-apply
24	first	alphabetical	never	never	Transfer Student	20-24	think-apply

Survey Number	*Survey*	*Order*	*Change1*	*Change2*	*Audience*	*Age*	*Purpose*
25	first	random	page	page	Transfer Student	20-24	i-apply
26	first	popular	page	page	New Freshman	16-19	i-apply
28	first	popular	visit	never	New Freshman	20-24	i-apply
29	first	popular	page	page	New Freshman	40-49	other-apply
30	first	alphabetical	page	page	New Freshman	16-19	i-apply
31	first	random	page	page	New Freshman	16-19	i-apply
32	first	alphabetical	visit	never	New Freshman	16-19	i-apply
33	first	alphabetical	never	never	New Freshman	16-19	i-apply
34	first	popular	visit	never	International Student	16-19	think-apply
35	first	popular	visit	never	New Freshman	16-19	i-apply
36	first	random	page	page	New Freshman	40-49	other-apply
37	first	random	page	page	New Freshman	16-19	i-apply
38	first	random	page	page	New Freshman	16-19	i-apply
39	first	alphabetical	visit	never	International Student	16-19	think-apply
40	first	random	page	page	Transfer Student	16-19	i-apply
41	first	random	never	never	New Freshman	16-19	i-apply
42	first	popular	never	never	International Student	20-24	i-apply
43	first	random	visit	never	International Student	20-24	i-apply
45	first	popular	never	never	New Freshman	0-15	think-apply
46	first	random	never	never	International Student	50-59	info
47	first	alphabetical	page	page	International Student	25-29	think-apply
48	first	popular	never	never	Transfer Student	16-19	i-apply
49	first	alphabetical	never	never	New Freshman	16-19	i-apply
50	first	popular	visit	never	New Freshman	70+	other-think-apply
51	first	alphabetical	never	never	Transfer Student	20-24	think-apply
52	first	random	visit	never	International Student	20-24	info
53	first	popular	never	never	International Student	20-24	think-apply

Survey Number	*Survey*	*Order*	*Change1*	*Change2*	*Audience*	*Age*	*Purpose*
54	first	popular	never	never	International Student	25-29	i-apply
55	first	popular	visit	never	New Freshman	16-19	think-apply
56	first	popular	never	never	New Freshman	16-19	i-apply
57	first	alphabetical	never	never	New Freshman	16-19	think-apply
58	first	popular	page	page	New Freshman	16-19	think-apply
59	first	random	visit	never	New Freshman	16-19	i-apply
60	first	alphabetical	never	never	New Freshman	16-19	i-apply
62	first	alphabetical	page	page	International Student	16-19	info
64	first	random	visit	never	New Freshman	16-19	i-apply
65	first	random	never	never	Visiting Student	20-24	i-apply
66	first	popular	page	page	New Freshman	16-19	i-apply
67	first	alphabetical	never	never	New Freshman	16-19	other-apply
68	first	random	page	page	International Student	16-19	i-apply
69	first	popular	never	never	New Freshman	0-15	think-apply
70	first	popular	never	never	Transfer Student	40-49	think-apply
71	first	alphabetical	page	page	New Freshman	50-59	other-apply
73	first	popular	visit	never	International Student	16-19	i-apply
74	first	random	never	never	New Freshman	20-24	i-apply
75	first	popular	visit	never	New Freshman	20-24	info
76	first	random	never	never	International Student	20-24	think-apply
77	first	alphabetical	page	page	New Freshman	16-19	i-apply
78	first	popular	page	page	New Freshman	16-19	think-apply
79	first	alphabetical	never	never	International Student	16-19	i-apply
80	first	random	never	never	International Student	16-19	think-apply
81	first	alphabetical	page	page	International Student	16-19	think-apply
82	first	alphabetical	visit	never	New Freshman	16-19	i-apply
83	first	popular	never	never	Transfer Student	25-29	i-apply

Survey Number	*Survey*	*Order*	*Change1*	*Change2*	*Audience*	*Age*	*Purpose*
84	first	random	page	page	New Freshman	16-19	think-apply
85	first	alphabetical	visit	never	Former Student	20-24	think-apply
86	first	random	visit	never	New Freshman	16-19	i-apply
87	first	random	never	never	International Student	16-19	think-apply
88	first	random	visit	never	Transfer Student	16-19	i-apply
89	first	random	visit	never	New Freshman	16-19	i-apply
90	first	popular	never	never	New Freshman	16-19	think-apply
91	first	alphabetical	never	never	Visiting Student	30-39	i-apply
92	first	alphabetical	visit	never	New Freshman	50-59	other-apply
93	first	popular	visit	never	Transfer Student	25-29	think-apply
95	first	popular	visit	never	New Freshman	16-19	i-apply
96	first	alphabetical	visit	never	New Freshman	16-19	i-apply
97	first	popular	never	never	New Freshman	16-19	i-apply
98	first	alphabetical	page	page	New Freshman	16-19	i-apply
99	first	popular	page	page	New Freshman	50-59	other-apply
100	first	random	page	page	New Freshman	20-24	other-think-apply
101	first	random	visit	never	New Freshman	16-19	i-apply
102	first	random	page	page	New Freshman	16-19	i-apply
103	first	popular	page	page	Transfer Student	16-19	i-apply
104	first	popular	visit	never	New Freshman	16-19	info
105	first	random	visit	never	International Student	50-59	think-apply
106	first	random	visit	never	New Freshman	16-19	i-apply
107	first	alphabetical	never	never	New Freshman	16-19	i-apply
108	first	alphabetical	visit	never	Transfer Student	20-24	i-apply
109	first	random	page	page	Transfer Student	20-24	i-apply
110	first	random	visit	never	International Student	20-24	info
111	first	popular	page	page	New Freshman	16-19	i-apply
112	first	popular	page	page	Visiting Student	40-49	other-think-apply
113	first	popular	never	never	New Freshman	16-19	i-apply

Survey Number	*Survey*	*Order*	*Change1*	*Change2*	*Audience*	*Age*	*Purpose*
114	first	random	never	never	New Freshman	16-19	i-apply
115	first	alphabetical	page	page	International Student	16-19	info
116	first	random	never	never	Postbaccalaureate	16-19	think-apply
117	first	random	never	never	International Student	20-24	think-apply
118	first	alphabetical	page	page	New Freshman	40-49	other-apply
119	first	random	never	never	New Freshman	50-59	other-think-apply
120	first	alphabetical	visit	never	New Freshman	16-19	i-apply
121	first	alphabetical	visit	never	New Freshman	16-19	i-apply
122	first	alphabetical	page	page	New Freshman	16-19	i-apply
123	first	popular	page	page	New Freshman	20-24	i-apply
124	first	popular	page	page	New Freshman	20-24	i-apply
125	first	alphabetical	page	page	New Freshman	16-19	i-apply
126	first	alphabetical	page	page	International Student	25-29	think-apply
127	first	random	visit	never	New Freshman	16-19	info
128	first	alphabetical	page	page	New Freshman	16-19	i-apply
129	first	alphabetical	page	page	International Student	30-39	other-think-apply
130	first	alphabetical	visit	never	New Freshman	16-19	i-apply
131	first	alphabetical	never	never	International Student	20-24	think-apply
132	first	alphabetical	never	never	International Student	16-19	think-apply
133	first	alphabetical	never	never	International Student	25-29	other-think-apply
134	first	random	never	never	International Student	16-19	think-apply
135	first	alphabetical	never	never	Transfer Student	16-19	think-apply
136	first	popular	visit	never	International Student	20-24	i-apply
137	first	popular	visit	never	International Student	20-24	other-apply
138	first	popular	visit	never	New Freshman	16-19	think-apply
140	first	alphabetical	never	never	Transfer Student	16-19	i-apply

Survey Number	*Survey*	*Order*	*Change1*	*Change2*	*Audience*	*Age*	*Purpose*
141	first	random	never	never	New Freshman	16-19	i-apply
142	first	alphabetical	page	page	New Freshman	20-24	i-apply
143	first	popular	page	page	International Student	16-19	think-apply
144	first	random	page	page	New Freshman	16-19	i-apply
145	first	popular	page	page	New Freshman	25-29	i-apply
146	first	random	page	page	Transfer Student	40-49	i-apply
147	first	random	never	never	Transfer Student	20-24	think-apply
148	first	popular	never	never	New Freshman	16-19	i-apply
149	first	popular	visit	never	New Freshman	20-24	think-apply
150	first	alphabetical	page	page	New Freshman	16-19	i-apply
151	first	alphabetical	visit	never	International Student	16-19	info
152	first	alphabetical	visit	never	New Freshman	30-39	other-think-apply
153	first	random	visit	never	New Freshman	16-19	i-apply
154	first	random	never	never	New Freshman	50-59	other-apply
155	first	random	never	never	Transfer Student	16-19	i-apply
156	first	random	never	never	Transfer Student	16-19	i-apply
157	first	random	never	never	Transfer Student	16-19	i-apply
158	first	popular	page	page	Transfer Student	20-24	i-apply
159	first	random	visit	never	New Freshman	16-19	i-apply
161	first	alphabetical	page	page	Transfer Student	16-19	think-apply
162	first	popular	page	page	Transfer Student	16-19	i-apply
163	first	popular	visit	never	New Freshman	16-19	info
164	first	alphabetical	never	never	Transfer Student	16-19	i-apply
165	first	popular	never	never	New Freshman	16-19	i-apply
166	first	alphabetical	visit	never	New Freshman	16-19	info
167	first	random	page	page	New Freshman	16-19	i-apply
168	first	alphabetical	page	page	New Freshman	16-19	i-apply
169	first	random	visit	never	International Student	16-19	think-apply
170	first	alphabetical	visit	never	New Freshman	16-19	i-apply

Survey Number	*Survey*	*Order*	*Change1*	*Change2*	*Audience*	*Age*	*Purpose*
171	first	random	page	page	International Student	25-29	i-apply
173	first	popular	visit	never	International Student	25-29	i-apply
174	first	random	page	page	International Student	20-24	info
175	first	popular	page	page	International Student	16-19	i-apply
176	first	random	page	page	International Student	16-19	think-apply
177	first	popular	page	page	Transfer Student	20-24	think-apply
178	first	random	page	page	International Student	30-39	other-apply
180	first	popular	never	never	New Freshman	20-24	i-apply
181	first	alphabetical	never	never	International Student	20-24	i-apply
182	first	popular	never	never	Transfer Student	20-24	i-apply
183	first	popular	visit	never	New Freshman	16-19	think-apply
184	first	alphabetical	never	never	New Freshman	16-19	i-apply
186	first	popular	visit	never	Visiting Student	40-49	other-think-apply
187	first	popular	never	never	Transfer Student	16-19	think-apply
188	first	alphabetical	never	never	Visiting Student	20-24	think-apply
189	first	random	page	page	New Freshman	40-49	other-apply
191	first	popular	never	never	Transfer Student	16-19	info
192	first	alphabetical	page	page	New Freshman	16-19	i-apply
193	first	popular	visit	never	Visiting Student	0-15	info
195	first	random	page	page	Transfer Student	20-24	i-apply
196	first	alphabetical	never	never	International Student	16-19	i-apply
197	first	popular	page	page	International Student	30-39	think-apply
198	first	random	never	never	New Freshman	50-59	other-think-apply
199	first	random	visit	never	New Freshman	25-29	i-apply
200	first	alphabetical	visit	never	New Freshman	16-19	think-apply

Survey Number	*Survey*	*Order*	*Change1*	*Change2*	*Audience*	*Age*	*Purpose*
201	first	popular	visit	never	International Student	20-24	think-apply
202	first	alphabetical	page	page	International Student	20-24	info
203	first	alphabetical	page	page	New Freshman	16-19	i-apply
204	first	popular	page	page	International Student	16-19	think-apply
205	first	alphabetical	never	never	International Student	25-29	think-apply
207	first	alphabetical	visit	never	Postbaccalaureate	25-29	i-apply
208	first	random	visit	never	Transfer Student	20-24	i-apply
209	first	alphabetical	page	page	Visiting Student	16-19	think-apply
210	first	random	visit	never	Visiting Student	20-24	think-apply
211	first	alphabetical	page	page	New Freshman	16-19	info
212	first	alphabetical	visit	never	Transfer Student	20-24	i-apply
213	first	random	page	page	International Student	16-19	think-apply
214	first	random	page	page	Transfer Student	20-24	i-apply
215	first	random	page	page	New Freshman	16-19	i-apply
216	first	alphabetical	visit	never	New Freshman	16-19	i-apply
217	first	random	never	never	New Freshman	16-19	i-apply
218	first	random	visit	never	New Freshman	0-15	i-apply
219	first	alphabetical	page	page	International Student	16-19	think-apply
220	first	alphabetical	page	page	International Student	16-19	think-apply
221	first	alphabetical	page	page	Visiting Student	20-24	think-apply
222	first	random	visit	never	New Freshman	16-19	think-apply
223	first	popular	never	never	Transfer Student	20-24	i-apply
224	first	popular	visit	never	New Freshman	16-19	i-apply
225	first	popular	visit	never	International Student	20-24	think-apply
226	first	random	visit	never	New Freshman	30-39	other-apply
227	first	random	never	never	Transfer Student	25-29	i-apply
228	first	alphabetical	never	never	Transfer Student	20-24	i-apply

Survey Number	*Survey*	*Order*	*Change1*	*Change2*	*Audience*	*Age*	*Purpose*
229	first	alphabetical	page	page	New Freshman	16-19	info
230	first	alphabetical	visit	never	Transfer Student	25-29	i-apply
232	first	popular	visit	never	New Freshman	16-19	i-apply
233	first	popular	never	never	Transfer Student	20-24	i-apply
234	first	random	page	page	Transfer Student	16-19	i-apply
235	first	popular	visit	never	Transfer Student	16-19	i-apply
236	first	alphabetical	visit	never	Transfer Student	30-39	i-apply
237	first	alphabetical	page	page	International Student	30-39	i-apply
238	first	alphabetical	visit	never	International Student	16-19	think-apply
239	first	random	visit	never	Transfer Student	20-24	think-apply
240	first	alphabetical	visit	never	International Student	20-24	i-apply
241	first	random	page	page	International Student	16-19	think-apply
242	first	random	page	page	Transfer Student	20-24	i-apply
243	first	random	page	page	Transfer Student	20-24	i-apply
244	first	alphabetical	visit	never	New Freshman	16-19	i-apply
245	first	random	page	page	International Student	60-69	other-think-apply
246	first	random	visit	never	Transfer Student	20-24	think-apply
247	first	random	page	page	New Freshman	16-19	i-apply
248	first	alphabetical	page	page	Transfer Student	25-29	think-apply
250	first	random	page	page	Transfer Student	0-15	info
251	first	random	page	page	Transfer Student	0-15	info
252	first	alphabetical	visit	never	Transfer Student	16-19	think-apply
253	first	popular	never	never	Transfer Student	20-24	think-apply
254	first	popular	visit	never	International Student	20-24	think-apply
255	first	popular	visit	never	New Freshman	16-19	i-apply
256	first	alphabetical	never	never	Transfer Student	20-24	think-apply
257	first	popular	page	page	Transfer Student	20-24	i-apply
258	first	random	visit	never	New Freshman	40-49	other-apply

Survey Number	*Survey*	*Order*	*Change1*	*Change2*	*Audience*	*Age*	*Purpose*
259	first	alphabetical	page	page	International Student	16-19	i-apply
260	first	random	never	never	New Freshman	16-19	i-apply
262	first	random	never	never	Transfer Student	16-19	i-apply
263	first	popular	visit	never	International Student	16-19	i-apply
264	first	popular	never	never	International Student	16-19	think-apply
265	first	random	page	page	New Freshman	16-19	i-apply
266	first	alphabetical	visit	never	Transfer Student	20-24	i-apply
267	first	alphabetical	never	never	International Student	16-19	think-apply
268	first	popular	page	page	Visiting Student	40-49	other-apply
269	first	popular	page	page	Visiting Student	40-49	other-apply
270	first	alphabetical	never	never	New Freshman	16-19	i-apply
271	first	popular	visit	never	International Student	16-19	info
272	first	alphabetical	visit	never	Former Student	30-39	i-apply
273	first	random	page	page	Visiting Student	16-19	i-apply
274	first	popular	visit	never	Transfer Student	16-19	i-apply
275	first	alphabetical	visit	never	New Freshman	16-19	i-apply
276	first	alphabetical	visit	never	Visiting Student	16-19	info
277	first	popular	visit	never	New Freshman	16-19	i-apply
278	first	alphabetical	never	never	Transfer Student	20-24	think-apply
279	first	alphabetical	page	page	International Student	16-19	think-apply
280	first	popular	page	page	New Freshman	16-19	think-apply
281	first	popular	never	never	International Student	16-19	think-apply
282	first	alphabetical	never	never	New Freshman	16-19	i-apply
283	first	alphabetical	never	never	New Freshman	16-19	i-apply
284	first	random	never	never	New Freshman	16-19	i-apply
286	first	alphabetical	visit	never	Transfer Student	20-24	think-apply
287	first	random	never	never	International Student	16-19	i-apply

Survey Number	*Survey*	*Order*	*Change1*	*Change2*	*Audience*	*Age*	*Purpose*
289	first	popular	page	page	International Student	20-24	think-apply
290	first	random	page	page	New Freshman	40-49	other-think-apply
291	first	popular	visit	never	International Student	20-24	i-apply
292	first	alphabetical	visit	never	Former Student	30-39	i-apply
293	first	popular	page	page	New Freshman	20-24	info
294	first	alphabetical	never	never	International Student	30-39	other-think-apply
295	first	alphabetical	page	page	New Freshman	16-19	i-apply
296	first	random	never	never	New Freshman	20-24	i-apply
297	first	random	never	never	New Freshman	50-59	other-think-apply
298	first	random	visit	never	New Freshman	30-39	info
299	first	alphabetical	visit	never	Transfer Student	16-19	i-apply
300	first	random	page	page	Transfer Student	16-19	think-apply
301	first	random	never	never	New Freshman	20-24	i-apply
302	first	random	never	never	International Student	20-24	i-apply
303	first	alphabetical	never	never	Visiting Student	50-59	other-think-apply
304	first	random	never	never	Transfer Student	25-29	info
305	first	popular	never	never	New Freshman	16-19	i-apply
306	first	alphabetical	page	page	New Freshman	16-19	i-apply
307	first	popular	visit	never	New Freshman	16-19	i-apply
308	first	alphabetical	page	page	Visiting Student	20-24	think-apply
309	first	popular	page	page	Transfer Student	20-24	think-apply
312	first	popular	visit	never	International Student	20-24	think-apply
313	first	alphabetical	page	page	International Student	20-24	i-apply
314	first	popular	visit	never	New Freshman	16-19	i-apply
315	first	popular	never	never	New Freshman	16-19	i-apply
316	first	popular	page	page	Transfer Student	20-24	i-apply

Survey Number	*Survey*	*Order*	*Change1*	*Change2*	*Audience*	*Age*	*Purpose*
317	first	random	visit	never	Transfer Student	50-59	other-think-apply
318	first	random	never	never	New Freshman	0-15	i-apply
319	first	alphabetical	page	page	New Freshman	16-19	i-apply
320	first	random	page	page	New Freshman	16-19	think-apply
321	first	random	never	never	Transfer Student	20-24	other-think-apply
323	first	random	never	never	Transfer Student	20-24	think-apply
324	first	alphabetical	never	never	International Student	16-19	i-apply
325	first	popular	visit	never	International Student	20-24	think-apply
327	first	random	visit	never	New Freshman	16-19	think-apply
328	first	popular	page	page	International Student	25-29	think-apply
329	first	popular	page	page	International Student	16-19	i-apply
330	first	alphabetical	page	page	New Freshman	20-24	i-apply
331	first	popular	never	never	New Freshman	30-39	other-apply
332	first	alphabetical	never	never	International Student	20-24	think-apply
333	first	random	page	page	International Student	20-24	think-apply
334	first	alphabetical	visit	never	International Student	16-19	think-apply
335	first	alphabetical	page	page	International Student	30-39	think-apply
336	first	popular	page	page	New Freshman	0-15	i-apply
337	first	popular	never	never	Visiting Student	30-39	info
338	first	random	visit	never	International Student	20-24	other-apply
339	first	random	visit	never	New Freshman	16-19	i-apply
340	first	alphabetical	visit	never	International Student	25-29	think-apply
341	first	random	never	never	New Freshman	16-19	i-apply
342	first	alphabetical	visit	never	International Student	50-59	think-apply
343	first	popular	page	page	New Freshman	50-59	other-apply

Survey Number	*Survey*	*Order*	*Change1*	*Change2*	*Audience*	*Age*	*Purpose*
344	first	random	page	page	New Freshman	16-19	think-apply
345	first	random	visit	never	International Student	20-24	i-apply
346	first	popular	visit	never	International Student	40-49	info
347	first	random	page	page	International Student	20-24	i-apply
348	first	random	page	page	New Freshman	16-19	think-apply
349	first	popular	never	never	International Student	25-29	i-apply
350	first	popular	visit	never	International Student	20-24	info
351	first	popular	visit	never	International Student	20-24	info
352	first	alphabetical	page	page	New Freshman	16-19	i-apply
353	first	alphabetical	visit	never	New Freshman	40-49	other-apply
354	first	alphabetical	visit	never	New Freshman	16-19	think-apply
355	first	popular	visit	never	Transfer Student	20-24	i-apply
356	first	random	visit	never	International Student	20-24	think-apply
357	first	alphabetical	visit	never	New Freshman	16-19	i-apply
358	first	alphabetical	visit	never	International Student	30-39	think-apply
359	first	random	visit	never	Concurrent Enrollment	30-39	other-think-apply
360	first	random	never	never	International Student	20-24	think-apply
361	first	popular	page	page	International Student	16-19	i-apply
362	first	alphabetical	visit	never	New Freshman	50-59	other-apply
363	first	alphabetical	visit	never	International Student	16-19	other-think-apply
364	first	popular	page	page	Transfer Student	20-24	think-apply
365	first	random	visit	never	New Freshman	16-19	i-apply
368	first	random	page	page	International Student	20-24	other-think-apply
369	first	popular	visit	never	International Student	20-24	think-apply

Survey Number	*Survey*	*Order*	*Change1*	*Change2*	*Audience*	*Age*	*Purpose*
370	first	popular	page	page	International Student	25-29	think-apply
371	first	popular	visit	never	International Student	16-19	think-apply
372	first	popular	visit	never	International Student	20-24	i-apply
373	first	popular	page	page	International Student	30-39	think-apply
374	first	popular	page	page	Transfer Student	20-24	i-apply
375	first	alphabetical	never	never	New Freshman	16-19	i-apply
376	first	alphabetical	visit	never	New Freshman	16-19	info
377	first	alphabetical	never	never	Transfer Student	20-24	think-apply
378	first	alphabetical	page	page	New Freshman	16-19	think-apply
379	first	popular	page	page	International Student	20-24	think-apply
381	first	random	visit	never	Transfer Student	25-29	think-apply
382	first	popular	visit	never	International Student	16-19	i-apply
383	first	popular	never	never	New Freshman	16-19	i-apply
384	first	alphabetical	page	page	International Student	20-24	think-apply
385	first	alphabetical	page	page	International Student	20-24	think-apply
386	first	random	never	never	International Student	40-49	other-apply
387	first	popular	never	never	International Student	16-19	i-apply
388	first	random	visit	never	International Student	25-29	i-apply
389	first	popular	page	page	New Freshman	16-19	i-apply
390	first	popular	visit	never	International Student	20-24	i-apply
391	first	popular	page	page	Transfer Student	20-24	i-apply
392	first	random	page	page	New Freshman	0-15	i-apply
393	first	random	visit	never	New Freshman	16-19	think-apply
395	first	popular	never	never	International Student	30-39	i-apply
396	first	alphabetical	never	never	New Freshman	16-19	i-apply

Survey Number	*Survey*	*Order*	*Change1*	*Change2*	*Audience*	*Age*	*Purpose*
397	first	popular	never	never	International Student	20-24	think-apply
398	first	popular	never	never	International Student	25-29	think-apply
400	first	alphabetical	visit	never	International Student	16-19	think-apply
401	first	alphabetical	never	never	New Freshman	16-19	think-apply
402	first	alphabetical	visit	never	International Student	20-24	think-apply
403	first	popular	page	page	New Freshman	16-19	think-apply
404	first	random	visit	never	International Student	16-19	i-apply
405	first	alphabetical	visit	never	New Freshman	16-19	i-apply
406	first	alphabetical	page	page	Visiting Student	16-19	think-apply
408	first	random	visit	never	International Student	16-19	think-apply
409	first	alphabetical	visit	never	New Freshman	16-19	think-apply
410	first	alphabetical	page	page	Transfer Student	16-19	think-apply
411	first	random	never	never	Transfer Student	40-49	other-think-apply
412	first	alphabetical	visit	never	New Freshman	16-19	think-apply
413	first	random	visit	never	Transfer Student	40-49	other-apply
414	first	alphabetical	visit	never	Transfer Student	20-24	think-apply
415	first	popular	page	page	Transfer Student	16-19	think-apply
416	first	popular	visit	never	Transfer Student	20-24	i-apply
417	first	popular	never	never	Transfer Student	20-24	think-apply
418	first	alphabetical	never	never	International Student	16-19	info
419	first	random	page	page	International Student	20-24	think-apply
420	first	alphabetical	never	never	International Student	25-29	think-apply
421	first	random	page	page	International Student	16-19	think-apply
422	first	random	page	page	Visiting Student	16-19	info
423	first	alphabetical	visit	never	International Student	20-24	think-apply

Survey Number	*Survey*	*Order*	*Change1*	*Change2*	*Audience*	*Age*	*Purpose*
424	first	alphabetical	page	page	International Student	16-19	i-apply
425	first	random	page	page	International Student	20-24	think-apply
426	first	alphabetical	page	page	New Freshman	40-49	other-apply
427	first	alphabetical	page	page	New Freshman	16-19	i-apply
428	first	alphabetical	visit	never	International Student	20-24	think-apply
429	first	alphabetical	page	page	New Freshman	16-19	i-apply
430	first	random	never	never	New Freshman	16-19	i-apply
431	first	alphabetical	page	page	International Student	16-19	i-apply
432	first	alphabetical	page	page	New Freshman	16-19	think-apply
433	first	random	visit	never	Transfer Student	20-24	think-apply
434	first	popular	never	never	International Student	20-24	think-apply
435	first	alphabetical	visit	never	Transfer Student	30-39	i-apply
436	first	alphabetical	visit	never	New Freshman	16-19	i-apply
437	first	popular	visit	never	International Student	25-29	think-apply
438	first	alphabetical	visit	never	International Student	20-24	i-apply
439	first	random	never	never	International Student	0-15	i-apply
441	first	popular	never	never	New Freshman	16-19	think-apply
442	first	popular	page	page	New Freshman	40-49	info
443	first	alphabetical	visit	never	International Student	16-19	think-apply
445	first	alphabetical	never	never	New Freshman	16-19	think-apply
446	first	popular	page	page	International Student	16-19	think-apply
447	first	popular	page	page	Visiting Student	0-15	think-apply
448	first	popular	never	never	New Freshman	16-19	i-apply
449	first	popular	page	page	New Freshman	16-19	think-apply
451	first	popular	page	page	New Freshman	16-19	info
452	first	random	never	never	Transfer Student	16-19	i-apply

Survey Number	*Survey*	*Order*	*Change1*	*Change2*	*Audience*	*Age*	*Purpose*
453	first	popular	visit	never	Transfer Student	25-29	think-apply
454	first	random	page	page	International Student	20-24	i-apply
455	first	alphabetical	visit	never	Transfer Student	40-49	other-apply
456	first	popular	visit	never	New Freshman	16-19	i-apply
457	first	popular	page	page	International Student	16-19	i-apply
458	first	popular	never	never	International Student	0-15	info
459	first	popular	page	page	Transfer Student	20-24	i-apply
460	first	popular	page	page	Transfer Student	20-24	think-apply
461	first	random	page	page	Visiting Student	16-19	i-apply
462	first	alphabetical	never	never	International Student	25-29	think-apply
463	first	alphabetical	page	page	Transfer Student	20-24	think-apply
464	first	popular	visit	never	International Student	16-19	think-apply
465	first	popular	visit	never	Transfer Student	20-24	think-apply
466	first	popular	visit	never	New Freshman	16-19	think-apply
467	first	alphabetical	page	page	New Freshman	30-39	other-think-apply
468	first	alphabetical	never	never	International Student	25-29	think-apply
469	first	alphabetical	page	page	International Student	25-29	think-apply
470	first	random	never	never	International Student	20-24	i-apply
471	first	alphabetical	visit	never	Transfer Student	20-24	i-apply
472	first	alphabetical	never	never	International Student	16-19	think-apply
473	first	popular	visit	never	Transfer Student	25-29	info
474	first	alphabetical	visit	never	New Freshman	16-19	i-apply
475	first	random	visit	never	New Freshman	16-19	i-apply
476	first	popular	visit	never	New Freshman	16-19	i-apply
477	first	random	visit	never	Transfer Student	20-24	i-apply
478	first	alphabetical	visit	never	Transfer Student	20-24	i-apply

Survey Number	*Survey*	*Order*	*Change1*	*Change2*	*Audience*	*Age*	*Purpose*
479	first	alphabetical	visit	never	New Freshman	16-19	i-apply
480	first	random	visit	never	International Student	16-19	think-apply
481	first	alphabetical	never	never	New Freshman	40-49	other-apply
482	first	alphabetical	never	never	Transfer Student	20-24	think-apply
483	first	alphabetical	never	never	International Student	20-24	i-apply
484	first	random	never	never	International Student	20-24	info
485	first	random	visit	never	International Student	16-19	info
486	first	popular	never	never	New Freshman	16-19	think-apply
487	first	random	never	never	International Student	20-24	think-apply
488	first	alphabetical	page	page	Transfer Student	20-24	i-apply
489	first	alphabetical	visit	never	Visiting Student	25-29	info
490	first	popular	never	never	New Freshman	16-19	i-apply
491	first	alphabetical	never	never	New Freshman	16-19	think-apply
492	first	popular	never	never	Transfer Student	20-24	think-apply
493	first	random	page	page	New Freshman	16-19	think-apply
494	first	alphabetical	visit	never	New Freshman	16-19	other-apply
495	first	alphabetical	page	page	New Freshman	20-24	i-apply
497	first	popular	visit	never	International Student	16-19	i-apply
498	first	random	visit	never	International Student	16-19	i-apply
499	first	popular	never	never	Transfer Student	20-24	i-apply
500	first	alphabetical	visit	never	New Freshman	16-19	info
502	first	random	never	never	Transfer Student	16-19	think-apply
503	first	popular	page	page	International Student	16-19	i-apply
504	first	random	never	never	New Freshman	50-59	other-think-apply
505	first	popular	page	page	International Student	16-19	think-apply
506	first	alphabetical	page	page	Transfer Student	20-24	think-apply

Survey Number	*Survey*	*Order*	*Change1*	*Change2*	*Audience*	*Age*	*Purpose*
507	first	alphabetical	page	page	New Freshman	40-49	other-apply
508	first	popular	page	page	New Freshman	16-19	think-apply
509	first	popular	visit	never	International Student	25-29	i-apply
510	first	alphabetical	never	never	International Student	16-19	i-apply
511	first	alphabetical	page	page	New Freshman	0-15	info
512	first	random	page	page	International Student	16-19	think-apply
513	first	random	never	never	International Student	30-39	think-apply
514	first	random	page	page	International Student	20-24	think-apply
515	first	popular	page	page	International Student	20-24	i-apply
516	first	random	page	page	New Freshman	16-19	i-apply
517	first	alphabetical	never	never	International Student	16-19	think-apply
518	first	popular	page	page	New Freshman	16-19	i-apply
519	first	random	visit	never	International Student	25-29	i-apply
520	first	random	page	page	New Freshman	16-19	i-apply
521	first	popular	visit	never	International Student	25-29	think-apply
522	first	popular	never	never	International Student	16-19	think-apply
523	first	popular	page	page	Transfer Student	20-24	think-apply
524	first	alphabetical	page	page	New Freshman	16-19	i-apply
525	first	alphabetical	never	never	New Freshman	40-49	other-apply
526	first	random	page	page	International Student	20-24	think-apply
527	first	random	page	page	New Freshman	20-24	i-apply
528	first	random	never	never	Transfer Student	20-24	i-apply
529	first	random	never	never	International Student	16-19	think-apply
530	first	random	page	page	Transfer Student	50-59	think-apply
531	first	alphabetical	page	page	New Freshman	30-39	info

Survey Number	Survey	Order	Change1	Change2	Audience	Age	Purpose
532	first	popular	page	page	New Freshman	16-19	i-apply
534	first	alphabetical	visit	never	International Student	20-24	think-apply
535	first	random	visit	never	New Freshman	16-19	i-apply
536	first	alphabetical	never	never	New Freshman	20-24	info
537	first	popular	visit	never	New Freshman	20-24	other-think-apply
539	first	popular	never	never	New Freshman	20-24	think-apply
540	first	popular	page	page	New Freshman	16-19	i-apply
541	first	random	page	page	New Freshman	16-19	think-apply
542	first	alphabetical	page	page	New Freshman	16-19	i-apply
543	first	random	visit	never	Transfer Student	20-24	think-apply
544	first	alphabetical	visit	never	New Freshman	16-19	other-think-apply
545	first	popular	visit	never	New Freshman	16-19	i-apply
546	first	random	visit	never	Transfer Student	30-39	think-apply
547	first	popular	visit	never	New Freshman	16-19	i-apply
548	first	alphabetical	page	page	International Student	16-19	i-apply
549	first	alphabetical	page	page	International Student	25-29	think-apply
550	first	alphabetical	never	never	New Freshman	16-19	i-apply
551	first	popular	page	page	Transfer Student	20-24	think-apply
552	first	popular	page	page	New Freshman	16-19	think-apply
553	first	random	visit	never	Transfer Student	25-29	think-apply
554	first	popular	page	page	International Student	20-24	i-apply
555	first	random	page	page	New Freshman	16-19	i-apply
558	first	alphabetical	never	never	New Freshman	20-24	info
559	first	alphabetical	page	page	Transfer Student	25-29	think-apply
560	first	random	page	page	Transfer Student	20-24	think-apply
562	first	popular	never	never	International Student	16-19	i-apply
563	first	alphabetical	never	never	Transfer Student	60-69	i-apply
565	first	random	visit	never	Visiting Student	16-19	info

Survey Number	*Survey*	*Order*	*Change1*	*Change2*	*Audience*	*Age*	*Purpose*
566	first	random	visit	never	International Student	25-29	think-apply
567	first	random	visit	never	International Student	16-19	i-apply
568	first	random	page	page	New Freshman	30-39	other-think-apply
569	first	popular	never	never	New Freshman	16-19	i-apply
570	first	alphabetical	visit	never	Transfer Student	30-39	i-apply
571	first	alphabetical	page	page	International Student	25-29	think-apply
572	first	random	page	page	New Freshman	20-24	other-think-apply
573	first	random	never	never	New Freshman	30-39	other-apply
574	first	random	visit	never	Visiting Student	25-29	think-apply
575	first	alphabetical	page	page	International Student	16-19	think-apply
576	first	popular	never	never	New Freshman	16-19	think-apply
577	first	random	never	never	Transfer Student	16-19	i-apply
578	first	alphabetical	page	page	New Freshman	16-19	think-apply
579	first	random	visit	never	International Student	20-24	think-apply
580	first	random	page	page	Postbaccalaureate	25-29	i-apply
581	first	random	never	never	International Student	16-19	other-think-apply
582	first	alphabetical	visit	never	New Freshman	16-19	i-apply
583	first	random	page	page	New Freshman	20-24	i-apply
584	first	alphabetical	never	never	New Freshman	16-19	info
585	first	random	page	page	International Student	16-19	think-apply
586	first	popular	visit	never	International Student	20-24	info
590	first	random	never	never	New Freshman	16-19	i-apply
591	first	alphabetical	visit	never	International Student	25-29	info
592	first	random	page	page	International Student	20-24	think-apply
593	first	alphabetical	visit	never	New Freshman	16-19	i-apply

Survey Number	*Survey*	*Order*	*Change1*	*Change2*	*Audience*	*Age*	*Purpose*
594	first	popular	never	never	International Student	30-39	think-apply
595	first	alphabetical	page	page	New Freshman	16-19	info
596	first	popular	visit	never	Visiting Student	16-19	i-apply
597	first	popular	page	page	New Freshman	0-15	info
598	first	popular	page	page	New Freshman	20-24	think-apply
599	first	random	never	never	New Freshman	16-19	i-apply
600	first	random	never	never	International Student	20-24	think-apply
601	first	alphabetical	page	page	Transfer Student	16-19	other-apply
602	first	random	visit	never	International Student	16-19	info
603	first	random	page	page	New Freshman	16-19	i-apply
604	first	popular	visit	never	International Student	16-19	think-apply
605	first	popular	never	never	International Student	16-19	think-apply
606	first	alphabetical	visit	never	New Freshman	16-19	i-apply
607	first	random	never	never	New Freshman	20-24	think-apply
608	first	random	never	never	Transfer Student	20-24	think-apply
609	first	popular	visit	never	International Student	16-19	i-apply
610	first	popular	never	never	Transfer Student	16-19	think-apply
611	first	popular	page	page	New Freshman	0-15	think-apply
612	first	popular	visit	never	Visiting Student	20-24	i-apply
613	first	popular	never	never	Transfer Student	16-19	think-apply
614	first	alphabetical	page	page	Visiting Student	16-19	i-apply
615	first	random	visit	never	New Freshman	16-19	i-apply
616	first	random	visit	never	New Freshman	16-19	i-apply
618	first	popular	visit	never	Transfer Student	50-59	other-apply
619	first	popular	never	never	International Student	20-24	think-apply
620	first	alphabetical	never	never	Transfer Student	40-49	other-apply
621	first	random	page	page	Transfer Student	16-19	think-apply

Survey Number	*Survey*	*Order*	*Change1*	*Change2*	*Audience*	*Age*	*Purpose*
622	first	alphabetical	visit	never	International Student	16-19	think-apply
623	first	random	page	page	New Freshman	0-15	i-apply
624	first	popular	visit	never	Transfer Student	20-24	think-apply
625	first	popular	visit	never	New Freshman	16-19	i-apply
626	first	random	never	never	New Freshman	16-19	think-apply
627	first	alphabetical	visit	never	New Freshman	16-19	think-apply
628	first	random	page	page	Transfer Student	16-19	think-apply
629	first	popular	visit	never	Visiting Student	25-29	i-apply
630	first	alphabetical	never	never	New Freshman	25-29	info
631	first	random	page	page	Transfer Student	20-24	think-apply
632	first	random	never	never	International Student	25-29	i-apply
633	first	popular	page	page	International Student	20-24	think-apply
634	first	popular	page	page	International Student	25-29	think-apply
635	first	alphabetical	visit	never	New Freshman	16-19	i-apply
636	first	popular	never	never	New Freshman	16-19	i-apply
637	first	random	visit	never	New Freshman	16-19	i-apply
638	first	popular	never	never	New Freshman	16-19	i-apply
639	first	alphabetical	page	page	New Freshman	16-19	i-apply
640	first	alphabetical	never	never	International Student	16-19	think-apply
641	first	alphabetical	never	never	Transfer Student	20-24	i-apply
642	first	random	never	never	New Freshman	16-19	i-apply
643	first	alphabetical	visit	never	New Freshman	16-19	i-apply
644	first	alphabetical	visit	never	New Freshman	16-19	i-apply
645	first	alphabetical	visit	never	New Freshman	16-19	think-apply
646	first	popular	never	never	New Freshman	16-19	i-apply
647	first	random	visit	never	New Freshman	40-49	other-apply
648	first	random	never	never	New Freshman	40-49	other-think-apply
650	first	random	never	never	New Freshman	16-19	i-apply
651	first	random	never	never	New Freshman	16-19	think-apply

Survey Number	Survey	Order	Change1	Change2	Audience	Age	Purpose
652	first	popular	visit	never	New Freshman	16-19	think-apply
653	first	alphabetical	never	never	New Freshman	16-19	i-apply
654	first	alphabetical	visit	never	International Student	20-24	think-apply
655	first	popular	page	page	New Freshman	16-19	think-apply
656	first	alphabetical	never	never	New Freshman	16-19	i-apply
658	first	popular	visit	never	Transfer Student	16-19	i-apply
659	first	popular	page	page	International Student	20-24	think-apply
660	first	random	never	never	New Freshman	16-19	i-apply
661	first	popular	never	never	New Freshman	20-24	i-apply
662	first	random	never	never	New Freshman	16-19	think-apply
663	first	alphabetical	page	page	New Freshman	16-19	i-apply
664	first	alphabetical	page	page	New Freshman	16-19	i-apply
665	first	random	visit	never	New Freshman	16-19	think-apply
666	first	alphabetical	page	page	Transfer Student	20-24	think-apply
667	first	random	visit	never	New Freshman	0-15	think-apply
668	first	random	never	never	New Freshman	40-49	other-think-apply
669	first	alphabetical	page	page	New Freshman	40-49	other-apply
670	first	popular	visit	never	New Freshman	16-19	i-apply
671	first	popular	page	page	International Student	50-59	other-think-apply
672	first	alphabetical	page	page	New Freshman	16-19	i-apply
673	first	alphabetical	visit	never	International Student	16-19	think-apply
674	first	popular	never	never	New Freshman	16-19	i-apply
675	first	alphabetical	page	page	New Freshman	16-19	i-apply
676	first	popular	page	page	International Student	50-59	think-apply
677	first	random	visit	never	New Freshman	16-19	i-apply
678	first	popular	visit	never	New Freshman	16-19	i-apply
679	first	alphabetical	visit	never	New Freshman	16-19	i-apply
680	first	random	visit	never	New Freshman	16-19	i-apply
681	first	popular	visit	never	New Freshman	16-19	info

Survey Number	*Survey*	*Order*	*Change1*	*Change2*	*Audience*	*Age*	*Purpose*
682	first	alphabetical	page	page	New Freshman	16-19	i-apply
683	first	random	page	page	New Freshman	16-19	i-apply
684	first	popular	never	never	Transfer Student	16-19	think-apply
685	first	popular	visit	never	International Student	20-24	i-apply
686	first	popular	page	page	International Student	20-24	think-apply
688	first	alphabetical	never	never	New Freshman	0-15	think-apply
689	first	popular	visit	never	International Student	25-29	i-apply
690	first	alphabetical	never	never	International Student	20-24	i-apply
691	first	popular	page	page	New Freshman	20-24	info
692	first	alphabetical	never	never	International Student	20-24	think-apply
693	first	popular	page	page	Transfer Student	16-19	think-apply
694	first	popular	page	page	Former Student	60-69	info
695	first	popular	visit	never	New Freshman	0-15	think-apply
696	first	random	page	page	New Freshman	16-19	i-apply
697	first	popular	visit	never	International Student	20-24	i-apply
698	first	random	never	never	International Student	50-59	other-apply
699	first	alphabetical	page	page	New Freshman	16-19	i-apply
700	first	alphabetical	page	page	New Freshman	16-19	i-apply
701	first	popular	visit	never	New Freshman	16-19	info
702	first	alphabetical	visit	never	Postbaccalaureate	40-49	info
703	first	random	never	never	New Freshman	16-19	i-apply
704	first	popular	page	page	International Student	16-19	think-apply
705	first	popular	page	page	International Student	16-19	think-apply
706	first	random	visit	never	New Freshman	30-39	other-apply
707	first	popular	never	never	Transfer Student	25-29	think-apply
708	first	random	never	never	Transfer Student	20-24	think-apply
709	first	random	visit	never	New Freshman	16-19	think-apply

Survey Number	*Survey*	*Order*	*Change1*	*Change2*	*Audience*	*Age*	*Purpose*
710	first	alphabetical	never	never	Transfer Student	25-29	think-apply
711	first	popular	visit	never	Transfer Student	20-24	think-apply
712	first	alphabetical	page	page	International Student	25-29	i-apply
713	first	alphabetical	never	never	New Freshman	16-19	info
714	first	popular	visit	never	New Freshman	16-19	i-apply
715	first	random	never	never	Former Student	20-24	i-apply
716	first	random	never	never	International Student	16-19	i-apply
717	first	popular	visit	never	International Student	20-24	think-apply
718	first	popular	page	page	International Student	16-19	i-apply
719	first	random	page	page	International Student	0-15	think-apply
720	first	random	page	page	New Freshman	16-19	i-apply
721	first	alphabetical	never	never	New Freshman	16-19	i-apply
722	first	popular	visit	never	New Freshman	16-19	i-apply
723	first	alphabetical	never	never	Transfer Student	20-24	i-apply
724	first	random	never	never	New Freshman	16-19	i-apply
725	first	alphabetical	visit	never	International Student	16-19	i-apply
726	first	alphabetical	page	page	Former Student	40-49	other-apply
727	first	popular	never	never	Transfer Student	16-19	think-apply
728	first	popular	never	never	Transfer Student	20-24	think-apply
729	first	popular	visit	never	International Student	30-39	think-apply
730	first	random	visit	never	New Freshman	50-59	other-apply
731	first	random	never	never	Visiting Student	40-49	other-apply
732	first	random	page	page	New Freshman	16-19	i-apply
733	first	popular	page	page	Transfer Student	20-24	think-apply
734	first	random	never	never	International Student	16-19	think-apply
735	first	alphabetical	page	page	New Freshman	16-19	i-apply
736	first	popular	visit	never	Transfer Student	20-24	info

Survey Number	*Survey*	*Order*	*Change1*	*Change2*	*Audience*	*Age*	*Purpose*
737	first	random	visit	never	New Freshman	16-19	think-apply
738	first	random	visit	never	New Freshman	16-19	info
739	first	random	visit	never	International Student	16-19	think-apply
740	first	alphabetical	visit	never	International Student	25-29	i-apply
741	first	random	visit	never	International Student	20-24	think-apply
742	first	alphabetical	never	never	New Freshman	16-19	i-apply
743	first	random	page	page	Former Student	25-29	i-apply
744	first	popular	never	never	International Student	20-24	i-apply
745	first	random	page	page	International Student	40-49	other-think-apply
746	first	random	never	never	New Freshman	0-15	info
747	first	random	page	page	New Freshman	20-24	think-apply
748	first	random	page	page	Visiting Student	40-49	other-apply
749	first	alphabetical	page	page	New Freshman	16-19	think-apply
750	first	random	page	page	International Student	25-29	i-apply
751	first	random	page	page	New Freshman	16-19	i-apply
752	first	random	page	page	New Freshman	30-39	other-think-apply
753	first	alphabetical	page	page	Transfer Student	16-19	i-apply
754	first	popular	never	never	International Student	16-19	think-apply
755	first	popular	visit	never	New Freshman	16-19	think-apply
756	first	alphabetical	visit	never	New Freshman	16-19	think-apply
757	first	alphabetical	page	page	New Freshman	25-29	info
758	first	random	page	page	New Freshman	16-19	i-apply
759	first	alphabetical	page	page	International Student	20-24	other-think-apply
760	first	random	visit	never	Transfer Student	50-59	other-think-apply
761	first	popular	page	page	Transfer Student	20-24	think-apply
762	first	random	never	never	Visiting Student	20-24	i-apply

Survey Number	*Survey*	*Order*	*Change1*	*Change2*	*Audience*	*Age*	*Purpose*
763	first	random	never	never	Former Student	25-29	i-apply
764	first	alphabetical	visit	never	International Student	50-59	other-think-apply
766	first	popular	page	page	Transfer Student	20-24	i-apply
767	first	random	visit	never	Transfer Student	20-24	i-apply
768	first	random	page	page	New Freshman	20-24	other-apply
769	first	random	page	page	Transfer Student	30-39	other-think-apply
770	first	popular	visit	never	New Freshman	16-19	think-apply
771	first	alphabetical	page	page	New Freshman	16-19	i-apply
772	first	random	visit	never	New Freshman	25-29	info
773	first	popular	visit	never	Transfer Student	40-49	think-apply
774	first	random	never	never	International Student	16-19	think-apply
775	first	random	visit	never	Visiting Student	0-15	i-apply
776	first	random	visit	never	New Freshman	16-19	i-apply
777	first	popular	page	page	New Freshman	16-19	i-apply
778	first	random	visit	never	Transfer Student	25-29	think-apply
779	first	random	visit	never	International Student	16-19	i-apply
780	first	popular	never	never	Transfer Student	16-19	think-apply
781	first	popular	never	never	International Student	20-24	i-apply
782	first	alphabetical	visit	never	International Student	30-39	i-apply
783	first	random	never	never	New Freshman	16-19	i-apply
784	first	alphabetical	visit	never	New Freshman	16-19	i-apply
785	first	random	page	page	Transfer Student	40-49	think-apply
786	first	popular	never	never	New Freshman	16-19	i-apply
787	first	popular	never	never	New Freshman	40-49	other-apply
788	first	popular	never	never	International Student	16-19	think-apply
789	first	popular	page	page	Transfer Student	16-19	think-apply
790	first	alphabetical	visit	never	International Student	20-24	think-apply

Survey Number	*Survey*	*Order*	*Change1*	*Change2*	*Audience*	*Age*	*Purpose*
791	first	alphabetical	never	never	International Student	30-39	think-apply
792	first	popular	visit	never	New Freshman	40-49	other-apply
793	first	random	page	page	International Student	20-24	i-apply
794	first	popular	never	never	New Freshman	16-19	i-apply
795	first	popular	page	page	International Student	16-19	think-apply
796	first	random	page	page	New Freshman	16-19	info
797	first	random	page	page	New Freshman	16-19	i-apply
799	first	alphabetical	never	never	New Freshman	16-19	i-apply
800	first	random	never	never	International Student	16-19	think-apply
801	first	random	visit	never	New Freshman	16-19	other-apply
802	first	popular	visit	never	New Freshman	16-19	i-apply
803	first	popular	never	never	International Student	20-24	think-apply
805	first	popular	visit	never	International Student	40-49	i-apply
806	first	popular	page	page	International Student	16-19	think-apply
807	first	random	never	never	International Student	16-19	i-apply
808	first	random	page	page	International Student	16-19	i-apply
809	first	random	visit	never	International Student	16-19	i-apply
810	first	popular	never	never	New Freshman	20-24	i-apply
811	first	random	visit	never	New Freshman	16-19	i-apply
812	first	alphabetical	visit	never	New Freshman	16-19	i-apply
813	first	alphabetical	never	never	Transfer Student	25-29	think-apply
814	first	popular	visit	never	International Student	20-24	i-apply
815	first	popular	page	page	International Student	16-19	think-apply
816	first	popular	page	page	Visiting Student	16-19	i-apply
817	first	popular	page	page	New Freshman	16-19	i-apply

Survey Number	*Survey*	*Order*	*Change1*	*Change2*	*Audience*	*Age*	*Purpose*
818	first	random	visit	never	New Freshman	16-19	think-apply
819	first	popular	visit	never	New Freshman	20-24	i-apply
820	first	random	page	page	Visiting Student	40-49	other-apply
821	first	random	page	page	New Freshman	16-19	i-apply
822	first	alphabetical	never	never	Visiting Student	16-19	i-apply
823	first	random	page	page	International Student	20-24	i-apply
824	first	random	page	page	New Freshman	16-19	think-apply
825	first	popular	page	page	International Student	16-19	i-apply
827	first	alphabetical	visit	never	Transfer Student	16-19	info
828	first	random	visit	never	New Freshman	16-19	i-apply
829	first	popular	never	never	Transfer Student	16-19	think-apply
830	first	random	page	page	New Freshman	16-19	i-apply
831	first	popular	never	never	Transfer Student	16-19	think-apply
832	first	popular	page	page	Visiting Student	30-39	other-think-apply
833	first	alphabetical	visit	never	International Student	20-24	think-apply
834	first	popular	page	page	New Freshman	16-19	i-apply
835	first	popular	never	never	New Freshman	0-15	info
836	first	random	never	never	New Freshman	16-19	i-apply
837	first	random	page	page	Transfer Student	40-49	other-apply
838	first	random	never	never	New Freshman	16-19	i-apply
839	first	random	never	never	New Freshman	16-19	i-apply
840	first	popular	visit	never	Transfer Student	20-24	i-apply
841	first	random	visit	never	New Freshman	16-19	i-apply
844	first	popular	visit	never	New Freshman	20-24	i-apply
845	first	alphabetical	page	page	International Student	20-24	think-apply
846	first	popular	visit	never	Transfer Student	16-19	think-apply
847	first	alphabetical	never	never	New Freshman	20-24	i-apply
848	first	popular	never	never	New Freshman	16-19	i-apply
849	first	popular	page	page	New Freshman	16-19	i-apply

Survey Number	*Survey*	*Order*	*Change1*	*Change2*	*Audience*	*Age*	*Purpose*
850	first	random	page	page	New Freshman	16-19	i-apply
851	first	popular	page	page	New Freshman	16-19	i-apply
852	first	alphabetical	never	never	New Freshman	16-19	info
853	first	alphabetical	visit	never	New Freshman	16-19	i-apply
854	first	random	never	never	New Freshman	20-24	i-apply
855	first	popular	page	page	International Student	16-19	i-apply
856	first	alphabetical	page	page	New Freshman	16-19	i-apply
857	first	random	page	page	International Student	20-24	i-apply
858	first	popular	never	never	New Freshman	16-19	i-apply
859	first	popular	never	never	International Student	20-24	think-apply
860	first	popular	visit	never	New Freshman	16-19	i-apply
861	first	random	page	page	International Student	30-39	info
862	first	alphabetical	visit	never	New Freshman	16-19	i-apply
863	first	random	never	never	New Freshman	16-19	i-apply
864	first	alphabetical	page	page	New Freshman	20-24	info
865	first	random	never	never	International Student	20-24	think-apply
866	first	alphabetical	visit	never	New Freshman	16-19	i-apply
867	first	alphabetical	visit	never	New Freshman	16-19	i-apply
868	first	alphabetical	page	page	New Freshman	16-19	i-apply
870	first	random	page	page	International Student	20-24	other-think-apply
871	first	popular	never	never	New Freshman	16-19	i-apply
872	first	random	page	page	New Freshman	16-19	think-apply
873	first	popular	visit	never	Transfer Student	25-29	think-apply
874	first	random	page	page	International Student	20-24	think-apply
875	first	alphabetical	never	never	New Freshman	16-19	i-apply
876	first	random	never	never	New Freshman	20-24	other-apply
877	first	alphabetical	visit	never	New Freshman	16-19	i-apply

Survey Number	*Survey*	*Order*	*Change1*	*Change2*	*Audience*	*Age*	*Purpose*
878	first	random	page	page	International Student	16-19	think-apply
879	first	random	page	page	International Student	40-49	think-apply
880	first	popular	never	never	International Student	30-39	i-apply
881	first	alphabetical	never	never	New Freshman	16-19	i-apply
882	first	random	page	page	International Student	25-29	i-apply
883	first	popular	visit	never	New Freshman	16-19	i-apply
884	first	popular	visit	never	New Freshman	16-19	i-apply
885	first	popular	visit	never	International Student	16-19	i-apply
886	first	random	visit	never	New Freshman	16-19	i-apply
887	first	alphabetical	never	never	Transfer Student	25-29	i-apply
888	first	random	page	page	New Freshman	16-19	i-apply
889	first	alphabetical	never	never	New Freshman	16-19	i-apply
890	first	alphabetical	page	page	International Student	20-24	think-apply
892	first	random	page	page	New Freshman	16-19	i-apply
894	first	alphabetical	never	never	New Freshman	16-19	i-apply
895	first	popular	never	never	New Freshman	16-19	i-apply
896	first	random	page	page	New Freshman	20-24	info
897	first	alphabetical	page	page	New Freshman	16-19	i-apply
898	first	popular	visit	never	International Student	16-19	info
899	first	alphabetical	never	never	Transfer Student	20-24	i-apply
900	first	alphabetical	visit	never	Transfer Student	16-19	i-apply
901	first	alphabetical	page	page	New Freshman	16-19	i-apply
903	first	popular	visit	never	New Freshman	16-19	i-apply
904	first	random	page	page	International Student	25-29	info
905	first	popular	never	never	International Student	16-19	think-apply
906	first	random	never	never	New Freshman	16-19	i-apply
907	first	alphabetical	page	page	New Freshman	16-19	info

Survey Number	*Survey*	*Order*	*Change1*	*Change2*	*Audience*	*Age*	*Purpose*
908	first	alphabetical	page	page	Visiting Student	70+	other-apply
909	first	random	visit	never	New Freshman	16-19	i-apply
910	first	alphabetical	page	page	New Freshman	16-19	think-apply
912	first	random	never	never	New Freshman	16-19	info
914	first	random	page	page	Transfer Student	16-19	think-apply
915	first	alphabetical	visit	never	New Freshman	40-49	info
916	first	random	never	never	Transfer Student	20-24	i-apply
917	first	popular	page	page	New Freshman	16-19	i-apply
918	first	alphabetical	visit	never	New Freshman	16-19	think-apply
919	first	popular	page	page	International Student	20-24	think-apply
920	first	popular	never	never	New Freshman	16-19	i-apply
922	first	random	page	page	Transfer Student	20-24	i-apply
923	first	alphabetical	page	page	New Freshman	16-19	i-apply
924	first	alphabetical	never	never	Transfer Student	30-39	i-apply
925	first	alphabetical	page	page	New Freshman	16-19	i-apply
926	first	popular	visit	never	New Freshman	16-19	i-apply
927	first	popular	page	page	New Freshman	20-24	info
928	first	popular	visit	never	Concurrent Enrollment	40-49	think-apply
929	first	popular	page	page	Transfer Student	20-24	i-apply
931	first	alphabetical	page	page	International Student	16-19	i-apply
932	first	random	never	never	New Freshman	40-49	other-apply
933	first	random	never	never	International Student	20-24	other-apply
934	first	random	visit	never	New Freshman	30-39	other-apply
935	first	alphabetical	page	page	New Freshman	20-24	think-apply
936	first	alphabetical	never	never	International Student	25-29	other-apply
937	first	alphabetical	visit	never	New Freshman	16-19	i-apply
938	first	random	page	page	New Freshman	16-19	i-apply
939	first	alphabetical	never	never	Transfer Student	20-24	think-apply
940	first	random	page	page	New Freshman	16-19	i-apply

Survey Number	*Survey*	*Order*	*Change1*	*Change2*	*Audience*	*Age*	*Purpose*
941	first	random	visit	never	New Freshman	16-19	i-apply
942	first	alphabetical	page	page	International Student	16-19	info
943	first	alphabetical	never	never	Transfer Student	16-19	other-apply
944	first	alphabetical	never	never	International Student	20-24	info
945	first	popular	visit	never	New Freshman	0-15	think-apply
946	first	random	page	page	International Student	25-29	think-apply
947	first	alphabetical	page	page	International Student	16-19	think-apply
948	first	popular	visit	never	International Student	16-19	think-apply
949	first	popular	visit	never	New Freshman	40-49	other-apply
950	first	alphabetical	visit	never	New Freshman	16-19	info
951	first	alphabetical	page	page	New Freshman	30-39	info
952	first	alphabetical	never	never	New Freshman	0-15	info
953	first	alphabetical	page	page	New Freshman	40-49	other-apply
954	first	alphabetical	visit	never	Transfer Student	20-24	i-apply
955	first	alphabetical	visit	never	New Freshman	20-24	think-apply
956	first	random	page	page	New Freshman	16-19	i-apply
957	first	popular	visit	never	New Freshman	30-39	info
958	first	alphabetical	page	page	New Freshman	16-19	i-apply
959	first	random	visit	never	New Freshman	16-19	i-apply
960	first	alphabetical	never	never	Postbaccalaureate	30-39	think-apply
961	first	popular	visit	never	International Student	16-19	i-apply
962	first	popular	never	never	New Freshman	50-59	info
963	first	popular	visit	never	Former Student	30-39	think-apply
964	first	random	visit	never	New Freshman	16-19	i-apply
965	first	alphabetical	page	page	Concurrent Enrollment	16-19	think-apply
966	first	random	never	never	International Student	20-24	i-apply
967	first	alphabetical	never	never	New Freshman	16-19	info

Survey Number	*Survey*	*Order*	*Change1*	*Change2*	*Audience*	*Age*	*Purpose*
968	first	alphabetical	visit	never	New Freshman	16-19	i-apply
969	first	popular	never	never	New Freshman	16-19	i-apply
970	first	alphabetical	page	page	International Student	30-39	think-apply
971	first	random	never	never	International Student	25-29	other-think-apply
972	first	random	never	never	International Student	16-19	i-apply
973	first	popular	visit	never	International Student	20-24	think-apply
974	first	popular	page	page	New Freshman	50-59	other-apply
975	first	popular	page	page	International Student	25-29	think-apply
976	first	popular	never	never	Transfer Student	16-19	think-apply
977	first	popular	visit	never	New Freshman	16-19	info
978	first	popular	visit	never	Transfer Student	16-19	i-apply
979	first	random	visit	never	New Freshman	16-19	think-apply
980	first	popular	visit	never	International Student	16-19	i-apply
981	first	random	never	never	New Freshman	16-19	info
983	first	random	visit	never	Transfer Student	20-24	think-apply
984	first	random	visit	never	New Freshman	40-49	other-apply
985	first	popular	never	never	New Freshman	16-19	i-apply
986	first	popular	never	never	International Student	25-29	think-apply
987	first	random	page	page	International Student	25-29	think-apply
988	first	random	never	never	International Student	20-24	i-apply
989	first	popular	page	page	New Freshman	16-19	i-apply
990	first	popular	never	never	New Freshman	16-19	think-apply
991	first	popular	never	never	New Freshman	40-49	info
992	first	random	never	never	Postbaccalaureate	40-49	other-think-apply
993	first	popular	page	page	New Freshman	16-19	i-apply
994	first	alphabetical	page	page	Transfer Student	16-19	think-apply

Survey Number	*Survey*	*Order*	*Change1*	*Change2*	*Audience*	*Age*	*Purpose*
995	first	popular	visit	never	International Student	16-19	think-apply
996	first	popular	visit	never	International Student	70+	other-apply
997	first	alphabetical	page	page	International Student	20-24	think-apply
998	first	random	never	never	New Freshman	16-19	info
999	first	popular	page	page	Transfer Student	16-19	i-apply
1000	first	alphabetical	visit	never	New Freshman	16-19	think-apply
1001	first	alphabetical	page	page	Transfer Student	25-29	i-apply
1002	first	alphabetical	page	page	New Freshman	25-29	think-apply
1003	first	random	visit	never	International Student	16-19	i-apply
1004	first	popular	page	page	New Freshman	20-24	think-apply
1005	first	random	visit	never	New Freshman	40-49	other-apply
1006	first	random	page	page	Transfer Student	20-24	think-apply
1007	first	random	visit	never	Transfer Student	25-29	think-apply
1008	first	alphabetical	page	page	International Student	16-19	i-apply
1009	first	random	visit	never	International Student	25-29	i-apply
1010	first	alphabetical	never	never	International Student	20-24	think-apply
1012	first	random	page	page	International Student	20-24	i-apply
1013	first	random	page	page	Transfer Student	50-59	i-apply
1014	first	popular	visit	never	New Freshman	16-19	think-apply
1015	first	popular	never	never	Transfer Student	16-19	think-apply
1016	first	random	visit	never	New Freshman	16-19	i-apply
1017	first	popular	page	page	New Freshman	16-19	i-apply
1018	first	popular	visit	never	New Freshman	16-19	i-apply
1019	first	popular	never	never	New Freshman	40-49	other-apply
1020	first	popular	visit	never	Transfer Student	20-24	i-apply
1021	first	alphabetical	visit	never	New Freshman	40-49	other-apply
1022	first	random	never	never	International Student	20-24	i-apply

Survey Number	*Survey*	*Order*	*Change1*	*Change2*	*Audience*	*Age*	*Purpose*
1023	first	alphabetical	page	page	New Freshman	16-19	i-apply
1024	first	alphabetical	never	never	Transfer Student	40-49	other-think-apply
1025	first	alphabetical	page	page	New Freshman	16-19	other-apply
1026	first	random	never	never	New Freshman	50-59	other-apply
1027	first	popular	page	page	New Freshman	16-19	i-apply
1028	first	popular	visit	never	New Freshman	16-19	info
1030	first	alphabetical	visit	never	New Freshman	20-24	i-apply
1031	first	alphabetical	never	never	New Freshman	16-19	i-apply
1032	first	alphabetical	visit	never	New Freshman	16-19	i-apply
1033	first	popular	never	never	Transfer Student	25-29	other-apply
1034	first	popular	visit	never	International Student	20-24	other-think-apply
1035	first	random	never	never	New Freshman	16-19	i-apply
1036	first	popular	visit	never	Transfer Student	30-39	other-think-apply
1037	first	random	page	page	Transfer Student	16-19	i-apply
1038	first	alphabetical	never	never	International Student	25-29	think-apply
1039	first	random	visit	never	New Freshman	16-19	i-apply
1040	first	random	visit	never	International Student	20-24	i-apply
1041	first	alphabetical	page	page	New Freshman	16-19	i-apply
1042	first	random	page	page	New Freshman	16-19	i-apply
1043	first	random	visit	never	New Freshman	16-19	i-apply
1044	first	alphabetical	visit	never	International Student	20-24	i-apply
1045	first	alphabetical	never	never	New Freshman	16-19	i-apply
1046	first	popular	page	page	Transfer Student	50-59	other-think-apply
1047	first	random	never	never	New Freshman	16-19	i-apply
1048	first	random	page	page	New Freshman	16-19	i-apply
1049	first	popular	page	page	New Freshman	40-49	other-think-apply
1050	first	popular	visit	never	New Freshman	16-19	i-apply

Survey Number	Survey	Order	Change1	Change2	Audience	Age	Purpose
1051	first	popular	never	never	New Freshman	40-49	other-apply
1052	first	random	visit	never	New Freshman	16-19	i-apply
1053	first	popular	never	never	New Freshman	16-19	i-apply
1054	first	alphabetical	page	page	International Student	20-24	think-apply
1055	first	random	visit	never	New Freshman	16-19	i-apply
1056	first	alphabetical	visit	never	New Freshman	16-19	i-apply
1057	first	random	never	never	Transfer Student	16-19	think-apply
1058	first	alphabetical	visit	never	New Freshman	16-19	i-apply
1059	first	random	visit	never	International Student	30-39	think-apply
1060	first	random	never	never	International Student	16-19	info
1061	first	popular	visit	never	International Student	70+	other-apply
1062	first	alphabetical	page	page	International Student	20-24	think-apply
1063	first	random	visit	never	Transfer Student	20-24	other-apply
1064	first	alphabetical	never	never	International Student	20-24	think-apply
1065	first	popular	never	never	International Student	16-19	i-apply
1066	first	alphabetical	page	page	New Freshman	0-15	i-apply
1067	first	alphabetical	never	never	International Student	16-19	think-apply
1068	first	popular	page	page	International Student	16-19	think-apply
1069	first	alphabetical	page	page	New Freshman	0-15	think-apply
1070	first	random	visit	never	International Student	20-24	think-apply
1071	first	alphabetical	page	page	New Freshman	16-19	i-apply
1072	first	popular	page	page	New Freshman	16-19	i-apply
1073	first	random	page	page	Transfer Student	16-19	i-apply
1074	first	random	page	page	New Freshman	16-19	i-apply
1075	first	popular	page	page	Visiting Student	0-15	other-think-apply
1076	first	popular	visit	never	Former Student	50-59	think-apply

Survey Number	*Survey*	*Order*	*Change1*	*Change2*	*Audience*	*Age*	*Purpose*
1077	first	alphabetical	page	page	New Freshman	16-19	i-apply
1078	first	alphabetical	never	never	New Freshman	16-19	i-apply
1079	first	popular	page	page	New Freshman	16-19	i-apply
1080	first	alphabetical	visit	never	International Student	16-19	think-apply
1081	first	alphabetical	visit	never	Transfer Student	30-39	i-apply
1082	first	random	visit	never	New Freshman	16-19	i-apply
1083	first	popular	page	page	International Student	16-19	think-apply
1084	first	popular	visit	never	Transfer Student	30-39	think-apply
1085	first	popular	visit	never	New Freshman	16-19	think-apply
1086	first	random	visit	never	Transfer Student	16-19	other-apply
1087	first	alphabetical	visit	never	Transfer Student	16-19	i-apply
1089	first	alphabetical	page	page	International Student	20-24	think-apply
1090	first	alphabetical	page	page	New Freshman	50-59	other-apply
1091	first	alphabetical	visit	never	New Freshman	20-24	info
1092	first	alphabetical	never	never	New Freshman	20-24	other-apply
1093	first	alphabetical	never	never	International Student	16-19	think-apply
1094	first	random	visit	never	New Freshman	16-19	think-apply
1097	first	random	visit	never	International Student	16-19	i-apply
1098	first	popular	visit	never	New Freshman	60-69	other-apply
1099	first	alphabetical	page	page	New Freshman	16-19	think-apply
1100	first	popular	visit	never	New Freshman	16-19	i-apply
1101	first	alphabetical	visit	never	Transfer Student	20-24	think-apply
1102	first	popular	never	never	New Freshman	16-19	i-apply
1103	first	popular	visit	never	New Freshman	16-19	i-apply
1104	first	popular	never	never	Transfer Student	20-24	i-apply
1105	first	alphabetical	page	page	Transfer Student	50-59	think-apply
1107	first	alphabetical	page	page	New Freshman	16-19	i-apply
1108	first	popular	never	never	New Freshman	16-19	i-apply
1109	first	popular	never	never	Transfer Student	25-29	think-apply

Survey Number	*Survey*	*Order*	*Change1*	*Change2*	*Audience*	*Age*	*Purpose*
1110	first	alphabetical	visit	never	Transfer Student	25-29	think-apply
1111	first	popular	never	never	Postbaccalaureate	30-39	think-apply
1112	first	random	never	never	New Freshman	16-19	think-apply
1113	first	random	page	page	Former Student	25-29	i-apply
1114	first	alphabetical	visit	never	Transfer Student	16-19	other-think-apply
1115	first	popular	page	page	New Freshman	16-19	i-apply
1116	first	random	visit	never	New Freshman	0-15	think-apply
1117	first	random	never	never	New Freshman	16-19	i-apply
1118	first	random	page	page	New Freshman	16-19	i-apply
1119	first	random	page	page	New Freshman	16-19	think-apply
1120	first	popular	visit	never	New Freshman	16-19	i-apply
1121	first	random	visit	never	New Freshman	16-19	i-apply
1122	first	random	page	page	New Freshman	20-24	think-apply
1124	first	alphabetical	never	never	New Freshman	16-19	think-apply
1125	first	alphabetical	page	page	International Student	20-24	think-apply
1126	first	popular	visit	never	International Student	20-24	i-apply
1127	first	popular	page	page	New Freshman	40-49	other-apply
1128	first	alphabetical	visit	never	New Freshman	30-39	other-apply
1130	first	alphabetical	page	page	Transfer Student	20-24	think-apply
1131	first	popular	page	page	Transfer Student	20-24	i-apply
1132	first	popular	page	page	New Freshman	50-59	other-think-apply
1133	first	random	never	never	International Student	16-19	i-apply
1134	first	popular	never	never	Transfer Student	40-49	other-apply
1135	first	popular	never	never	International Student	30-39	think-apply
1136	first	popular	never	never	International Student	20-24	think-apply
1137	first	popular	never	never	New Freshman	16-19	i-apply
1138	first	random	visit	never	New Freshman	0-15	i-apply
1139	first	popular	visit	never	Transfer Student	40-49	think-apply

Survey Number	*Survey*	*Order*	*Change1*	*Change2*	*Audience*	*Age*	*Purpose*
1141	first	random	never	never	New Freshman	30-39	other-apply
1142	first	random	never	never	Visiting Student	16-19	think-apply
1143	first	random	visit	never	New Freshman	20-24	info
1144	first	alphabetical	never	never	International Student	16-19	think-apply
1145	first	popular	never	never	New Freshman	16-19	i-apply
1146	first	popular	visit	never	Former Student	20-24	i-apply
1147	first	random	never	never	New Freshman	0-15	think-apply
1148	first	random	visit	never	International Student	20-24	think-apply
1149	first	random	never	never	New Freshman	16-19	i-apply
1150	first	popular	visit	never	New Freshman	16-19	i-apply
1151	first	alphabetical	never	never	International Student	16-19	i-apply
1153	first	random	page	page	New Freshman	30-39	other-apply
1154	first	alphabetical	visit	never	Visiting Student	16-19	think-apply
1155	first	popular	page	page	International Student	16-19	think-apply
1156	first	random	visit	never	Transfer Student	40-49	other-think-apply
1157	first	popular	page	page	New Freshman	16-19	info
1158	first	random	visit	never	New Freshman	16-19	i-apply
1159	first	random	never	never	Transfer Student	20-24	think-apply
1160	first	alphabetical	page	page	International Student	16-19	i-apply
1162	first	popular	visit	never	Transfer Student	16-19	info
1163	first	popular	never	never	New Freshman	16-19	i-apply
1164	first	alphabetical	never	never	Transfer Student	20-24	think-apply
1165	first	popular	never	never	New Freshman	16-19	info
1166	first	popular	visit	never	New Freshman	16-19	i-apply
1167	first	alphabetical	never	never	International Student	25-29	other-think-apply
1169	first	random	page	page	International Student	25-29	info
1170	first	popular	visit	never	International Student	25-29	think-apply

Survey Number	Survey	Order	Change1	Change2	Audience	Age	Purpose
1171	first	alphabetical	page	page	International Student	16-19	think-apply
1172	first	alphabetical	visit	never	New Freshman	16-19	i-apply
1173	first	random	page	page	Transfer Student	25-29	info
1174	first	alphabetical	page	page	New Freshman	16-19	think-apply
1175	first	popular	never	never	Transfer Student	50-59	other-apply
1176	first	random	never	never	New Freshman	16-19	i-apply
1177	first	popular	visit	never	Visiting Student	25-29	info
1178	first	alphabetical	visit	never	New Freshman	40-49	other-think-apply
1179	first	popular	never	never	International Student	25-29	i-apply
1180	first	random	visit	never	New Freshman	16-19	i-apply
1181	first	random	page	page	Transfer Student	20-24	think-apply
1183	first	alphabetical	visit	never	International Student	16-19	think-apply
1184	first	random	visit	never	New Freshman	16-19	think-apply
1185	first	popular	page	page	New Freshman	16-19	think-apply
1186	first	random	never	never	International Student	30-39	info
1187	first	random	visit	never	New Freshman	16-19	i-apply
1188	first	random	visit	never	International Student	30-39	think-apply
1189	first	alphabetical	page	page	New Freshman	16-19	i-apply
1190	first	random	never	never	Transfer Student	30-39	think-apply
1191	first	random	page	page	Transfer Student	20-24	think-apply
1192	first	alphabetical	never	never	New Freshman	40-49	other-apply
1193	first	alphabetical	never	never	Transfer Student	20-24	think-apply
1194	first	random	visit	never	International Student	16-19	i-apply
1196	first	random	visit	never	International Student	20-24	i-apply
1197	first	alphabetical	page	page	International Student	16-19	info
1198	first	popular	page	page	New Freshman	50-59	other-apply

Survey Number	*Survey*	*Order*	*Change1*	*Change2*	*Audience*	*Age*	*Purpose*
1200	first	popular	visit	never	International Student	20-24	i-apply
1201	first	random	page	page	Visiting Student	16-19	think-apply
1202	first	alphabetical	page	page	International Student	20-24	i-apply
1203	first	popular	page	page	Former Student	16-19	info
1204	first	alphabetical	visit	never	Transfer Student	30-39	other-think-apply
1205	first	alphabetical	page	page	New Freshman	50-59	other-think-apply
1206	first	popular	never	never	New Freshman	16-19	info
1207	first	random	page	page	Transfer Student	20-24	i-apply
1208	first	random	never	never	Transfer Student	20-24	think-apply
1209	first	alphabetical	page	page	New Freshman	16-19	i-apply
1210	first	random	never	never	Transfer Student	16-19	think-apply
1211	first	popular	visit	never	Transfer Student	20-24	think-apply
1212	first	random	page	page	Transfer Student	20-24	think-apply
1213	first	popular	never	never	New Freshman	16-19	i-apply
1214	first	random	page	page	New Freshman	0-15	i-apply
1215	first	alphabetical	visit	never	New Freshman	16-19	i-apply
1216	first	popular	visit	never	New Freshman	16-19	i-apply
1217	first	popular	page	page	International Student	50-59	other-think-apply
1218	first	popular	never	never	Visiting Student	20-24	info
1219	first	alphabetical	page	page	Transfer Student	16-19	think-apply
1220	first	popular	never	never	International Student	30-39	think-apply
1221	first	alphabetical	never	never	New Freshman	40-49	other-think-apply
1223	first	random	never	never	New Freshman	16-19	i-apply
1224	first	popular	page	page	New Freshman	16-19	i-apply
1225	first	alphabetical	page	page	New Freshman	16-19	i-apply
1226	first	alphabetical	never	never	New Freshman	40-49	other-think-apply
1227	first	popular	page	page	New Freshman	16-19	i-apply

Survey Number	*Survey*	*Order*	*Change1*	*Change2*	*Audience*	*Age*	*Purpose*
1228	first	alphabetical	visit	never	Transfer Student	16-19	i-apply
1229	first	random	visit	never	New Freshman	20-24	think-apply
1230	first	popular	never	never	Transfer Student	40-49	other-think-apply
1231	first	popular	visit	never	Transfer Student	20-24	think-apply
1232	first	alphabetical	page	page	Transfer Student	16-19	i-apply
1233	first	alphabetical	never	never	International Student	20-24	think-apply
1234	first	random	page	page	New Freshman	30-39	i-apply
1235	first	alphabetical	page	page	International Student	20-24	info
1236	first	random	visit	never	International Student	25-29	i-apply
1237	first	random	never	never	New Freshman	16-19	i-apply
1238	first	random	page	page	Transfer Student	16-19	i-apply
1240	first	popular	page	page	New Freshman	40-49	other-think-apply
1241	first	random	page	page	Transfer Student	16-19	think-apply
1242	first	alphabetical	visit	never	Concurrent Enrollment	16-19	info
1243	first	random	never	never	Transfer Student	16-19	think-apply
1244	first	popular	page	page	New Freshman	0-15	think-apply
1245	first	random	page	page	International Student	20-24	think-apply
1246	first	popular	visit	never	New Freshman	16-19	i-apply
1247	first	random	visit	never	New Freshman	16-19	think-apply
1248	first	alphabetical	page	page	Transfer Student	25-29	think-apply
1249	first	alphabetical	never	never	New Freshman	16-19	i-apply
1250	first	alphabetical	never	never	New Freshman	16-19	i-apply
1251	first	random	page	page	New Freshman	16-19	i-apply
1252	first	random	visit	never	Transfer Student	16-19	i-apply
1253	first	popular	page	page	New Freshman	40-49	other-apply
1254	first	popular	never	never	International Student	16-19	think-apply

Survey Number	*Survey*	*Order*	*Change1*	*Change2*	*Audience*	*Age*	*Purpose*
1255	first	alphabetical	visit	never	New Freshman	16-19	i-apply
1256	first	alphabetical	visit	never	Transfer Student	16-19	info
1257	first	random	visit	never	New Freshman	20-24	think-apply
1258	first	random	page	page	New Freshman	16-19	i-apply

Qualitative Survey Data

Survey Number	*Efficacy*		*Effective*			*Efficient*		*Satisfice*		
	1	**2**	**1**	**2**	**3**	**1**	**2**	**1**	**2**	**3**
2	81	69	50	50	72	58	62	60	78	57
3	89	70	70	63	50	50	70	42	68	53
4	100	92	85	66	74	66	75	70	88	72
5	51	52	90	73	52	52	73	79	50	79
6	75	67	100	80	70	60	73	65	70	79
7	89	70	49	70	71	35	69	86	60	70
8	50	50	70	70	70	70	78	70	50	69
9	90	59	99	100	91	66	80	96	50	63
10	90	90	91	90	71	91	92	92	90	92
12	88	83	91	91	74	69	76	91	51	81
13	71	70	90	70	69	29	30	70	90	69
14	89	91	67	55	70	56	71	57	54	75
15	89	91	67	55	70	56	71	57	54	75
16	71	70	77	70	90	90	73	70	77	89
17	70	72	69	90	70	70	69	71	92	73
18	73	70	71	9	36	63	60	24	61	29
19	84	87	50	37	66	34	39	66	62	58
22	71	34	43	51	0	38	0	35	32	40
23	70	90	73	52	70	69	70	69	69	69
24	87	93	69	72	70	60	54	50	51	70
25	70	70	70	72	71	70	90	70	90	71
26	78	80	81	83	78	81	78	78	86	82
28	100	100	100	100	100	100	100	100	80	99
29	90	87	70	70	71	70	69	69	52	69
30	70	71	90	70	70	70	70	70	50	69
31	90	78	92	89	70	69	70	71	65	69
32	88	70	50	71	69	93	70	72	73	67
33	85	82	80	80	70	60	68	75	55	71
34	90	70	80	71	70	70	70	70	63	69
35	73	52	96	100	68	43	56	50	43	71

Survey Number	Efficacy		Effective			Efficient		Satisfice		
	1	2	1	2	3	1	2	1	2	3
36	90	54	51	69	49	49	51	51	51	51
37	78	74	75	58	71	39	56	57	62	83
38	91	70	75	70	94	93	92	93	88	95
39	60	34	72	65	79	74	69	66	34	35
40	78	78	69	78	70	63	71	65	70	70
41	89	91	69	62	68	50	70	53	89	77
42	68	67	66	68	71	67	72	70	72	69
43	70	69	69	70	70	69	70	70	70	70
45	70	70	90	90	70	70	70	70	91	69
46	70	73	69	89	70	71	70	75	67	67
47	69	50	69	71	70	70	70	70	69	70
48	31	31	50	65	70	50	31	31	36	28
49	70	73	90	84	75	79	81	90	90	78
50	100	100	0	10	0	0	0	0	0	0
51	91	88	90	92	69	89	89	69	90	90
52	93	91	28	25	44	59	69	22	55	61
53	70	70	70	70	69	70	70	70	71	70
54	90	57	89	90	100	85	51	70	73	72
55	91	77	93	70	62	68	59	62	55	70
56	83	93	79	75	70	71	81	78	69	59
57	100	100	89	79	79	86	79	75	92	84
58	75	78	63	74	56	70	61	53	49	61
59	78	83	74	80	52	71	71	79	85	70
60	70	70	91	90	70	70	89	70	71	31
62	81	79	73	90	71	64	66	68	62	93
64	100	100	100	91	88	89	87	73	80	80
65	72	70	92	89	90	71	90	90	91	90
66	62	90	90	93	70	72	90	70	69	89
67	71	72	90	91	84	82	74	70	67	76
68	60	58	69	69	57	59	31	59	56	68
69	100	100	96	98	98	100	100	100	99	100
70	70	70	69	70	28	28	30	29	29	71

Survey Number	Efficacy		Effective			Efficient		Satisfice		
	1	2	1	2	3	1	2	1	2	3
71	90	57	87	89	90	87	89	86	90	85
73	80	87	54	65	57	58	56	81	53	72
74	90	89	88	89	71	90	89	90	88	92
75	51	100	57	30	38	43	41	37	43	42
76	78	91	82	100	69	94	100	79	100	89
77	100	93	87	92	58	75	54	66	52	62
78	100	100	100	100	100	100	100	100	100	100
79	72	77	78	78	72	79	78	72	80	85
80	72	73	70	71	100	71	70	98	70	70
81	91	100	91	90	98	99	100	100	100	89
82	89	90	69	89	70	91	70	89	88	70
83	68	70	77	75	68	70	79	74	71	76
84	91	91	70	89	91	70	70	70	70	69
85	70	72	70	87	70	70	70	70	65	70
86	100	100	88	85	77	95	87	95	100	84
87	68	46	70	51	31	70	54	52	53	53
88	90	100	86	78	89	87	78	89	76	100
89	70	70	72	70	30	28	32	30	29	68
90	69	66	30	70	69	52	52	52	52	54
91	81	76	69	68	63	70	63	70	60	62
92	96	96	97	86	71	70	96	88	70	87
93	98	92	93	91	96	91	90	90	94	91
95	97	90	90	80	88	94	87	92	83	86
96	70	89	70	70	70	70	90	90	70	70
97	78	76	71	72	70	73	83	82	71	82
98	79	76	90	95	90	77	90	91	70	83
99	88	82	74	90	93	79	82	87	68	83
100	90	90	92	92	69	69	70	70	68	68
101	92	100	90	83	75	90	79	80	69	90
102	89	88	91	92	71	70	70	75	62	75
103	83	78	100	81	69	70	79	72	90	81
104	91	88	89	90	90	89	88	71	92	91

Survey Number	Efficacy		Effective			Efficient		Satisfice		
	1	2	1	2	3	1	2	1	2	3
105	89	71	70	89	90	70	70	69	70	69
106	100	100	95	31	21	29	67	35	71	33
107	90	91	90	92	91	88	90	89	92	90
108	91	87	88	82	91	91	87	89	77	92
109	91	87	70	91	69	70	70	70	70	71
110	62	55	56	53	67	57	52	48	52	55
111	81	77	84	85	70	71	81	92	95	80
112	89	94	75	81	94	72	79	90	84	78
113	100	100	83	88	79	100	81	79	98	92
114	78	69	79	80	50	66	50	76	46	50
115	68	68	71	69	88	69	68	69	69	68
116	98	89	72	88	74	79	75	67	72	68
117	67	68	93	90	70	69	70	71	70	70
118	100	90	93	79	91	100	70	85	100	92
119	68	56	50	70	50	63	59	58	68	65
120	90	89	100	90	70	82	69	70	72	79
121	94	95	90	89	100	84	100	88	90	83
122	89	93	89	93	90	71	95	70	89	74
123	71	93	71	83	63	59	68	68	69	70
124	20	38	47	33	0	53	19	33	50	33
125	72	90	30	71	71	32	68	70	70	91
126	68	89	65	92	91	66	70	91	89	70
127	75	72	72	50	70	70	56	56	50	65
128	89	88	71	71	69	70	71	68	68	71
129	71	63	57	69	60	64	36	67	63	40
130	70	70	91	71	70	70	91	70	70	70
131	71	69	69	72	71	69	70	69	70	88
132	89	59	50	73	70	58	58	50	67	68
133	77	70	71	89	71	90	71	92	66	66
134	91	84	90	81	80	70	84	80	90	85
135	90	90	90	50	90	91	90	90	90	90
136	100	100	100	100	100	100	100	100	100	100

Survey Number	Efficacy		Effective			Efficient		Satisfice		
	1	2	1	2	3	1	2	1	2	3
137	62	67	69	63	63	70	69	69	52	59
138	88	90	91	92	89	90	70	91	89	91
140	71	43	59	70	57	57	46	61	38	66
141	91	90	91	90	71	70	95	69	69	75
142	91	90	90	90	70	70	70	71	90	71
143	70	70	71	90	70	70	89	70	70	74
144	90	70	65	71	70	69	70	69	70	69
145	10	32	80	90	30	29	70	70	67	50
146	71	71	70	91	70	70	70	69	71	90
147	80	80	70	71	91	80	50	80	61	70
148	55	54	96	91	89	64	54	67	90	89
149	99	99	70	80	70	80	70	70	78	91
150	91	78	90	90	69	70	69	70	91	70
151	74	74	100	100	74	66	69	71	81	82
152	51	60	67	71	72	57	70	71	72	72
153	71	71	71	90	70	71	70	70	70	70
154	91	88	90	89	90	69	91	87	69	68
155	94	92	96	96	92	71	95	93	71	92
156	94	92	96	96	92	71	95	93	71	92
157	94	92	96	96	92	71	95	93	71	92
158	100	100	100	100	97	66	99	70	100	100
159	72	69	89	90	69	29	89	72	70	89
161	88	54	92	69	69	63	69	68	65	69
162	53	39	70	71	70	56	44	69	53	82
163	42	40	59	50	74	54	58	61	58	70
164	87	86	90	95	76	92	69	74	72	78
165	68	76	73	76	69	47	46	63	52	59
166	100	100	50	50	58	50	55	58	57	55
167	99	100	99	88	99	100	91	100	99	100
168	85	83	85	78	82	83	81	80	83	90
169	70	81	71	71	77	67	43	71	71	70
170	43	58	59	50	57	31	50	50	100	90

Survey Number	Efficacy		Effective			Efficient		Satisfice		
	1	2	1	2	3	1	2	1	2	3
171	70	71	69	71	70	69	70	70	73	69
173	72	89	90	90	93	72	72	71	89	88
174	98	82	69	66	85	86	76	66	86	82
175	65	81	70	68	89	89	69	73	90	71
176	32	50	69	70	70	9	30	31	36	50
177	68	68	70	69	70	68	70	69	50	71
178	71	70	70	69	70	71	69	71	71	79
180	70	67	69	68	70	70	64	82	75	70
181	100	98	93	100	100	70	70	68	95	69
182	92	93	91	83	80	70	86	70	70	99
183	78	84	73	100	81	67	74	68	72	68
184	81	73	80	73	83	68	79	75	75	73
186	71	70	33	30	30	30	30	32	50	30
187	69	70	70	89	100	70	50	69	91	70
188	69	60	69	64	32	29	31	30	69	42
189	69	71	69	91	70	71	70	70	50	84
191	99	100	100	100	71	74	62	71	90	87
192	89	100	92	87	72	91	71	91	73	83
193	70	65	72	72	71	71	71	73	67	71
195	91	100	91	92	84	50	90	100	70	91
196	71	92	87	89	68	87	89	68	88	83
197	68	69	50	68	68	50	68	69	50	67
198	79	78	91	50	91	76	69	89	53	71
199	85	85	87	89	95	84	83	88	77	85
200	93	92	69	79	73	75	55	69	50	67
201	96	69	70	91	70	90	94	70	70	70
202	70	73	69	50	40	33	40	70	32	58
203	94	91	94	82	89	94	92	91	96	82
204	70	51	53	62	55	56	55	58	47	53
205	45	45	45	68	45	33	43	39	44	45
207	91	66	51	72	58	63	53	56	57	71
208	66	50	46	36	66	49	42	50	64	75

Survey Number	Efficacy		Effective			Efficient		Satisfice		
	1	2	1	2	3	1	2	1	2	3
209	30	70	68	30	69	29	9	30	70	30
210	95	99	53	66	56	75	67	69	65	46
211	92	94	90	81	70	72	69	70	68	68
212	70	71	69	71	70	70	70	70	71	71
213	52	83	92	69	43	55	36	70	49	51
214	87	89	90	90	70	69	91	70	89	92
215	65	61	77	63	70	40	43	68	64	63
216	93	94	92	92	98	96	97	90	96	98
217	96	100	100	99	93	70	100	100	84	92
218	71	92	71	100	92	70	70	90	71	89
219	81	78	91	80	82	76	80	81	81	75
220	81	78	91	80	82	76	80	81	81	75
221	71	70	67	70	69	66	66	67	70	69
222	80	83	75	76	70	81	91	78	91	78
223	85	88	89	100	91	74	74	72	75	79
224	79	83	89	95	81	82	84	88	97	86
225	52	44	71	69	33	53	32	34	45	36
226	100	71	100	100	70	99	56	52	59	80
227	93	89	57	50	35	32	17	41	34	30
228	70	79	81	79	71	67	57	73	51	72
229	90	66	91	93	70	69	60	72	72	59
230	91	94	93	71	90	52	100	92	92	93
232	73	90	90	81	77	70	70	75	73	79
233	70	69	65	63	72	61	69	61	61	57
234	69	68	30	50	70	71	70	50	30	30
235	30	20	29	50	30	30	11	71	10	20
236	93	87	77	90	60	79	69	70	80	70
237	70	90	70	90	70	70	70	76	90	71
238	90	71	70	90	70	69	69	70	68	71
239	100	99	100	100	100	100	100	72	100	100
240	70	68	83	74	71	68	77	70	69	67
241	69	82	94	79	77	60	88	75	59	69

Survey Number	Efficacy		Effective			Efficient		Satisfice		
	1	2	1	2	3	1	2	1	2	3
242	68	69	59	70	59	29	31	70	70	70
243	68	69	59	70	59	29	31	70	70	70
244	69	68	88	81	87	70	69	72	67	69
245	92	91	67	85	79	79	94	88	86	85
246	88	90	90	90	73	77	90	71	70	82
247	100	100	98	94	98	100	81	100	81	95
248	91	90	89	89	99	94	70	92	89	88
250	78	88	78	97	94	74	80	87	82	83
251	78	88	78	97	94	74	80	87	82	83
252	89	93	90	90	69	89	88	69	57	89
253	89	89	85	69	89	94	94	88	88	84
254	91	92	92	72	90	92	90	92	91	71
255	67	64	68	70	71	69	70	63	66	66
256	89	100	81	96	70	50	59	79	72	70
257	90	70	90	70	70	70	70	70	69	70
258	88	89	29	72	70	70	91	71	85	71
259	53	64	100	91	60	64	70	67	69	69
260	59	61	66	91	69	71	69	67	50	64
262	92	77	69	88	71	77	88	73	69	70
263	71	69	70	90	70	69	70	69	70	70
264	92	90	69	90	90	90	89	90	89	90
265	21	29	65	57	55	31	16	90	18	13
266	99	100	100	50	70	70	100	70	70	70
267	71	59	100	91	91	69	100	100	69	82
268	89	92	30	31	70	31	30	30	31	29
269	89	92	30	31	70	31	30	30	31	29
270	100	100	100	100	100	100	100	100	100	100
271	74	70	77	91	71	70	77	76	69	82
272	81	70	50	50	10	19	30	55	10	19
273	91	70	70	70	57	58	70	70	50	70
274	70	87	91	71	85	90	71	89	70	82
275	93	100	85	83	71	71	71	73	67	70

Survey Number	Efficacy		Effective			Efficient		Satisfice		
	1	2	1	2	3	1	2	1	2	3
276	49	52	50	47	40	30	50	51	50	50
277	90	81	70	77	68	73	70	70	72	83
278	66	88	71	43	71	63	90	62	72	67
279	72	75	73	100	70	78	79	73	71	94
280	70	90	71	71	89	90	70	68	70	89
281	68	71	70	70	70	30	69	69	70	69
282	75	76	78	81	98	97	93	97	100	100
283	59	59	50	99	70	71	70	70	71	71
284	71	70	71	71	70	70	70	70	68	70
286	73	90	79	50	74	70	78	92	62	54
287	89	70	89	97	91	91	91	94	70	100
289	69	71	73	71	70	62	86	66	70	70
290	90	91	11	50	11	10	10	12	70	32
291	90	91	90	89	89	88	90	91	91	89
292	72	81	35	10	8	11	17	7	2	3
293	84	87	88	86	75	69	71	70	68	71
294	91	71	74	69	72	71	70	71	70	70
295	100	100	100	100	100	100	100	100	70	100
296	70	69	77	71	71	44	65	56	70	66
297	88	75	91	90	79	90	77	76	76	79
298	52	53	91	52	53	50	52	54	55	52
299	87	88	81	72	85	90	74	80	86	88
300	60	62	52	100	60	53	52	55	80	52
301	91	81	90	90	82	90	71	79	84	69
302	71	70	86	72	70	70	70	70	70	93
303	92	91	91	91	90	70	89	70	70	91
304	89	83	37	70	35	23	38	55	50	53
305	90	90	50	71	70	69	50	71	70	69
306	91	88	80	81	65	76	72	73	75	82
307	90	90	90	90	82	65	56	72	84	79
308	100	100	100	100	100	100	100	100	100	100
309	80	80	70	70	70	70	70	70	50	70

Survey Number	Efficacy		Effective			Efficient		Satisfice		
	1	2	1	2	3	1	2	1	2	3
312	32	29	74	80	91	78	78	79	99	74
313	79	95	75	90	78	65	75	67	93	70
314	91	76	100	90	78	87	87	100	91	80
315	90	91	90	80	90	70	90	78	70	70
316	89	76	89	69	72	70	71	69	70	70
317	95	93	67	68	68	67	69	69	69	32
318	90	91	69	70	90	70	70	70	90	70
319	78	96	87	100	78	100	86	92	92	75
320	61	66	64	62	70	64	61	66	70	77
321	76	81	50	47	52	51	41	51	48	47
323	48	47	70	70	56	70	63	53	52	71
324	77	90	90	90	90	70	61	80	79	69
325	64	61	56	59	43	43	39	62	65	56
327	67	69	23	30	23	32	30	27	16	26
328	33	58	32	67	40	46	70	62	31	44
329	68	72	69	74	69	69	86	70	86	70
330	70	71	70	71	71	70	70	70	70	72
331	91	91	91	50	73	66	71	70	76	63
332	71	70	68	71	72	69	71	69	72	73
333	94	73	91	95	73	95	93	94	89	72
334	70	70	70	90	30	30	29	70	70	70
335	90	89	89	72	73	70	81	68	89	81
336	74	88	66	69	61	77	54	61	60	70
337	87	87	90	89	72	70	68	92	50	70
338	89	90	90	90	70	89	91	89	69	91
339	100	100	99	99	99	100	82	80	70	100
340	69	70	50	50	91	29	70	71	70	68
341	71	70	89	71	92	70	69	59	71	71
342	68	69	92	68	91	67	70	88	70	75
343	71	73	67	50	90	88	81	77	57	73
344	68	72	23	37	55	53	50	50	54	69
345	94	88	50	71	43	70	61	71	56	75

Survey Number	Efficacy		Effective			Efficient		Satisfice		
	1	2	1	2	3	1	2	1	2	3
346	70	70	70	50	78	70	70	70	70	83
347	70	89	89	100	70	91	91	71	70	71
348	70	30	70	29	70	71	70	31	70	70
349	70	71	68	50	70	89	70	69	89	69
350	91	90	90	89	91	89	90	91	90	89
351	91	90	90	89	91	89	90	91	90	89
352	81	85	88	86	91	84	88	71	72	81
353	94	94	65	70	71	67	71	70	53	68
354	97	84	82	84	80	91	70	77	70	87
355	50	45	30	10	30	69	42	29	50	50
356	66	60	70	59	70	54	72	53	55	60
357	73	78	70	84	75	76	70	77	72	77
358	73	68	68	71	68	70	71	69	72	70
359	72	91	91	73	71	73	71	89	74	75
360	70	78	91	75	70	70	79	78	50	50
361	91	86	89	89	91	90	70	89	90	90
362	58	59	72	50	70	59	70	60	57	64
363	100	92	94	96	97	94	100	91	94	95
364	70	62	74	50	55	63	57	69	50	67
365	90	90	29	70	29	30	29	29	30	29
368	73	91	91	69	71	70	82	71	70	75
369	96	74	71	71	50	72	50	76	100	67
370	90	68	70	70	70	69	69	90	90	90
371	100	78	90	82	70	83	70	79	70	78
372	70	70	80	18	70	71	79	70	70	78
373	31	31	91	50	29	50	30	43	70	67
374	44	57	32	36	55	29	41	55	44	51
375	80	76	72	82	80	76	74	73	82	76
376	65	69	69	76	74	62	73	73	43	69
377	90	100	69	70	70	31	70	30	30	70
378	74	84	78	76	70	69	69	70	50	79
379	70	59	89	70	70	59	70	59	44	71

Survey Number	Efficacy		Effective			Efficient		Satisfice		
	1	2	1	2	3	1	2	1	2	3
381	90	70	70	71	71	71	70	70	50	70
382	86	86	86	62	69	60	56	57	58	63
383	46	41	45	70	70	58	69	61	69	57
384	100	100	100	100	100	100	98	100	100	100
385	70	73	100	100	88	99	94	70	71	100
386	32	50	34	71	69	70	70	69	50	70
387	90	91	90	93	91	93	70	94	92	92
388	69	73	50	70	70	69	12	69	70	68
389	82	78	100	85	79	81	100	84	81	82
390	72	88	67	67	71	90	70	66	70	94
391	70	72	72	72	71	71	68	69	67	70
392	70	70	91	70	90	70	70	70	51	57
393	85	70	83	90	69	70	82	70	71	84
395	71	71	69	90	88	69	29	71	69	30
396	65	65	85	85	75	70	70	71	95	78
397	71	71	70	70	71	70	70	70	71	69
398	90	71	71	90	70	89	70	71	69	93
400	100	100	85	68	73	70	70	61	50	97
401	70	70	73	72	74	64	70	69	60	71
402	70	70	72	91	70	69	70	72	70	70
403	68	75	73	75	70	59	75	71	71	80
404	93	98	100	99	100	93	99	93	90	99
405	73	75	78	75	72	72	69	100	71	71
406	78	76	78	42	78	81	83	20	83	83
408	61	59	70	54	81	57	69	58	79	76
409	88	76	70	80	82	74	91	70	63	71
410	68	92	95	94	91	89	90	92	92	90
411	79	70	61	68	58	53	61	69	57	69
412	71	68	67	69	76	72	71	92	68	70
413	71	73	70	71	71	70	70	71	70	70
414	68	70	69	71	71	70	69	70	72	67
415	100	92	100	91	69	69	90	100	100	87

Survey Number	Efficacy		Effective			Efficient		Satisfice		
	1	2	1	2	3	1	2	1	2	3
416	75	79	80	81	94	0	100	30	82	100
417	78	58	70	77	70	70	70	60	40	71
418	97	77	71	70	90	71	71	81	70	81
419	92	71	71	71	73	73	72	71	72	71
420	69	71	70	71	70	71	71	71	70	72
421	91	100	90	90	70	100	100	70	91	100
422	68	0	0	0	0	11	31	0	67	32
423	90	91	90	90	90	70	90	70	90	91
424	72	90	90	69	71	69	69	69	70	30
425	69	52	91	70	70	69	70	70	50	69
426	70	70	89	70	71	71	71	71	70	88
427	100	100	100	100	100	71	100	100	72	100
428	40	70	50	71	50	50	29	61	70	39
429	75	70	83	100	83	71	76	83	86	84
430	85	70	92	73	69	70	70	71	78	78
431	58	62	63	63	69	60	59	59	58	63
432	87	94	50	50	22	50	32	26	25	26
433	90	69	80	71	73	90	92	71	71	73
434	71	70	68	50	71	93	91	70	91	73
435	70	70	69	89	70	70	69	69	91	71
436	71	71	81	70	59	63	69	55	68	63
437	67	68	56	69	53	63	49	69	57	58
438	46	55	59	62	43	54	57	56	63	46
439	100	100	100	100	100	100	100	100	100	100
441	83	63	82	79	72	69	65	70	42	73
442	90	92	91	50	92	90	89	90	91	90
443	68	55	51	58	62	51	49	69	51	54
445	58	51	70	70	89	70	51	61	71	58
446	70	69	90	71	70	70	70	69	66	70
447	72	90	69	69	70	70	69	90	69	70
448	100	100	81	99	70	70	90	69	66	61
449	94	92	87	91	89	91	91	93	89	90

Survey Number	Efficacy		Effective			Efficient		Satisfice		
	1	2	1	2	3	1	2	1	2	3
451	54	71	50	50	35	50	50	50	60	50
452	74	74	93	86	86	73	77	75	86	80
453	95	71	85	91	70	93	93	100	72	70
454	69	69	70	71	70	89	70	70	70	70
455	70	70	91	70	71	70	70	70	67	70
456	100	70	81	81	67	70	70	70	70	82
457	71	68	90	89	91	71	91	88	90	90
458	90	93	90	89	94	100	93	71	92	89
459	70	80	67	89	49	53	56	58	50	69
460	91	91	96	89	100	95	93	93	90	100
461	60	56	70	73	65	59	70	80	61	60
462	70	71	71	70	29	71	30	70	70	29
463	79	79	70	50	69	66	69	51	77	60
464	50	74	70	90	57	60	36	69	69	50
465	71	76	61	62	67	62	55	63	56	59
466	70	70	70	84	93	100	93	100	79	99
467	63	54	69	71	63	69	68	66	59	69
468	69	69	69	69	70	29	70	70	50	69
469	71	71	67	71	70	70	70	69	70	66
470	70	69	71	91	70	71	70	70	69	88
471	91	68	71	70	71	90	71	71	55	71
472	70	70	70	70	70	70	70	69	68	71
473	60	70	69	90	70	71	70	70	72	70
474	100	97	99	99	99	97	94	88	99	85
475	85	78	70	78	46	48	64	69	51	57
476	91	71	70	70	70	90	90	70	71	91
477	59	57	70	89	69	69	69	70	79	66
478	70	70	50	71	70	70	80	70	61	91
479	85	92	89	90	86	76	100	87	75	86
480	42	41	86	93	79	69	76	74	73	86
481	72	64	64	64	60	63	65	58	64	62
482	100	72	70	70	30	50	71	50	30	70

Survey Number	Efficacy		Effective			Efficient		Satisfice		
	1	2	1	2	3	1	2	1	2	3
483	71	70	69	69	90	69	70	70	70	70
484	72	72	70	81	99	80	70	80	67	72
485	70	91	90	90	70	90	90	69	90	90
486	100	90	100	90	91	100	91	89	90	100
487	76	76	82	91	70	90	86	79	97	93
488	92	83	82	87	87	95	83	85	84	80
489	87	85	42	40	75	34	47	55	84	26
490	69	70	90	70	70	70	70	70	53	71
491	71	90	81	66	70	56	70	70	71	71
492	70	100	82	82	95	70	80	94	79	90
493	74	70	66	70	70	54	67	61	62	80
494	95	100	100	82	83	94	100	100	80	100
495	70	72	100	86	83	71	90	66	71	71
497	90	89	91	70	91	91	90	91	91	91
498	98	89	100	93	93	77	86	76	87	88
499	94	68	95	91	71	89	30	71	71	89
500	72	68	68	91	70	72	70	71	71	70
502	75	70	73	71	89	65	87	74	76	76
503	100	96	100	80	100	64	80	84	100	80
504	91	89	50	50	30	10	10	9	8	9
505	75	93	91	85	81	82	86	94	72	88
506	42	37	87	91	88	69	83	54	71	79
507	87	86	75	71	76	83	69	73	76	79
508	70	70	71	71	70	71	70	69	53	70
509	70	91	90	71	70	70	90	69	90	70
510	51	62	75	77	40	42	36	30	76	41
511	79	79	91	69	90	79	87	78	59	94
512	91	68	92	31	71	70	29	70	69	71
513	68	69	70	91	69	52	50	69	68	69
514	71	71	72	80	70	70	70	71	71	81
515	93	93	72	69	74	72	71	63	32	69
516	96	99	81	83	94	85	95	79	59	72

Survey Number	Efficacy		Effective			Efficient		Satisfice		
	1	2	1	2	3	1	2	1	2	3
517	80	78	70	83	70	78	70	83	89	89
518	83	100	60	76	83	82	70	71	91	82
519	86	86	87	95	90	100	81	100	89	86
520	83	76	72	70	70	69	58	61	39	42
521	70	71	70	69	70	70	70	70	70	68
522	66	54	91	91	70	69	91	70	69	56
523	74	75	80	84	97	80	76	90	80	82
524	87	89	89	88	69	63	75	89	99	89
525	71	70	68	88	68	64	69	71	60	54
526	70	80	85	91	78	74	91	78	79	83
527	89	91	89	90	71	70	70	70	70	70
528	70	100	71	100	69	70	100	99	71	71
529	90	91	91	90	71	89	91	71	91	89
530	72	89	30	29	9	29	9	10	30	10
531	89	92	50	91	31	30	30	27	28	25
532	99	99	99	99	99	100	100	100	99	100
534	71	71	71	73	71	69	71	68	71	72
535	84	80	86	83	70	80	70	74	70	94
536	30	30	58	71	70	68	90	70	79	81
537	81	91	70	70	70	30	70	30	70	70
539	69	72	63	70	68	71	71	72	68	67
540	70	68	71	69	70	72	70	70	52	69
541	70	67	70	70	70	68	69	69	70	67
542	80	71	57	89	30	30	30	30	29	50
543	88	87	89	90	82	78	70	84	80	89
544	100	100	30	30	25	9	69	4	70	28
545	62	67	69	91	70	59	70	69	61	70
546	95	71	91	70	70	29	70	71	70	70
547	70	99	50	50	91	70	50	71	70	89
548	70	70	70	70	70	69	71	69	70	71
549	88	97	100	90	100	94	72	69	78	68
550	91	68	70	91	66	70	66	68	84	90

Survey Number	Efficacy		Effective			Efficient		Satisfice		
	1	2	1	2	3	1	2	1	2	3
551	86	100	100	88	87	72	95	71	80	93
552	61	67	72	97	52	47	55	53	49	53
553	56	60	73	79	70	70	70	71	71	68
554	71	72	69	69	67	71	71	71	78	71
555	70	69	83	97	83	73	78	78	74	86
558	96	87	39	36	57	28	57	38	58	60
559	100	100	100	100	92	100	100	96	100	100
560	100	100	70	70	77	77	63	89	50	71
562	70	69	89	69	71	71	89	89	69	69
563	30	31	69	90	89	88	90	91	70	91
565	91	69	90	91	70	70	70	69	69	88
566	27	30	30	50	70	29	70	70	50	50
567	69	62	62	70	69	57	70	56	61	64
568	100	92	88	84	78	94	85	83	62	90
569	89	100	70	90	88	100	100	70	71	79
570	70	31	71	30	30	69	70	30	68	32
571	62	70	55	50	47	47	53	47	89	47
572	92	70	91	91	69	69	69	70	50	70
573	56	69	71	63	76	58	60	56	58	61
574	71	70	60	71	70	70	70	72	50	70
575	71	71	67	90	70	68	70	69	70	70
576	91	92	50	49	69	45	30	32	44	54
577	70	70	70	50	70	30	69	69	72	70
578	90	89	90	90	90	88	90	90	87	90
579	70	70	69	70	70	69	92	90	70	69
580	70	71	81	70	70	70	71	69	69	70
581	70	70	63	70	69	62	70	71	70	68
582	87	90	91	80	74	72	80	84	95	81
583	100	99	100	100	100	92	100	91	97	100
584	90	89	91	89	90	90	31	89	70	71
585	87	59	91	77	77	70	57	44	84	50
586	64	71	73	73	63	70	84	62	54	68

Survey Number	Efficacy		Effective			Efficient		Satisfice		
	1	2	1	2	3	1	2	1	2	3
590	58	63	70	69	69	69	59	69	49	60
591	70	79	73	90	70	70	81	80	92	80
592	70	70	50	69	69	70	90	70	50	70
593	10	29	70	71	90	91	98	90	89	71
594	70	71	90	72	71	72	72	72	69	71
595	100	100	94	90	77	56	61	65	72	70
596	50	70	70	70	71	50	56	50	72	70
597	92	81	100	83	80	78	82	27	60	69
598	70	70	68	99	89	88	70	71	86	69
599	92	70	71	70	70	70	70	69	71	70
600	89	71	91	70	71	70	90	71	70	71
601	69	91	56	84	70	71	55	72	84	71
602	71	69	91	71	89	70	90	70	89	71
603	100	100	77	71	92	83	87	87	81	69
604	71	91	88	90	88	89	89	69	91	89
605	70	70	70	70	70	70	70	70	70	70
606	90	90	92	71	54	33	70	70	31	69
607	46	52	56	31	63	51	51	41	50	56
608	90	90	91	70	71	70	90	70	73	70
609	69	92	92	71	89	71	90	70	70	89
610	91	100	50	61	38	34	69	68	43	40
611	90	90	70	70	70	70	70	70	71	90
612	70	70	73	69	70	71	70	70	71	69
613	79	100	80	89	74	67	80	80	68	79
614	73	86	100	100	85	88	91	88	70	89
615	91	70	90	71	70	69	70	70	90	92
616	71	71	99	100	71	54	70	71	54	71
618	100	0	32	39	0	6	0	5	0	0
619	70	69	69	70	70	69	90	69	70	70
620	87	95	80	78	89	71	79	75	89	89
621	87	70	89	92	90	89	89	92	86	89
622	71	64	53	79	48	33	36	52	50	62

Survey Number	Efficacy		Effective			Efficient		Satisfice		
	1	2	1	2	3	1	2	1	2	3
623	94	77	87	100	100	82	100	98	76	69
624	79	85	96	82	94	93	92	92	94	90
625	58	98	79	91	71	91	70	71	93	89
626	71	71	50	70	91	89	71	71	70	92
627	100	100	100	70	100	100	100	100	100	100
628	70	72	92	96	75	90	94	80	79	79
629	58	66	67	67	72	59	71	67	58	66
630	63	72	69	69	92	70	71	71	91	67
631	69	50	90	61	69	59	74	50	60	73
632	76	85	70	59	90	89	70	77	82	70
633	70	70	70	71	70	70	70	70	70	70
634	53	45	53	53	71	44	53	53	43	56
635	100	90	90	70	70	70	70	99	90	70
636	71	72	82	76	65	54	70	69	50	71
637	87	73	70	90	92	70	69	71	72	70
638	91	90	88	90	70	63	69	69	67	70
639	79	57	50	70	50	30	70	63	50	69
640	71	69	69	70	72	28	71	71	30	71
641	91	92	81	74	80	70	82	71	89	90
642	75	60	63	44	30	57	44	56	70	36
643	90	90	71	80	79	70	70	70	58	71
644	92	95	85	91	90	70	72	92	100	91
645	69	73	73	91	71	70	71	71	71	71
646	100	100	100	100	99	100	91	100	98	98
647	94	89	97	82	85	81	95	80	68	81
648	94	91	1	30	30	30	9	10	1	10
650	70	75	92	86	79	68	90	74	94	71
651	62	78	70	70	50	50	69	69	69	59
652	29	56	70	50	50	50	71	68	89	68
653	70	69	91	92	71	31	33	69	32	70
654	69	70	70	70	90	70	90	71	71	72
655	28	70	88	50	70	71	70	89	50	68

Survey Number	Efficacy		Effective			Efficient		Satisfice		
	1	2	1	2	3	1	2	1	2	3
656	68	68	89	92	64	71	71	72	54	78
658	78	88	89	58	60	51	66	67	51	70
659	69	70	50	31	70	70	70	69	70	34
660	94	100	91	72	71	76	79	72	79	82
661	88	88	50	45	31	69	54	50	50	54
662	70	63	70	69	51	38	55	7	42	54
663	92	70	69	90	35	31	30	71	76	30
664	97	79	100	70	79	100	70	70	90	85
665	72	73	33	32	39	73	71	71	73	70
666	52	49	52	68	52	51	51	51	52	52
667	69	72	72	97	71	33	72	69	92	67
668	69	69	91	72	71	70	70	50	69	89
669	90	90	70	89	70	70	71	71	50	69
670	100	100	100	70	100	100	70	100	100	100
671	45	38	31	42	55	56	43	45	54	44
672	90	89	89	90	70	61	71	69	89	90
673	68	73	70	61	81	77	91	75	79	79
674	69	71	90	89	73	71	89	71	68	89
675	100	100	100	99	68	67	93	69	69	28
676	89	90	93	89	71	70	91	71	70	71
677	89	88	87	89	90	90	88	88	89	91
678	84	61	52	67	84	54	78	72	48	48
679	90	82	74	84	70	63	70	93	99	82
680	89	92	90	71	71	71	71	92	67	72
681	80	84	80	74	76	73	96	97	50	95
682	70	86	100	100	100	100	79	100	100	69
683	94	82	83	84	82	69	44	72	56	68
684	92	91	90	91	92	91	88	92	90	92
685	70	71	50	70	71	70	70	29	91	71
686	70	71	71	70	71	71	91	70	71	70
688	73	73	91	100	91	70	57	100	74	91
689	71	93	91	92	70	72	71	73	94	71

Survey Number	Efficacy		Effective			Efficient		Satisfice		
	1	2	1	2	3	1	2	1	2	3
690	69	68	50	69	28	10	70	28	91	29
691	62	47	65	42	12	32	27	31	30	53
692	51	51	51	52	52	51	49	49	49	51
693	0	0	94	90	92	86	85	84	100	83
694	90	85	31	47	31	21	36	27	22	34
695	70	91	81	81	80	70	70	69	74	87
696	90	89	90	90	90	70	91	91	90	90
697	70	99	70	70	70	81	71	70	71	71
698	91	90	90	71	70	71	70	71	90	89
699	96	91	70	23	62	73	29	58	25	30
700	68	65	91	90	64	70	58	91	58	63
701	76	81	50	70	69	70	50	70	50	72
702	93	90	93	91	90	95	89	93	93	90
703	69	69	90	70	89	70	90	91	70	90
704	95	96	64	66	57	80	56	56	71	65
705	71	69	69	63	86	100	73	51	50	69
706	89	68	89	90	89	71	91	71	71	96
707	100	76	89	79	89	80	80	77	77	76
708	69	68	90	82	86	70	70	70	67	70
709	91	100	73	82	100	70	89	92	77	93
710	100	100	57	70	41	58	52	50	58	61
711	69	90	70	50	30	29	70	28	50	28
712	69	70	70	70	70	70	70	70	71	69
713	69	68	69	68	69	50	69	68	76	66
714	71	68	94	72	85	73	85	89	91	82
715	56	64	34	30	41	29	33	43	36	35
716	90	100	90	85	87	85	80	92	84	90
717	72	70	73	70	70	70	71	71	71	69
718	71	77	70	80	69	70	70	67	80	71
719	100	100	100	100	100	100	100	100	100	100
720	80	75	55	65	58	38	39	21	47	51
721	74	68	95	90	73	70	69	71	68	94

Survey Number	Efficacy		Effective			Efficient		Satisfice		
	1	2	1	2	3	1	2	1	2	3
722	83	69	69	90	69	69	72	71	62	73
723	30	31	50	70	70	9	71	31	9	70
724	87	79	79	75	71	70	73	77	65	86
725	89	69	97	70	71	75	79	77	71	68
726	91	90	71	72	90	80	83	73	82	71
727	71	61	60	70	72	69	53	85	60	54
728	50	63	53	42	51	36	44	31	50	52
729	90	92	90	50	70	70	70	70	50	70
730	89	91	100	90	80	79	72	80	64	66
731	94	99	100	100	94	97	100	100	100	100
732	81	70	94	98	82	76	80	80	79	91
733	93	70	80	90	99	71	63	43	69	80
734	55	61	64	78	64	59	68	58	59	59
735	69	91	69	90	69	41	29	30	50	69
736	70	85	91	91	82	69	62	69	58	74
737	89	91	32	30	32	31	0	30	9	30
738	98	86	67	60	69	61	59	71	70	65
739	82	100	91	85	85	100	84	70	89	86
740	31	69	29	31	70	70	70	31	70	31
741	74	71	75	73	71	73	71	74	73	71
742	69	69	30	69	70	31	70	29	70	70
743	87	75	100	100	100	100	95	98	97	89
744	70	70	68	69	70	71	70	91	70	72
745	63	67	61	66	66	62	65	60	79	63
746	82	75	61	71	70	69	50	61	58	50
747	50	54	65	60	50	70	69	69	68	57
748	69	70	71	70	70	71	70	70	50	70
749	32	41	0	0	46	70	0	0	23	0
750	70	71	70	89	91	91	71	90	92	90
751	66	81	91	78	92	90	77	70	92	92
752	80	90	64	66	71	70	87	73	61	56
753	69	70	90	81	90	62	85	70	91	70

Survey Number	Efficacy		Effective			Efficient		Satisfice		
	1	2	1	2	3	1	2	1	2	3
754	70	100	77	70	71	50	70	71	100	69
755	88	88	86	91	80	84	90	92	70	88
756	70	70	69	69	70	70	70	70	69	69
757	72	82	70	83	68	98	73	74	57	77
758	70	87	89	88	71	71	89	89	71	90
759	94	80	83	55	30	76	75	50	57	68
760	91	91	73	70	69	70	71	70	51	71
761	86	85	100	100	81	70	100	100	78	100
762	63	68	85	61	69	71	66	69	86	61
763	81	79	59	70	59	70	53	70	46	60
764	71	91	69	90	71	70	70	71	72	71
766	85	79	100	88	85	91	94	77	100	75
767	71	72	90	90	69	89	71	70	90	68
768	99	100	94	78	69	70	90	72	50	86
769	70	68	68	70	71	68	69	70	50	69
770	100	64	70	68	78	63	53	63	50	76
771	70	71	70	69	70	70	71	70	30	70
772	69	57	79	77	0	59	0	0	41	31
773	90	92	90	88	92	92	91	89	90	90
774	68	62	62	66	61	59	65	67	65	57
775	100	96	77	79	84	81	73	85	65	80
776	91	89	91	90	89	90	91	91	90	91
777	100	83	100	100	100	82	87	100	100	90
778	27	38	61	57	28	29	56	27	56	34
779	80	76	75	100	86	84	71	74	72	78
780	96	96	93	94	98	97	92	93	96	93
781	64	64	62	70	62	72	76	46	60	73
782	69	70	70	71	71	71	71	69	69	71
783	79	69	88	73	70	71	72	72	81	81
784	69	91	64	66	77	56	97	52	53	70
785	92	93	90	91	89	70	90	91	86	89
786	59	76	89	99	70	83	62	71	57	70

Survey Number	Efficacy		Effective			Efficient		Satisfice		
	1	2	1	2	3	1	2	1	2	3
787	70	87	64	32	35	39	41	29	35	63
788	31	33	91	50	69	70	69	68	70	69
789	83	71	91	90	82	91	90	78	91	91
790	31	71	70	71	70	50	82	70	43	51
791	71	71	27	28	69	29	29	29	70	30
792	87	91	69	70	70	63	70	70	50	70
793	70	74	70	85	74	69	71	73	68	71
794	92	86	93	73	92	71	70	85	71	88
795	88	50	88	91	69	50	71	70	50	48
796	100	100	100	71	100	73	100	70	100	100
797	98	94	95	97	70	70	90	91	76	68
799	70	74	91	100	78	70	79	70	100	91
800	100	100	67	71	86	62	76	77	73	90
801	71	69	71	70	71	71	70	73	68	74
802	70	71	90	89	90	70	71	90	71	72
803	91	70	90	70	70	90	70	70	70	69
805	91	92	72	69	70	70	71	71	71	69
806	71	87	89	54	71	72	70	73	87	72
807	71	70	69	68	71	70	71	73	71	90
808	31	71	72	73	70	69	70	70	69	69
809	98	95	85	84	86	87	85	88	85	91
810	85	100	89	100	95	88	100	94	83	91
811	100	100	56	84	73	63	94	79	62	79
812	73	81	80	86	70	84	87	74	70	85
813	89	94	91	90	90	92	89	90	90	90
814	93	100	100	98	92	96	50	72	71	95
815	64	71	80	72	71	64	69	74	67	67
816	76	76	70	79	78	78	70	89	75	71
817	70	69	71	63	90	80	70	70	66	73
818	68	66	69	71	69	72	70	70	50	69
819	70	70	70	50	55	50	70	30	30	29
820	94	84	96	75	80	91	70	68	63	76

Survey Number	Efficacy		Effective			Efficient		Satisfice		
	1	2	1	2	3	1	2	1	2	3
821	90	90	90	90	91	69	93	92	90	90
822	90	70	91	91	91	91	90	91	90	90
823	71	71	70	90	71	69	70	70	69	70
824	59	56	0	29	32	8	69	30	29	33
825	98	82	80	79	79	90	79	99	90	80
827	81	100	100	99	70	82	70	59	50	94
828	86	81	89	87	82	75	83	75	69	79
829	68	68	68	68	69	70	70	70	70	66
830	72	84	79	84	70	71	71	80	55	76
831	100	100	72	77	74	71	84	79	76	83
832	51	52	52	51	51	51	51	51	52	51
833	57	58	69	52	57	59	58	59	57	61
834	73	83	71	72	72	69	72	79	70	85
835	87	83	85	85	50	47	83	70	73	79
836	80	71	73	83	90	71	72	76	50	72
837	90	90	72	70	78	70	78	70	71	78
838	90	91	91	91	70	70	70	70	91	70
839	64	70	100	95	87	99	86	91	96	91
840	71	71	76	73	73	95	60	69	70	67
841	69	70	72	70	75	59	70	69	68	71
844	91	91	90	95	93	93	89	90	83	91
845	71	56	69	71	64	65	70	69	71	67
846	100	100	72	62	78	75	70	70	55	61
847	69	70	51	92	69	94	32	71	99	72
848	55	70	70	66	70	57	70	66	64	52
849	81	77	82	98	74	62	90	75	64	71
850	92	88	89	86	81	67	75	81	66	83
851	68	53	56	84	53	54	57	52	53	88
852	90	92	90	71	79	70	91	91	50	70
853	100	99	71	82	50	71	71	60	50	72
854	89	90	91	91	90	92	91	70	89	91
855	93	80	85	84	91	71	91	80	71	91

Survey Number	Efficacy		Effective			Efficient		Satisfice		
	1	2	1	2	3	1	2	1	2	3
856	63	67	68	90	72	70	60	62	68	64
857	67	82	67	91	69	71	98	72	58	91
858	56	32	70	70	50	70	30	50	32	50
859	70	71	69	73	69	71	70	72	70	72
860	72	69	69	89	100	59	71	69	69	72
861	80	89	71	91	90	70	77	78	91	89
862	88	86	89	76	56	39	42	69	53	77
863	84	82	100	74	80	79	78	79	80	87
864	94	98	74	87	70	48	63	65	61	48
865	50	50	60	68	70	56	49	49	66	58
866	90	88	100	73	79	90	91	89	97	87
867	89	68	67	69	70	69	58	70	70	56
868	90	89	100	100	77	73	84	100	100	76
870	68	69	67	71	65	68	61	61	67	86
871	100	92	68	20	72	72	75	65	80	73
872	50	62	77	74	70	91	69	61	50	72
873	70	68	90	70	69	70	70	70	68	69
874	68	70	71	32	70	71	71	33	90	70
875	77	75	80	78	74	80	75	80	50	79
876	89	89	79	77	72	74	72	67	70	77
877	96	100	96	81	100	89	100	86	97	100
878	85	80	70	65	72	70	70	73	70	67
879	70	90	89	73	71	90	92	70	71	67
880	100	100	100	100	100	100	100	100	100	100
881	71	76	100	87	72	69	83	86	78	79
882	71	70	90	70	91	89	70	70	90	70
883	95	63	79	94	69	73	74	74	79	75
884	100	100	100	100	100	100	100	100	100	100
885	79	84	80	93	76	70	91	70	88	71
886	69	61	70	92	66	54	69	54	53	53
887	55	57	69	69	79	71	60	50	69	58
888	99	99	98	99	99	99	99	99	99	100

Survey Number	Efficacy		Effective			Efficient		Satisfice		
	1	2	1	2	3	1	2	1	2	3
889	53	44	72	67	81	65	56	55	84	85
890	71	69	91	70	70	69	70	70	70	71
892	100	100	100	100	100	100	100	100	71	100
894	69	34	58	49	58	46	69	49	70	57
895	16	70	70	70	58	69	70	70	59	72
896	70	69	90	90	70	91	70	57	50	71
897	89	89	89	11	72	72	90	72	91	70
898	72	70	70	77	70	70	70	66	69	65
899	70	70	71	89	70	70	71	70	81	69
900	89	89	71	90	69	90	90	69	69	89
901	80	78	86	76	75	79	69	73	67	69
903	66	73	51	39	31	60	28	42	52	46
904	96	88	68	72	86	69	68	68	67	82
905	68	72	69	70	69	64	70	70	71	69
906	37	30	71	71	56	54	30	56	69	56
907	90	69	92	99	70	91	92	69	70	91
908	37	34	58	50	66	50	68	65	73	50
909	70	70	90	90	91	70	90	70	70	90
910	60	81	95	100	89	65	77	73	77	98
912	94	73	86	85	66	71	69	71	62	75
914	33	57	68	70	57	53	59	71	65	70
915	12	32	69	30	28	26	31	12	31	25
916	69	70	69	80	69	69	71	70	72	78
917	100	100	57	59	74	68	100	100	53	68
918	71	69	70	37	53	48	51	50	48	31
919	83	97	70	61	80	39	89	62	79	43
920	90	90	71	71	69	69	70	71	50	68
922	31	71	81	61	63	70	70	70	56	82
923	86	91	89	78	82	62	86	77	90	95
924	92	89	30	75	68	69	69	69	70	70
925	100	100	100	100	100	100	100	100	100	100
926	90	85	100	83	73	70	73	76	78	82

Survey Number	Efficacy		Effective			Efficient		Satisfice		
	1	2	1	2	3	1	2	1	2	3
927	90	89	50	31	71	9	90	50	73	71
928	74	72	50	72	71	71	72	72	69	97
929	89	61	88	78	78	70	71	70	67	69
931	73	71	68	71	70	70	70	70	71	69
932	81	68	57	66	61	61	58	59	50	50
933	77	70	91	96	86	71	72	93	83	70
934	92	91	94	86	72	78	73	75	50	81
935	94	70	70	50	81	91	94	69	92	90
936	80	91	70	92	72	81	69	71	74	73
937	72	66	66	67	70	70	58	71	49	61
938	70	100	100	100	100	100	100	100	50	100
939	81	82	62	90	79	66	84	68	70	71
940	97	100	88	82	90	80	82	69	89	81
941	90	89	90	71	90	89	69	91	91	89
942	36	63	68	63	70	71	91	82	64	60
943	41	41	46	30	30	31	60	70	22	62
944	52	29	30	51	51	70	70	51	52	52
945	100	69	81	86	68	60	70	68	86	78
946	1	7	71	64	27	26	0	0	30	24
947	100	86	80	73	59	43	36	49	59	63
948	91	91	70	70	71	70	70	70	71	71
949	69	68	66	52	70	68	69	70	66	33
950	29	26	46	70	35	55	50	45	30	50
951	100	100	81	40	60	66	69	52	43	56
952	89	72	89	91	70	71	71	71	30	70
953	92	93	93	71	90	71	73	70	73	90
954	71	72	74	70	70	74	70	75	75	70
955	54	72	28	50	31	65	50	39	32	65
956	70	70	61	57	70	30	52	53	37	48
957	77	77	66	66	70	69	63	66	56	45
958	75	70	81	90	68	58	56	69	56	69
959	71	68	50	43	73	74	71	73	71	60

Survey Number	Efficacy		Effective			Efficient		Satisfice		
	1	2	1	2	3	1	2	1	2	3
960	91	93	29	19	30	38	39	10	31	10
961	71	71	71	30	30	70	70	32	71	30
962	100	95	99	97	100	50	91	90	82	98
963	70	70	67	72	69	70	69	70	67	71
964	100	100	100	100	100	100	100	100	100	100
965	90	89	92	90	71	92	92	91	89	91
966	89	71	69	70	69	69	69	70	69	91
967	100	100	100	100	72	100	85	46	48	34
968	73	72	79	90	63	50	75	70	71	70
969	68	68	91	70	70	92	70	70	71	69
970	91	9	71	30	91	70	30	11	91	33
971	70	71	90	71	91	70	91	90	71	68
972	70	71	90	89	86	72	81	74	51	86
973	71	70	30	90	70	70	71	70	71	71
974	87	89	88	88	83	74	83	87	76	83
975	82	78	70	71	74	70	70	77	73	71
976	92	89	91	91	70	89	91	70	69	89
977	64	59	50	48	49	26	47	13	48	48
978	61	59	71	76	58	58	47	62	72	63
979	76	80	100	70	69	58	73	67	55	86
980	88	92	90	70	70	72	71	90	90	69
981	100	100	100	99	100	100	100	100	71	100
983	100	100	100	100	100	100	30	100	100	28
984	75	91	72	71	73	51	69	61	69	68
985	90	90	69	90	89	90	91	90	90	89
986	62	57	68	54	71	57	53	69	64	71
987	57	58	57	58	53	53	55	54	57	53
988	100	100	93	89	100	96	89	99	90	92
989	70	70	49	50	46	46	30	50	30	56
990	92	69	93	90	70	70	29	31	87	70
991	91	91	70	70	89	72	91	70	72	71
992	31	30	90	92	70	69	70	71	55	76

Survey Number	Efficacy		Effective			Efficient		Satisfice		
	1	2	1	2	3	1	2	1	2	3
993	100	100	100	100	99	100	100	100	100	100
994	99	100	96	83	72	94	92	100	100	85
995	71	70	100	79	76	78	76	77	90	79
996	92	91	52	52	30	32	31	30	31	30
997	73	76	77	71	70	76	75	72	81	68
998	69	67	100	50	50	100	100	50	100	100
999	70	70	91	71	70	71	71	91	50	70
1000	72	89	100	85	71	76	71	80	76	100
1001	46	42	53	61	30	44	28	30	53	56
1002	69	69	70	70	70	70	70	70	68	70
1003	72	91	88	92	70	71	70	72	71	72
1004	100	100	65	69	60	28	30	8	30	26
1005	85	72	80	81	77	73	91	91	75	82
1006	70	90	88	50	70	32	31	29	30	68
1007	90	90	71	50	70	70	70	91	70	50
1008	30	35	48	84	44	63	35	72	31	40
1009	69	90	90	69	70	90	70	70	71	91
1010	70	75	70	90	92	71	71	92	69	92
1012	90	90	69	70	70	70	70	70	71	90
1013	52	34	51	69	52	47	40	51	49	62
1014	64	69	67	50	64	70	64	64	58	65
1015	96	83	90	69	83	69	91	78	72	89
1016	50	35	44	30	34	30	44	40	35	49
1017	81	91	81	91	94	94	93	91	94	91
1018	100	98	97	88	99	78	74	88	100	96
1019	81	83	75	82	76	81	71	66	73	79
1020	86	91	90	91	70	69	81	85	72	84
1021	76	60	96	80	89	61	65	82	70	79
1022	99	92	93	90	69	50	92	50	58	69
1023	0	24	76	38	33	61	97	1	62	58
1024	70	70	71	60	70	30	44	29	42	68
1025	70	71	70	70	50	70	70	69	70	70

Survey Number	Efficacy		Effective			Efficient		Satisfice		
	1	2	1	2	3	1	2	1	2	3
1026	76	87	85	91	81	72	74	70	69	79
1027	97	87	100	79	100	97	90	100	100	98
1028	67	59	64	67	68	58	41	60	51	58
1030	97	91	67	72	68	40	71	38	60	60
1031	76	77	56	66	59	65	58	63	42	55
1032	89	90	90	91	90	90	70	70	89	90
1033	91	91	69	66	57	72	54	56	39	58
1034	71	70	68	60	59	70	69	31	30	30
1035	81	72	68	75	70	87	71	71	67	72
1036	78	100	70	83	67	68	70	70	69	71
1037	90	70	88	90	69	90	91	89	71	90
1038	97	92	94	76	87	71	96	80	89	100
1039	70	91	70	71	71	70	70	31	71	91
1040	31	29	70	50	30	31	29	30	71	30
1041	93	96	95	92	94	90	93	91	93	94
1042	71	63	70	69	77	60	60	70	71	68
1043	54	55	61	66	53	55	51	56	51	60
1044	100	93	91	98	94	98	93	95	97	96
1045	89	91	85	82	83	90	78	70	81	80
1046	77	70	74	71	71	87	80	76	68	84
1047	90	79	90	80	83	84	79	92	90	82
1048	88	94	92	71	70	61	63	71	92	90
1049	56	61	61	54	57	56	60	64	56	55
1050	92	71	91	91	77	75	78	82	96	76
1051	85	83	82	81	75	71	70	64	77	80
1052	90	71	71	70	69	69	71	69	68	70
1053	73	71	69	71	50	52	48	53	51	54
1054	75	78	88	74	90	72	83	73	91	80
1055	100	100	100	78	85	100	100	57	50	83
1056	93	92	71	82	79	70	68	79	52	81
1057	87	87	88	70	90	68	90	88	71	91
1058	83	90	83	91	56	64	46	71	50	78

Survey Number	Efficacy		Effective			Efficient		Satisfice		
	1	2	1	2	3	1	2	1	2	3
1059	77	75	90	88	52	41	41	61	74	59
1060	71	66	71	51	75	66	78	63	72	68
1061	87	88	87	69	88	71	92	68	71	87
1062	65	60	71	50	50	31	37	60	70	51
1063	39	49	42	45	37	69	37	35	40	35
1064	90	70	70	70	70	70	90	90	70	71
1065	100	70	99	30	99	100	99	100	100	100
1066	70	69	87	70	88	71	88	83	83	76
1067	69	69	67	71	70	72	30	70	67	74
1068	90	81	98	75	79	81	85	91	89	73
1069	100	95	82	72	89	69	81	72	65	68
1070	91	71	98	92	90	70	70	71	70	74
1071	82	88	81	92	71	85	78	89	74	88
1072	62	58	56	62	57	55	60	60	55	56
1073	47	100	42	22	27	46	31	39	43	49
1074	76	79	71	77	91	71	88	72	72	91
1075	80	71	82	92	58	55	70	63	50	69
1076	82	84	50	52	63	70	59	52	60	67
1077	71	71	69	90	70	70	69	70	70	91
1078	100	90	94	99	97	81	100	87	76	85
1079	90	56	70	71	69	70	50	69	90	71
1080	69	70	69	91	90	92	71	90	70	69
1081	70	70	70	91	70	69	70	70	70	90
1082	100	69	69	78	78	69	82	78	80	69
1083	91	76	72	85	70	70	82	69	59	57
1084	69	66	70	68	71	75	89	89	67	73
1085	78	99	32	55	55	58	41	34	45	39
1086	54	71	70	65	53	35	63	71	66	57
1087	70	69	70	69	70	66	70	66	62	70
1089	71	70	70	50	70	71	70	50	69	70
1090	94	96	74	94	90	59	78	82	82	73
1091	72	72	88	89	89	89	12	93	90	88

Survey Number	Efficacy		Effective			Efficient		Satisfice		
	1	2	1	2	3	1	2	1	2	3
1092	100	99	31	30	50	55	25	11	29	32
1093	90	70	90	91	70	92	91	70	72	70
1094	100	100	96	97	50	71	60	52	78	82
1097	100	100	90	100	70	70	71	100	69	100
1098	72	73	92	90	92	91	89	89	91	84
1099	69	71	90	91	69	71	70	70	91	69
1100	100	67	100	100	76	68	89	80	78	95
1101	73	78	84	81	79	69	73	70	50	78
1102	66	67	62	70	59	59	59	55	52	66
1103	56	57	56	70	69	55	89	69	70	70
1104	90	11	89	9	11	31	29	8	10	29
1105	82	88	96	89	91	70	70	91	50	97
1107	70	71	69	89	70	90	70	79	73	69
1108	100	100	70	70	90	91	70	99	80	100
1109	90	88	53	78	48	53	63	61	56	53
1110	67	64	63	43	44	45	43	45	59	45
1111	92	90	90	90	90	90	90	91	90	92
1112	52	52	38	50	53	51	53	48	51	52
1113	100	100	100	100	100	100	100	70	100	100
1114	74	75	63	82	71	72	79	68	90	71
1115	70	60	70	70	58	55	70	58	60	71
1116	100	100	82	98	74	70	51	83	51	76
1117	70	70	70	70	90	90	90	70	70	90
1118	80	86	74	92	70	69	11	73	38	38
1119	85	71	71	70	71	71	69	69	71	71
1120	81	70	100	99	100	69	70	80	70	100
1121	77	86	77	78	73	92	74	76	77	79
1122	63	80	70	65	61	50	56	57	50	58
1124	100	100	31	38	29	70	53	30	50	68
1125	82	70	70	90	67	47	70	79	70	71
1126	100	90	96	93	89	85	92	71	82	77
1127	50	49	28	50	89	50	31	50	68	70

Survey Number	Efficacy		Effective			Efficient		Satisfice		
	1	2	1	2	3	1	2	1	2	3
1128	89	93	85	81	92	90	86	90	100	91
1130	100	100	100	87	100	100	100	100	100	93
1131	72	63	90	63	70	70	73	70	68	70
1132	65	58	44	42	58	43	64	42	55	29
1133	70	92	70	90	70	70	31	70	71	69
1134	100	90	70	70	64	70	70	70	80	70
1135	65	27	72	70	70	71	69	70	71	34
1136	50	70	100	30	50	97	69	69	50	69
1137	68	74	69	70	70	92	70	69	72	68
1138	100	100	100	99	100	100	100	100	100	100
1139	91	90	56	81	57	63	71	52	60	59
1141	71	68	62	28	42	29	55	44	44	50
1142	29	49	50	69	33	40	31	49	50	36
1143	81	47	47	50	9	47	48	48	46	31
1144	70	91	71	71	90	70	70	71	71	71
1145	88	91	98	94	84	87	82	83	63	86
1146	84	66	70	52	70	70	57	56	70	70
1147	69	69	70	70	71	71	70	70	90	70
1148	70	69	50	70	59	29	41	45	57	57
1149	69	69	72	63	67	73	70	68	71	69
1150	85	85	69	66	58	59	50	55	60	74
1151	75	69	71	71	67	69	90	67	90	91
1153	100	100	86	88	88	70	70	70	52	86
1154	83	73	40	50	69	35	28	31	47	57
1155	100	96	100	100	99	96	89	95	99	100
1156	70	91	90	30	70	50	70	50	72	70
1157	78	88	70	70	70	70	72	75	90	80
1158	69	85	100	89	100	80	70	100	70	80
1159	49	49	49	48	49	49	49	49	49	49
1160	60	50	57	46	50	70	70	37	76	71
1162	71	70	70	71	71	71	71	72	72	72
1163	83	81	90	91	83	70	80	69	74	82

Survey Number	Efficacy		Effective			Efficient		Satisfice		
	1	2	1	2	3	1	2	1	2	3
1164	51	53	70	56	70	52	55	55	54	52
1165	73	84	100	100	93	76	100	17	58	85
1166	91	93	68	76	89	78	89	72	79	90
1167	70	68	88	71	91	90	70	91	71	71
1169	72	71	70	91	72	71	72	94	68	72
1170	51	75	70	70	69	100	70	70	81	79
1171	71	71	70	71	70	70	77	68	70	79
1172	70	70	90	90	71	70	70	70	72	70
1173	90	91	84	93	81	78	87	93	90	88
1174	88	78	82	97	96	88	70	67	85	79
1175	95	91	93	73	70	73	72	72	91	89
1176	64	68	60	59	54	58	56	56	54	69
1177	77	91	5	50	30	8	25	25	29	22
1178	99	100	100	100	100	70	100	100	99	100
1179	70	70	91	91	70	70	90	70	70	90
1180	57	70	73	76	64	64	67	64	74	71
1181	71	71	69	70	71	71	91	69	80	70
1183	69	70	70	71	68	72	69	70	68	69
1184	55	55	73	79	73	76	86	74	73	84
1185	100	100	100	100	70	80	82	84	86	88
1186	37	24	57	40	69	24	40	46	10	32
1187	73	100	100	100	100	100	100	100	100	100
1188	92	90	71	71	90	78	100	80	94	93
1189	93	91	89	92	70	72	71	70	50	94
1190	92	92	90	92	90	92	91	92	91	92
1191	71	90	92	91	90	90	71	54	55	70
1192	34	33	1	79	67	69	72	78	80	80
1193	91	91	81	90	91	90	70	91	100	90
1194	70	72	71	70	70	70	71	69	92	69
1196	63	70	93	90	80	71	72	80	79	87
1197	70	74	89	89	70	72	71	89	90	70
1198	70	72	70	70	71	71	71	70	70	72

Survey Number	Efficacy		Effective			Efficient		Satisfice		
	1	2	1	2	3	1	2	1	2	3
1200	100	100	100	100	100	100	100	100	100	100
1201	69	32	91	68	69	70	70	67	76	66
1202	69	69	90	89	91	80	87	91	90	91
1203	88	66	70	69	69	58	64	66	56	61
1204	96	85	91	75	91	77	83	74	89	81
1205	87	87	88	89	84	68	67	76	76	80
1206	100	99	100	100	0	0	50	50	0	0
1207	65	58	60	19	60	67	62	63	34	30
1208	92	91	82	71	81	74	90	83	88	91
1209	91	90	90	90	94	87	92	96	91	72
1210	90	88	82	81	79	92	91	83	79	80
1211	77	72	70	56	59	56	60	56	53	69
1212	88	70	92	70	92	71	93	92	91	93
1213	100	100	50	84	71	79	70	62	100	91
1214	100	100	100	99	99	100	100	99	100	100
1215	90	89	92	89	91	89	89	91	69	91
1216	100	100	83	87	71	81	88	71	70	89
1217	87	90	89	28	71	89	72	71	70	87
1218	86	74	67	68	58	68	75	77	69	63
1219	71	71	90	91	71	71	71	72	70	86
1220	68	68	67	67	70	69	69	70	70	65
1221	100	83	100	84	65	51	74	63	47	60
1223	94	90	94	90	93	83	91	90	70	90
1224	88	70	89	93	88	86	70	97	69	90
1225	89	71	88	68	88	70	68	71	87	68
1226	85	71	69	78	67	68	68	70	68	63
1227	94	80	100	100	77	90	70	100	80	80
1228	100	100	97	93	92	100	100	100	100	100
1229	71	70	76	70	88	71	71	70	70	77
1230	100	90	91	9	88	82	89	91	70	84
1231	100	100	99	100	100	100	100	100	100	100
1232	70	90	89	90	69	70	69	90	70	70

Survey Number	Efficacy		Effective			Efficient		Satisfice		
	1	2	1	2	3	1	2	1	2	3
1233	79	72	91	71	70	65	91	59	69	91
1234	71	71	71	91	92	70	70	69	72	68
1235	54	96	91	89	94	71	69	70	89	92
1236	70	69	69	72	69	69	69	67	66	68
1237	90	100	100	100	70	70	90	85	90	83
1238	61	87	0	51	44	56	36	41	51	45
1240	80	82	96	71	76	71	72	72	81	79
1241	89	79	68	90	30	30	30	31	50	48
1242	50	61	50	90	71	70	71	70	73	70
1243	70	61	74	71	69	61	61	53	63	73
1244	71	51	59	52	49	51	57	51	69	68
1245	71	70	100	96	71	66	35	72	98	71
1246	89	88	92	90	67	67	89	91	66	68
1247	89	65	71	29	68	89	71	79	91	70
1248	70	70	70	71	70	70	70	70	50	70
1249	93	91	70	91	91	71	95	70	70	92
1250	56	62	58	64	58	48	60	42	62	58
1251	89	92	70	90	89	91	90	69	72	89
1252	100	100	100	100	65	100	40	30	30	25
1253	69	77	78	80	61	60	57	71	64	73
1254	70	70	71	78	71	74	64	69	57	62
1255	70	100	100	100	100	100	100	100	100	100
1256	52	51	52	54	49	53	52	54	54	53
1257	71	70	86	70	76	63	90	70	80	71
1258	58	70	55	70	70	50	62	61	50	46

APPENDIX D QUALITATIVE SURVEY DATA

The following tables list the survey responses for the qualitative data. Each qualitative answer is paired with its survey number so that it can be linked to its paired survey results. The qualitative data listed in these tables unedited except for the name of the university being removed where present.

Effective4 Qualitative Results

Survey Number	*Question Effective4: In what ways did the navigation help you to find what you were looking for (page or information)?*
12	Through google.
16	The navigation signs are clearly writen.
18	didn't offer what I want, ie, just want to take one class. Have Ph.D. Want to enroll in Hebrew 101
52	I did not find anything special with the navigation. It was like many other sites. I use Google Chrome so there might have been some compatibility issues.
54	page
59	Admission requirements, fees, etc
61	There are a lot of short cuts which seem to made navigation better.
67	Easy to navigate labels for each page of the website :)
78	It helped a lot.
90	info written on page
93	It is very clearly laid out and simple to find what one is looking for.
104	I knew where to look to check how my AP scores will affect my transcript

Survey Number	*Question Effective4: In what ways did the navigation help you to find what you were looking for (page or information)?*
105	in order to know the programs that are now available
119	So farits working
130	I was looking for what credits I could get from my IB scores
131	It will tell me that wheter its in my budget or not
133	very accurate and fast
136	This is the page i was looking for
140	It had pictures of things. I just wish it had them altogether so I wouldn't have to click back all the time.
142	guiandome mejor y mas directo a donde devo ir..
143	Buscando
148	Great
170	What GPA and ACT score I should have
187	Contactarme con alguien
198	I just tried your search option to see if that would have been an easier way to find info. It took me directly to the info I needed when I search for 'tours'.
205	i found you throught internet , by LDS page
209	costs
224	Using understandable terms instead of 'hiding' what i want in hard-to-find places and links like most sites I've visited.
237	page linkers
239	alot
246	went quickly from a main topic to the specific one that i was looking for
250	It helped me clearly see what I think I was looking for
251	It helped me clearly see what I think I was looking for
253	Short, to the point navigatIon list in the order I need to read the pages.
263	in everything , i have find a answer to all my questions!
265	The navigation has been pretty difficult for this sight throughout my application process. Some of the necessary information I need is call something different and really hard to find. Most of the time I just do a Google search with [university] and the thing
287	Page

Survey Number	*Question Effective4: In what ways did the navigation help you to find what you were looking for (page or information)?*
290	It hasn't yet. I love the format - but I don't think the information is there.
291	It took me to the correct path where i have to apply for [university].
295	Very satisfying. Clear and straight to the point
297	Pertinent information is handy
305	I can find someone who has gone through the same situation
332	encontrar información acerca del proceso para poder aplicar a la universidad
342	Because I was directly in the story department where he wanted to see the graduate for foreigners.
346	international student admission
349	it cleary helped me to define my goal
350	for an admission
351	for an admission
353	there is an icon of a form with the words mission deferment under it, so we are assuming it will lead us to the needed information
361	is my church
368	I am still looking, so far it is organized very well.
374	It shifted me right into where I wanted to go. It was easy to read, and it sent me where I thought I wanted to go but I'm struggling! I'm struggling!
383	I'm still looking.
392	Housing information
395	infomation
411	I found the information given out in the answers to questions to be quite informational.
412	It was simple in its words and the tabs helped me find what I wanted.
416	Everything is clearly labeled
424	information
428	it is [university] which give a link by facebook.
435	It help me.
448	It led me to the page that contained the information that I was searching for.
465	The nevigation exhibits all the choices that I assumed it should have.

Survey Number	*Question Effective4: In what ways did the navigation help you to find what you were looking for (page or information)?*
470	boa
494	We saw "admissions" and "criteria" - helped us find exactly what we needed!
513	Information
522	me da una mejor idea acerca de lo que necesito saber, aunque no en todo, pero es muy buena ayuda.
524	Each section was clearly organized and had correct sub-groups. The layout is also clean, simple, easy to use, modern, and updated.
529	The section for international students seems to be extremely helpful.
531	it didn't
538	It had the options specified on the side panel.
542	It didn't at all. I'm trying to find the essay prompt for an application, I know I've seen it before, but I can't find it now.
563	As I said before, you have helped me to make possible to get the information I need to . thanks again.
564	not sure
566	I think, no!
569	The links are not general so I think what I wanted
570	idk
575	la navegación me ayudo a encontrar la pagina que necesitaba
577	internet
578	It helped me in finding the information i need super quick.
584	It directed me to information concerning AP transfer credit at [university]. Very helpful!
600	in everything
612	It answered all of the questions that I was thinking in my head and by the way those videos are hilarious.
618	I'm sorry, but after using the site several times I find [university] navigation to be one of the most difficult I've encountered, and I'm usually pretty good at navigation. It is challenging to find anything!
620	The were very easy to follow, making the information easy to find.
627	It helped extremely, whoever helped in making this exceedingly outstanding piece of technological work should definitely be praised!
632	the colors/contrast, simple layout
639	specific

Survey Number	*Question Effective4: In what ways did the navigation help you to find what you were looking for (page or information)?*
646	It was easy and simple to guide through each topic.
648	Didn't help
671	was able to type in key words to find information
677	Perfect organization
682	Easy umbrella terms, followed by more detailed searches was VERY helpful
685	I just tried to find diligently and then got it
690	I DONT KNOW YET
693	It was clear and obvious where to find the information I was looking for.
694	I found it difficult. I needed to know the cost of admissions and had a hard time getting to the site.
696	helpful subheadings within general headings
705	is really easy and fast helping you on what you are looking
708	it was very specific and easy to use, directed me right where I needed to go.
713	so far so good :)
715	too many options...
741	Criteria for international student application
743	Great new website!
749	It is easy to find basic information on anything by using the menu on the top.
752	Easy clear choices
753	It was very easy to find all the links to what I wanted to find.
772	The navigation was not helpful because there is not a tab for current/already admitted students. I was looking for information on deferring a semester. The search box was the most helpful.
776	I like the "Related Links" section. It pretty much read my mind and directed me exactly where I needed to go! Thanks for that.
782	information
790	-
800	It has very relevant information and a lot of choices for the various types of interested applicants.
805	just to get the right and needed information and help go.
811	I was looking for as much information as I can get so that I know what I am up against. It was very helpful with that goal.

Survey Number	*Question Effective4: In what ways did the navigation help you to find what you were looking for (page or information)?*
813	quick and easily identifiable
819	It got me in the general area, but did not answer my specific question.
820	Conversational style was nice: How to pay for it, etc.
827	It was easy to get where I wanted to go through the site.
835	I didn't have too look through multiple tabs.
838	The links were very specific. I have no trouble finding information.
840	I want a page that explains the difference and dates of the Fall, Spring, Winter and Summer Semesters.
847	studying
851	Easy to find needed info.
854	Finding the admissions button from the home page took some looking. I know it was just down there at the bottom, but I've been working on my app for a little while and just noticed it. Once I found the link, everything has been wonderful since.
855	I just look for something and I find it. Just reading the page...
857	information
860	I saw the "Admissions" tab and I clicked on it, which led me to what I wanted.
870	la información necesaria de como ingresar a [university]
878	en todas las maneras, ya que la Internet es el medio mas rápido que existe en el mundo y todo lo que uno busca esta de manera rápida y segura y solo basta con hacer un clik y ya esta la información pero siempre hay que fijarse que la pagina este l
880	Translating into my needs and into the highest celestial glory of Elohim!
885	The related links section is very helpful.
889	yeah both the page and information were supporting me .but I think i got more help through the page.
898	yes
909	It had the exact heading I needed.
910	Key words are...well...key! The way things were worded helped move things along in the right direction.
919	By options
923	The graphics by every information bullet were very helpful, and more interesting.
926	The navigation has helped in numerous ways when using the Future Student link.
928	I am not sure with this

Survey Number	*Question Effective4: In what ways did the navigation help you to find what you were looking for (page or information)?*
932	It gave me general information. I need more specific information like current admission deadlines. I now have no idea where to go to find that information out. HOpefully, I can find it.
977	It has not, I just need some of the application essay questions.
985	Options are clear on what the information is
992	The icons were helpful.
995	Option pop ups
1002	Great color variation and use of clear keywords.
1005	clear language and clean back ground keeping the focus on the links not fluf
1023	It was too easy. I don't think I'm getting into [university], am I...?
1040	information
1057	It had the FAQ about [university]laid out in 5 porions with organized subsections. Very nice.
1082	When I can apply to [university]
1085	I haven't found what I am looking for yet.
1092	N/A

Effective4 Qualitative Results

Survey Number	*Question Effective5: In what ways did the navigation hinder or not help you to find what you were looking for (page or information)?*
4	I want to get letters with information about [university] in the mail, and can't find a way to do that.
16	It's helpful
18	No option for "enrolling in one or two classes only with no intention of getting a degree?
28	It mad it much easier because many of the questions I had there was a link for them on the right side of the screen.
29	It would be nice to have the headers for the chart on each page so I didn't have to scroll back up to the top
52	The navigation was quite smooth. Though, I did find a dearth of information (for international students) on the pages as a whole but I guess it cannot be blamed on the navigation.
54	information
60	It helped me figure out how certain criteria is weighted-- like grades, ap classes, and extra curricular activities
61	So far I haven't had any problems. I've only been looking on the site for about five minutes, though.
90	a better search engine might be nice
95	It was easier than it used to be because there weren't too many choices in each drop down.
105	Think it's very close to what I'm looking for
108	It has helped me nicely so far!
133	not applicable
136	is a good website it does not take much time to find what you're looking for
140	I have to press back if I want to see transfer credits and then look at AP and IB scores.
142	no me dificulta... me ayuda mucho ..
143	Ninguna
187	ninguna
200	It was really clear what I needed to click to get the information I needed.
224	Placing the links at the bottom of the page instead of in a list on the side.
226	Had to click through multiple links to get to the AP credit pages. I hoped I was going the right way and it turns out that I was.
237	I find easy to search info.
239	nt at all
253	None
259	I have taken all the necessary information I need
266	Some links did not work which frusterated me. Other than that I found what I needed.
268	Some of the titles are not clear

Survey Number	*Question Effective5: In what ways did the navigation hinder or not help you to find what you were looking for (page or information)?*
269	Some of the titles are not clear
271	I wasn't looking for many information so my navigation was easy.
282	it has really good information but I don't understand how to apply.
290	A site map might be nice. I'm not being able to intuit where I should look.
295	Not at all
317	the phrase...contact us..... But what I am looking for is a link to talk to someone about units from a JC and what transfers and what doesn't transfer...so after I get to a live person I am going to have to ask to be transfered
321	it was easy to find the page with transfer information but not transfer applications
328	no me ayuda
330	hope they also have translations
332	a veces se dificulta mucho por la cantidad de informacion pero esta bien clara y completa la informacion
335	It help me to find all the information I need. But I think program should be appear more apparently.
342	When the information is not accurate and specific.
346	It is very good
349	in no way
353	none that I can see yet.
361	page
383	My account password always seems to have issues. I just changed it earlier today when looking at EFY information and had to change it again to log in.
395	information
416	N/A
422	It hindered. I'm just trying to figure out if I scored high enough on my AP tests to receive credit at [university].
424	information
428	I was lost because I've never been before on this site
435	It help located the page
439	I WAS LOOKING FOR THE CAREERS
457	it helped a lot, its easy to understand, everybody can use it.
465	The sequence.
470	nenhuma
471	It's been pretty straight forward.
483	nil
492	n/a

Survey Number	*Question Effective5: In what ways did the navigation hinder or not help you to find what you were looking for (page or information)?*
509	i am looking for india entry requirements for study & course fees & visa information
513	Page
520	A search bar would be useful.
522	aveces la información no es la correcta o no esta actualizada
524	There is so much information on one subject that I get stuck on that one topic rather than searching all the other ones, too.
529	Once again International Students Page
530	I am looking for information that will allow me to take [university] Online Courses - but I have not found any such connection... Not even in the search engine option.
531	When I first came to the site, I entered "deferment" in the search bar. It forced me to choose what type of student I am...but I am none of the options because I am a current student. So that is WAY confusing and frustrating. I ended up just picking
538	I am looking for a re
545	It made all the possible options linked to the key word accessible.
547	I'm not finished looking yet.
563	Again, I have just to follow the right instructions and it was done. thank you so much.
564	No comment
566	Have about [university] page on facebook or to send news up date about [university] in investigators e-mail.
569	Nothing
570	idk
577	-
578	It helped me find what i needed to know about this college.
583	NA
584	Sometimes to find the information I wanted I had to click on the links on the bottom of the page. It would be easier if every page was more accessible.
585	basic links that are most looked for such as Programs/Course and Tuition Fees were not easy to find
599	It's a little difficult to find the AP and dual credit (from a community college) credits that will transfer to [university].
600	navigation helped me find this page there was no problem.
612	It helped.
620	It helped, but you keep asking the same type questions. I like the site, but not your questions...too repetitive.
622	It is quite confusing?
632	n/a
646	No complaints

Survey Number	*Question Effective5: In what ways did the navigation hinder or not help you to find what you were looking for (page or information)?*
648	Not sure
652	There was alot of different options that confused me right off the bat, but it's fairly organized
655	The first page, the main page seemed a little overwhelming.
666	na
671	x
678	It was hard to find information on scholarships on the admissions page. I ended up looking from the home page. It gives better information.
685	i just click and every thing is coming up quickly
696	the headings were great, i just read them and found what i was looking for
702	T
705	again?
708	page had detailed information on what I needed to know.
713	Just started navigating :)
715	It hindered. Too many unclear options
723	It is confusing to find what page actually holds the information that i need
731	none so far very easy and easy on the eyes
737	I couldn't do a control F, I can't find the deadlines page
742	Some links don't take you to where you want. It says the page is unavailable.
749	It was hard for me to find specific information about what scholarships are available to incoming freshman.
752	Different wording from what I was thinking.
757	When clicking on "Admissions" under "Admissions and Aid", the link led to "the page could not be found"
782	information
790	nothing
805	anyway
813	none
819	I used the "search" tool, which got brought me to the phrase that I was looking for, but not the information I needed.
827	N/A
835	None
847	I was looking for a major in artchitecture and i couldn't find it..
851	None
870	quizás por las muchas opciones

Survey Number	*Question Effective5: In what ways did the navigation hinder or not help you to find what you were looking for (page or information)?*
878	Me ayuda a buscar las opciones que yo puedo tener como extranjero. Igual me dificulta por el idioma y que algunas paginas están editadas y no tienes información correspondiente a lo que yo quiero saber
879	they didnt
880	I am 32 years young but am not yet admitted!
883	None
886	I haven't really had any time to look around yet haha
889	yeah it does ,thnx to the page editior
898	well
903	The navigation did not lead me to the information that I was looking for when I clicked on the link “How To Get In.”
911	Don't know I just started
915	didn't answer my question about High School classes required for admittance to [university]
916	It didn't really.
919	Don't know
924	The link didn't open when I finally reached my destination.
926	When I was looking for information about specific programs in the college, such as the Animation page that I had to Google, the navigation did not help me.
927	I was looking for the admission office phone number so that I could ask a question about a mission deferment form. The page about mission deferment papers did not have that phone number.
928	It should direct me straight to doctorate program right away..
941	Very clear and accessible. It was easy for me to find the most important information.
944	I don't know yet
945	It didnt quite say what I was looking for exactly
968	The organization was far clearer on this website than on many college websites--UNC Chapel Hill, for instance.
969	It didn't not help me. I was able to find all that I needed and more.
977	It is not clear where the application essay questions are.
989	There are multiple sites that differ slightly in there content but appear to be the same. This makes it very confusing when looking for specific information, such as application essays. Several times did I try to find the requirements for new freshma
990	I dont know
1001	admission information
1004	It's hard to get to the application for visiting student program.
1005	Well, it was pretty easy to find what I needed. Getting used to pop-ups and the movement take a bit but that is cause my connection is slower.

Survey Number	*Question Effective5: In what ways did the navigation hinder or not help you to find what you were looking for (page or information)?*
1009	None
1022	Actually, I found what I was looking for.
1023	ugh...
1033	there was no tab with admission deadlines, just preliminary information
1040	page
1058	There should be a category for current seniors looking to apply in the fall. I had to scan the facebook forum only to find out that [university]'s 2014 AP test credit changes didn't apply to me.
1059	I am trying to find information about what options there are for studying in different subjects, haven't found it yet... but I am pretty sure I will after this survey :)
1073	I wish there was a separate page for incoming freshman and transfer students. I'm a freshman at BYUI and want to transfer to [university] but I finding it difficult to find specific information orientated towards transfer students.
1083	some things just don't appear in the page or are too hard to find.
1084	google
1085	I feel like the titles for admissions pages are really general.

Efficient3 Qualitative Results

Survey Number	*Question Efficient3: In what ways did the navigation help you to make a decision quickly on which link to click (page or information)?*
4	I knew I was looking for information about getting into [university] before I came here.
16	It's clearly writen and divided by different titles with which I could simply find what I'm looking for.
18	Helped me get to certain point, then could not find information for my inquirey.
37	It helps to filter the information so I knew where I was going.
43	Because provide the right information, in the exact part on the web page to be referral of that subject.
49	The choices were clear. I knew exactly what kind of information I would find by clicking a link.
54	information
61	Very quickly. The short cuts were clearly marked.
65	The labels in the cost section are clearly marked and easy to follow.
67	Easy to navigate labels for each page of the website that were true to the info found on each page :)
78	It did not help.
93	The subcategories within the main topics helped a lot
105	it's simple, and clear
108	It was very clear to find exactly what I was looking for, I was able to navigate to the page I needed to in just a couple seconds. I just needed to follow the links, from the home page I clicked on admissions and aid, transfer students, then I went e
119	Ask these questions as a part of signing off website. I really just started looking.
136	it was easily to find
140	Pictures.
142	tendran mayor guia para saber que hacer..
148	Very good. Very detailed. Very organized!
151	Headings and sub-headings are shown clearly e.g. portion on international students' acceptance criteria
168	It was very well organized and easy to find what I was looking for.
187	creo que las 2
198	It followed a logical flow. I expected the information I needed to be under admissions and it was.
202	It was confusing.
226	The links were titled well. It would be nice to see a whole navigation tree at once.
239	yes
246	super clear what they were leading to.
247	The links follow each other, step by step.
250	It layed out separate points simply and clearly :)
251	It layed out separate points simply and clearly :)

Survey Number	*Question Efficient3: In what ways did the navigation help you to make a decision quickly on which link to click (page or information)?*
253	Easy to read, fun format, good order of pages.
268	There needs to be a list of what is included with that tab
269	There needs to be a list of what is included with that tab
271	The homepage is well organized and contains all the links that I was expecting to find. The information is also well organized (at least the information I had the opportunity to check).
287	The page
290	The categories are good and broad, but the information doesn't seem to be there.
291	INFORMATION
295	Concise and to the point
317	again the word contact us...it gives me a phone number
321	it said transfer students but not applications
327	It didn't help.
330	they are categorized and specific
332	en que si la informacion es concreta puedo aplicar de una vez a la universidad
335	It is big and clear. The color is also helpful.
338	The icons are clear and not hidden.
342	Link to visually show the pages to be accessed.
346	CLEAR
349	precision determinant
350	to find admission
351	to find admission
353	The tab was for missionary deferment. We need to know if the assignment our son is being asked to do (pre-mission call) will qualify him for mission deferment.
361	information
383	The box with the options makes it very clear where the info I need is.
385	the name of the link
395	information
416	There were different categories and when you move the cursor to the categories, there are easy-to-differentiate sub-categories
422	It didn't. I can't find what I'm looking for.
424	information
428	the navigation i not help me at take my decisions.
432	Clear titles but too mixed up informationwise

Survey Number	*Question Efficient3: In what ways did the navigation help you to make a decision quickly on which link to click (page or information)?*
435	It help my work easier
448	It helped navigate me to the page which had the information related to the topic I was researching.
457	I like that everything is classified, that helped.
465	The brievety.
470	nenhuma
474	This website's general topics is followed by the sub topics that I am looking for.
504	I didn't takes much more time to find info than on other college sites.
513	Information
524	They were clearly organized and made my search for application criteria, financial estimates, etc. easy.
529	International students page
531	you just need to add "Current Student" to the options because if you're searching for admissions information, but you're not a new freshman or transfer or whatever, you feel like you can't get into the site and it's very annoying.
535	The options were very clear and I knew what I wanted to search for.
538	It was easy to locate, when looking for transfer student options.
563	It is a wonderful help especially for me, I am not very good following the computer instructions. thanks !
564	Easy to read
566	What's anything else about [university] news new.
569	The wording was easy to read and find
570	idk
575	la navegación me ayudo a tomar una desicion rápidamente sobre cada enlace
578	How everything is well organized it is very helpful. For having calendars of important dates.
584	It said what I wanted, so I clicked on it. That's pretty quick.
595	It said AP Credit guide
600	it helped me showing the way i want to go
612	They were all there when I needed them.
618	Navigation is constantly misleading and sends me somewhere other than where I want to go.
627	It was easy to find which links I needed in order to make my decision because they were there for me in broad daylight, and I didn't need to go searching for it.
631	it was pretty simple and clear
632	it was clearly seen, and described as well.
639	straight to the point
648	No quick descision

Survey Number	*Question Efficient3: In what ways did the navigation help you to make a decision quickly on which link to click (page or information)?*
664	Headings were clear but concise making it easy to find the correct link.
671	x
682	I've checked out the website a few times now, but when I first checked it out it was still easy to navigate.
685	I just type [university] Admissions and after that i found that site.
690	I DONT KNOW
693	I was looking for tuition and cost, I found a tab labeled tuition which led me to an easy to understand chart showing the cost for each level of education, rather than a confusing chart of tuition and fees that I don't know if I have to pay all of or
696	each page had accurate and helpful subheadings within the general headings
701	The information presented is concise, but thorough.
703	It was clear and concise.
705	really again?
713	Simple, yet the pictures With words are easiest so far. oh and for #2.... check below :)
715	I did not
734	It was pretty straight forward
752	Drop down menus so I didn't have to wait for the page to load.
753	It was very easily found, which helped me to click on the next link.
764	Tabs well named
772	See above.
782	information
790	-
805	things are made clear
813	unique navigation, great graphical work
819	the name of the link
821	Informational titles of links and pages.
827	It helped because it takes you directly to where you need to be.
835	It had a title that summarized what would be there if i clicked on it.
847	my friend told me to
849	it is very organized
866	not blasted with information all at once
870	la mayoría de los navegadores buscan solo una cosa, la manera de como ingresar a [university]
878	gracias a la navegación yo puedo saber y tener conocimiento acerca de algo desconocido como por ejemplo una universidad, saber información de ella, pagos, ramos, viviendas, becas, etc. Y yo creo que si me ayuda a tener una rápida decisión ya que

Survey Number	*Question Efficient3: In what ways did the navigation help you to make a decision quickly on which link to click (page or information)?*
880	Easy, light, excellent to be perfect as father in heaven is perfect with You!
889	well the Ideas of this webdesigner was too gud ..the page attacted me so I could get it quickly.
898	quicly
908	As I recall the links could have been highlighted and more prominent.
916	Easy to find. Simple description.
919	By your Details
924	It was very clear which direction I needed to go.
926	Having the Future Student link has always helped me to know exactly where to go to find the information I needed.
928	it is detailing what it is
969	information on the page, subject caught my eye.
970	supposition according to the answer but guessed right
977	It helped me find the admissions area, but still not where I want to go.
985	Having the type of student the first option (new freshman, transfer, etc) and easy to find options that can be quickly assessed.
992	I was looking for the tuition price for one semester of classes for a full time student at [university], and it was stated quiet clearly.
995	To the point
997	the titles
1002	Navigation is clearly organized.
1004	The picture/"How to Get In" tab.
1009	Easy accessibility, User friendly and very dynamic
1033	labeled transfer students
1040	page
1055	Google led me straight to the AP credit page and years were clearly labeled.
1057	It had large icons with easy to read text.
1059	I have found a lot of different information that make me feel secure and excited to come and study :)
1085	I am looking to see if there is a registration fee. I am just looking up admissions stuff to see if I can find whether or not there is.
1090	It was very clear.

Efficient4 Qualitative Results

Survey Number	*Question Efficient4: In what ways did the navigation hinder or not help you to make a decision quickly on which link to click (page or information)?*
4	It didn't
16	It's helpful to me
47	page
49	It didn't hinder at all. It's a lot more efficient than my prior attempts at finding information.
54	information
60	It is laid out quite easily
61	It was fine.
66	it wasnt the page
83	It didn't give a minimum GPA needed to apply just an average
89	Confusing organization.
90	written info
93	It didn't hinder me at all. It was very helpful.
105	I choose the MORE LINK for general information
136	it did not take me a lot
140	The same.
142	muy serio.. porque demorarian mas buscando en otros sitios web.
143	Ninguna
158	Only one of the links didn't work, so I had to go back and try again.
164	The labels are very clear, but it does take a bit for EACH page to load, just to click on another link right after.
187	Am deberian de poner idiomaas
198	It seems you have changed your website format, and it is better. Thank you!! I was looking for a specific answer to the question...does [university] offer tours or meet with prospective students? I thought that this information would be under 'admissions &
200	I didn't like the "more" option.
202	Confusing
234	Everything on the site seem so separate from each other. It makes it very difficult to find exactly what I am looking for in one place.
239	not at all
242	Sometimes the information was not that clear, and I had to call a school rep.
243	Sometimes the information was not that clear, and I had to call a school rep.
253	It seemed fine. Gave exactly the pages I needed in a sensible order.
254	its hepls a lot cuz y knew wich are the options

Survey Number	*Question Efficient4: In what ways did the navigation hinder or not help you to make a decision quickly on which link to click (page or information)?*
263	to showing me the options about what im searching
280	It was very clear where to click for what information I was looking for.
290	I think you need an additional box - When to apply. I'm still looking for that content and I've been on the page for about 10 minutes now.
295	Not at all. I was very satisfied
308	i'm chilean, so the only problem was the language, i can understand but if it was in spanish it would be much easier
317	It helped my find how to call you...and that was good enough...it just doesn't take me directly to the person who evaulates transcripts
321	I was looking for the actual applications for transfer students
328	aun no encuentro la información
332	la información no es concreta
342	The browser helps me take the desizões faster when it find all the information you need as quickly and clearly.
343	It has seemed easy so far.
346	I have not
349	in limited way
353	none
361	page
383	The first time I was on this website it was hard to find the admission dates.
395	informationj
416	I clicked the link and it didn't send me to that page, I had to right click and select 'open in a different tab'
422	It didn't help me.
424	information
426	It was helpful. Clear choices and I liked the colors and pictures. Nice for visual people like me.
432	Not clear, too many charts. Needs to be more concise information
435	It help me help what I need to find out.
441	There are a lot of 404 errors on certain links to pages.
456	It directed me to specific things I wanted was looking for.
465	If the navigation give us too much key words that we do not use so often.
470	nenhuma
489	I was actually looking for information about visiting [university] and getting a tour. I typed in the address I was given (visit.[university].edu) and it took me to the admissions/[university].com page but did not take me to or lead me to finding any information about visiti
494	None

Survey Number	*Question Efficient4: In what ways did the navigation hinder or not help you to make a decision quickly on which link to click (page or information)?*
504	too much jumping around. windows popping up, sliding in/out,etc/ basic info is hard to find
509	not sure
513	Page
520	An explanation of what each page contained might be more useful.
522	muchas veces no muestra las paginas que son importantes
524	It's organized so neatly that there are so many different topics to choose from. There are so many aspects to the application process that it's slightly overwhelming, but the 4 major labels to each sub-topic is helpful.
531	When I first came to the site, I entered "deferment" in the search bar. It forced me to choose what type of student I am...but I am none of the options because I am a current student. So that is WAY confusing and frustrating. I ended up just picking
538	I am looking for the requirements needed of a transfer student going to [university].....and I am still unsure what they need.
544	I'm already enrolled in [university] and need to transfer IB/AP credits.
563	I have just to read the instructions. It was easy to follow them.
564	This survey should be given at the end not at the beginning.
566	Have link to a member's student at [university] or 'till [university] student to know this new, to help someone who want to know can be know about what's news of [university].
569	Nothing everything was easy to find
570	idk
572	Did not notice either way.
575	la navegación me permite tomar una desicion rápidamente
577	-
578	It was really helpful it gives me the information i need for the choice i have in mind.
583	NA
600	nothing navigator was a great help
620	I found what I wanted right away.
621	The information was clear and did not immediately direct me to a different page, instead there were links which makes it less confusing when navigating.
632	The only thing- is that this survey popped up almost immediately .. so I didn't get very far, and don't have very much to base all these answers on. there was nothing hindering me to make a decision quickly.
652	...Haven't been on that long to think about it
656	When I tried to get into Financial Aid section it wouldn't let me and said I needed to clear my cookies.
658	I was only on the page for all of maybe 8 seconds before I was asked to do this survey so I honestly can't judge the navigation.
666	trying to find transfer requirements

Survey Number	*Question Efficient4: In what ways did the navigation hinder or not help you to make a decision quickly on which link to click (page or information)?*
669	I only got onto the site for my first time and this questionaire popped up, but I had not had time to really navigate the site.
671	im looking for a rather specific set of information and will probably need to call [university] international student information
675	there was no link for the page i wanted (ACT/SAT conversion)
685	no its really helps
690	I HAVE NOT EVEN SEEN WHAT I AM LOOKING FOR
696	didn't specify incoming freshmen, just said new freshmen and i wasn't sure if that was transferring freshmen or freshmen out of high school
705	well i think that you guys need a spanish version :D
708	hard to determine which link will take me to what I am looking for.
713	CLutter. Little more simple room. basic flow. 3 Columns seems to be cluttered for this info.
715	There were too many unclear options
737	They aren't clear on what they contain
740	not graphical user interface
749	I can't find the scholarship page that lists what scholarships are available to incoming freshman. I've been at if for about an hour now.
752	I'm not sure if I found the right spot.
777	I was looking for the actual application, which was under the "more" tab. So it wasn't a hassle at all, but maybe that should be one of the first options.
782	information
790	-
805	anyway
813	didn't at all
819	there was not a specific definition of what a "visiting student" is, and who can and who cannot apply for it.
820	It was fine.
827	N/A
835	A lot of the titles were similar and I was not sure what the difference was.
847	it was k
854	Everything was very clear and easy to find, the links were well labelled.
855	It never happened.
863	Not at all.
870	tiene un buen menú de elecciones
878	la dificultad que tengo con la navegación acerca de tomar una buena decisión es el idioma y que algunas paginas están alteradas o editadas que no me dan la información correspondiente.

Survey Number	*Question Efficient4: In what ways did the navigation hinder or not help you to make a decision quickly on which link to click (page or information)?*
879	the icons for information are well placed and appealing
880	I am 32 years young but am not yet admitted!
885	Some links seemed too similar so I just opened 4 tabs to find out which page held the information I was looking for.
889	obiviously the page
898	yes
903	It was fairly easy to find specific information by clicking on links that led to a certain category. I was looking for application deadlines for freshmen, however, and I could not find them under any of the five main links here.
908	Too many web pages seem to have conflicting information. Hope this one has it correctly done. You've asked in later questions about LINKS - - - - that was too long ago. Can't recall the links.
919	Information link
923	I was never hindered, as said above, all information is obvious andeasy to get to.
927	It would have been helpful to have the number near the top of the page.
928	detailing information
929	All of it was very helpful; no hindering.
945	I wasnt sure whether or not it was going to show me specific options to what I wanted to see
949	I can't find what I need.
960	Can't find doctoral programs
968	The graphics were distracting
970	he/she doesn't go directly with the information that one search
990	the truth I can not speak much English
1005	None
1006	When searching for the Transfer Students tab, I kept getting redirected multiple times. That was frustrating.
1022	Again, it does a fine job. No complaints.
1023	I may as well not even try to apply...
1030	I want to transfer to [university] but it is unclear of what they would require for a transfer.
1040	information
1055	I wasnt sure if the year to select was the one I took the AP test in or the one I will be a freshman in.
1085	Not as specific as I'd like. It seems like there is a lot of different information about admissions but not what I am looking for.
1090	I was using my mobile phone and it was difficult to navigate the page I wanted
1092	The stupid survey came up a million times. It was irritating. And when I click on what I want, it brings me to an annoying/ugly checklist page. I just want basic information, I dont want all this pizzaz.

APPENDIX E ELIMINATED SURVEYS

Column for Survey Number, Link Ordering, Change Frequency, and Demographics

Survey Number	*Survey*	*Order*	*Change1*	*Change2*	*Audience*	*Age*	*Purpose*
1	first	random	visit	never	New Freshman	0-15	i-apply
11	first	popular	visit	never	International Student	16-19	think-apply
20	first	random	page	page	New Freshman	16-19	happenstance
21	first	popular	visit	never	International Student	30-39	think-apply
27	first	popular	visit	never	New Freshman	16-19	happenstance
44	first	random	visit	never	International Student	20-24	info
61	first	popular	page	page	Transfer Student	16-19	think-apply
63	first	popular	never	never	Postbaccalaureate	20-24	i-apply
72	first	random	page	page	Postbaccalaureate	50-59	think-apply
94	first	random	never	never	New Freshman	16-19	i-apply
139	first	popular	never	never	Transfer Student	20-24	i-apply
160	first	popular	visit	never	New Freshman	20-24	think-apply
172	first	popular	never	never	International Student	16-19	i-apply
179	first	popular	never	never	New Freshman	20-24	happenstance
185	first	alphabetical	page	page	New Freshman	20-24	happenstance
190	first	alphabetical	page	page	New Freshman	16-19	info
194	first	popular	page	page	Transfer Student	20-24	happenstance
206	first	popular	visit	never	New Freshman	40-49	other-apply
249	first	alphabetical	page	page	Transfer Student	40-49	think-apply
261	first	popular	never	never	International Student	16-19	think-apply
285	first	alphabetical	never	never	International Student	16-19	think-apply
288	first	random	visit	never	Concurrent Enrollment	50-59	happenstance
310	first	random	visit	never	New Freshman	16-19	happenstance

Survey Number	*Survey*	*Order*	*Change1*	*Change2*	*Audience*	*Age*	*Purpose*
311	first	random	visit	never	International Student	20-24	think-apply
322	first	popular	never	never	New Freshman	16-19	happenstance
326	first	alphabetical	visit	never	International Student	20-24	think-apply
366	first	alphabetical	page	page	New Freshman	16-19	think-apply
367	first	random	page	page	New Freshman	16-19	i-apply
380	first	popular	page	page	International Student	16-19	info
394	first	popular	never	never	International Student	30-39	think-apply
399	first	alphabetical	visit	never	Postbaccalaureate	16-19	think-apply
407	first	alphabetical	page	page	New Freshman	16-19	happenstance
440	first	popular	page	page	International Student	16-19	think-apply
444	first	random	visit	never	New Freshman	50-59	happenstance
450	first	popular	page	page	New Freshman	50-59	other-apply
496	first	popular	visit	never	Visiting Student	20-24	i-apply
501	first	popular	page	page	International Student	16-19	happenstance
533	first	random	page	page	New Freshman	16-19	happenstance
538	first	random	page	page	Transfer Student	20-24	other-apply
556	first	popular	never	never	New Freshman	16-19	i-apply
557	first	popular	never	never	New Freshman	16-19	i-apply
561	first	popular	visit	never	Transfer Student	16-19	i-apply
564	first	random	never	never	International Student	16-19	think-apply
587	first	random	never	never	Concurrent Enrollment	30-39	other-think-apply
588	first	alphabetical	page	page	Postbaccalaureate	30-39	think-apply
589	first	random	never	never	International Student	16-19	think-apply
617	first	alphabetical	never	never	New Freshman	50-59	other-think-apply
649	first	alphabetical	never	never	Postbaccalaureate	25-29	info
657	first	popular	never	never	International Student	16-19	think-apply
687	first	popular	visit	never	Transfer Student	20-24	think-apply
765	first	alphabetical	page	page	Visiting Student	16-19	i-apply
798	first	random	page	page	Visiting Student	30-39	think-apply
804	first	random	visit	never	New Freshman	16-19	other-apply
826	first	random	page	page	International Student	25-29	happenstance
842	first	random	never	never	New Freshman	16-19	i-apply

Survey Number	*Survey*	*Order*	*Change1*	*Change2*	*Audience*	*Age*	*Purpose*
843	first	random	page	page	New Freshman	16-19	think-apply
869	first	popular	page	page	Transfer Student	50-59	other-apply
891	first	popular	visit	never	New Freshman	16-19	i-apply
893	first	random	visit	never	International Student	20-24	happenstance
902	first	popular	visit	never	International Student	16-19	i-apply
911	first	alphabetical	visit	never	New Freshman	16-19	think-apply
913	first	random	never	never	New Freshman	16-19	i-apply
921	first	random	visit	never	International Student	16-19	think-apply
930	first	random	visit	never	International Student	50-59	other-think-apply
982	first	alphabetical	visit	never	Transfer Student	16-19	think-apply
1011	first	alphabetical	visit	never	Transfer Student	50-59	happenstance
1029	first	random	never	never	New Freshman	16-19	i-apply
1088	first	popular	never	never	New Freshman	30-39	other-apply
1095	first	alphabetical	page	page	New Freshman	16-19	i-apply
1096	first	random	never	never	New Freshman	50-59	info
1106	first	popular	page	page	Former Student	40-49	i-apply
1123	first	random	never	never	New Freshman	16-19	i-apply
1129	first	popular	never	never	International Student	16-19	think-apply
1140	first	popular	visit	never	New Freshman	16-19	think-apply
1152	first	popular	page	page	Transfer Student	16-19	info
1161	first	popular	never	never	Transfer Student	16-19	happenstance
1168	first	alphabetical	page	page	International Student	25-29	think-apply
1182	first	alphabetical	never	never	Concurrent Enrollment	16-19	i-apply
1195	first	popular	page	page	International Student	20-24	i-apply
1199	first	popular	never	never	Former Student	20-24	i-apply
1222	first	random	never	never	International Student	20-24	think-apply
1239	first	random	never	never	Former Student	20-24	info
1259	second	random	visit	never	New Freshman	16-19	i-apply
1260	second	alphabetical	never	never	International Student	16-19	i-apply
1261	second	random	never	never	International Student	30-39	i-apply

Qualitative Survey Data

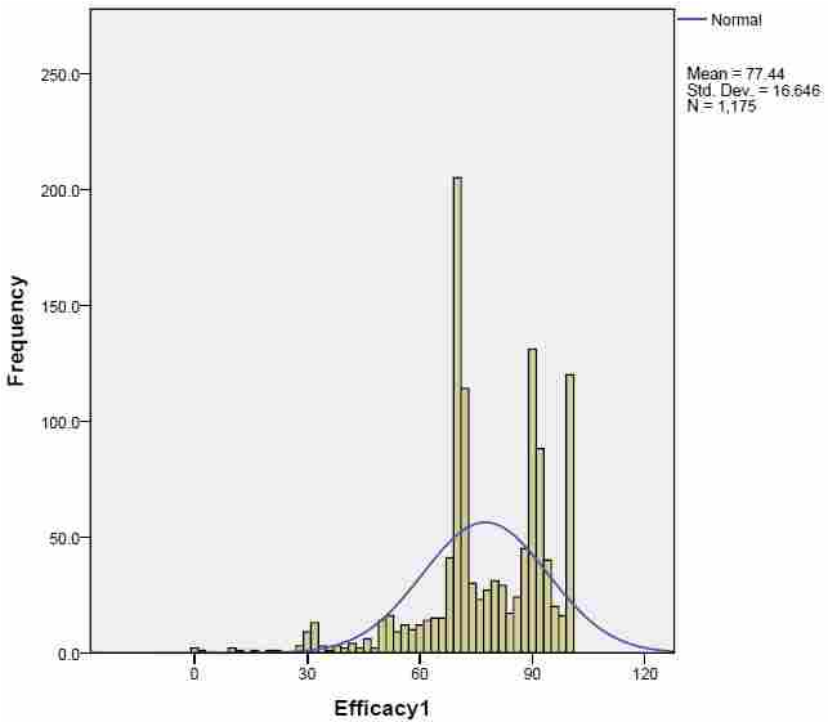
Survey Number	*Efficacy*		*Effective*			*Efficient*		*Satisfice*		
	1	**2**	**1**	**2**	**3**	**1**	**2**	**1**	**2**	**3**
1	50	50	50	50	50	50	50	50	50	50
11	50	50	50	50	50	50	50	72	50	50
20	69	69	30	29	50	70	71	50	50	50
21	50	50	50	50	50	50	67	50	45	50
27	87	89	99	100	86	80	70	87	75	88
44	50	50	50	50	69	50	50	50	50	50
61	50	57	50	70	65	58	50	56	61	62
63	70	43	70	50	50	68	58	50	50	50
72	71	50	50	50	50	50	50	50	31	71
94	50	50	50	70	69	50	51	70	55	52
139	69	69	69	70	70	29	50	59	50	50
160	50	69	50	50	70	50	70	50	69	70
172	50	70	90	90	50	50	70	70	50	70
179	98	99	11	30	77	50	33	31	50	50
185	69	67	50	50	54	55	50	50	55	67
190	54	57	56	68	56	50	50	50	71	54
194	90	90	70	71	30	80	70	57	42	30
206	68	71	31	50	50	69	46	50	50	72
249	50	99	50	50	50	50	50	50	50	50
261	53	50	50	58	50	50	50	50	50	52
285	50	50	50	50	69	69	70	50	57	70
288	31	8	44	51	29	29	7	8	30	30
310	50	50	17	50	26	24	29	27	50	50
311	70	69	70	70	70	50	50	70	70	69
322	85	79	50	50	39	10	8	8	3	38
326	51	54	50	50	64	70	59	50	56	50
366	91	89	50	70	69	50	70	69	50	50
367	50	50	50	50	50	50	49	50	50	50
380	70	69	50	50	70	91	50	50	70	70
394	70	50	92	70	50	70	50	70	50	71

Survey Number	Efficacy		Effective			Efficient		Satisfice		
	1	2	1	2	3	1	2	1	2	3
399	50	50	50	70	50	70	50	50	50	50
407	67	64	44	70	50	50	54	67	72	53
440	70	50	50	50	50	50	57	56	50	56
444	50	62	29	10	50	50	10	9	50	50
450	29	30	50	70	50	50	50	50	50	50
496	90	90	50	50	29	28	50	50	72	32
501	46	46	43	70	55	68	61	55	54	46
533	91	69	70	90	69	70	70	69	50	71
538	79	89	50	50	50	65	44	50	55	42
556	100	100	100	100	50	50	50	50	69	50
557	100	100	100	100	50	50	50	50	69	50
561	50	51	50	51	70	50	50	50	50	50
564	30	50	68	50	50	50	69	69	50	28
587	50	48	52	50	50	48	69	50	40	52
588	94	50	39	50	70	63	50	50	70	50
589	71	68	50	71	69	50	50	51	54	70
617	50	48	48	54	46	47	50	46	50	43
649	69	71	31	32	50	31	50	50	50	70
657	71	50	50	50	69	50	50	50	50	76
687	80	83	50	69	50	50	30	50	50	50
765	50	50	50	50	50	50	50	50	50	50
798	50	50	50	50	50	50	50	50	49	48
804	81	70	50	70	50	50	42	75	50	58
826	69	55	70	69	50	70	69	69	54	69
842	70	78	50	50	50	44	56	58	50	42
843	50	50	29	50	71	29	50	50	50	71
869	50	50	51	50	50	50	50	50	50	50
891	50	50	50	50	50	50	50	50	50	50
893	90	90	70	90	70	90	89	91	71	89
902	69	50	69	71	61	50	50	65	50	50
911	68	68	50	50	69	50	53	69	72	50
913	50	50	50	50	50	50	50	50	50	64

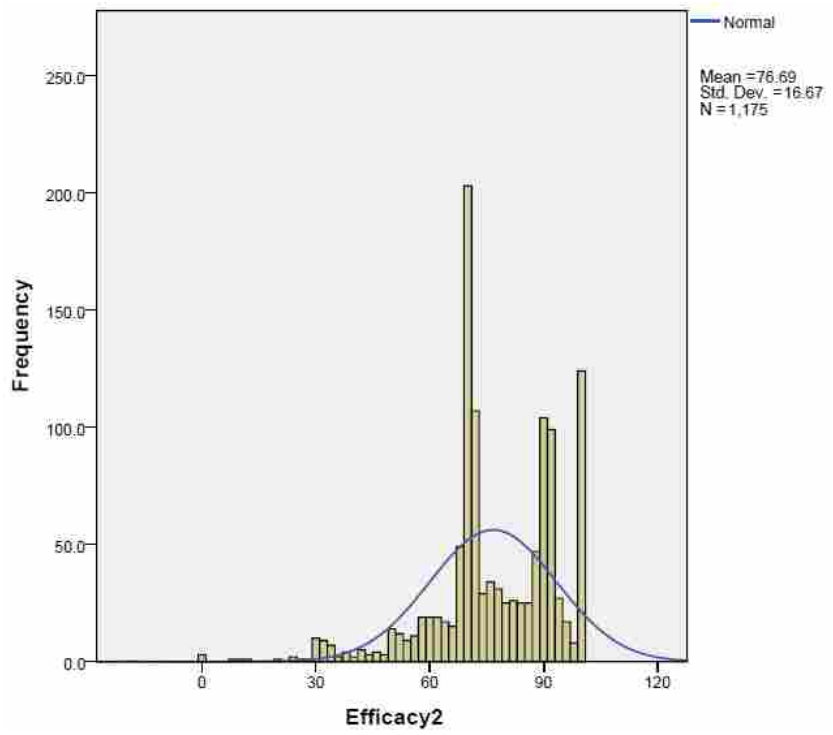
Survey Number	Efficacy		Effective			Efficient		Satisfice		
	1	2	1	2	3	1	2	1	2	3
921	31	50	50	41	50	29	30	50	50	50
930	50	53	50	50	50	44	45	38	50	51
982	75	78	50	50	51	51	48	50	50	50
1011	60	62	43	50	50	28	48	26	57	57
1029	58	62	90	70	50	50	50	70	50	69
1088	89	70	50	93	35	50	31	50	50	50
1095	50	50	50	72	50	56	37	29	50	49
1096	90	100	70	50	50	61	69	50	50	71
1106	50	50	50	50	45	41	41	50	50	44
1123	50	50	50	50	50	50	51	50	50	50
1129	50	50	50	50	50	50	50	50	50	50
1140	57	44	71	50	50	43	54	50	50	59
1152	50	50	50	50	50	50	50	50	50	50
1161	4	69	29	72	29	70	9	68	31	70
1168	60	58	66	50	62	53	50	50	64	50
1182	50	100	50	50	59	50	50	50	50	50
1195	50	50	50	50	50	51	50	50	50	50
1199	50	50	50	50	50	50	50	50	50	50
1222	41	50	49	50	50	50	26	20	29	28
1239	50	50	70	50	50	50	50	29	50	50
1259	71	69	54	77	56	40	53	56	37	56
1260	81	61	89	90	81	75	92	70	90	82
1261	70	70	70	70	71	70	70	70	73	70

APPENDIX F RESULTS

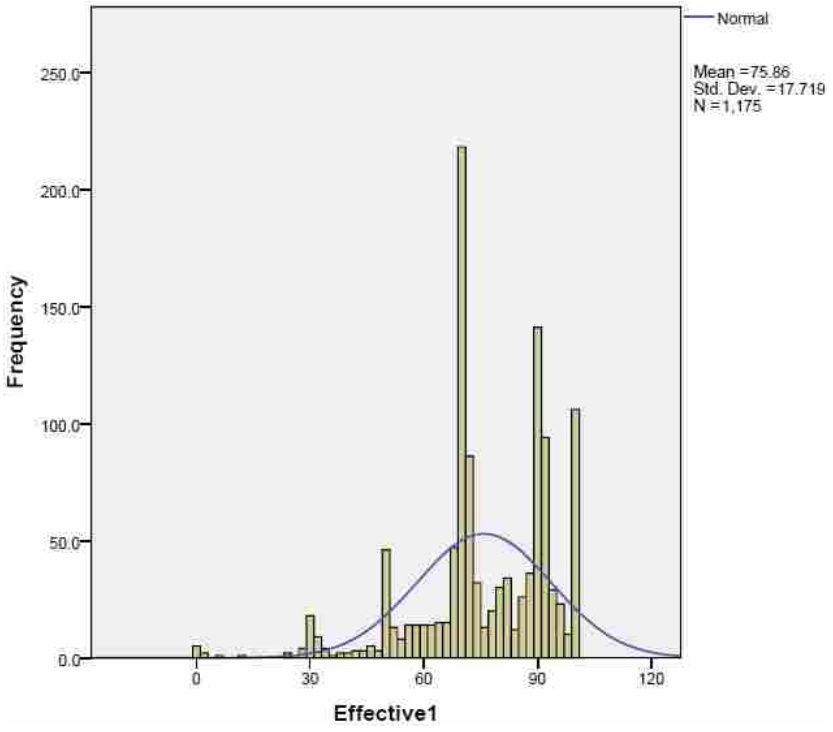
F.1 Normal Distributions



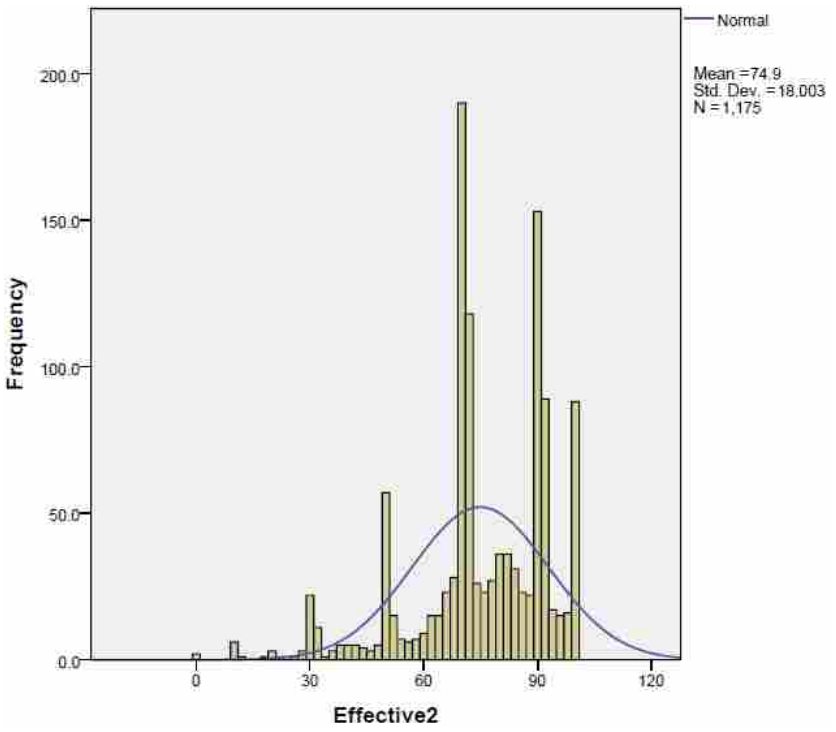
Normal Distribution for Efficacy1 vs. Change Frequency



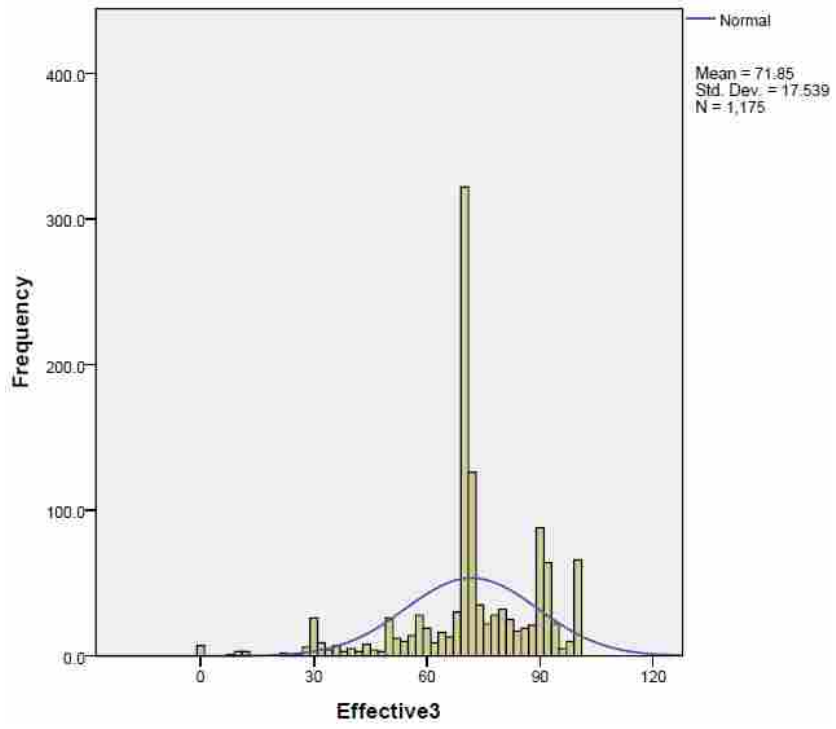
Normal Distribution for Efficacy2 vs. Change Frequency



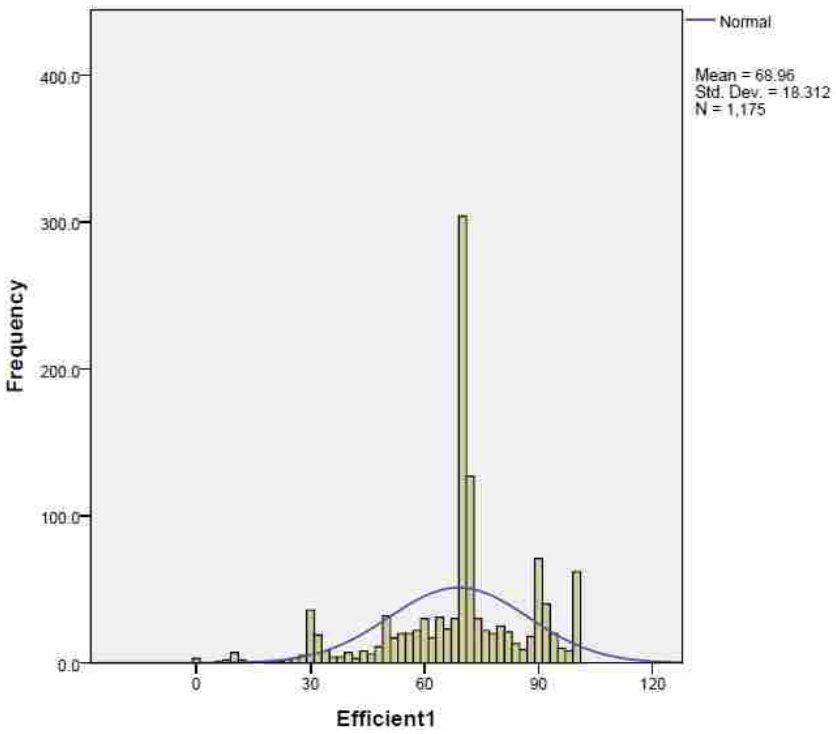
Normal Distribution for Effective1 vs. Change Frequency



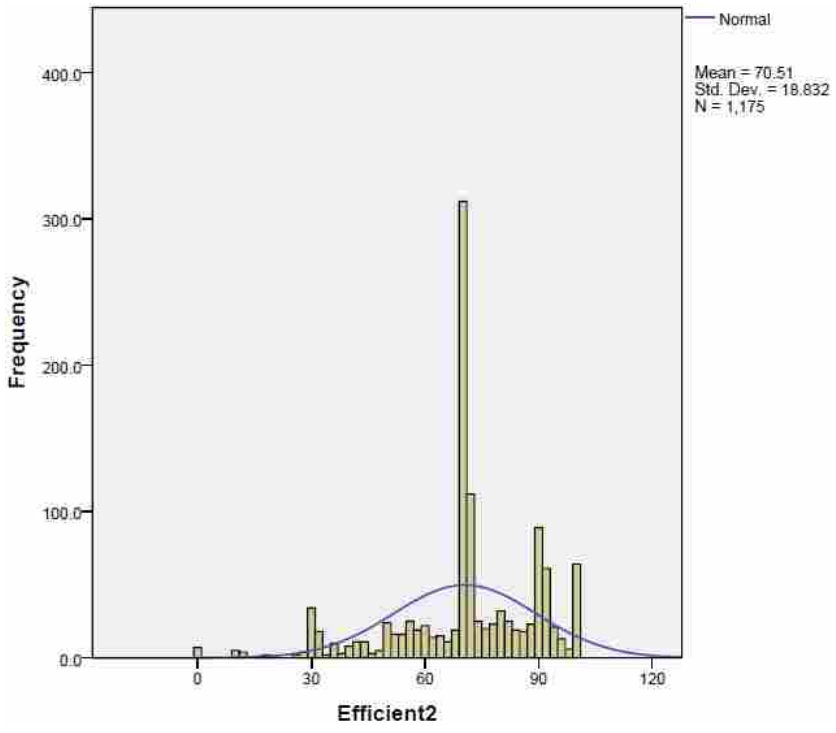
Normal Distribution for Effective2 vs. Change Frequency



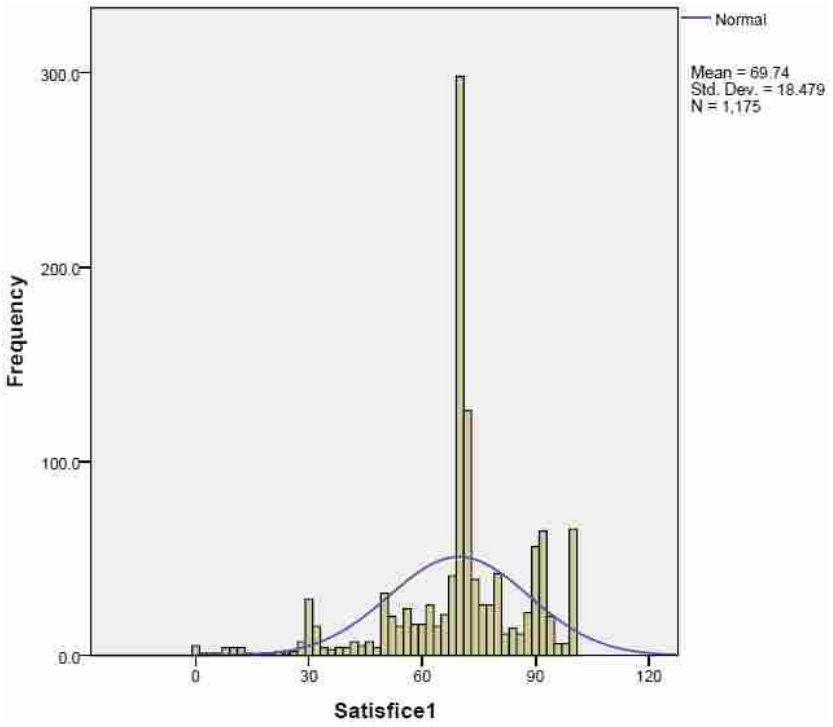
Normal Distribution for Effective3 vs. Change Frequency



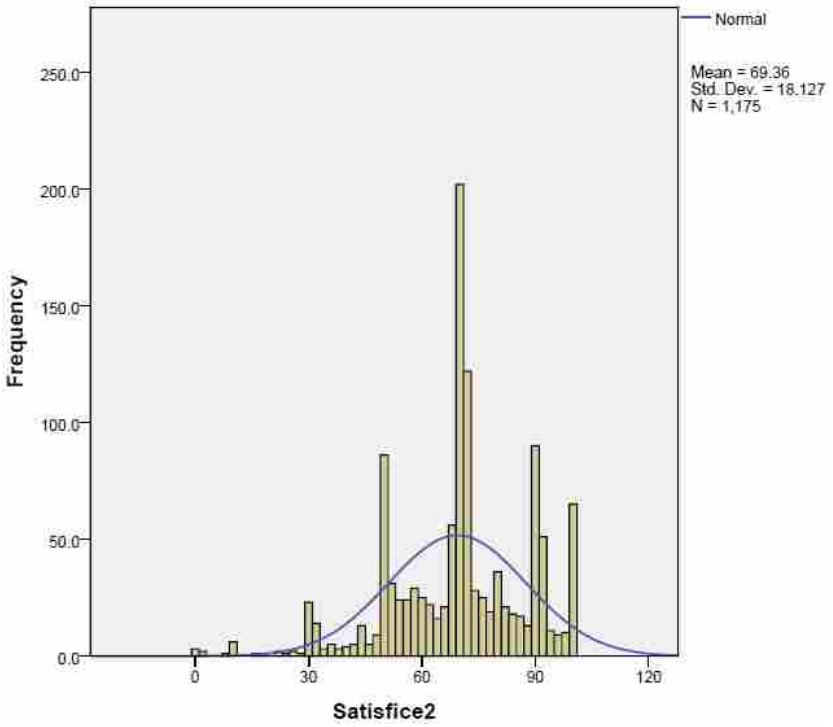
Normal Distribution for Effecient1 vs. Change Frequency



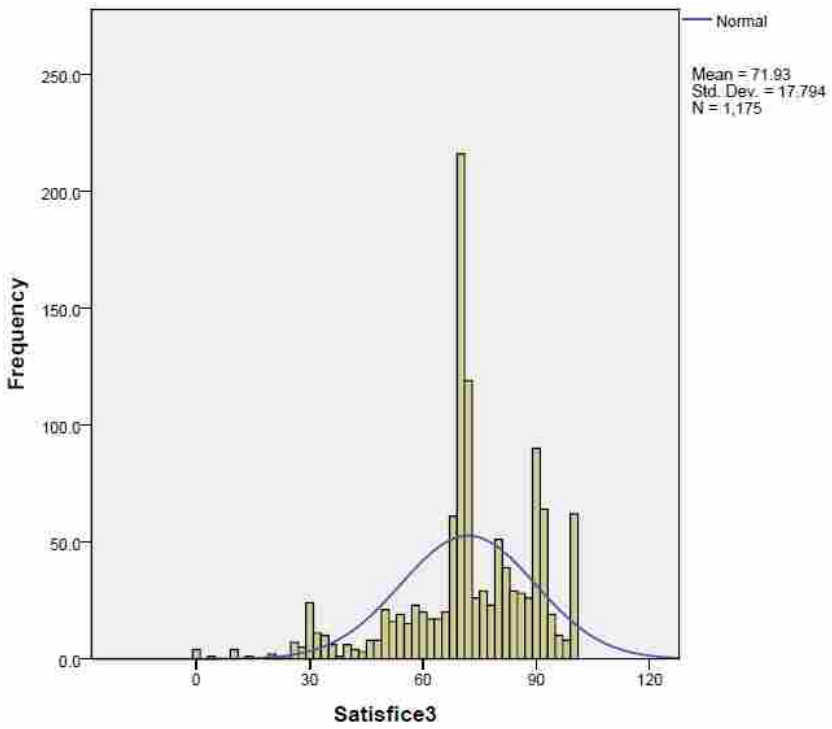
Normal Distribution for Effecient2 vs. Change Frequency



Normal Distribution for Satisfice1 vs. Change Frequency



Normal Distribution for Satisfice2 vs. Change Frequency



Normal Distribution for Satisfice3 vs. Change Frequency

F.2 MANOVA Results Using Univariate ANOVA Tests of Between-Subjects Effects

MANOVA Results of Corrected Model Using Univariate ANOVA Tests of Between-Subjects Effects

Dependent Variable	*Type III Sum of Squares*	*df*	*Mean Square*	*F*	*Sig.*	*Partial Eta Squared*	*Noncent. Parameter*	*Observed Power*
Efficacy1	1029.335	5	205.867	.742	.592	.003	3.711	.270
Efficacy2	1298.675	5	259.735	.934	.458	.004	4.672	.338
Effective1	4103.794	5	820.759	2.632	.022	.011	13.161	.810
Effective2	2388.192	5	477.638	1.477	.195	.006	7.384	.523
Effective3	660.213	5	132.043	.428	.829	.002	2.141	.165
Efficient1	2354.811	5	470.962	1.407	.219	.006	7.034	.501
Efficient2	318.788	5	63.758	.179	.970	.001	.896	.093
Satisfice1	443.233	5	88.647	.259	.935	.001	1.294	.115
Satisfice2	2549.943	5	509.989	1.556	.170	.007	7.779	.548
Satisfice3	163.785	5	32.757	.103	.992	.000	.515	.074

MANOVA Results of Intercept Using Univariate ANOVA Tests of Between-Subjects Effects

Dependent Variable	*Type III Sum of Squares*	*df*	*Mean Square*	*F*	*Sig.*	*Partial Eta Squared*	*Noncent. Parameter*	*Observed Power*
Efficacy1	6434541.703	1	6434541.703	23196.507	.000	.952	23196.507	1.000
Efficacy2	6315984.392	1	6315984.392	22721.653	.000	.951	22721.653	1.000
Effective1	6222225.914	1	6222225.914	19955.593	.000	.945	19955.593	1.000
Effective2	6061816.269	1	6061816.269	18741.217	.000	.941	18741.217	1.000
Effective3	5582282.784	1	5582282.784	18103.302	.000	.939	18103.302	1.000
Efficient1	5122870.532	1	5122870.532	15303.348	.000	.929	15303.348	1.000
Efficient2	5360308.175	1	5360308.175	15062.446	.000	.928	15062.446	1.000
Satisfice1	5257169.036	1	5257169.036	15347.153	.000	.929	15347.153	1.000
Satisfice2	5197774.748	1	5197774.748	15856.507	.000	.931	15856.507	1.000
Satisfice3	5578576.032	1	5578576.032	17551.315	.000	.938	17551.315	1.000

MANOVA Results of Order Using Univariate ANOVA Tests of Between-Subjects Effects

Dependent Variable	*Type III Sum of Squares*	*df*	*Mean Square*	*F*	*Sig.*	*Partial Eta Squared*	*Noncent. Parameter*	*Observed Power*
Efficacy1	6.699	2	3.349	.012	.988	.000	.024	.052
Efficacy2	59.367	2	29.684	.107	.899	.000	.214	.066
Effective1	335.210	2	167.605	.538	.584	.001	1.075	.139
Effective2	1712.907	2	856.454	2.648	.071	.005	5.296	.527
Effective3	131.791	2	65.896	.214	.808	.000	.427	.084
Efficient1	88.523	2	44.262	.132	.876	.000	.264	.070
Efficient2	175.699	2	87.850	.247	.781	.000	.494	.089
Satisfice1	137.373	2	68.686	.201	.818	.000	.401	.081
Satisfice2	1424.564	2	712.282	2.173	.114	.004	4.346	.446
Satisfice3	.557	2	.278	.001	.999	.000	.002	.050

MANOVA Results of Change2 Using Univariate ANOVA Tests of Between-Subjects Effects

Dependent Variable	*Type III Sum of Squares*	*df*	*Mean Square*	*F*	*Sig.*	*Partial Eta Squared*	*Noncent. Parameter*	*Observed Power*
Efficacy1	235.456	1	235.456	.849	.357	.001	.849	.151
Efficacy2	108.206	1	108.206	.389	.533	.000	.389	.096
Effective1	395.973	1	395.973	1.270	.260	.001	1.270	.203
Effective2	221.986	1	221.986	.686	.408	.001	.686	.131
Effective3	280.823	1	280.823	.911	.340	.001	.911	.159
Efficient1	18.258	1	18.258	.055	.815	.000	.055	.056
Efficient2	2.903	1	2.903	.008	.928	.000	.008	.051
Satisfice1	156.534	1	156.534	.457	.499	.000	.457	.104
Satisfice2	158.174	1	158.174	.483	.487	.000	.483	.107
Satisfice3	17.136	1	17.136	.054	.816	.000	.054	.056

MANOVA Results of Order X Change2 Using Univariate ANOVA Tests of Between-Subjects Effects

Dependent Variable	*Type III Sum of Squares*	*df*	*Mean Square*	*F*	*Sig.*	*Partial Eta Squared*	*Noncent. Parameter*	*Observed Power*
Efficacy1	681.363	2	340.682	1.228	.293	.002	2.456	.269
Efficacy2	1149.960	2	574.980	2.068	.127	.004	4.137	.427
Effective1	3660.952	2	1830.476	5.871	.003	.010	11.741	.875
Effective2	937.429	2	468.715	1.449	.235	.002	2.898	.311
Effective3	299.929	2	149.965	.486	.615	.001	.973	.130
Efficient1	2177.524	2	1088.762	3.252	.039	.006	6.505	.620
Efficient2	225.790	2	112.895	.317	.728	.001	.634	.101
Satisfice1	226.603	2	113.302	.331	.718	.001	.662	.103
Satisfice2	1558.969	2	779.485	2.378	.093	.004	4.756	.482
Satisfice3	130.071	2	65.035	.205	.815	.000	.409	.082

APPENDIX G CODE

G.1 Survey Generator

```
<?php
require('../../requires.php');
require('../../objects/Survey.php');
require('adaptive_navigation_test.php');

//define the questions to be randomly ordered
$pool = array(
      'efficacy' => array(
            array(
                  'question' => 'In general, how comfortable are you at
looking for information within web sites?',
                  'type' => 'slider',
                  'values' => array('Very uncomfortable', 'Uncomfortable',
'|', 'Comfortable', 'Very comfortable'),
                  'name' => 'efficacy1',
            ),
            array(
                  'question' => 'In general how comfortable are you using
navigation on web sites?',
                  'type' => 'slider',
                  'values' => array('Very uncomfortable', 'Uncomfortable',
'|', 'Comfortable', 'Very comfortable'),
                  'name' => 'efficacy2',
            ),
      ),
      'effective' => array(
            array(
                  'question' => 'How confident are you that you found the web
page you wanted?',
                  'type' => 'slider',
                  'values' => array('Sure it is not', 'Think it is
incorrect', 'Not sure ', 'Think it is correct ', 'Sure it is correct'),
                  'comments' => true,
                  'name' => 'effective1',
            ),
            array(
                  'question' => 'How confident are you that this web page
contains the information you are looking for?',
                  'type' => 'slider',
                  'values' => array('Sure it does not', 'Think it does not',
'Not sure ', 'Think it does ', 'Sure it does'),
                  'comments' => true,
```

```
                  'name' => 'effective2',
            ),
            array(
                  'question' => 'How helpful were the links in helping you
make a decision on finding the information you wanted?',
                  'type' => 'slider',
                  'values' => array('Not helpful at all', 'Not very helpful',
'| ', 'Helpful', 'Very helpful'),
                  'comments' => true,
                  'name' => 'effective3',
            ),
            array(
                  'question' => 'In what ways did the navigation help you to
find what you were looking for (page or information)?',
                  'type' => 'textarea',
                  'name' => 'effective4',
            ),
            array(
                  'question' => 'In what ways did the navigation hinder or
not help you to find what you were looking for (page or information)?',
                  'type' => 'textarea',
                  'name' => 'effective5',
            ),
      ),
      'efficient' => array(
            array(
                  'question' => 'How quickly did the link help you decide on
the link to the next page you wanted?',
                  'type' => 'slider',
                  'values' => array('Not quickly at all', 'Not very quickly
', '| ', 'Quickly', 'Very quickly'),
                  'comments' => true,
                  'name' => 'efficient1',
            ),
            array(
                  'question' => 'How easy was it to find the link to the next
page you wanted?',
                  'type' => 'slider',
                  'values' => array('Not easy at all ', 'Not very easy', '|
', 'Easy', 'Very easy'),
                  'comments' => true,
                  'name' => 'efficient2',
            ),
            array(
                  'question' => 'In what ways did the navigation help you to
make a decision quickly on which link to click (page or information)?',
                  'type' => 'textarea',
                  'name' => 'efficient3',
            ),
            array(
                  'question' => 'In what ways did the navigation hinder or
not help you to make a decision quickly on which link to click (page or
information)?',
                  'type' => 'textarea',
                  'name' => 'efficient4',
            ),
      ),
```

```
	'satisfice' => array(
		array(
			'question' => 'Using the links how satisfying was it to
find what you were looking for?',
			'type' => 'slider',
			'values' => array('Not satisfying at all', 'Not very
satisfying  ', '| ', 'Satisfying', 'Very satisfying'),
			'comments' => true,
			'name' => 'satisfice1',
		),
		array(
			'question' => 'How much did you like the navigation on this
site compared to other websites',
			'type' => 'slider',
			'values' => array('The navigation on this site is much
worse', 'The navigation on this site is worse', '| ', 'The navigation on this
site is better', 'The navigation on this site is much better'),
			'comments' => true,
			'name' => 'satisfice2',
		),
		array(
			'question' => 'Was the navigation good enough to find the
pages you were looking for?',
			'type' => 'slider',
			'values' => array('It was terrible', 'It was not good
enough  ', '| ', 'It was good enough', 'It was excellent'),
			'comments' => true,
			'name' => 'satisfice3',
		),
	)
);

//if the user elects to not take the survey by clicking 'No' then they will
never be prompted to take
//the survey again (for that audience). This code is activated via AJAX.
if (isset($_POST['u'])) {
	for ($i = 0; $i < 2; $i++) {
		$survey = new Survey();
		$survey->userId = $_POST['u'];
		$survey->stage = 3;
		$survey->audienceId = 0;
		$survey->visitId = 0;
		$survey->order = '-';
		$survey->change = '-';
		$survey->age = '-';
		$survey->purpose = '-';
		$survey->set('final-comments', '-');
		foreach ($pool as $segment) {
			foreach ($segment as $question) {
				$survey->set($question['name'], '0');
			}
		}
		$survey->dbInsert();
	}
}

//the user has filled out the form so submit and redirect
```

```
if (isset($_POST['userId'])) {
	$userId = $_POST['userId'];
	$stage = $_POST['stage'];
	$audienceId = $_POST['audienceId'];
	$visitId = $_POST['visitId'];

	//gather the survey results into the DBI object
	$survey = new Survey();
	$survey->userId = $userId;
	$survey->stage = $stage;
	$survey->audienceId = $audienceId;
	$survey->visitId = $visitId;
	$survey->order = substr($_POST['order'], 0, 1);
	$survey->change = substr($_POST['change'], 0, 1);
	$survey->age = $_POST['age'];
	$survey->purpose = $_POST['purpose'];
	$survey->set('final-comments', $_POST['final-comments']);
	foreach ($pool as $segment) {
		foreach ($segment as $question) {
			$survey->set($question['name'], $_POST[$question['name']]);
		}
	}

	//insert the survey results into the database
	$survey->dbInsert();

	//redirect to the complete page (prevent survey resubmit by refreshing
browser)
	header("Location: survey-complete.php");
}

?>

<!DOCTYPE html PUBLIC "-//W3C//DTD XHTML 1.0 Transitional//EN"
"http://www.w3.org/TR/xhtml1/DTD/xhtml1-transitional.dtd">
<html xmlns="http://www.w3.org/1999/xhtml">
<head>
<meta http-equiv="Content-Type" content="text/html; charset=utf-8" />
<title>Survey</title>
<script type="text/javascript" src="js/jquery-1.5.2.min.js"></script>
<script type="text/javascript" src="js/jquery-ui-1.8.12.min.js"></script>
<link href="css/jquery-ui-base.css" rel="stylesheet" type="text/css" />
<link href="css/survey.css" rel="stylesheet" type="text/css" />

<script type="text/javascript">
$(function() {
	$('.slider').slider({
		min: 0,
		max: 100,
		value: 50,
		change: function() {
			var t = $(this), input;
			input = t.parent().children('input').first();
			input.val(t.slider('value'));

			t.parents('.survey-segment').addClass('ok');
			t.parents('.survey-segment').removeClass('required');
```

```
            }
      });

      var inputs = $('.survey-segment input, .survey-segment textarea');
      inputs.change(function() {
            $(this).parents('.survey-segment').addClass('ok');
            $(this).parents('.survey-segment').removeClass('required');
      });

      $('form').submit(function() {
            var required = $('.survey-segment.required');
            if (required.length > 0) {
                  alert('One or more required questions have not been
answered. Please answer them before submitting.');
                  return false;
            }
      });

});
</script>



<?php

function array_shift_assoc(&$array) {
      if (!is_array($array)) return NULL;
      foreach ($array as $key => $value) {
            $ar = array($key => $value);
            array_shift($array);
            return $ar;
      }
      return NULL;
}

function array_assoc_value(&$array, $index) {
      $i = 0;
      if (!is_array($array)) return NULL;
      foreach ($array as $key => $value) {
            if ($i == $index) return $value;
      }
      return NULL;
}

function array_assoc_key(&$array, $index) {
      $i = 0;
      if (!is_array($array)) return NULL;
      foreach ($array as $key => $value) {
            if ($i == $index) return $key;
      }
      return NULL;
}
?>
</head>

<body>
```

```
<form action='survey.php' method="post">

<div id="Intro">
      <p>Thank you for being willing to take this
      <?php
      if ($_GET['s'] == 1) {
            echo "preliminary";
      } else {
            echo "follow-up";
      }
      ?>
      survey. Your answers will help us to improve our website navigation.
Please fill out this survey in its entirety.</p>
</div>

<div class="survey-segment required">
      <div class='question'>1. What is your age?</div>
      <div class='answers'>
            <input type="radio" name="age" value='0-15' />Less than 15<br />
            <input type="radio" name="age" value='16-19' />16-19<br />
            <input type="radio" name="age" value='20-24' />20-24<br />
            <input type="radio" name="age" value='25-29' />25-29<br />
            <input type="radio" name="age" value='30-39' />30-39<br />
            <input type="radio" name="age" value='40-49' />40-49<br />
            <input type="radio" name="age" value='50-59' />50-59<br />
            <input type="radio" name="age" value='60-69' />60-69<br />
            <input type="radio" name="age" value='70+' />70 or older
      </div>
</div>
<div class="survey-segment required">
      <div class='question'>2. What is your purpose or goal for trying to
find information on this web site?</div>
      <div class='answers'>
            <input type="radio" name="purpose" value='i-apply' />I will be
applying to BYU<br />
            <input type="radio" name="purpose" value='think-apply' />I am
thinking of applying to BYU<br />
            <input type="radio" name="purpose" value='other-think-apply' />I
am looking up information about applying to BYU for someone else who is
THINKING of applying to BYU<br />
            <input type="radio" name="purpose" value='other-apply' />I am
looking up information about applying to BYU for someone else who is GOING TO
apply to BYU<br />
            <input type="radio" name="purpose" value='info' />I am just
looking up information about BYU admissions in general<br />
            <input type="radio" name="purpose" value='happenstance' />I was
not looking for BYU admissions information and starting browsing through BYU
admissions information<br />
      </div>
</div>

<?php
$orderedQuestions = array();
while (count($pool) > 0) {
      $lengths = array();
      foreach ($pool as $type => $questions) $lengths[$type] =
count($questions);
```

```
	arsort($lengths);

	$choices = array_shift_assoc($lengths);
	$longest = array_assoc_value($choices, 0);

	while ($lengths > 0) {
		$item = array_shift_assoc($lengths);
		if ($longest == array_assoc_value($item, 0)) {
			$choices[array_assoc_key($item, 0)] =
array_assoc_value($item, 0);
		} else {
			break;
		}
	}

	//echo "<pre>" . print_r($choices) . "</pre>";

	$choiceIndex = rand(0, count($choices) - 1);
	$type = array_assoc_key($choices, 0);
	$questions = $pool[$type];
	//echo "TYPE $type <br />";

	//echo "<pre>" . print_r($pool[$type], true) . "</pre>";

	$questionIndex = rand(0, count($questions) - 1);
	//echo "QUESTION INDEX $questionIndex <br />";
	$question = array_splice($pool[$type], $questionIndex, 1);
	$question = $question[0];
	array_push($orderedQuestions, $question);
	//echo "<b>$type</b><pre>" . print_r($question, true) . "</pre>";

	if (count($pool[$type]) == 0) unset($pool[$type]);
}

for ($i = 0; $i < count($orderedQuestions); $i++) {
	$q = $orderedQuestions[$i];

	echo "<div class='survey-segment" . ($q['type'] == 'slider' ? '
required' : '') . " segment-{$q['type']}'>";
	echo "<div class='question " . ($i % 2 == 0 ? "even" : "odd") . "'>" .
($i + 3) . "." . $q['question'];

	if ($q['type'] == 'slider') {
		echo " <span class='instruction'>Adjust the slider to make your
selection.</span></div>";
		echo "<div class='answers'>";
		echo "<div class='slider-ct " . ($i % 2 == 0 ? "even" : "odd") .
"'>";

		echo "<div class='slider-prompt'>";
		$width = 100 / count($q['values']);
		for ($j = 0; $j < count($q['values']); $j++) {
			echo "<span style='width: " . $width . "%'>" .
$q['values'][$j] . "</span>";
		}
		echo "<div class='clear'></div></div>";
```

```
            echo "<div id=\"Slider-" . $q['name'] . "\"
class='slider'></div>";
            echo "<input type='hidden' name=\"" . $q['name']} . "\"
value='50' />";
            echo "</div></div>";
      } elseif ($q['type'] == 'textarea') {
            echo "</div><div class='answers'>";
            echo "<textarea name=\"" . $q['name'] . "\"></textarea>";
            echo "</div>";
      }

      echo "</p></div>";
}
?>

<div class="survey-segment">
      <div class='question'>17. Do you have any other comments on
navigation?</div>
      <div class='answers'><textarea name="final-comments"></textarea></div>
</div>

<?php
if (isset($_GET['o'])) {
      switch ($_GET['o']) {
            case 'a':
                  $order = 'alphabetical';
                  break;
            case 'r':
                  $order = 'random';
                  break;
            case 'p':
                  $order = 'popular';
                  break;
            default:
                  $order = 'unknown';
      }
} else {
      $order = 'unknown';
}

if (isset($_GET['f'])) {
      switch ($_GET['f']) {
            case 'n':
                  $changeFreq = 'never';
                  break;
            case 's':
                  $changeFreq = 'site';
                  break;
            case 'p':
                  $changeFreq = 'page';
                  break;
            default:
                  $changeFreq = 'unknown';
      }
} else {
      $changeFreq = 'unknown';
}
```

```
$daysBetweenVisits = isset($_GET['d']) ? round(((int) $_GET['d']) / 86400, 2)
: 0;
?>

<input type="hidden" name="userId" value="<?php echo isset($_GET['u']) ?
$_GET['u'] : 0; ?>" />
<input type="hidden" name="audienceId" value="<?php echo isset($_GET['a']) ?
$_GET['a'] : 0; ?>" />
<input type="hidden" name="order" value="<?php echo $order; ?>" />
<input type="hidden" name="change" value="<?php echo $changeFreq; ?>" />
<input type="hidden" name="stage" value="<?php echo $_GET['s']; ?>" />
<input type="hidden" name="visitId" value="<?php echo $_GET['v']; ?>" />

<div class="survey-segment">
      <p><input type="submit" value='Submit Survey' /></p>
</div>

</form>

</body>
</html>
```

G.2 Tracking Code

```
define('ANT_CHANGE_NEVER', 'Never');
define('ANT_CHANGE_VISIT', 'Visit');
define('ANT_CHANGE_PAGE', 'Page');
define('ANT_ORDER_ALPHABETICAL', 'Alphabetical');
define('ANT_ORDER_POPULAR', 'Popular');
define('ANT_ORDER_RANDOM', 'Random');

class AdaptiveNavigationTest {

      public static $dev = false;
      private $schemas = array();
      private $activeSchema;
      private static $audienceId = NULL;
      private $visitId;

      /**
        * The constructor:
        * 1. Modifies the $siteData which is used to render the site.
        * 2. Increments user progress with each page load - progress is used
to display the survey
        * 3. Caches navigation or uses navigation cache
      **/
      public function AdaptiveNavigationTest($audienceId, $pageId,
$audiences, &$siteData, $newVisit, $dev = false) {
            //set the id of objects to their keys in the array
            $this->keyArray($siteData['sections'], 'id');
            $this->keyArray($siteData['audiences'], 'id');
            foreach ($siteData['sections'] as $section_id => $section) {
                  $this-
>keyArray($siteData['sections'][$section_id]['pages'], 'id');
```

```
            }

            //grab the sections
            $sections = $siteData['sections'];

            //set the development trigger
            AdaptiveNavigationTest::$dev = $dev;

            //make sure a valid audience is selected, otherwise return
            if (!in_array($audienceId, $audiences)) return;

            //store the audience id because this will be used for all cookies
            self::$audienceId = $audienceId;

            //generate the schemas available
            $this->schemas[] = (object) array('change' => ANT_CHANGE_NEVER,
'order' => ANT_ORDER_ALPHABETICAL);
            $this->schemas[] = (object) array('change' => ANT_CHANGE_NEVER,
'order' => ANT_ORDER_POPULAR);
            $this->schemas[] = (object) array('change' => ANT_CHANGE_NEVER,
'order' => ANT_ORDER_RANDOM);
            $this->schemas[] = (object) array('change' => ANT_CHANGE_VISIT,
'order' => ANT_ORDER_ALPHABETICAL);
            $this->schemas[] = (object) array('change' => ANT_CHANGE_VISIT,
'order' => ANT_ORDER_POPULAR);
            $this->schemas[] = (object) array('change' => ANT_CHANGE_VISIT,
'order' => ANT_ORDER_RANDOM);
            $this->schemas[] = (object) array('change' => ANT_CHANGE_PAGE,
'order' => ANT_ORDER_ALPHABETICAL);
            $this->schemas[] = (object) array('change' => ANT_CHANGE_PAGE,
'order' => ANT_ORDER_POPULAR);
            $this->schemas[] = (object) array('change' => ANT_CHANGE_PAGE,
'order' => ANT_ORDER_RANDOM);

            //get the user ID, otherwise create one if the user doesn't have
one
            $userId = $this->getUserId();

            //register the user progress
            AdaptiveNavigationTestController::register_page_load($userId,
$pageId, $newVisit);

            //get the visit ID and number of pages visited
            $visitId = AdaptiveNavigationTestController::visit_id($userId);
            $pages =
AdaptiveNavigationTestController::page_pages_this_visit($userId, $visitId);
            $this->visitId = $visitId;
            self::cookie('visit_' . $visitId, $pages);

            //identify the user schema type
            $activeSchemaIndex = $userId % count($this->schemas);
            $this->activeSchema = $this->schemas[$activeSchemaIndex];
            $schema = $this->activeSchema;

            //identify whether the survey should be shown or not
            $this->survey($visitId, $pages, $siteData);
```

```
            //identify based on visit number, pages loaded, and schema if
navigation chache should be used
            $use_navigation_cache = !($schema->change == ANT_CHANGE_PAGE ||
                  ($schema->change == ANT_CHANGE_VISIT && $pages == 1) ||
                  ($schema->change == ANT_CHANGE_NEVER && $visitId == 1 &&
$pages == 1));

            //update the site data so that the render will load the proper
navigation links
            $this->updateSiteData($siteData, $use_navigation_cache, $pageId,
$schema);
      }

      //links are already sorted by popularity, this will order them based on
schema
      public function orderPages($pages) {
            //no audience = no adaptive navigation test = nothing to order
            if (self::$audienceId == NULL) {
                  return $pages;
            }

            $results = array();
            $order = $this->activeSchema->order;

            //order links alphabetically by page title
            if ($order == ANT_ORDER_ALPHABETICAL) {
                  $ordered = array();
                  foreach ($pages as $page) {
                        //put the page title and page id to prevent array key
conflicts
                        $title_key = $page['title'] . $page['id'];

                        //place each page in array, based on keyed title and
page id
                        $ordered[$title_key] = $page;
                  }

                  //sort the array by keys (and consequently by title)
                  ksort($ordered);

                  //place ordered pages into the results array
                  foreach ($ordered as $page) {
                        $results[] = $page;
                  }

            //order links randomly
            } elseif ($order == ANT_ORDER_RANDOM) {
                  $ordered = array();
                  $pagesCopy = $pages;
                  while (count($pages) > 0) {
                        $random_index = rand(0, count($pages) - 1);
                        $page_array = array_splice($pages, $random_index, 1);
                        $ordered[] = $page_array[0];
                  }

                  //restore the pages (debugging stuff - not necissary)
                  $pages = $pagesCopy;
```

```
                  //place ordered pages into the results array
                  $results = $ordered;


            //keep links in popular order
            } elseif ($order == ANT_ORDER_POPULAR) {
                  //the $pages array is already sorted by popularity
                  //so throw that into the results array
                  $results = $pages;

            }

            return $results;
      }

      // Get or Set cookie values
      // A single cookie is stored for each audience. This function takes
that into account and
      // stores values as key value pairs within a json string.
      public static function cookie($key) {
            if (func_num_args() > 1) {
                  $value = func_get_arg(1);
                  self::cookieAudience(self::$audienceId, $key, $value);
            } else {
                  return self::cookieAudience(self::$audienceId, $key);
            }
      }

      public static function cookieAudience($audienceId, $key) {
            //get the cookie key
            $cookie = 'b4byu_ant_' . $audienceId;

            //get the data stored for the cookie (it is stored in a JSON
string
            $data = isset($_COOKIE[$cookie]) ? json_decode($_COOKIE[$cookie],
true) : array();

            //set a cookie value
            if (func_num_args() > 2) {
                  $value = func_get_arg(2);
                  $data[$key] = $value;

                  //update the cookie
                  $str = json_encode($data);
                  setcookie($cookie, $str, time() + 60*60*24*365); //expires
in one year
                  $_COOKIE[$cookie] = $str;                        //update
the local active copy of the cookie
            } else {
                  $data = isset($_COOKIE[$cookie]) ?
json_decode($_COOKIE[$cookie], true) : array();
                  return array_key_exists($key, $data) ? $data[$key] : NULL;
            }
      }

      //get the user's existing ID by pulling from a cookie on their browser
```

```
	//if they don't have a cookie then give them the next id
	//Note: cookies are dependent on the selected audience. A single
	//browser could have on user ID for each audience.
	private function getUserId() {
		//get existing user ID for the audience
		$uid = self::cookie('userId');

		//if no user ID then create one now
		if (!$uid) {
			$uid = AdaptiveNavigationTestController::user_next_id();
			self::cookie('userId', $uid);
		}

		return $uid;
	}

	private function updateSiteData(&$siteData, $use_cached_navigation,
$current_page_id, $schema) {

		//if cached and cache should be used
		$cache = self::cookie('nav');
		if ($use_cached_navigation && $cache) {

			//overwrite page popularity to use cached popularity
			foreach ($siteData['sections'] as $section_id => $section)
{
				foreach ($section['pages'] as $page_id => $page) {
					$popularity_score = array_key_exists($page_id,
$cache['popularity']) ? $cache['popularity'][$page_id] : 0;

	$siteData['sections'][$section_id]['pages'][$page_id]['popularity'] =
$popularity_score;
				}
			}

		//if not cached
		} else {

			//define the caching array
			$cache = array(
				'schema' => NULL,
				'popularity' => array(),
			);

			//define a navigation schema
			$siteData['schema'] = $schema;
			$cache['schema'] = $schema;

			//get the top next pages array
			$top_next_pages =
AdaptiveNavigationTestController::page_top_next($current_page_id);
			$count_top = count($top_next_pages);

			//overwrite page popularity to use next page popularity and
not to use pre-existing site wide page popularity)
			foreach ($siteData['sections'] as $section_id => $section)
{
```

```
                        foreach ($section['pages'] as $page_id => $page) {
                              $popularity_index = array_search($page_id,
$top_next_pages);
                              $popularity_score = $popularity_index === FALSE
? 0 : $count_top - $popularity_index + 1;


      $siteData['sections'][$section_id]['pages'][$page_id]['popularity'] =
$popularity_score;
                              $cache['popularity'][$page_id] =
$popularity_score;
                        }
                  }
                  ksort($cache['popularity']);

                  //cache the navigation
                  self::cookie('nav', $cache);
            }
      }

      //set a flag in the site data to show a survey if it is time to do so
      private function survey($visitId, $pagesLoaded, &$siteData) {
            //get the user ID
            $userId = $this->getUserId();

            //get the survey status (or set it)
            $surveys = Survey::getByUserId($userId);
            $stage = count($surveys) + 1;

            //get the visit ID for the last time a survey was taken
            $lastVisitId = 0;
            if (count($surveys) > 0) {
                  $survey = $surveys[count($surveys) - 1];
                  $lastVisitId = $survey->visitId;
            }

            //if it is time to show a survey then define the survey path
            if (($stage == 1 && $pagesLoaded >= 3) || ($stage == 2 &&
$pagesLoaded >= 3 && $lastVisitId + 2 <= $visitId)) {
                  $schema = $this->activeSchema;
                  $siteData['survey']['userId'] = $userId;
                  $siteData['survey']['audienceId'] = self::$audienceId;
                  $siteData['survey']['order'] = strtolower(substr($schema-
>order, 0, 1));
                  $siteData['survey']['change'] = strtolower(substr($schema-
>change, 0, 1));
                  $siteData['survey']['stage'] = $stage;
                  $siteData['survey']['visitId'] = $visitId;
            }
      }

      //get a section object out of the site sections array
      private function getSectionById($sections, $section_id) {
            foreach ($sections as $section) {
                  if ($section['id'] == $section_id) return $section;
            }
            return NULL;
```

```
	}

	//get a page object out of the section pages array
	private function getSectionPageById($pages, $page_id) {
		foreach ($pages as $page) {
			if ($page['id'] == $page_id) return $page;
		}
		return NULL;
	}

	//modify the keys on an array to be the value of a field within each
item of the array
	private function keyArray(&$array, $key) {
		$ar = array();
		foreach($array as $item) {
			$itemAr = (array) $item;
			$keyValue = $itemAr[$key];
			$ar[$keyValue] = $item;
		}
		$array = $ar;
	}

	//temporary function for debugging and testing
	private function section_pages_dump($sectionId, $pages) {
		if (AdaptiveNavigationTest::$dev) {
			echo "<p>$sectionId: ";
			foreach ($pages as $page) echo $page['id'] . ' ';
			echo "</p>";
		}
	}

	public static function error($message = NULL, $includeBacktrace = TRUE)
{
		if (!AdaptiveNavigationTest::$dev) return;

		if ($includeBacktrace) {
			if (is_string($message)) echo "<p><b>$message</b></p>";
			echo "<table border='1'>";
			echo
"<tr><th>File</th><th>Line</th><th>Function</th><th>Arguments</th>";

			$bt = debug_backtrace();
			for ($i = 1; $i < count($bt); $i++) {
				$ar = $bt[$i];

				echo "<tr>";
				echo "<td valign='top'>" . $ar['file'] . "</td>";
				echo "<td valign='top'>" . $ar['line'] . "</td>";

				$function = '';
				if (array_key_exists('class', $ar)) $function .=
$ar['class'];
				if (array_key_exists('type', $ar)) $function .=
$ar['type'];
				$function .= $ar['function'];
				echo "<td valign='top'>$function</td>";
```

```
                        $args = "<table border='1' cellspacing='0'>";
                        $index = 1;
                        foreach ($ar['args'] as $o) {
                              $args .= "<tr><td valign='top'>$index</td><td
valign='top'>" . gettype($o) . "</td>";
                              $args .= "<td valign='top'>" . (is_array($o) ||
is_object($o) ? print_r($o, true) : $o) . "</td></tr>";
                              $index++;
                        }
                        $args .= "</table>";

                        echo "<td><pre>$args</pre></td>";
                        echo "</tr>";
                  }

                  echo "</table>";
            } elseif (is_string($message)) {
                  echo '<p>' . $message . '</p>';
            }
      }


}

//database control for adaptive navigation test interactions
class AdaptiveNavigationTestController {

      //get the next available user ID from the database
      public static function user_next_id() {
            //get the max userId and then add one to it for this user's ID
            $query = "SELECT MAX(`userId`) FROM `b4byu`.`ant`";
            $result = mysql_query($query);
            self::mysql_error($query);
            $topUserId = (int) mysql_result($result, 0, 0);
            return $topUserId + 1;
      }

      //get the current visit ID
      public static function visit_id($userId) {
            //check for valid user ID
            if (!self::valid_id($userId, 'user')) return NULL;

            //get the max userId for this visit ID
            $query = "SELECT MAX(`visitId`) as `visitId` FROM `b4byu`.`ant`
WHERE `userId`=$userId";
            $result = mysql_query($query);
            self::mysql_error($query);
            $visitId = (int) mysql_result($result, 0, 0);

            return $visitId;
      }

      //get an array of ID's of the top most popular next pages
      public static function page_top_next($pageId) {
            //one day equals 86400 seconds
            $day = 86400;
```

```
            //check for valid page ID
            if (!self::valid_id($pageId, 'page')) return NULL;

            //get the most recent navDate from the page_path table
            $query = "SELECT MAX(`navDate`) as 'maxdate' FROM
`b4byu`.`page_path`";
            $result = mysql_query($query);
            self::mysql_error($query);
            //echo $query;
            $maxDate = strtotime(mysql_result($result, 0, 0));
            //echo "<br />$maxDate <br />";

            //determine the min date (10 days before max date)
            $minDate = $maxDate - 10 * $day;

            //get all next page hits over the last 10 days for this page ID
            $query = "SELECT `navDate`, `nextPageId`, `hits` FROM
`b4byu`.`page_path` WHERE `pageId`=$pageId";
            $query .= " AND `navDate` >= '" . date('Y-m-d', $minDate) . "'";
            $query .= " AND `navDate` <= '" . date('Y-m-d', $maxDate) . "'";
            //echo $query;
            $results = mysql_query($query);
            self::mysql_error($query);

            //parse returned results and build raw data array
            $raw = array();
            while ($row = mysql_fetch_assoc($results)) {
                  //determine the number of days between this result and the
max date
                  //because it will affect the weight of the hits
                  $daysDifference = (($maxDate - strtotime($row['navDate']))
/ $day) + 1;

                  //initialize raw key if need be
                  $nextId = $row['nextPageId'];
                  if (!array_key_exists($nextId, $raw)) $raw[$nextId] = 0;

                  //add additional wieght for this page
                  $weight = $row['hits'] / $daysDifference;
                  $raw[$nextId] += $weight;
            }

            //sort the raw array by weight, maintaining key value
associations
            arsort($raw);

            //generate an indexed array based on sorted raw data
            $data = array();
            foreach ($raw as $nextPageId => $weight) {
                  $data[] = $nextPageId;
            }

            return $data;
      }

      //get the number of pages on this visit
      public static function page_pages_this_visit($userId, $visitId) {
```

```
            //check for valid user ID and visit ID
            if (!self::valid_id($userId, 'user') || !self::valid_id($visitId,
'visit')) return NULL;

            //get the number of pages for this visit
            $query = "SELECT COUNT(`time`) as `pages` FROM `b4byu`.`ant`
WHERE `userId`=$userId AND `visitId`=$visitId";
            $result = mysql_query($query);
            self::mysql_error($query);
            return (int) mysql_result($result, 0, 0);
      }

      //register a page load
      public static function register_page_load($userId, $pageId, $newVisit)
{
            //check for valid user ID and page ID
            if (!self::valid_id($userId, 'user') || !self::valid_id($pageId,
'page')) return NULL;

            //get the active visit id
            $visitId = self::visit_id($userId);
            if ($newVisit) $visitId++;

            //get the current time off the PHP server
            $time = time();

            //check against the cookie to see if this registration just
occured (I have no idea why, but the page seems to be loading twice)
            $register_ok = FALSE;
            $last_register = isset($_SESSION['lastRegister']) ?
$_SESSION['lastRegister'] : NULL;
            $register_ok = !$last_register || $last_register['time'] + 5 <
$time || $last_register['page_id'] != $pageId;

            //store the registration cookie
            $_SESSION['lastRegister'] = array('time' => $time, 'page_id' =>
$pageId);

            //run the query and report any errors
            if ($register_ok) {
                  $query = "INSERT INTO `b4byu`.`ant` (`userId`, `visitId`,
`pageId`) VALUES ($userId, $visitId, $pageId)";
                  mysql_query($query);
                  self::mysql_error($query);
            }
      }

      //output a SQL error if in development mode and an error occured
      private static function mysql_error($sql = NULL) {
            if (AdaptiveNavigationTest::$dev) {
                  $error = mysql_error();
                  if (strlen($error)) {
                        $msg = $error;
                        if (is_string($sql)) $msg .= '<br />' . $sql;
                        AdaptiveNavigationTest::error($msg);
                  }
            }
```

```
	}

	//test that the ID is an integer, otherwise produce a hard exit with
error
	private static function valid_id($id, $type) {
		if (!is_int($id)) {
			if (AdaptiveNavigationTest::$dev)
AdaptiveNavigationTest::error('Invalid ' . $type . ' identifier for the
adaptive navigation test: ' . $id);
			exit('Invalid ' . $type . ' identifier for the adaptive
navigation test: ' . $id);
			return FALSE;
		}
		return TRUE;
	}
}

?>
```