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Holistic Model of Website Design Elements that Influence Trustworthiness

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HOLISTIC MODEL OF WEBSITE DESIGN ELEMENTS THAT INFLUENCE TRUSTWORTHINESS

by

Christopher Travis LaValley

A thesis submitted to the
School of Computing
in partial fulfillment of the requirements for the degree of
Master of Science in Computing and Information Sciences

UNIVERSITY OF NORTH FLORIDA
SCHOOL OF COMPUTING

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As with all fledglings, this Osprey will be leaving the Nest! It is time to spread my wings and grab an adult beverage! Swoop! Swoop!

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ABSTRACT

Trustworthiness of a website relies foremost on a good first impression which includes the visitor's perception of the user interface. The focus of this research is to investigate the effects of website design elements on user perception of trustworthiness of a site and provide a set of guidelines for website designers.

The research design is based on Yosef Jabardeen's (2009) "conceptual framework analysis". In this research paper, a holistic model is developed to depict the relationships among website design elements and trustworthiness. The model was tested, validated and updated using the results of the repertory grid technique, a process that elicits perceptions about a topic from an individual. For this research, the topic was website trust, the objects were the website design elements, and the constructs were elicited perceptions regarding those website design elements. The repertory grid technique was applied in two stages to a set of participants made up of website users and website designers. Analysis yielded useful information regarding website design associations and correlations of perceptions. The research findings confirmed original suggestions regarding associations and produced an updated, validated model of website design elements. The research indicated that while all design elements had their importance regarding trust, those elements that provided for the function and security of the website rated the highest in importance and expectation.

The validated model will aid website designers in understanding what elements are appealing to the visual senses and conjure credibility and trust. Most importantly, this new

understanding may help designers to create websites that attract and retain new users and establishing a successful presence on the Internet.

Chapter 1

INTRODUCTION

Websites, particularly those that sell a commodity, abound on the Internet. Many of these sites sell the same products but at varying price ranges, and with different descriptions and appearance. However, not all of these websites conjure a feeling of trust or credibility. Nor do they have same level of aesthetic value or ease of navigation. Website design elements such as navigation options, typeface size, typographic layout, element organization, color schemes, pictures, and graphics (images and icons) may promote either rejection or acceptance, which in turn can be key to attract and retain visitors, and make a sale (Moys, 2014; Ou & Sia, 2010; Cyr, Head & Larios, 2010; Chen & Barnes, 2007). A disorganized layout with ill-placed elements and a multitude of colored text objects can be unappealing and confusing, leading to a negative response (Sonderegger, Sauer & Eichenberger, 2014). Conversely, an organized layout with easy to read text and appealing images may elicit a welcoming appeal and positive response. With a multitude of sites vying for a piece of the market share, it is essential for businesses to design a web page that effectively grabs, retains, and sells to a visitor.

Understanding which website design elements not only appeal to the visitor but also engage and conjure feelings of credibility and trustworthiness is the focus of this study. Based on a comprehensive literature review not only from a trust aspect but also in the area of visual design of web pages, a holistic model to illustrate the relationships among website design

elements, trust, and credibility of a site was developed. Since related studies focused primarily on one or a couple of design elements, it was important to assimilate the research into a comprehensive model that provides greater insights into the relationship of website design as it pertains to trust. The primary goal of this study is to establish what those design elements are and validating their perceived effectiveness at instilling trust and credibility while at the same time attaining and retaining the user's attention. Furthermore, to also provide a set of guidelines for website designers.

The holistic model was developed using the procedure of conceptual framework analysis as defined by Josef Jabareen (2009). Jabareen (2009) stated that the conceptual framework was a “network, or ‘a plane,’ of interlinked concepts that together provide a comprehensive understanding of a phenomenon or phenomena”. This conceptual framework analysis provides a systematic approach of understanding the phenomenon of website trustworthiness through peer reviewed literature and developing a holistic model to describe the phenomenon. By linking all of individually identified design elements that promote trustworthiness, the holistic model provides a larger perspective on the overall effects of these combined design elements.

Validation of the holistic model was conducted by applying the repertory grid technique, a process that elicits perceptions about a topic from an individual or individuals, to establish a measurement for qualitative-quantitative evaluation of the model components. The technique requires the identification of elements that relate to a specific topic. Once the elements are identified, a series of constructs or perceptions are created. These developed

constructs are then rated against one another. In this research, the elements are the design elements that promote trustworthiness. The repertory grid technique (Fransella, Bell & Bannister, 2004) has been used in a similar fashion. Antonina Bauman's (2015) research applied the repertory grid technique in trust research regarding online activities.

The repertory grid technique was applied in two separate stages. During the first stage, a sample size of 14 webpage users were recruited to participate in the repertory grid technique assessment of the model. Study participants developed bipolar constructs (e.g. hot vs cold) by comparing and contrasting 35 website design elements through a process of finding their similarities and contrasts. From these developed constructs, a total of 10 were compiled to create a complete repertory grid for evaluation via rating. This grid was then administered to participants during the second stage

During the second stage, a sample size of 35 individuals were recruited from both groups of webpage users and webpage designers. The participants were provided the completed repertory grid from the first stage to rate each element of the grid using a 5-point Likert-type rating scale. Each participant was required to rate each of the 35 design elements as to how it applied to the construct set or contrasting ends for all constructs. The completed grid contained a set of rating numbers ranging from -2 to 2. This range was established to determine which end of the construct has the most influence or applicability, where -2 would be the left side of the construct and the 2 would be the right side of the construct.

The completed grids were analyzed using descriptive statistics, hierarchical clustering, and Pearson bivariate correlative analysis (Bruce & Bruce, 2016; Fransella et al., 2004; Stehlik-Barry & Babinec, 2017). The analysis provided more insight into how the elements of trustworthiness are perceived in relation to other elements and establish confirmation of the developed holistic model. By allowing the participants to create their own constructs and rate each design element against another, a greater perspective is elicited of the participant's perception toward trustworthiness with minimal researcher influence.

The validated holistic model can have a profound effect for businesses with a web presence. By applying knowledge gained from this research, businesses can ensure that they are creating webpages that enhance trustworthiness and thus the user's pleasurable experience. Competing in a global environment among millions of other webpages, be it used for information dissemination or sales, it is essential to be recognized and trusted to ensure repeat visits and/or purchases from users.

Chapter 2

BACKGROUND

In 2015, there were over 863 million websites and over 3 billion online users (Internet Live Stats, 2016). Of the top one million websites, it was estimated that there were approximately 110,000 commerce websites in the United States in mid-2014 (Quora, 2014). Websites are either used for commerce, information dissemination or both. Both types, commerce and informational, expect and rely on visitors. As more individuals turn to the Internet to conduct e-commerce activities, trust is an essential component to produce positive business results. Studies have shown that nearly all Internet customers have refused to provide their personal information to a website at least one time due to mainly trust issues (Siau & Shen, 2003). Most recently, a poll conducted in July 2015 by the U.S. Census Bureau, 45% of online households stopped conducting online financial transactions and/or purchases during the year due to trust issues (Goldberg, 2016).

Trust, as defined by Tseng and Fogg (1999) is "a positive belief about the perceived reliability of, dependability of, and confidence in a person, object or process". Another word often used in conjunction, if not interchangeably, with trust is trustworthiness. Despite their similarity, it could be argued that there is a subtle difference in meaning between the two words (Sekhon, Ennew, Kharouf & Devlin, 2014). Trust is formulated by judgment and assessments of previous behavior and implied values by the consumer, or individual making the decision to trust or not. However, the characteristic imposed on

the entity or individual in a relationship wishing to be trusted is trustworthiness. Thus, trustworthiness can be viewed as a characteristic of an individual or entity of a relationship wishing to be trusted (Sekhon et al., 2014).

Ganesan (1994) states that trust reflects two distinct components--credibility and benevolence. In the context of e-commerce, Ganesan (1994) states that credibility is the "extent to which the retailer believes that the vendor has the required expertise to perform the job effectively and reliably". Benevolence is seen as the "extent to which the retailer believes that the vendor has intentions and motives beneficial to the retailer when new conditions arise, conditions for which a commitment was not made" (Ganesan 1994). Even though Ganesan (1994) research focused on e-commerce entities, their definition can be extended to all forms of websites. Simply put, a website must project knowledge and expertise that gives the visitor the perception that it is capable of delivering its service and/or product dependably, effectively and reliably. Furthermore, the e-commerce entity must be perceived as providing goodwill toward the visitor.

2.1 Trust

The importance of trust in e-commerce has been highlighted by researchers (Toufaily, Souiden & Ladhari, 2013; Lee & Turban, 2001). Because online activities are riskier in nature due to the potential of unethical behavior by vendors of e-commerce, trust tends to be emphasized more in this context (Toufaily et al., 2013). The interaction between the visitor and e-commerce entity is limited to just the website that represents that e-commerce entity. The website and its contents are not tangible objects that can be

visited, touched or handled. Nor is there a physical presence of a real person to observe and question. Furthermore, the visitor is unable to monitor any transactions made in its entirety to ensure the security of personal information, like credit card number, phone number, etc. Transactions conducted over the Internet may expose sensitive personal information to parties whose intentions are not clearly known (Lee & Turban, 2001). Thus, the user has to evaluate the website based on what the visitor sees and experiences with the interface. Consequently, e-commerce entities must be proactive in creating an environment that is conducive to building a trusting relationship with visitors and mitigating the perception of high risk. With a high degree of trust, uncertainty and perceived risk in online transactions can be eliminated (Chen & Barnes, 2007). From research, the use of appropriate website design elements is key to promoting trust and affecting visitors' intended behaviors such as making a purchase (Bart, Shankar, Sultan & Urban, 2005) and inducing greater online shopping intentions (Cyr, 2008). Because websites are the "store frontage" for e-commerce, it is important to instill perceptions of trust and credibility quickly upon first visits.

2.2 Credibility

Credibility can be found associated with and researched across a number of domains spanning such fields as, but not limited to, media, economics and computing. Its importance lies with its definition. Credibility is believability (McKnight & Kacmar, 2007). It is a perceived quality (Fogg, 1999).

Fogg (1999) described four types of credibility as presumed credibility, reputed

credibility, surface credibility and experienced credibility. Presumed credibility is based on general assumptions an individual has toward an object or person. These assumptions are based on one's belief system, stereotypes and/or experiences. Reputed credibility is based upon the information provided by third parties about a person or object. Surface credibility is based on first impressions. Experienced credibility is based on first-hand experience regarding an object or person.

Because websites present information to the user, credibility lies within the information that is provided. Is the information presented believable? Websites, like those that provide advice, credibility is key to their success. By establishing credibility, trust can be formed, and perceived risk lowered (McKnight & Kamar, 2007). This is crucial since trust is a very important factor where conditions of uncertainty and risk are higher in an online commercial setting versus a traditional shopping setting (Lee & Turban, 2001).

2.3 Benevolence

The presentation of material on a website may be perceived not only as credible, but also as projecting a sense of goodwill or benevolence toward the user. Benevolence, as defined by Chen and Dhillon (2003) is the "ability of a company to hold consumer interests ahead of its own self-interest" but also to indicate to the consumer that the company has a sincere concern for their welfare, as well. Because website users routinely pass personal information to websites, whether it be for the purchase of items or registration purposes, there is an expectation and/or assumption that information will be kept private and secure. Believing that the website entity takes that notion seriously has

trust building implications. Based on research from Miyazaki and Fernandez (2001), 52% of surveyed respondents to online shopping concerns indicated that privacy and system security concerns were important. Because of these concerns, the belief that a website entity takes security and privacy seriously, as a form of goodwill, is a foundational building block to trust formation. As such, the projection of goodwill must be evident in the website design and presentation of material for a user to make such a judgment.

Beyond the concerns of security and privacy, the lack of physical contact with product and service personal of the Internet vendor, the presentation of material and its content leave little to the Internet user for judgment. Consequently, the perceptions of goodwill can be extended and demonstrated to the user by exhibiting caring responsiveness and concern (Salam, Lyer, Palvia & Singh, 2005).

A number of researchers have investigated the relationship of website design elements and their effect on the user's perceptions of a website's trustworthiness. Such design elements examined included design aesthetics, color, type font, assurance seals, graphic images and placement and visual cues such as navigation icons, links, etc. All of these design elements play a role in the user's perception of a website's trustworthiness. However, little research has been done from a holistic view of website design and the design elements that comprise it. To knowledge, none of the prior work have comprehensively aggregated all of the researched design elements and investigated them

from a macro level to determine how these design elements are perceived when placed together.

Though trust models with web-based commerce have been explored and developed, they didn't address the actual web design component specifically or holistically. Research by Salam et al. (2005) developed a trust conceptual model to understand the trust relationship between Internet vendors and Internet consumers. The framework was drawn from theoretical and empirical foundations based on four research areas—technology acceptance model, trust theories, relationship dependence theories and reasoned action theory based on the integration of the other three research areas. The research highlighted the importance of trust building in web-based commerce but didn't address the specifics of the website design itself. Instead, it focused on the social phenomenon of trust and its complexities.

Corbitt, Thanasankit & Yi (2003) explored the key factors that were related to trust in the business-to-consumer context. The researchers were looking to find answers to what factors influence the level of trust in the Internet and how it influences participation in e-commerce. Their findings resulted in a framework developed to show the relationships between the trust factors identified. The researchers believed that the online experience and the greater experience with e-commerce resulted in greater trust in e-commerce. To test their model, the researchers used a self-administered survey approach by soliciting New Zealand Internet users via email and directing them to a URL for the survey that consisted of 74 questions. A total of 80 valid surveys were collected. Based on the

responses, the two main reasons for using the Internet was information searching (63.8% of the respondents) and communication (27.5% of the respondents). Only 5% of the respondents indicated the main reason for using the Internet was for shopping. Analysis of the results, confirmed the researchers' basic assumptions regarding trust and experiences. Most importantly, the researchers found that website quality was a very important factor in influencing a positive attitude toward e-commerce. The researchers indicated that website quality factors in a user's decision process for engaging e-commerce. Furthermore, the researchers suggest that website customers could be a good source of feedback on website design for proper construction since technical trustworthiness is an essential factor of trust. The trust model developed from this research did not address website design itself, but instead looked at components related to the user's experience, perceptions and willingness to engage e-commerce. Though website quality is a trust factor, it was not further elaborated upon.

The trust model developed by McKnight, Choudhury & Kacmar (2002) analyzed the perceptions and beliefs toward trust in an e-commerce setting that resulted in trust related behaviors by looking at disposition to trust, institution-based trust, trusting beliefs, and trusting intentions with the purpose of creating a multidimensional definition of trust. The foundation of the model was derived from a number of research sources of different disciplines by organizing the research sources into different groups of positive trusting beliefs. However, trusting behavior that leads to trust-related behavior was not explored. To validate the trust model, the researchers created a hypothetical, legal advice website for respondents to navigate after being provided a theoretical scenario requiring legal

advice. After interacting with the website, the respondents were administered a survey. The testing was conducted at three large universities soliciting 1,403 valid responses. Based on the results, the researchers were able to validate the model of trust. Furthermore, the researchers were able to show that consumers do not view website vendors in broad, general terms but instead by specific attributes. It is possible for a consumer to quickly believe a website vendor is benevolent and honest on a first-time interaction. Most importantly, the research found that the quality of the website was strongly related to both trusting beliefs and trusting intentions. Again, this model, too, explores the trust and its related factors but does not identify specifically those elements that give way to positive perceptions of website quality.

The web trust model proposed by Beatty, Reay, Dick & Miller (2011) touched on several trust factors related to website design. The model was construed through a qualitative meta-analysis of main theoretical frameworks proposed in other literature related to factors that influence e-consumer trust. The purpose of the research was to understand and characterize online trust. The researchers examined 28 reports, 20 of which were journals and the remaining from conference proceedings. A variety of research areas with an online nexus were examined but the majority came from the e-commerce realm which accounted for 16 of the reports. The selected reports were identified from a group of 114 reports that were reviewed for factors and their relationships that influence the use of an online resource. The identified factors were coded based on a categorical scheme developed from the data and recurring themes found from the analysis of current

literature in the field. The sorted data revealed correlations and frequencies between the factors that comprised the trust model created by the researchers.

Since the goal of Beatty et al.'s (2011) research was to define a working definition of online trust, website design was not the primary focus of their research. Other external factors that influence trust behavior were identified such as social pressures, risk, previous actions, competence, etc. Nonetheless, their research did identify factors that could be directly attributed to website design or a consequence of design. These factors include use (utility), ease of use, usefulness, cognitive enjoyment and benevolence. Their findings revealed useful information regarding how trust factors are correlated. Furthermore, it provided a beginning point for website designers that may want to add trust-building features into their websites. However, it did not address the website design as a single focal point nor did it address specifically any design element(s). This gap in online trust as it relates to website design in a holistic manner is an area that has not been fully explored.

Chapter 3

METHODOLOGY

The model development for this research was established using the conceptual framework analysis as defined by Yosef Jabareen in his research, “Building a Conceptual Framework: Philosophy, Definitions and Procedure” (2009). Jabareen described the conceptual framework analysis as a “procedure of theorization for building conceptual frameworks based on grounded theory method”, a systematic approach to analyzing data for theory development. The conceptual framework itself, though, is defined as a network of interconnected concepts and can be produced through a process of qualitative analysis (Jabareen, 2009).

Qualitative analysis is performed either by inductive analysis—the process of identifying patterns, themes or categories of data; or via deductive analysis—the process of categorizing data based on an existing framework (Yates & Leggett, 2016). Inductive or deductive analysis may be used together or separately depending on the type of study being conducted. Inductive analysis is used for exploratory research whereas deductive would be used for confirmatory research (Yates & Leggett, 2016).

To identify the concepts of website design elements that influence trustworthiness and credibility that are central to the conceptual model presented in this paper, inductive qualitative analysis, which was exploratory in nature, was utilized. This phenomenon of

trust influence was researched and analyzed following Jabareen's steps for conceptual framework analysis. Jabareen's steps are as follows:

1. Identify and map selected data sources
2. Read and categorize selected data
3. Identify and name concepts
4. Categorize concepts
5. Reduce concepts through integration
6. Synthesize framework
7. Validate conceptual framework

This form of exploratory research is iterative in nature and requires above steps to be repeated in an attempt to exhaust all efforts in identifying a complete collection of concepts related to the phenomena of trust influence via website design elements.

3.1 Identify and Map Selected Data Sources

To ensure that the phenomena of website design elements and their influence on trustworthiness was extensively researched, web searches for periodicals and books were performed to find related research that involved website design and trust. These searches were performed through the web services of Google Scholar and University of North Florida's Thomas G. Carpenter Library's OneSearch. The web service Google Scholar is a free web search engine that indexes the text and metadata related to scholarly works such as academic journals, books and abstracts, as well as other academic literature, and facilitates the search of digital and physical copies of these works found online or within

libraries. Similarly, the web service OneSearch allows the search of scholarly works by combining multiple databases of information from library catalogs and digital repositories of books, journals, articles and other academic works from a number of content providers.

The use of the web search services targeted peer-reviewed articles published by a number of journals and conference proceedings. To narrow the scope of material searched, the keywords “trust”, “website design”, “on-line trust” and “website trustworthiness” were used. Related works were further reviewed for relevancy and content, focusing on the discussions, data, results and conclusions. From those research articles, relevant cited publications were identified as additional resources and subsequently reviewed. Furthermore, related material either in blogs, web postings, magazines and books became an additional source of new resources or ideas to research. To properly provide an extensive and holistic view regarding the trust influence from website design elements, it was important that a large spectrum of literature be examined but also be exhaustive in process.

Identified, relevant material discovered via the searches was documented and noted using tables and commercial assistive software, Scrivener, for content-generation. This allowed the organization, outlining and display of key points identified from the research documents. Most importantly, it provided the data collection platform for the continued review and processing of the collected data and information.

3.2 Read and Categorize Selected Data

As the research articles were identified as relevant to the phenomena, each were read thoroughly to identify basic generalities. Those generalized ideas and/or concepts were charted with an associated brief description. This generalization provided a basic framework in which to sort and identify more specific ideas and/or concepts into sub components. This phase was repeated a number of times as new concepts emerged.

3.3 Identify and Name Concepts

Once the basic concepts were identified and categorized, the identified research material was further examined for other characteristics or granular concepts. Because of conflicting or similar concepts, the material was reread to extract any new ideas or concepts. This process allowed for the identification of individual website design elements or categories that composed the larger concepts or categories of website design. Furthermore, it facilitated the identification of other concepts in which specific design elements were related but not directly stated. These new concepts were also charted with a description and associated website design element. This chart became the basic framework from which further distillation occurred.

3.4 Categorize Concepts

After a basic chart was completed, the concepts and descriptions were further reviewed and analyzed for similar characteristics. During this stage, it was important to identify the main features, attributes and roles for each concept. From this point, the concepts were further

organized and categorized developing a multi-columned table in which the website design elements were sorted and placed into a table that provided the concept name, role, description and associated resources for the concept.

3.5 Reduce Concepts Through Integration

Due to the categorization, some concepts were combined to create a clearer, more encompassing concept. The subsequent production of the concept table allowed for identification of some groups of concepts that had similarities. Those concepts were restructured to reduce to the number of like concepts in order to provide a more succinct representation of the phenomena.

3.6 Synthesize Framework

The extensive table of website design element concepts was formulated into a visual graphic representation to relay the relationship of website design concepts central to the design element-trust phenomena. This phase, like the others, was an iterative process. The framework design was restructured and reorganized multiple times to ensure that proper representation of the design element-trust phenomena was made. The model, as presented in this paper, is the framework that was borne from accumulated and researched concepts. Finalized synthesized model is presented in the Chapter 4.

3.7 Validate Conceptual Framework

Important to the research and development of the synthesized model regarding trust influence from website design elements, is validation. It is necessary that the concepts presented make sense to others outside of the research circle. Jabareen (2009) suggests seeking validation from “outsiders” by eliciting discussion and feedback. For the model presented in this research, validation is sought through website users and designers by applying the repertory grid technique. This process is outlined and explained in Chapter 5, Repertory Grid Technique.

Chapter 4

HOLISTIC MODEL

Trustworthiness is an important issue in regard to website design, particularly for retail businesses as websites are the core of Internet marketing strategies. Website trustworthiness influences consumer perception of whether the business can deliver the goods and provide stated services, believability of the information provided in the site, and overall confidence of the business capabilities (Urban, Amyx & Lorenzon, 2009). Empirical studies have been conducted to demonstrate that website trustworthiness plays an influential role in enabling a visitor to engage in actions such as transactions (buying and selling), following provided advice, and sharing information (Büttner & Göritz, 2008). Research also indicates that usage of appropriate website design elements are key to promote trust and affect visitors' intended behaviors such as making a purchase (Bart et al., 2005).

Website trustworthiness can be described as willingness of a visitor to take part in a transaction with a business (Prasarnphanich, 2007). Trust can include two dimensions: credibility and benevolence (Prasarnphanich, 2007). Credibility refers to the degree to which a visitor trusts information provided in the site. Based on the credible information presented in the site, the visitor perceives whether the business or service provider has required expertise to perform the job effectively and deliver the promised goods reliably. Visual design elements such as physical appearance, color, layout, and graphics are known

to play significant roles in improving credibility and trustworthiness of a website (Chen, 2006). Benevolence refers to the degree to which the visitor believes that business is interested in visitor's welfare and motives to seek mutual gain (Prasarnphanich, 2007). Therefore, benevolence dimension associates with business's ability to protect the visitor's personal and financial information from potential loss to hackers. Thus, benevolence dimensions of trust are consistent with privacy and security concerns of the visitor. Relevant trustworthiness and visual design literature was reviewed iteratively and a hermeneutic circle inquiry method was used to identify concept grouping and relevant design element attributes of the conceptual model. Figure 1 depicts the conceptual model along with details of attributes. Below, discussions are provided for each concept identified in the conceptual model.

4.1 Visual Appeal

First impression of a site influences a visitor's decision to continue exploring the site or leave the site (Kim & Fesenmaier, 2008). A good first impression of a site helps to attract visitors, keep them on the site, provide a memorable experience, and improve their return rate to the site. Empirical research findings reveal that visual appeal design elements are the important tools to impress and convert site visitors into a user who is willing to stay, browse, and becomes a frequent user (Kim & Fesenmaier, 2008). The finding of one study showed that visitors can assess visual appeal of a site within 50ms, thus, designers have about 50ms to make a good first impression (Lindgaard, Dudek, Sen & Sumegi, 2006). Therefore, it is very crucial that designers understand which design elements can be incorporated to create visually appealing pages for their constituent visitors.

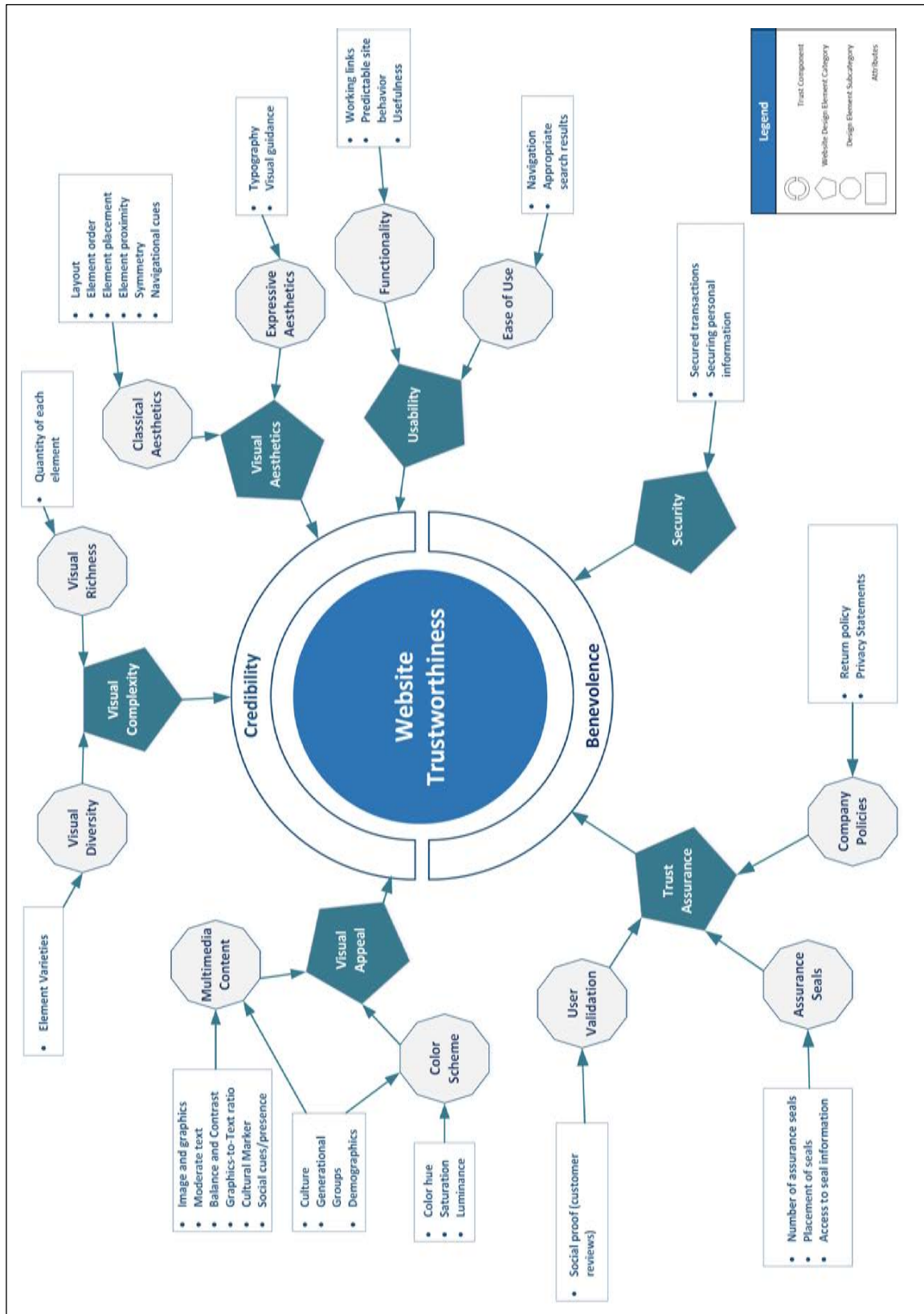


Figure 1. Holistic model developed from literature review

4.2 Color Schemes

With all objects perceived, they are defined by one of many characteristics – color. In the commercial setting, color can influence attitudes and expectations (Cyr et al., 2010). According to a research conducted by Cyr et al. (2010), cultural aspects play a role in which color schemes have an impact on consumer perceptions and different cultural groups have varying preferences and feelings toward the same color schemes. In their study, three color hues were used—blue, grey and yellow for testing. Participants from Germany, Japan and Canada were tested. Their findings indicate that blue and grey color schemes were preferred over the yellow color scheme by all groups. However, preference for the grey or blue color scheme was related to the cultural standing of the participants. The Germans preferred blue much more than the other color schemes and more so than any other group. The Canadians, however, preferred grey more than the Germans. The yellow color scheme definitely elicited a negative response from all groups. According to interviews, participants indicated yellow was considered “showy” or “too friendly”. It was also considered a bad color for product presentation. As for trust, the Germans trusted the blue color scheme more than the Japanese. The grey color scheme was more satisfying for the Canadians and the Japanese were less favorable toward the blue color scheme. Based on their study results, researchers concluded that website color appeal was a significant determinant for website trust and satisfaction.

Reinecke and Gajos (2014) presented their findings on user’s visual preference of visual complexity and colorfulness. They gathered data on user’s visual appeal preference from nearly 40,000 participants of diverse demographic backgrounds. Colorfulness refers to a

color's hue (purity of the color regards to primary colors red, blue, and yellow), saturation (intensity of color), and value (luminance or brightness of the color) (Reinecke et al., 2013). Their analysis indicates that preference of visual appeal, in particular the level of colorfulness varies with relation to demographic groups (Reinecke & Gajos, 2014). Their findings reveal that females liked colorful websites more than males, neighboring countries have similar preference on colorfulness, and high education level lowers preference for colorfulness.

4.3 Multimedia Content

Multimedia content is comprised of a mixture of varied graphical constructs that affect visual appeal. Though these constructs differ in characteristic, several have been identified from research as being influential toward web page trust. These constructs were identified and labeled as: images and graphics, moderate text, balance and contrast, graphics-to-text ratio, cultural markers and social cue/presence.

Djamasbi, Siegel and Tullis (2010) sought to define the web preferences of the Generation Y group (individuals born from 1982 to 2000) by examining the reaction to several factors that may influence their perception of a retail web page in regard to visual appeal. Their findings indicated that Generation Y individuals preferred web pages that included a main large image, minimal text, images of celebrities, and a search feature. Based on eye-tracking, design elements were evaluated in regard to what attracted the attention of the individual while web page browsing. To evaluate appeal, eye-tracking equipment recorded eye movement and fixations within the first five seconds of the viewing (Djamasbi et al.,

2010). The fixations determined what object was being viewed. Web pages with a large image were rated as the most appealing while those without a large image were rated as unappealing. Furthermore, those web pages with a large image play an important role in the formation of an impression regarding the page. Their research findings imply that adjusting the size of objects and adding pictures can help cue the viewer into focusing on page elements in a particular order.

Lindgaard et al. (2011) conducted extensive three experiments (each building on previous experiment and findings) to investigate relationships between visual appeal design elements, trustworthiness, and perceived usability. In their study, they investigated role of following design elements: balance (distribution of size, color, and location of visual objects), contrast (degree of difference between elements in size, color, and location), density (ratio between area of the background and the area covered by the element), graphics, symmetry (visual composition across vertical or horizontal axis), and text (Lindgaard et al., 2011). Their findings reveal that pages containing ample graphics, modest amount of text, good balance, and moderate contrast were deemed to be trustworthy. However, density and symmetry elements did not play a role in influencing trustworthiness.

Social presence is defined as the perception of contact with a human (Casey, 2014) which appears to be sociable and sensitive. In the context of the visual user interface, that social presence is a design element. It can be in the form of an avatar, chat balloon, encouraging, positive text statements, static image of a customer representative or even an image of a

person(s) that are engaged with or part of the organization being represented by the website. Research conducted by Casey (2014) into the web survey experience found that social presence was positively related to trust in the web survey research. Casey used photographs of the researcher along with personalized comments like, “thanks for persisting through the survey” that were added to the survey user interface. In Burt and Durham’s (2009) experiment, which investigated the trust generated by an aid agency’s web design, the researchers found that images that related to the crisis/need and response of the agencies’ request significantly increased rated trust of the agency.

Moller, Brezing & Unz (2012) investigated the inclusion of social presence components on a company’s homepage in the form of an image that allowed the visualization of a company representative. The experimental company homepage consisted of having no image, or either a photograph or line drawing of a company contact person. Their findings revealed that the decision to contact the company was greatly influenced by the social presence component. Furthermore, the research indicated that a simple picture significantly increases the perceived social presence.

4.4 Visual Complexity

Visual complexity refers to the amount of visual variations in the content and organization of content varieties displayed. Visual complexity can also play a decisive role in forming a good first impression of the site (Tuch, Bargas-Avila & Opwis, 2009). Websites with low to moderate visual complexity are known to create favorable attention, attitudes, and intentions from visitors, thereby, influencing their trust (Geissler, Zinkhan & Watson,

2006). Tuch et al. (2009) study shows that website design with low visual complexity, specifically for home page, helps to improve visitor's perceived pleasure, remembering the site, and performing tasks like searching.

4.5 Visual Diversity

Visual diversity of a website refers to the number of distinguishable elements and dissimilarity between elements (Geissler et al., 2006). Designers should be aware of the level of element diversity used within each page as it influences a visitor's perception of visual complexity and in turn their attention to targeted elements. Geissler et al. (2006) conducted a qualitative empirical study to measure the influence of home page complexity on visitor's attention, attitudes, and purchase intents. They created three versions of home page – low diversity (one link, one screen page, and one graphic), moderate diversity (five links, two screen pages, and four graphics), and high diversity (thirteen links, three screen pages, and seven graphics). Their findings reveal that pages with low and moderate element diversifications were effective in influencing visitor attention to targeted elements, their perception of complexity, and their trust. They recommended designers to create pages with moderate element diversity to present relevant content while ensuring visual complexity of the page is not too high which may overwhelm the visitor.

4.6 Visual Richness

Visual richness refers to quantity of each design element displayed in the page, for example, the amount of text, number of graphics, number of hyperlinks, number of multimedia content, page length, and number of columns in layout (Deng & Poole, 2010).

Deng and Poole (2010) conducted a study to identify the influence of visual richness and web page order on visitor's emotional reaction and ability to facilitate intended behaviors. Their findings show that pages with high complexity (54 links, 14 graphics, and 118 text elements) created unpleasant emotions and failed to lead to intended behaviors like making a purchase. Sites with low complexity (12 links, 2 graphics, and 33 text elements) created pleasant emotions and had carry-over effects on intended behaviors. In the study, they also investigated whether influence on visitor's emotional response and behavior depends upon visitor's meta-motivational states such as telic state (goal-oriented mindset) or paratelic state (excitement seeking mindset). Experimental finding shows that participants in telic (goal oriented) state felt more pleased and had higher tendency for intended behaviors towards web pages with low visual richness where paratelic (excitement seeking) state participants were more receptive to web pages with high visual richness.

4.7 Visual Aesthetics

Website aesthetics plays a crucial role in influencing overall user experience including usability of the site and perceived trust (Tuch, Vargas-Avila & Opwis, 2010). Aesthetics can be categorized into two dimensions: classical aesthetics and expressive aesthetics (Lavie & Tractinsky, 2004). Classic aesthetics refers to pleasant, orderly, clear, clean, and symmetrical design of a website. Classical aesthetics provides visual clarity for visitor whereas expressive aesthetics helps visitors perceive the creativity and originality of the site design. Expressive aesthetics refers to designer's creativity such as originality, fascinating design and the use of special effects (Tuch et al., 2010).

4.8 Classical Aesthetics

Navigation refers to possible sequence of clicks and paths followed by the visitor to accomplish their goals in the website. Navigation elements have a positive association to trustworthiness particularly for high information content such as retail websites, where taking consumers to their desired product page with a minimum number of clicks is very crucial (Bart et al., 2005). Websites having high content or selling products should be easy to navigate with no or minimal mental effort from visitors. Cyr (2008) study indicates that navigation schemes influence trust and satisfaction, however, this relationship is mediated by culture. Americans and Europeans prefer consistent navigation schemes that enhance their movement within the site while Asians prefer navigation schemes that change appearance of the site (Cyr, 2008).

Djamasbi et al. (2010) eye-tracking study on element placement in web pages indicated that certain locations were consistently viewed. The top left corner of the screen received most fixation from study participants. Another location that consistently received fixations was the navigation or internal links area. Based on the number of fixations (average of four), it was suggested that the viewer may look for navigational references for basic orientation when first viewing the page. In contrast to those areas that did receive fixations, there were also areas that did not receive fixations. The fixations were heavily concentrated toward the top of the page and tapered off toward the bottom. Within the first five seconds of the initial view, the bottom portion of the page, that below the fold, received none. Additionally, large text and images consistently had high levels of fixations. When a large

image was not present, the first three fixations included navigation links with a large amount of textual information.

Tan and Wei (2006) conducted research on location typicality. Results from their research indicated that ease of site navigation elicited a pleasant response. Furthermore, the establishment of consistent orientation clues, such as header, logo, navigation bars, hyperlinks, sitemaps, etc. and presentational style are important to efficiency and satisfaction (Tan & Wei, 2006). The presentation style, as referred by Tan and Wei (2006), is a layout design that should be clear in its purpose, whether it be for commercial, recreation or personal use. By following an established or widely used layout design pattern (company logo placement in upper right corner, help icon and search bar upper left, etc.), users are able to navigate through unfamiliar websites easier since the landscape is familiar. This is particularly true for new users.

Tuch et al. (2010) study examines the effects of web page symmetry on website aesthetics by taking gender differences into account. To aid their research, they selected 20 pages from World Wide Web that had symmetric layout design and another 20 pages that looked asymmetric. A total of 60 people (30 males and 30 females) participated in their experiment. Their experiment findings show that participants considered vertical symmetric pages (i.e., symmetrical along vertical axis) to be aesthetically pleasing and asymmetric pages were considered less pleasing. However, male participants were more unfavorable to asymmetric pages in comparison to female participants. These findings

suggest that designers need to take gender difference into account while creating preferred aesthetics look for target audience.

Element order refers to order and relationship in which different design elements are displayed in a page. Element order, also known as web page order, is about presenting contents in the page using a logical organization, creating harmony among design element used by grouping similar elements, and creating clarity by contrasting between dissimilar elements (Deng & Poole, 2010). Grouping similar elements in a hierarchical arrangement can imply a perception of priority as compared to the other elements. Proximity to one object helps define its relationship with nearby objects. Objects closer to one another tend to be more related than objects further apart (Ellis, 1999). Along with visual complexity, Deng and Poole also examined influence of element order on visitor's emotional reaction and ability to facilitate intended behaviors. Their experiment findings show that pages with low ordering (free-form layout of elements without any sense of logical organization) created unpleasant emotions and failed to lead to intended behaviors like making a purchase. Sites with high ordering (layout design pattern along with grouping of similar elements and differentiation of dissimilar elements) created pleasant emotions and had carry over effects on intended behaviors. Experimental findings show that influence of element order on users were also dependent on user's meta-motivational states. Participants in telic state felt more pleased and had higher tendency for intended behaviors towards web pages with high ordering where paratelic state participants were more receptive to web pages with low element ordering.

4.9 Expressive Aesthetics

Beyond web object placement and location typicality, typographic layout of information also influences the first impression (Moys, 2014). In Moys (2014), research findings suggest that layout style associated with low, moderate, or high typographic differentiation have an impact on reader judgment. Typographic differentiations can be created by using noticeable variations in typeface, text and graphic sizes, font weight, color, illustrations, and visual effects such as shadows, reflections, and 3D effects. Thus, typographic layout fits with expressive aesthetics concept rather than classical aesthetics, as it requires to bring most of the visual design elements together to create a fascinating design. Moys found that high typographic differentiation was considered to be attention-grabbing, sensationalist, and youthful (appealing to younger readers). Moderate differentiation was considered academic, formal, and serious whereas low differentiation was considered calm. Moys defined high differentiation as documents having tight spacing with no or little prominent white space. Text was placed in multiple columns mixed with images and/or text boxes either placed apart or at angles to introduce compositional movement. Text and graphics overlapped in different places to create a layered effect and there was a high density of color. Moderate differentiation was defined by maintaining an equal use of white space and tight spacing (Moys, 2014). A grid system was used to set text in either three columns of equal measure or two equal columns with a proportionate half measure open column. Graphic objects were evenly spaced and aligned to grid system. The main heading was appropriately sized in moderation to create a lead in. Low differentiation documents contained the most salient use of white space and had both characters and lines generously spaced. Composition was either symmetric in nature or asymmetric with the use of white

space. The heading, unlike that in moderate differentiation, used moderate to large text with a generous amount of white space to define the lead in. Object frames and rules were used sparingly and were generally light in visual weight. Based on the findings from Moys (2014), it is apparent that the use of typographic layout can be controlled to create a judgment favorable to the material being presented. Understanding the relationships of typographic layout, color and space can lead to the elicitation of preferred impressions.

Branding is crucial for any business, yet it is one of the under researched topic in human computer interaction. Bart et al. (2005) found that brand was an important conveyor of trust. Products with strong brand equity enjoy an immediate trust gain in an online environment. Designers need to create brand identity using the site to influence trustworthiness. Brand identity refers to how a brand would be perceived (Yang & Bolchini, 2014). Brand identity traits can be embedded into a website using user interface consistency and visual guidance (Yang & Bolchini, 2014). User interface consistency can be achieved by using same navigational and layout design elements for all web pages of the site. Visual guidance can be achieved by grouping, coloring, and positioning text, graphics, and multimedia elements to allow users to easily locate, recognize, and read the content. Yang and Bolchini (2014) studied the role of interface consistency and visual guidance design elements for creating brand identity using websites. They created an anonymized university website to measure influence of consistency and visual design elements on brand identity. Findings of their research reveal that visual guidance influence brand identity, i.e., high visual guidance increase brand identity whereas interface consistency did not play a

role. Comparison of participant gender indicated that females are more influenced than males in regard to the role of visual guidance for brand identity.

4.10 Usability

Searching, locating and performing tasks within a website that satisfy user's expectations with the least amount of effort can be pleasurable (Neilson, 2012). Furthermore, the use can be perceived as advantageous or enhancing (Davis, 1989). The inability to navigate through a website easily and quickly can greatly affect a user's experience. According to Grahame, Laberge & Scialfa (2004), navigation is one of the largest problems for users of the World Wide Web as it relates to hypertext. This problem is associated with users getting lost while searching for information.

Microsoft Corporation produced a set of basic guidelines for usability as defined by their Usability Guidelines (Microsoft, 2016). The guidelines, in summary, address the need to avoid distracting elements that might divert attention from relevant content, necessitate the need for logical order, suggest placement of critical features in prominent areas, provide instructions that are clearly visible and/or available and avoid cluttering.

Hampton-Sosa and Koufaris (2005) indicated that "ease of navigation, search and information gathering, relevant content and interactivity, site consistency and reliability" were all factors of usability as related to website use and had been used as a tool of measure for such. Karimov, Brengman & Van Hove's (2011) empirical research regarding website design on initial trust found that navigation, search functions, ease of use and valid links

were all antecedents to perceived usefulness and thus initial trust (Ogonowski, Montandon, Botha & Reyneke, 2014). Additionally, Seckler, Heinz, Forde, Tuch & Opwis (2015) found that usability in general (ease of browsing) affected trust but not distrust.

4.11 Functionality

Websites are designed for use and subsequently are expected to perform as promoted. Most importantly they are expected to perform predictably. All aspects are needed to work as designed, particularly links, search functions and other navigational cues. Lack or improper function can be frustrating. As such, a user that is not satisfied by the functional abilities may become displeased or leave the site altogether.

Finding a product easily via the search function ranked high among 16 Internet shoppers surveyed regarding website trust (Bauman, 2015). This is not surprising since Internet shoppers take advantage of the convenience and accessibility of the online store. Thus, finding the appropriate product and finding it quickly is an important outcome of the search function.

Wang, Law, Guillet, Hung & Fong's (2015) research into hotel website quality found that functionality was one of three dimensions that comprised hotel website quality. The other two dimensions were identified as usability, and security and privacy. Functionality is critical to consumers looking to purchase goods via the Internet since they lack the ability to physically examine and explore the products (Wang et al., 2015).

Though functionality is not a tangible design element into itself, it is an important characteristic of those design elements that represent a function or capability. Therefore, that design element must perform as intended and expected.

4.12 Ease of Use

Hampton-Sosa and Koufaris (2005) defined ease of use as the “user’s subjective perception regarding the amount of effort necessary to learn and use a technology”. Davis (1989) referred to perceived ease of use as “the degree to which a person believes that using a particular system would be free of effort.” Thus, the importance of ease of use is readily apparent. The perceptions of ease of use can influence a user’s behavior. Consequently, any attempts at improving these perceptions can be valuable when faced with users that have little desire to make an investment in learning a new system or have a limited attention span (Casey & Poropat, 2014).

Casey and Poropat (2014) conducted research analyzed data from 178 participants who were asked to complete a survey via a web interface. The participants were randomly shown one of eight variations to complete. The researchers were examining the aesthetic quality and social presence aspects of the web survey design. From their research, Casey and Poropat (2014) found that the higher the social presence and ease of use, the greater the trust. Furthermore, they found that expressive aesthetics negatively impacted ease of use during their experiment. This negative association was attributed to perceived difficulty of use, confusion and frustration related to the novel or creative design presented even though the design was intended to induce positive affective reactions.

Ogonowski et al. (2014) found that perceived ease of use had a positive association with initial trust. Furthermore, they also found that ease of use had a positive influence on the perception of usability and enjoyment. Their research was based on a static webpage in which two variations existed—one with social presence and one without. The website portrayed a fictitious digital camera company that sells online. Participants of the 80 selected and used were asked to browse the website for five minutes and to make a decision as what camera they would buy based on their needs and complete questionnaire.

4.13 Trust Assurance

Trust assurances are statements that can be self-stated or made via third-party promotion. These statements imply that the site is dependable in regard to the ability, integrity and benevolence of the site (Kim & Benbasat, 2010; Utz, Kerkhof & van den Bos, 2012). Trust assurances may come in the form of either an image such as a seal, or a textual claim such as a policy, guarantee or user feedback. These assurances appeal to the user's perceptions regarding security and privacy safeguards, quality of content and site reliability (Bonsón Ponte, Carvajal-Trujillo & Escobar-Rodriguez, 2015).

Kim and Benbasat (2015) randomly polled 85 Internet stores that sold a variety of commonly sold goods such as books, clothing, electronics, etc.) to gauge the use of trust assurances. Of those, 48 of the stores were considered popular based on Yahoo.com classification. A total of 453 assurances were counted with an average of 5.3 assurances per site. Of those, 69% accounted for self-proclaimed assurances. The second largest group identified was third-party assurances at 28%. Customer assurances (user validation)

only accounted for 3%. From survey results, Kim and Benbasat (2010) were able to correlate the number of trust assurances to positive perceptions regarding beliefs in the claims. Thus, the more claims made, the greater the perception that the site was trustworthy. Conversely, Seckler et al.'s (2015) research on distrustful and trustful experiences of websites found that privacy concerns and overstated claims were most frequently described as distrustful.

Kim and Benbasat (2010) also reported that information about trust assurances need to be present, clear and easily found. Access should not restrict a user from returning to their original position, particularly if they are involved in a sale or checkout process and had previously clicked on a hypertext link to obtain policy information. Unnecessary navigation to and from these posted assurances can lead to a negative experience. A user may be led to believe there is deception. To instill trustworthiness, it was recommended that policies should not be hidden behind navigational maze work or obscured by improper documentation.

4.14 User Validation

Utz et al. (2012) argued that customer reviews of an online store were more influential than the overall reputation of the store when making a judgment regarding trustworthiness. Because the Internet store is virtual in nature there is little information about a product that is being promoted. The website user is unable to handle the product, to visualize it or feel it. As such this lack of information can lead to an incomplete assessment of the product. Consequently, social-based information about the same product and about the Internet store

promoting the product can help fill in the missing pieces of information needed to make an informed decision that otherwise may be difficult from a virtual setting.

Seckler et al. (2015) research found that personal and social proof was very important in enhancing a user's trust but not toward distrust. The research was garnered from a total of 221 participants who provided information on trustful and distrustful website experiences. The researchers defined personal and social proof as being comprised of the user's social proof which is comprised of reviews and ratings, the user's friend's social proof which is that information provided by associates, friends and family and the user's prior experience with the described website.

4.15 Assurance Seals

Bonsón Ponte et al. (2015) conducted an experiment using 451 participants instructed to make a purchase decision from two to three travel websites from which they were directed to focus upon. Once the websites were selected, the participants were given a questionnaire. From the results of the questionnaires, Bonsón Ponte et al. (2015) revealed that the main predictor of trust was perceived security. This perception was dependent upon third-party assurance seals, the participant's knowledge of the seals and what they mean and the participant's pre-disposition toward such.

4.16 Company Policies

Company policies outline a company's procedures and/or promises made to the user. These policies can include but are not limited to security, privacy, product return, refunds,

money-back guarantees and shipping policies (Bonsón Ponte et al., 2015; Karimov et al., 2011). They are statements that clarify what can be expected from the company should the user engage them in a transaction. Karimov et al. (2011) referred to these policies as “internally or externally provided e-assurance structures”.

The inclusion of such structures gives the perception of a lower risk to the user. Consequently, this perception leads to greater trust. Karimov et al.’s (2011) research supports this supposition. Their findings from an empirical study regarding website design toward initial trust indicated a positive impact toward initial trust through posted company policies. Bonsón Ponte et al.’s (2015) research also found that security and privacy policies were antecedents to perceived security and trust.

4.17 Security

Security measures are necessary to facilitate transactions between the user and website in a secure and safe manner which includes securing personal information and transactions. However, it is not just limited to such activities. Security measures include encryption (Belanger, Hiller & Smith, 2002; Siau & Shen, 2003), password protection (Belanger et al., 2002), digital certificates (Siau & Shen, 2003), integrity and non-repudiation (Cheung & Lee, 2001). Though the manner by which these items are implemented does not appear to be relevant to the user. It is, however, important in the trust relationship of a website. According to Mayayise and Osunmakinde (2014), their research findings found security, in general, was a trust assurance measure. Furthermore, there was no clear differentiation between the security features. Nonetheless, the perception of security and privacy control,

as well as third party recognition, were found to be antecedents to trust (Siau & Shen, 2003).

According to Belanger et al. (2002), the presence of security features on the website were found to be more important to users even over privacy statements and security seals. Furthermore, research indicated that there was a correlation between security features, security seals and privacy statements. Basically, with the presence of one, users also expected the presence of the others.

Chapter 5

REPERTORY GRID TECHNIQUE

In order to understand how an individual perceives website design trustworthiness in relation to website design elements that comprise a webpage, the individual's beliefs and perceptions of such must be evaluated. Exploring these beliefs and perceptions can be accomplished by using a process known as the repertory grid technique. To use the repertory grid technique, ideas related to a target concept are elicited, evaluated and rated. The rating process provides a means by which to quantify the results and perform statistical analysis. The resulting analysis can reveal ideas that are similar, dissimilar or even inconsequential to the topic being researched. This insight provides a means to truly understand the perceptions that individuals hold regarding a topic holistically.

The repertory grid is actually composed of four components—a topic, elements, constructs and ratings (Jankowicz, 2004). The topic is the point of interest or research. The elements are defined as those objects or ideas that are the focus of the research (Edwards et al., 2009). The constructs are the perceptions and/or characteristics of an element and thus represent a meaning that is conveyed through similarities and contrasts (Jankowicz, 2004). The essential notion of the construct is that it is bipolar. Thus, the construct has opposing poles, like hot versus cold. These poles are seen as contrasting points and are based on the idea of likenesses and differences. It is within this contrast where meaning is derived. As such, constructs do not have to be poles made of direct opposites such as hot and cold or

wet and dry. The construct is merely a reference to a transition from one characteristic to another, like the color red to the color blue. (Fransella et al., 2004).

To complete the grid, the elements are placed on the horizontal vertices while the constructs are placed along the vertical vertices and appears in form as a standard grid (See Figure 2). Where the element intersects a construct, a point of evaluation is created for which the element can be rated in relation to the construct. This rating is performed by using an odd-numbered rating scale such as a five-point rating scale (-2, -1, 0, 1, 2), where the middle point is considered neutral and the end point labels indicate the construct poles. Because the constructs of the repertory grid are bi-polar, a rating chosen from the left most part of the scale indicates a greater strength in association to that characteristic of the construct pole on that side. Conversely, a rating that is chosen from the right side of the scale shows a greater strength in association to characteristic of the construct pole for that side. For example, an orange that is rated against the bi-polar construct of juicy::dry will be viewed in the following context,

juicy -2 -1 0 1 2 dry

where '-2' is considered very juicy and '2' is considered very dry. The middle point, '0' would indicate a neutral position.

The evaluation of a completely rated repertory grid allows for the quantitative analysis of the rated elements. The completed analysis can reveal trends and patterns among individual grids and grids as a collective and thus a greater understanding of the relationships between the elements and constructs, as well as the elements themselves.

Fruit							
Left Pole	Mango	Strawberry	Pineapple	Banana	Blueberry	Apple	Right Pole
Smooth skin	-2	1	2	-2	-2	-2	Rough skin
juicy	-1	-1	-2	2	-1	0	Dry
sweet	-2	-1	-2	-1	-1	-1	Bitter
round	2	1	0	0	0	-1	Elongated
large seeds	2	-2	0	0	0	1	Small seeds

Figure 2. Example of repertory grid using a scale of -2 to 2

5.1 Historical Context and Developmental Process

The repertory grid, first introduced in 1955 by George Kelly as the Personal Construct Theory, is used to identify how an individual perceives his or her experience. Originally, the process involved the selection of a topic. Using the topic as a guide, a list of items or elements is generated about the topic. Afterwards, the elements are then compared against one another to find similarities and contrasts. This is performed by evaluating the elements against each other in the context of the research question using one of three sort processes—dyad sort, triad sort or full context sort. The dyad sort compares one element against a different element to find how they differ. The full context sort looks at any one of the elements to find how it differs from any other element. The third method, triad sort, is the most frequently used approach (Embacher & Buttle, 1989; Hair, Rose & Clark, 2009; Tan, Tung & Xu, 2009). The first two elements of the triad group are compared against one another to find the similarities. Then, those similarities are compared against

the third element of the triad group to find the contrasts which results in the implicit pole. According to Reger (1990), seven to ten triads are sufficient in eliciting all of the constructs from a participant. Similarly, Hadley (1996) indicates eight to fifteen constructs is adequate.

These contrasts and similarities are then used to develop a set of constructs which are bipolar in nature from which the elements can be rated. The bipolar construct is composed of the emergent (similar) pole and the implicit (contrast) pole (Kelly, 1955). The construct is an explanation of a characteristic to an element which can be expressed as a single word or sentence (Bauman, 2015). The construct represents how the individual perceives the element by conferring meaning to their experiences (Hair et al., 2009). Each element is then evaluated against each set of constructs using a point scale. It is this approach that identifies the repertory grid technique as a well-known method for quantitative and statistical calculations for the personal construct theory (Burr, King & Butt, 2014).

The repertory grid technique is not unique to clinical studies or psychoanalysis. It has been used in other discipline studies, as well, since it constitutes a mechanism for deriving and representing cognitive models in system development (Latta & Swigger, 1992). Specifically, such research has included a number in software engineering (Edwards, McDonald & Young, 2009), online trust (Bauman, 2015) and information systems (Tan & Hunter, 2002). These studies examined how individuals view and interpret these complex computer-related systems.

The use of the repertory grid technique can be applied in three different fashions. The researcher may elicit both elements and constructs from participants, supply elements and elicit constructs from the participants or supply both elements and constructs to the participants (Tan & Hunter, 2002). The application of either method is dependent upon what the researcher is intending to learn from the results.

The first alternative, where both elements and constructs are elicited from the participants, is exploratory in nature. For evaluative research, the second alternative can be applied. This alternative involves the researcher supplying the elements. However, the constructs are developed by the participants. This is useful to evaluate a topic against known elements. The last alternative involves the researcher supplying both the elements and constructs. This enables the researcher to make comparisons of evaluative research (Edwards et al., 2009). Should the constructs be provided by the researcher, they need to be representative of the topic and that the participants have an adequate understanding of what the construct means. Latta and Swigger's (1992) research into the repertory grid technique found that supplied constructs (from professor) versus elicited (from students), that there was commonality between the two sets of constructs. Though there were some differences, they did find support for the use of the repertory grid technique to "represent a consensus of knowledge about concepts" within a body of common knowledge. It is this flexibility that makes the repertory grid technique extremely easy to modify and adapt to variety of different applications (Easterby-Smith, 1980).

To evaluate the elements, either supplied to or generated by the participants, one of three different methods may be applied: dichotomizing, ranking, and rating (Tan & Hunter 2002). The first method, dichotomizing, involves associating the element to either side of the bi-polar construct (contrasting poles). However, skewed distribution could result since an element either belonged to one side or the other of the construct. Ranking, the second method, evolved as an alternative to dichotomization. Participants would be required to place the elements in order of relevant association between the contrasting poles of the construct. This method provides a greater form of discrimination. Unfortunately, participants would be forced to place elements in ranking order where no difference existed between some elements. The last method, rating, which is also the most favored for evaluating elements, involves a five, seven, nine or 11-point scale. According to findings from research in 'The analysis of a Kelly repertory grid' by M.L.G. Shaw, 70% of published studies used the rating method (Easterby-Smith, 1980). For rating, the participants would be required to evaluate an element based on its perceived strength of association between either of the polar constructs. (Tan & Hunter, 2002). Despite the rating scale size varieties, research tends to favor the five-point scale. Scales above a five-point scale have been found to be difficult to use and a seven-point scale approaches the limit of most participant's discrimination abilities (Tan & Hunter, 2002). Though scales may be even numbered, scales with an odd number are considered normal since it provides a neutral position between the contrasting poles (Edwards et al., 2009).

The grid size is recommended to have approximately 15-25 elements in a clinical setting. However, it is not necessary to have that many for organizational applications. The

purpose of the number of recommended elements is to ensure that a topic is adequately covered (Easterby-Smith, 1980).

5.2 Application of Repertory Grid Technique to this Study

Due to the repertory grid technique's capability in providing perceptual insight, the technique was applied to the holistic model developed in this research using the preferred or common methods. The holistic model, central to website design trustworthiness, is composed of website design elements that have been identified through extensive literature review as having influence on the perception of trustworthiness. The model contains a total of 35 website design elements. In order to elicit individual perceptions toward this model, the holistic model's components were presented to study participants for evaluation.

To prepare the repertory grid for evaluation, volunteer participants were solicited from the University of North Florida's student body and those employed in the website design profession. Furthermore, those volunteers in the website profession were required to be employed in that domain and have at least two years of concurrent work experience. All participants were required to be 18 years of age or older (See Appendix H for IRB approval letter for this research).

Because the perceptions of individuals as they view website design elements in the context of trustworthiness are being tested, it is important to have minimal researcher involvement. This is to ensure that unbiased responses are elicited and that the actual perceptions of individuals are being represented. However, researchers may provide contextual clues to

help keep participants focused on the study topic (Tan & Hunter, 2002). Thus, study participants were used to develop the constructs that were applied to the repertory grid's final design but informed that the context is trustworthiness as it applies to design. Therefore, the design and application of the repertory grid was conducted in two separate phases—construct development and grid evaluation.

To facilitate the construct development and grid evaluation, the software program, Idiogrid, that specializes in repertory grid development and analysis was utilized (Grice, 2002). This software provides for the elicitation of constructs, construct rating, and multiple grid analysis and has been used in other research involving the repertory grid technique (Curtis, Wells, Lowry & Higbee, 2008; Raja, Bourne, Goffin, Çakkol & Martinez, 2013; Sanberk & Bagis, 2016). Due to its versatility and capability, the software was utilized for both phases of data collection.

5.3 Construct Elicitation

For the construct development (first phase), the 35 identified design elements that comprised the holistic model were supplied to the Idiogrid program. During this phase, the UNF student body was solicited for volunteers to participate in the study. A few faculty members from the School of Computing and Public Health departments were contacted. Only 14 students responded and participated. The participants were provided a brief summary of the research, an informed consent form, a set of instructions on how to use the Idiogrid software (See Appendix F) and a list of definitions of the provided website design elements (See Appendix A). Each participant was informed orally that the context of the

survey was trust. Using the triad sort method that is commonly used to elicit the compare and contrast characteristics of elements, each participant was provided with 10 sets of three randomly selected website design elements from the supplied elements to evaluate for similarities and contrasts. As few as 7-10 triads are needed for construct elicitation (Curtis et al, 2008). Of each group of three elements, the participants were asked to find two of the design elements that were similar and then contrast it with the remaining design element. The participants were then asked to describe those differences and likenesses, respectively, in a single word or phrase. Once accomplished, the participant was then asked to indicate which description was most positive or desirable. The process resulted in ten developed constructs from each participant which took approximately 30-45 minutes to complete. A total of 140 constructs were collected from all participants. See Appendix C for a complete list of the constructs.

The aggregated constructs were evaluated for similarity, clarity and relevance in a series of steps to ensure that the most representative and meaningful constructs were selected for implementation in the second phase--grid evaluation. First, the constructs were evaluated individually to determine the nature of the polar ends and to appropriately label as either contrasting or antonyms. The labeled constructs were further evaluated to determine if the two polar ends were actually related. This evaluation was noted for each contrasting construct. The process resulted in 55 remaining constructs. For the next step, the remaining constructs were sorted into groups of two or more constructs of close similarity or context. That resulted in 14 groups, see Table 1.

Group	Frequency
Likeness	4
Variance	4
Quantity	2
Perceptions	5
Meaning/Purpose	3
Predictability	2
Design	12
Placement	4
Social	4
Importance	3
Usability & Navigation	3
Audience	4
Access/Information Control	3
Helpful	2

Table 1. Elicited & Sorted Construct Groups

For each of the groups, a single construct that was clear, understandable and most representative was selected. Lastly, the selected constructs were further examined for applicability and study value through two more iterative processes. For the first iteration, each construct was evaluated to determine whether it was comparative or evaluative in nature. If it was comparative, it was dismissed. Since the purpose of the grid is to evaluate only one element at a time, independent from others via a rating scale, a comparative construct would not be relevant since it would require at least another element for which to make a comparison. The remaining constructs from the first evaluative iteration were then reviewed to determine their ability to add value to the study. If the construct could not add any new information to the question of website trustworthiness and the perceptions of website design toward trustworthiness, then the construct was considered potentially

unsuitable for use and thus dismissed. Though this question is subjective in nature, it stands to reason that finding a set of constructs related to the question is relative. As a result of the selection process, 10 suitable constructs were identified from the group representatives. Thus, no two constructs came from the same group. The selected constructs, along with the total number of similar constructs from which they were chosen, are listed in Table 2. The use of 10 constructs is consistent with previous research using the repertory grid technique (Fallman & Waterworth, 2005 (10 constructs); McCloughlin & Matthews, 2009 (6 constructs); Sanberk & Bagis, 2016 (10 constructs)). Refer to Appendix D for a complete list of the grouped constructs with researcher notes.

Left Pole	Right Pole	Similar Construct Responses
Maximize purpose	No particular purpose	3
Predictable/Expected	Subjective/Dependent on target group	2
More important	Less important	3
Concerned with capturing attention	Concerned with content representation	12
Related to relative placement of items	Open and not related to any placement of items	4
More humanistic / personable	More robot-like / impersonal	4
Useful for navigation	Distraction to navigation	3
Shaped around the target audience	Shaped by the personal preference of the site designer	4
Helpful to site visitor	Helpful to site owner	2
Associated with security and trust	Associated with layout and designing	5

Table 2. Selected Elicited Bi-Polar Constructs

5.4 Grid Evaluation

To complete the final grid design, the 10 participant-developed constructs were added to the Idiogrid software alongside the 35 website design elements from the holistic model.

The completed grid was then administered to a second group of volunteer participants during the second phase (grid evaluation).

During the grid evaluation period, students from UNF and web designers with a minimum of two years professional experience were solicited to participate. There was a total of 35 respondents, of which six were identified as web designers with at least two years professional experience, that participated. As in the first phase, the participants were provided a brief summary of the research, an informed consent form, a set of instructions on how to use the Idiogrid software (See Appendix G) and a list of definitions of the provided website design elements (See Appendix A). Each participant was informed orally that the context of the survey was trust. With the assistance of the Idiogrid software, the participants were then asked to evaluate the prepared grid using a 5-point Likert scale. The left-most portion of the scale was defined as ‘-2’, the right-most as ‘2’ and the central or neutral position as ‘0’. Participants were asked to rate each element in relation to all of the intersecting bi-polar constructs. Selection of a rating left of the neutral point indicated a greater association to that side of the bi-polar construct. The converse applied to the right side of the scale. Due to the grid size, the participants rated 350 items each and took 30-50 minutes to complete. A visual representation of the completed repertory grid is displayed in Figure 3.

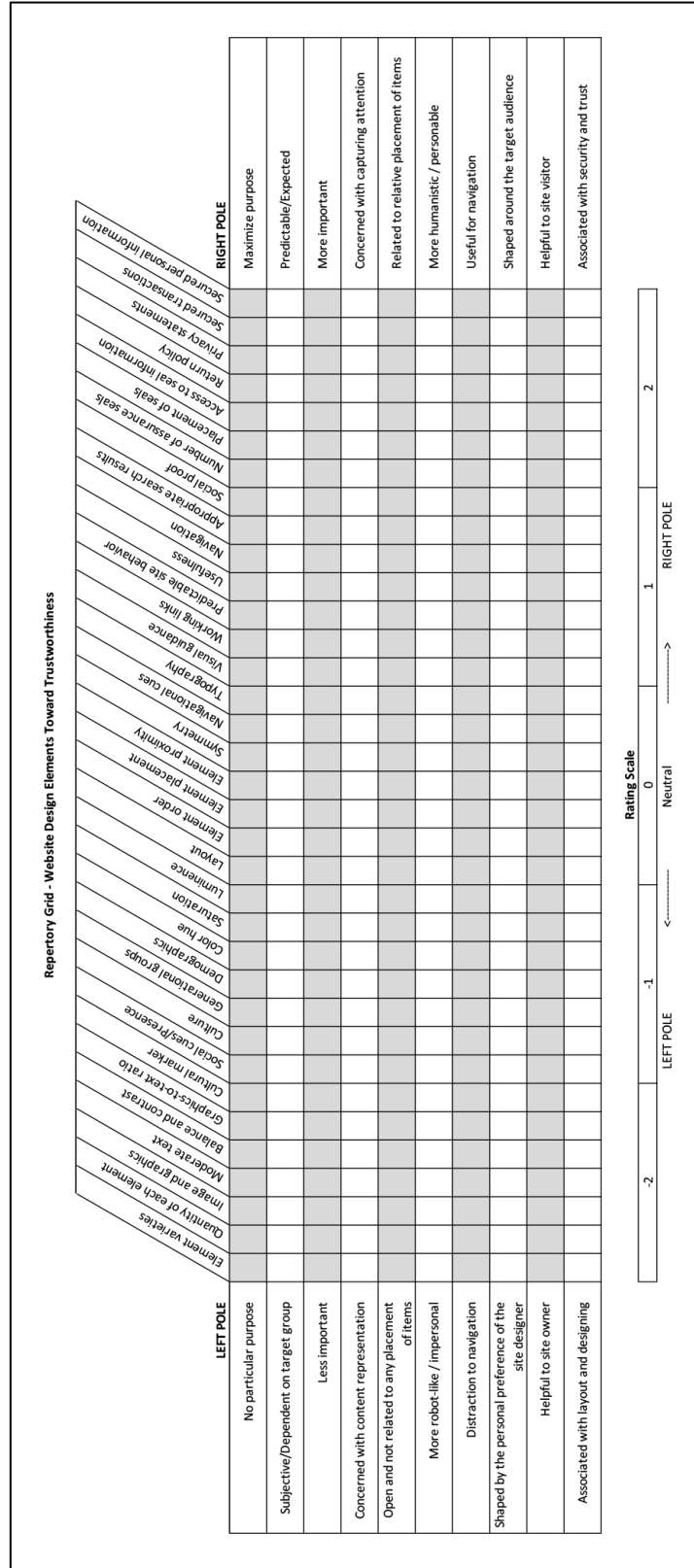


Figure 3. Trust repertory grid used in research study

5.5 Participants

The sample size for this research was comparable to or exceeded other related research using the repertory grid technique where 11-25 participants were used (McCloughlin & Matthews, 2009; Niu & Easterbrook, 2007; Fallman & Waterworth, 2005; Tan et al., 2009; Embacher & Buttle, 1989). For this research, a total of 14 participants were used in phase one and 35 participants used in phase two. For phase two, the grid rating period, participants were aged from 18 to 48 with 18 (51%) being in the age group of 18-25 years old and 17 (49%) being in the age group of 26-49 years old. The participants had varying degrees of web design experience that spanned from none to professional experience. Those that had some experience, but not professional, stated it as a hobby interest. Ten participants claimed hobby experience (29%) and 16 stated none (46%). Six individuals were identified as professional web designers with at least two years of professional experience (17%). Three others had professional experience of less than one year (9%). Of the 49 participants, three volunteered for both phases.

Chapter 6

RESULTS

The 35 completed repertory grids collected from the survey were merged into one grid via the Idiogrid software. Since all grids were identical with the exception of the rating data, the grids were easily combined. Because the grid is composed of a horizontal component (35 web design elements) and a vertical component (10 constructs), the intersecting points for each creates a cell or position for which a rating score is associated. The matching cell locations for each of the completed grids were totaled and the mean value calculated. Thus, the singular, resulting grid contains only the mean value of the rating scores. Positive values indicate a position toward the left pole whereas a negative value would indicate a position nearer the right pole. This is counter to the orientation in which the grid was originally presented to participants. This alignment is due to participants being required to indicate the most desirable pole of each construct they developed during the construct elicitation phase. As such, the most desirable pole is aligned with the positive valued pole and thus presented first within the construct. A value of zero would indicate a neutral position. The maximum and minimum values range from -2.00 to 2.00, which reflect the rating scale upon which the items were rated. Table 3 contains a listing of the mean values that comprise the merged grid as well as the constructs in left/right pole orientation. The survey rating data was further analyzed using both Idiogrid and IBM SPSS Statistics software.

		CONSTRUCTS									
		C1	C2	C3	C4	C5	C6	C7	C8	C9	C10
ELEMENTS	Element Varieties	1.03	0.29	0.17	0.29	1.17	0.57	0.46	0.80	1.03	-1.34
	Quantity of Each Element	0.54	-0.14	0.09	0.00	1.20	0.37	0.09	0.46	0.83	-1.37
	Image and Graphics	1.46	0.66	1.03	0.89	1.14	1.37	0.63	0.83	1.34	-1.40
	Moderate Text	0.91	0.57	0.83	-0.40	0.49	0.51	0.63	0.26	1.23	-1.00
	Balance and Contrast	1.54	0.77	1.11	0.57	0.34	0.69	0.89	0.06	1.06	-1.26
	Graphics-to-text Ratio	0.89	0.17	1.06	0.23	1.34	0.86	0.83	0.20	1.06	-1.37
	Cultural Marker	0.54	-0.69	-0.17	0.40	-0.86	1.11	-0.29	1.14	0.83	-0.20
	Social Cues/Presence	0.37	-0.49	0.26	0.40	-0.34	1.29	0.00	1.46	0.91	0.26
	Culture	0.66	-0.66	-0.09	0.31	-0.63	1.29	-0.31	1.37	0.69	-0.06
	Generational_groups	0.89	-0.31	0.40	-0.06	-0.20	1.26	0.06	1.34	0.49	0.26
	Demographics	0.54	-0.29	0.23	0.06	-0.20	1.20	0.09	1.40	0.49	0.20
	Color Hue	0.83	0.66	0.74	0.49	0.00	0.69	0.51	-0.60	0.69	-1.17
	Saturation	0.71	0.40	0.46	0.63	-0.14	0.43	0.46	-0.60	0.63	-1.20
	Luminance	0.74	0.46	0.51	0.69	-0.06	0.46	0.54	-0.71	0.69	-1.31
	Layout	1.71	1.31	1.57	0.11	1.46	0.54	1.74	-0.31	1.26	-1.14
	Element Order	1.54	1.11	1.20	-0.63	1.69	0.26	1.66	-0.03	1.09	-1.23
	Element Placement	1.57	0.86	1.17	-0.14	1.71	0.37	1.63	0.06	1.14	-1.29
	Element Proximity	1.23	1.03	0.83	0.06	1.63	0.23	1.46	-0.09	0.91	-1.17
	Symmetry	1.17	1.09	0.89	0.31	1.51	0.29	1.06	-0.43	0.83	-1.23
	Navigational Cues	1.51	1.34	1.54	0.00	1.26	0.57	1.89	0.69	1.51	-0.34
	Typography	1.17	0.66	0.80	0.11	0.40	0.66	1.06	0.37	1.00	-0.54
	Visual Guidance	0.91	0.94	1.14	0.57	1.34	1.00	1.60	0.91	1.40	-0.26
	Working Links	1.83	1.77	1.80	-0.23	-0.20	-0.23	1.60	0.09	1.29	0.46
	Predictable Site Behavior	1.71	1.74	1.77	-0.29	-0.09	0.06	1.63	0.54	1.14	1.09
	Usefulness	1.74	1.60	1.66	-0.20	-0.03	0.97	1.37	1.06	1.46	1.17
	Navigation	1.66	1.57	1.66	-0.14	1.09	0.74	1.89	0.74	1.60	0.34
	Appropriate Search Results	1.57	1.29	1.46	-0.77	-0.54	0.29	1.46	0.80	1.60	0.97
	Social Proof	1.06	0.26	0.71	0.26	-0.51	1.11	0.00	1.26	0.57	1.26
	Number of Assurance Seals	0.83	0.17	0.23	0.80	-0.43	0.11	-0.43	0.60	0.03	1.17
	Placement of Seals	0.54	0.34	0.20	0.97	0.31	0.00	-0.14	0.37	0.37	0.69
	Access to Seal information	0.74	0.66	0.66	-0.09	-0.14	0.17	-0.03	0.29	0.46	1.40
	Return Policy	1.37	1.51	1.49	-0.31	0.17	0.40	0.20	0.66	0.91	1.57
	Privacy Statements	1.20	1.43	1.40	-0.37	0.14	0.06	0.06	0.63	0.71	1.60
	Secured Transactions	1.86	1.74	1.86	-0.17	0.09	0.14	0.06	0.69	1.06	1.83
	Secured Personal Information	1.89	1.69	1.91	-0.23	-0.20	0.20	0.06	0.83	1.29	1.80
C1 Maximize purpose ... No particular purpose											
C2 Predictable/Expected ... Subjective/Dependent on target group											
C3 More important ... Less important											
C4 Concerned with capturing attention ... Concerned with content representation											
C5 Related to relative placement of items ... Open and not related to any placement of items											
C6 More humanistic / personable ... More robot-like / impersonal											
C7 Useful for navigation ... Distraction to navigation											
C8 Shaped around the target audience ... Shaped by the personal preference of the site designer											
C9 Helpful to site visitor ... Helpful to site owner											
C10 Associated with security and trust ... Associated with layout and designing											

Table 3. Merged grid - Averaged ratings

Referencing Table 3, an examination of the mean values provides some insight on how the participants viewed individual website design elements in relation to the constructs. The elements “secured transactions” and “secured personal information” were strongly associated with the construct “maximize purpose” (C1) with values 1.83 and 1.80, respectively. These same two elements were also strongly associated with the construct “associated with security and trust” (C10) with values 1.86 and 1.89 and the construct “more important” (C3) at 1.86 and 1.91, respectively. The constructs “culture” and “cultural marker” were considered the least important of any of the design elements. The constructs “layout”, “navigational clues”, “working links”, “predictable site behavior”, “usefulness” and “navigation” were rated the highest on the construct “more important” than most of the other elements and ranged in value between 1.57 to 1.80. The participants also viewed “working links”, “predictable site behavior”, “secured transactions” and “secured personal information” as “expected” (C2). Their values ranged from 1.69 to 1.77.

Looking at the construct statistics in Table 4, some observations about how the constructs were rated can be made. Since the ratings of constructs range from -2 to 2 in value, the midpoint would be zero. Judging from the means, the left pole (positive) appears to be favored for “maximize purpose” (1.1567) along with two others—“more important” (0.9306) and “helpful to site visitor” (0.9592). With the exception one construct, all other constructs have a standard deviation that is relatively low, indicating that the ratings are centered around the mean value and are not quite widespread. The construct “associated with security...” had a mean close to zero but its standard deviation (1.1282) was the

highest of all constructs. This construct exhibited a larger variance of ratings between participants.

Construct	N	Mean	Std. Deviation
Maximize purpose ... No particular purpose	35	1.1567	0.4544
Predictable/Expected ... Subjective/Dependent on target group	35	0.7290	0.7233
More important ... Less important	35	0.9306	0.6077
Concerned with capturing attention ... Concerned with content representation	35	0.1176	0.4230
Related to relative placement of items ... Open and not related to any placement of items	35	0.3976	0.7798
More humanistic / personable ... More robot-like / impersonal	35	0.5722	0.4310
Useful for navigation ... Distraction to navigation	35	0.6963	0.7357
Shaped around the target audience ... Shaped by the personal preference of the site designer	35	0.4890	0.5959
Helpful to site visitor ... Helpful to site owner	35	0.9592	0.3728
Associated with security and trust ... Associated with layout and designing	35	-0.0808	1.1282

Table 4. Construct statistics

The grid rating data was further analyzed using hierarchical clustering which is used to show relationships (Jankowicz, 2004). The hierarchical cluster analysis was performed by IBM SPSS software using the method between-groups linkage (average) with squared Euclidean distance. From the cluster analysis, a Dendrogram was produced and is presented in Figure 4 (see Appendix D for the associated agglomeration schedule). The scale on the Dendrogram starting from the left begins at zero and increases in value to the right. The closer the convergence of branches to the value zero or ‘root’ of the

Dendrogram, the more similar the elements are that are connected. The further away the branches converge from the root the more dissimilar the elements are in comparison to those branches that converge closer to the root.

From the root of the Dendrogram, a number of defined clusters found within a scale distance of seven is evident. The most notable group of elements due to their similarity is the cluster of “saturation”, “luminance” and “color hues”. This cluster matches the developed model (refer to Chapter 4, Figure 1) group “Color Scheme” identically. However, not all clusters are representative of the developed model components, but they do show some similarity in organization.

Moving downward from the top of the Dendrogram, the next similarly related cluster, B2, is comprised of “moderate text”, “typography”, and “balance and contrast”. Though cluster B2 is not as similar to cluster B1 they are ultimately branched to one another. The element “typography” categorized under “expressive aesthetics” of the developed model is found closely related to “moderate text” and “balance and contrast” which are organized under “visual appeal” of the developed model.

The next cluster, B3, is comprised of “element varieties”, “quantity of each element”, “graphics-to-text ratio” and “image and graphics” which is to a lesser extent similar to the other elements in cluster B3. Clusters B1, B2 and B3 form a larger cluster, B10, indicating their relationship to one another. The elements “element varieties” and “quantity of each

element” are found to be closely related. Though they are to a lesser extent similar to “graphics-to-text ratio” and to an even lesser extent to “image and graphics”, the two elements are categorized similarly in the developed model under the category “visual complexity”.

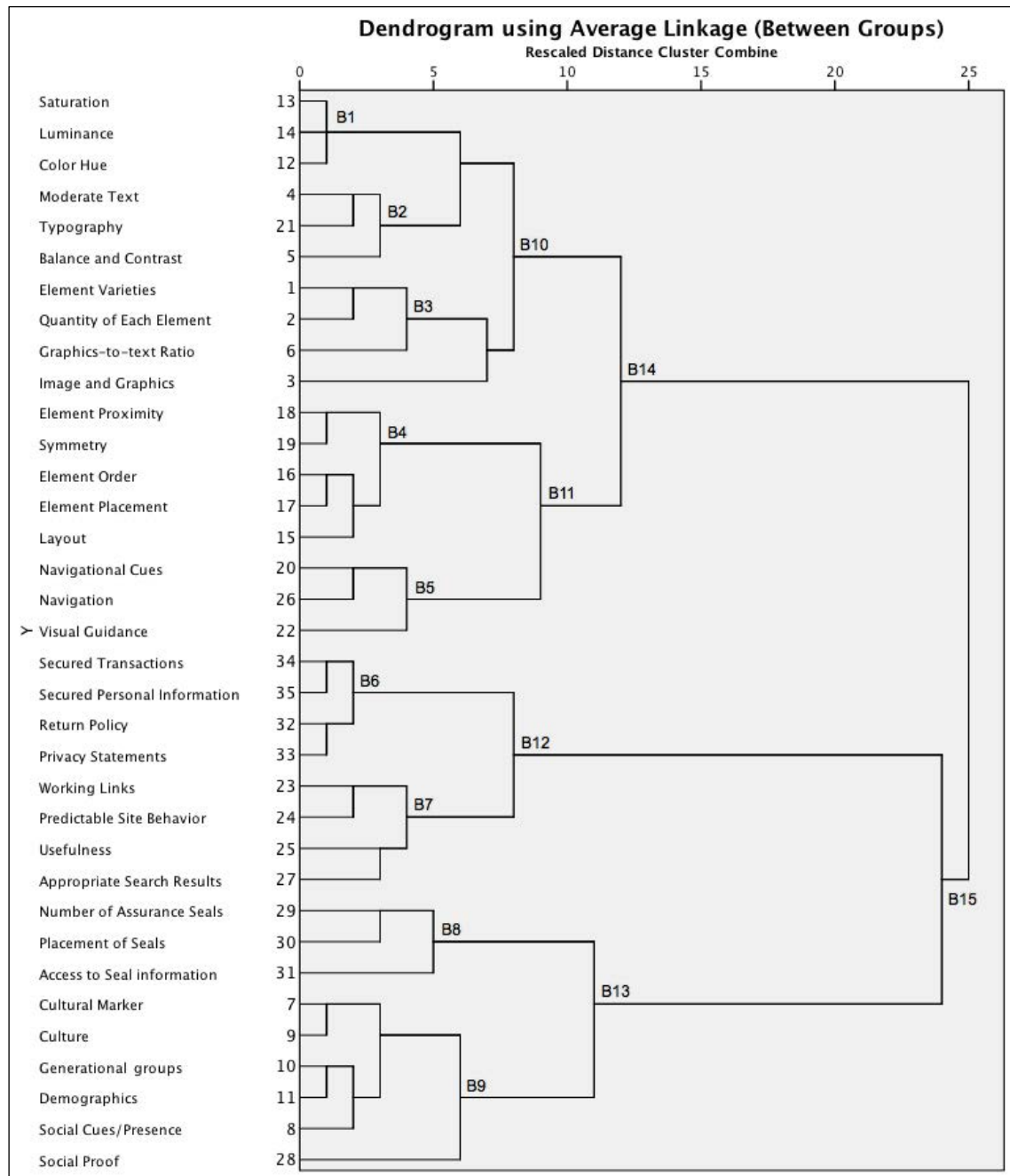


Figure 4. Dendrogram of combined survey rating results

Cluster B4 is comprised of “element proximity”, “symmetry”, “element order”, “element placement” and “layout”. All of these are closely related and can be found similarly organized in the subcategory “classical aesthetics” of the developed model. The element “navigational cues” originally grouped with “classical aesthetics” is not as closely related to those elements of cluster B4. However, it is linked to adjacent cluster B4 through its membership of cluster B5 at the branch of B11.

Cluster B5 is made up of “navigational cues” and two other elements—“navigation” and “visual guidance”. “Navigational cues” and “navigation” are more similar to one another than “visual guidance”. These three elements are spread between three different subcategories of the developed model. The element “navigational cues” is found in “classical aesthetics”, “visual guidance” is found in “expressive aesthetics” and “navigation” is found in “ease of use”. As indicated earlier, cluster B5 is related to cluster B4 but their similarity is not as defined as the elements themselves that comprise both clusters.

Clusters B1 through B5 ultimately all connect to branch B14 revealing that they all have some similarity amongst them. A closer examination of the elements that make up cluster 14 tend to be formatting features. Cluster B6 which contains navigational elements appears to be an exception.

Another cluster, B12, is composed of two smaller clusters—B6 and B7. Cluster B6 is comprised of “secured transactions” and “secured personal information” which are very closely related. Those two clusters are related to two other clusters—“return policy” and

“privacy statements”—which are also similarly related. These two groups are closely related to each other. These two clusters are found similarly in the developed model under the categories “trust assurances” and “security”.

Cluster B7 which is composed of “working links”, “predictable site behavior”, “usefulness” and “appropriate search results” are related but not as strong as the elements in cluster B6 are to each other. The elements “working links” and “predictable site behavior” are more similar to one another than the other two elements, “usefulness” and “appropriate search results” are together. Nonetheless, both groups of elements are connected. Both cluster B6 and B7 can be seen as those elements that provide a level of functionality to the web design. All of these elements are grouped together similarly in the developed model under the category “usability”. The only element not found related to these two clusters, but included in the developed model under “usability”, is “navigation”. This may suggest that navigation is not necessarily perceived as a function but as a product of formatting and design.

The last large cluster, B13, is comprised of two smaller clusters B8 and B9. Cluster B8 is comprised of three elements—“number of assurance seals”, “placement of seals” and “access to seal information”. These elements are grouped similarly in the developed model under the subcategory “trust assurances” which is a subset of category “trust assurances”. This category also contains two other subcategories, “user validation” and “company policies”. However, the element “user validation” does not emerge connected to these clusters. Instead, it is found in cluster B9.

Cluster B9 contains the last of the elements clustered together which contains “cultural marker”, “culture”, “generational groups”, “demographics”, “social cues/presence” and “social proof”. The first two, “cultural marker” and “culture”, are very similar. These two elements are then related to the next three elements, “generational groups”, “demographics” and “social cues/presence” which themselves are quite similar. The last element, “social proof”, is somewhat of an outlier amongst these elements. It is the least similar of the group. Furthermore, all of the elements of cluster B9, with the exception of “social proof”, were originally categorized under “visual appeal” within the developed model and linked to the subcategories, “multimedia content” and “color scheme”. However, the elements “image and graphics”, “moderate text”, “balance and contrast”, “graphics-to-text ratio” were also included with them in the developed model.

It’s important to note that clusters B10 and B11 are similarly related and connected at B14. Cluster B14, though separate from clusters B12 and B13, is not that much dissimilar than those two clusters in terms of distance scale. Interestingly, cluster B14 appears to represent all those design elements that are considered to be webpage formatting/layout features.

Hierarchical clustering, which provides insights into the associations between the design elements, does not reveal the correlations that exist between the constructs. By analyzing the constructs through correlative analysis, positive and negative correlations can be identified. Thus, individual design elements may be compared with the others to determine how they interact. Some design elements may not work well with others while some may require or expect the presence of another design element. Though the hierarchical

clustering Dendrogram visually depicts all of the trust influencing design elements and their association with the others, it does not show the correlative relationships that may diminish or enhance trust perceptions. To reveal possible correlations between the constructs, a correlation table (see Table 5) was prepared using Pearson correlation analysis, also known as bivariate correlation, with two-tailed test of significance. This analysis, which measures the linear correlation between one construct and another, was conducted using IBM SPSS software (see Appendix E for construct scatter plots depicting the linear correlations). The correlation coefficient values (r) span from 1 to -1. A value of 1 indicates a positive correlation whereas a value of -1 is a negative correlation. Zero, however, indicates that there is no linear correlation. Because the constructs are bipolar, a positive correlation would indicate that the left pole of one construct is associated with the left pole of the compared construct. This would be the same for the right poles, as well. However, if there is a negative correlation, the left pole of one construct would be associated with the right pole of the compared construct and vice versa.

Referring to Table 5, the construct “maximize purpose” ($r = 0.871$) is closely associated to the construct “predictable/expected”. However, it is important to note that due to the bipolar construct, it also means that “no particular purpose” is also closely associated to “subjective/dependent on target group”. With “maximize purpose” ($r = 0.909$) there is even a greater association that exists between “more important”. While examining “more important”, it is found that there is a high correlation to “predictable/expected” ($r = 0.936$). It is also found that “concerned with content representation” is correlated with “maximize purpose”, whereas “concerned with capturing attention” is correlated with “no particular

Correlations										
	Maximize purpose ... No particular purpose	Predictable/Expected ... Subjective/D dependent on target group	More important ... Less important	Concerned with capturing attention ... Concerned with content representation	Related to relative placement of items ... Open and not related to any placement of items	More humanistic / personable ... robot-like / impersonal	Useful for navigation ... Distraction to navigation	Shaped around the target audience ... Shaped by the preference of the site designer	Helpful to site visitor ... Helpful to site owner	Associated with security and trust ...
Pearson Correlation	1	.871**	.909**	-.517**	.254	-.360*	.627**	-.120	.682**	.217
Sig. (2-tailed)		.000	.000	.001	.141	.034	.000	.493	.000	.210
N	35	35	35	35	35	35	35	35	35	35
Pearson Correlation	.871**	1	.936**	-.498**	.265	-.592**	.616**	-.302	.589**	.310
Sig. (2-tailed)	.000		.000	.002	.123	.000	.000	.078	.000	.070
N	35	35	35	35	35	35	35	35	35	35
Pearson Correlation	.909**	.936**	1	-.554**	.224	-.389*	.626**	-.147	.694**	.324
Sig. (2-tailed)	.000	.000		.001	.195	.021	.000	.399	.000	.058
N	35	35	35	35	35	35	35	35	35	35
Pearson Correlation	-.517**	-.498**	-.554**	1	-.039	.313	-.354*	-.125	-.445**	-.335*
Sig. (2-tailed)	.001	.002	.001		.824	.067	.037	.473	.007	.049
N	35	35	35	35	35	35	35	35	35	35
Pearson Correlation	.254	.265	.224	-.039	1	-.120	.599**	-.388*	.389*	-.605**
Sig. (2-tailed)	.141	.123	.195	.824		.493	.000	.021	.021	.000
N	35	35	35	35	35	35	35	35	35	35
Pearson Correlation	-.360*	-.592**	-.389*	.313	-.120	1	-.185	.544**	.025	-.215
Sig. (2-tailed)	.034	.000	.021	.067	.493		.288	.001	.887	.216
N	35	35	35	35	35	35	35	35	35	35
Pearson Correlation	.627**	.616**	.626**	-.354*	.599**	-.185	1	-.342*	.748**	-.315
Sig. (2-tailed)	.000	.000	.000	.037	.000	.288		.044	.000	.065
N	35	35	35	35	35	35	35	35	35	35
Pearson Correlation	-.120	-.302	-.147	-.125	-.388*	.544**	-.342*	1	.032	.519**
Sig. (2-tailed)	.493	.078	.399	.473	.021	.001	.044		.857	.001
N	35	35	35	35	35	35	35	35	35	35
Pearson Correlation	.682**	.589**	.694**	-.445**	.389*	.025	.748**	.032	1	-.108
Sig. (2-tailed)	.000	.000	.000	.007	.021	.887	.000	.857		.539
N	35	35	35	35	35	35	35	35	35	35
Pearson Correlation	.217	.310	.324	-.335*	-.605**	-.215	-.315	.519**	-.108	1
Sig. (2-tailed)	.210	.070	.058	.049	.000	.216	.065	.001	.539	
N	35	35	35	35	35	35	35	35	35	35

**, Correlation is significant at the 0.01 level (2-tailed).

*, Correlation is significant at the 0.05 level (2-tailed).

Table 5. Construct correlations

purpose”. Furthermore, “maximize purpose” is also strongly correlated to “helpful to site visitor”.

The construct “useful for navigation” was found to be significantly correlated to “maximize purpose” ($r = 0.627$), “predictable/expected” ($r = 0.616$), “more important” ($r = 0.626$) and “related to relative placement of items” ($r = 0.599$). Most importantly, though, it was highly correlated with “helpful to site visitor” ($r = 0.748$). Interestingly though, “associated with security and trust” was slightly associated with “distraction to navigation” ($r = -0.315$). This could be misleading since their opposing poles “associated with layout and designing” and “distraction to navigation” are also correlated.

The construct “security and trust” has positive associations with “maximize purpose” ($r = 0.217$), “predictable/expected” ($r = 0.310$) and “more important” ($r = 0.324$) but they are slightly weak. However, it’s correlation to “shaped around the target audience” ($r = 0.519$) is modest.

From a personal perspective, “more humanistic/personable” was correlated to “subjective/dependent on target group” (-0.592) whereas the converse “more robot-like/impersonal” was correlated to “predictable/expected”. There is also a modest but significant correlation of “shaped around target audience” (0.544). Interestingly, “more humanistic/personable” (-0.389) and “subjective/dependent on target group” (0.936) were both correlated with “less important”.

Chapter 7

DISCUSSION

The model developed from extensive literature review was created to underline the relationships of website design elements based on website user's perceptions toward trustworthiness. In order to test the correctness of the model, website users were recruited to evaluate the website design elements comprising the model but also to learn more about how users perceive individual website design elements. In order to truly isolate a user's perception toward website design elements, attempts to keep researcher's bias at a minimum were made. This included having participants create their own constructs--interpretation of the design elements in regard to similarities and differences—from the design elements comprising the model. Furthermore, no actual websites, either fictitious or real, were used since it was believed that their use could introduce bias just on the selection of a type of website itself. By eliminating the visual component, participants were forced to make judgement on mental thought as opposed to sight. This may seem counter intuitive since the research is based on those design elements that comprise a webpage and are actually viewed. However, this was important to eliciting perceptions, so they would be based on the design element itself and not in the context of viewed content. Participants were informed orally that their evaluations were to be made in the context of trust to ensure that each participant remained on topic.

Since each participant was provided a set of definitions for the design elements, it could be argued that unnecessary researcher bias was introduced. That argument may have some

merit since the definitions were self-written. However, definitions should be a matter of fact not opinion. Due to this premise, researcher bias should be held to a minimum for their inclusion. The definitions were created to ensure clarity and consistency among the participants' understanding of what each web design element represented. This was intended to elicit a more meaningful and consistent set of survey results.

The use of the repertory grid technique was quite useful in collecting data from the participants in regard to their perceptions toward the web design elements. The technique facilitated the elicitation of participant constructs and then the evaluation of the web design elements in relation to those elicited constructs. This provided the means to evaluate the participants' perceptions on the web design elements and determine the validity of the developed model, but most importantly, find any associations and correlations between the design elements and constructs.

The hierarchal clustering generated from the results indicated associations between some design elements that were not in-line with the developed model's associations. The most noticeable association differences fell within the developed model's categorization of elements under visual aesthetics and visual appeal. The model attempted to define visual aesthetics into two types of distinct aesthetic styles—classical and expressive. However, the clustering indicates those design elements that were thought to make up the aesthetic styles are instead seen as non-differentiated. This may suggest that styles are perceived from the use of the design elements as opposed to being seen as styles made from certain design elements.

From a broader perspective, it appears that all of the design elements that might be construed as functional in formatting and layout were collectively but separately clustered from the others. These elements include the following: saturation, luminance, color hue, moderate text, typography, balance and contrast, element varieties, quantity of each element, graphics-to-text ratio, image and graphics, element proximity, symmetry, element order, element placement, layout, navigational cues, navigation and visual guidance. There was a clear delineation of these design elements from the others.

The next revelation was the clustering of social-related design elements. This group was labeled as “social identity” which included the following: “cultural marker”, “culture”, “generational groups”, “demographics”, “social cues/presence” and “social proof”. The developed model had them listed for the most part as a visual appeal item that linked them to both color scheme and multimedia content. “Social proof”, conversely, was considered a trust assurance element. However, the clustering did not reveal any close relationship between “social proof” and those elements originally listed under “visual appeal” of the developed model. Furthermore, it was the least similar to the other elements within its cluster. This could be related to the fact that social proof is differently defined. According to Seckler et al (2015), social proof is made up of reviews, ratings and experiences--all of which is shared with others. This is quite different from the other related design elements—“cultural marker”, “culture”, “generational groups”, “demographics” and “social cue/presence”. Instead, these design elements function as personalization markers for different social groups.

Another cluster that revealed itself as different from the developed model's associations was that of "navigational cues", "navigation" and "visual guides". These elements were relatively closely related. However, the developed model depicted "navigational cues" as an attribute of "classical aesthetics" whereas "visual guidance" was depicted as an attribute of "expressive aesthetics". The remaining element, "navigation", was associated with "usability". This revealed a relationship might indicate that the participants view the elements for what they represent and/or do but not necessarily how they are applied in style. These elements were regrouped under the label "navigation" to properly represent their close relationship.

From the findings, more was learned about the individual design elements that comprise the model. Certain design elements were considered more important over others. This information could provide some insight on to what the design elements are recommended to be included in website design. By looking at the construct "more important...less important" elements that are perceived important can be quickly identified. Notably, the element "secured personal information" rated the highest in importance just over "secured transactions". The elements "working links", "predictable site behavior", "usefulness", "navigation" and "navigational cues" followed in decreasing order of importance. Based on these findings, it would appear that security and predictable functionality trumps any other form of design implementation.

In contrast to the elements deemed important, the elements "cultural marker" and "culture" were considered the least important though their ratings hovered around neutral but on the

side of “least important”. It appears that a personal identification to a cultural aspect is not a primary factor for initial trust building. Instead, it may be ancillary, meaning it is not necessary but supportive if present.

Looking at the construct “predictable/expected...subjective/dependent on target group”, it was found that “working links” was rated the highest of all design elements for predictable/expected. It was followed by “predictable site behavior”, “secured transactions”, “secured personal information”, “usefulness” and “navigation”. Not only are these design elements important, they are also expected to be present and predictable. Interestingly, “culture” and “cultural marker” were rated the lowest. Based on this, the findings for this construct appear to suggest that the elements are ancillary, too.

The construct “maximize purpose...minimize purpose” revealed some useful information. The elements “secured personal information” and “secured transactions” were rated the highest for maximize purpose followed by “working links” and “usefulness”. Again, it is found that these elements are highly emphasized in general importance for website design. Starting with the first, the lowest ratings fell on “social cues/presence”, “cultural marker”, “demographics” and “placement of seals”. However, none of these elements were rated under “minimize purpose”. Though this construct was one-sided in ratings across all elements, it could indicate that none of the elements diminish the purpose of the website design due to their inclusion.

Some unexpected results were revealed from the construct “associated with security and trust...associated with layout and designing”. As anticipated, the elements “secured transactions”, “secured personal information”, “privacy statements”, “return policy” and “access to seal information” were found to be rated the highest for their association to security and trust. However, three other unexpected elements followed closely behind. They were identified as “social proof”, “usefulness” and “predictable site behavior”. If the presumption is made that these elements were seen only in the light of trust, the likely distinction that these elements are trust builders can be made. This distinction is further bolstered by previous research by Cyr (2008), Davis (1989), Neilson, 2012), Wang et al (2015), Seckler et al (2015) and Ken and Benbasat (2015).

The largest insight from the findings was revealed through analysis of the correlations between the constructs. It was found that the construct “predictable/expected”, “maximize purpose” and “more important” have a high level of correlation between them. This means that if one element is considered predictable or expected, it should follow that it is more important and maximizes purpose, as well. A correlative extension to “maximize purpose” is “concerned with capturing attention”. The converse to this correlation is “no particular purpose” to “concerned with capturing attention”. These findings among the four constructs may indicate that those design items which are expected, such as those items commonly used and found in web design, are considered important because they maximize the purpose of the design. This could indicate that a level of familiarity is also necessary to maximize purpose and that a unique alternative design could be problematic if it departs from what is expected to a user. Thus, it could be implied that straight-forward web design

is preferred over attention-grabbing design where its purpose exceeds the perceived value of content and ease of use. Previous research by Casey and Poropat (2014) appears to suggest this. The researchers found that expressive aesthetics, which they defined as novel, creative and psychologically arousing, appeared to decrease the sense of usability with the website interface over classical aesthetics which was referred to as traditional, good design comprised of balance, orderliness, and cleanliness.

Navigational characteristics also appeared to be relatively important to the participants. The construct “useful for navigation” was strongly correlated with “helpful to site visitor”. However, “distraction to navigation” was moderately correlated with “associated with trust and security” and “associated with layout and designing”. This could indicate that design, layout and security features could lead to navigational impediments or distractions. However, more information would need to be developed in relationship to this correlation to extract greater detail.

Security and trust correlations were slightly weak across the constructs “maximize purpose”, “predictable/expected” and “more important”, yet were quite modest with “shaped around the target audience”. Thus, it appears that security and trust are perceived positively, considered important and somewhat expected, but more so when it is perceived that it pertains more to the user. This could be construed as a form of benevolence where the user believes that the perceptions of trust and security are for their benefit.

These correlations, coupled with the hierarchical clustering analysis, provide a more holistic view of the design elements that influence trust. Though the clustering doesn't reveal labeling to the categories of relationships formed, it does provide a template from which to make a comparison to the developed model between design element associations. The correlations, in turn, detail the inter-relationships, whether positive or negative, between the clusters themselves and individual design elements. From a broad perspective, the findings from the hierarchical cluster analysis and correlation analysis support the general representation of the developed model from which little or no change is necessary in the depicted associations. However, these new revelations in relationships and correlations has led to the modification of the developed model to reflect a new, revised model based on the findings. This model is depicted in Figure 5.

In summary, the research findings have substantiated the extant research. The findings also substantially validated the originally proposed model regarding website design elements' influence on perceptions of trust. Only minor realignment and category name changes were needed to finalize the holistic model.

The secondary goal of this research was to identify any correlations found between the website design elements depicted in the originally proposed model. From the analysis of the participant data, several worth noting correlations were made. Importantly, those elements that provide for navigation, security, usefulness, working links, and predictability were found to be of utmost importance. In essence, these are the elements that provide for functionality, ease of use, and security. Furthermore, they appear to have the greatest

influence to trust building. Since participants rated layout very strongly as important, expected and maximizing purpose, it appears to suggest that the use and layout of those design elements are key to their effectiveness. However, the scope of this research did not encompass explanations on how to assemble the design elements for maximum use and effect.

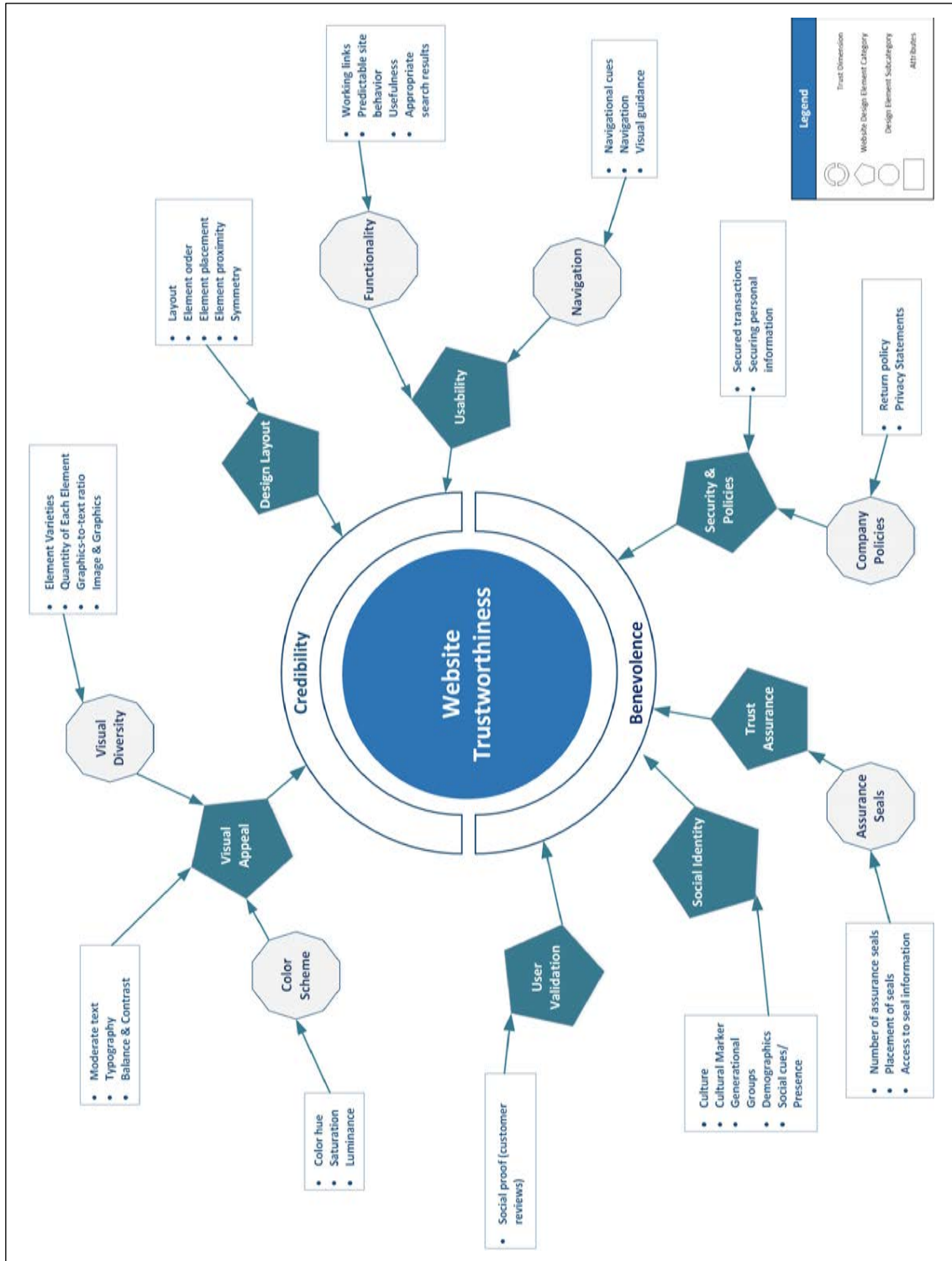


Figure 5. Revised holistic model after research findings

Chapter 8

CONCLUSION

Drawing from the extant literature, a holistic model was developed that explains the relationship of website design with users' perception of trustworthiness. The model encompasses all website design elements identified as having influence on trust. The holistic model was validated through quantitative analysis by examining the user perceptions of these design elements through the use of the repertory grid technique. Furthermore, the research revealed correlations that provide greater understanding of user's perceptions toward trustworthiness of a site. Research limitations, such as possible instructional misunderstanding, limited participation from actual website designers, and construct elicitation time hamper the generalizability of the findings, but also introduce new research opportunities. Further research may involve better communication of the research topic for greater participant understanding, comparison of website user's and website designers' perceptions, greater time spent following up on elicited constructs for greater clarification and expansion of the newly revealed correlations.

8.1 Website Designer's Guide

As a result of the empirical literature review and the refined holistic model of website design elements, the following set of guidelines were borne. These guidelines summarize the body of findings discussed and represented by the refined model within this research.

Relevant elements from the refined model and its components are highlighted in the discussion.

Guide 1: Navigation needs to be intuitive and easy. To maximize navigation, focus on layout in regard to element proximity, symmetry, element order, and element placement. These elements should provide for navigational guidance and should incorporate navigational cues. Navigation, which is a sub-category of Usability, is influenced by the attributes of Design Layout.

Guide 2: Functionality should not be compromised. The site must have working links, predictable site behavior, usefulness, and appropriate search results. Failure on any of these design elements can lead to frustration and negative perceptions. User's expect all of these to properly perform. It is important that design layout promotes proper functionality through ease of use and navigation. As referenced in Guide 1, Design Layout attributes influence Usability in which Navigation is a sub-category.

Guide 3: Use caution when adding and placing assurance seals. Consideration should be taken regarding navigation to and from the seals, as these elements can be a distraction for users. Focus on minimal disruption to navigation. Placement of Assurance Seals, an attribute of Assurance Seals, is related to Design Layout.

Guide 4: Social proof adds benefit. Consider adding social proof elements when applicable. Social proof elements increase trust perceptions for users and is seen as a

benevolent gesture. Social Proof (customer reviews) is an attribute to User Validation which is part of the Benevolence trust dimension.

Guide 5: Incorporate and ensure benevolent behavior. Secured transactions, secured personal information, and business process policies (such as return policies for retail websites) are very important elements. Users must know and believe the site has their interests in mind. Importantly, process policies must be easy to find, and to navigate to and from with minimal disruption to the user's access and experience. These elements are part of the Security and Policies category attached to the Benevolence trust dimension. Though these elements are categorized as benevolent, they are still influenced by usability factors. Thus, navigation (related to Usability) to and from these elements is just as important as the elements themselves.

Guide 6: Avoid unnecessary user distractions by careful implementation of security-related elements. Too many security features can create an ease of use and functionality problem that can lead users to have negative perceptions. Focus on finding a proper balance between functionality and security measures. These features are direct attributes to Security and Policies category of the Benevolence trust dimension. However, they are also influenced by Functionality attributes of the category Usability. Since problematic functionality can lead to negative perceptions, credibility can be also affected due to Functionality's link to the trust dimension Credibility.

Guide 7: Be wary of attention grabbing techniques. Attention-grabbing techniques should be carefully implemented since this may lead to distractions. Too much focus on attention-grabbing design can minimize perception of content importance. In general, the site should be clean and neat with its primary focus on content. These techniques fall under the categories of Visual Appeal and Design Layout as part of the trust dimension Credibility. Thus, overall distractions to the site user via visual appeal and design layout should be minimized to alleviate credibility issues.

Guide 8: Know target audience. If the site is designed for a specific audience, know the targeted user. Develop security assurances and measures designed around the target's expectations. These elements comprise both the Social Identity, and Security and Policies categories of the Benevolence trust dimension. For the site to be properly perceived as benevolent, security measures and assurances should be applicable to the site users.

Guide 9: Personalization through social identity design elements can be seen as personable. Ensure that cultural marker, culture, generational groups and demographic design elements are consistent and appropriately associated. These elements can add positive perceptions, but they do necessarily affect general trust perceptions, if excluded. Personalization is derived through the attributes of the Social Identity category of the trust dimension Benevolence. It can be incorporated as an independent implementation or an extension to Guide 8.

Guide 10: Keep layout clean. Layout should be clean, neat and understandable. Avoid confusing or distracting placement of design elements. The design should “move” the user through the page in an orderly and predictable fashion with great ease. The assimilation of design elements to promote a clean layout are derived from the attributes found under Visual Appeal, Design Layout and Usability. This encompasses all of the attributes linked to the trust dimension of Credibility.

8.2 Contributions

This research produced many interesting findings, but four contributions stand out. First, the entire repertory grid technique was applied to test user’s perceptions, whereas previous researchers used a modification of the technique. Second, a more comprehensive model of web design elements toward trustworthiness was introduced. Though some previous research encompassed several design elements that influence trustworthiness, none approached it from a holistic view as introduced here.

Third, this research introduces an experimentally validated model that comprehensively identifies website design elements that influence trust. These findings confirm the central thesis of the extant literature but find that functionality-related design elements were more influential than previous research suggested. This research also adds to the collective knowledge of trust-influencing website design elements by introducing these findings, and correlations between social proof, usefulness, and predictable site behavior with security and trust.

Lastly, a guide was developed for website designers to practice and incorporate into website design. The guide was derived from both research analysis and literature review.

8.3 Limitations and Future Research

There are several limitations of the current study that provide for additional research opportunities. First, it is unclear if the participants fully understood that the context of the research was trust. Although participants were instructed verbally to focus on perceptions of the design elements as it pertains to trustworthiness, this research design did not enable us to ascertain how participants actually interpreted those instructions.

Another potential limitation to this study is that the constructs developed by the participants were unclear or not understandable. As a result, a number of the aggregated constructs were eliminated during the selection. Reviewing the responses while the participant was still present may have helped establish clarity with the responses. Some of the responses did not appear related or lacked contrast. This may have indicated a misinterpretation of the instructions. Additionally, time may have been a factor imposed by participant's schedules despite having no researcher-defined time limits. Several participants had made inquiries into or comments referencing the time requirements since many participated in the study before their scheduled classes. To elicit 10 constructs required approximately 45-60 minutes of participant's time.

The fact that participants had to mentally envision the web design elements that were presented to them could have presented another potential problem. Participants may not

have fully comprehended a design element if they did not have a previous memory or point of reference. Due to this abstraction, visual aid examples to accompany the definitions may have been helpful.

Despite having an adequate number of participants, another potential limitation is that there was not a large presence of actual website designers taking part in the survey. Only 6 out of 35 participants were identified with web design background, and a greater participation level may change the outcomes. However, this limitation does present itself as a new research opportunity. Comparing perceptions drawn from website designers and website users could determine whether the groups perceive the research questions similarly.

Exploration into the new correlative findings could reveal numerous research opportunities. For instance, further investigation into the correlation between navigation and security-related design elements could help determine what, if any, implementation of the security-related design elements is creating a distraction for navigation. A deeper look at design with the purpose of gaining attention over the functional operation of the website may provide further understanding of the implications of using design elements for of capturing attention at the expense of usability and functionality. Lastly, exploring the correlation between security and target audience may clarify the association and reveal the factors involved.

As websites vie for a piece of the growing Internet market, it's important that they have a website design that effectively grabs and retains visitors. A business or content provider will be able to compete more successfully by understanding website design elements that

are not only appealing but also conjure perceptions of trust. This research offers greater insight into the relationships of the website design elements and provides a comprehensive holistic model. This model will serve as a guide to website designers, businesses, and content providers. Furthermore, it will serve as a basis for further research and greater understanding of relationships on how website design affects user's perception of trustworthiness.

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APPENDIX A. MODEL ELEMENT DEFINITIONS

Appropriate Search Results

Search response that returns context related material that is suitable to the inquiry.

Assurance seals

Third-party stamps of approval signifying compliance or promise to a standard or philosophy in regard to service, security or satisfaction.

Quantity – The number of different third-party assurance seals

Placement – Location on the webpage

Access – Ease of locating and finding valid, informative information regarding the seal.

Balance and Contrast

The composition of text and graphics that provides for a visually appealing layout in which the text or graphics does not appear to be overwhelmingly dominant or awkward. Balance and contrast can be achieved through the proportional mix of graphics and text as well as the use of white space.

Color hue

Separate and defined color spaces or parameters such as red, blue, yellow, etc.

Culture

Culture preferences influence the choice of objects and how they are displayed and formatted. These objects represent or can be associated with a particular culture.

This can be in the form of language, images, audio and behavioral implementations.

Cultural Marker

An image or object that can be easily and readily identifiable to a particular culture.

This could be a famous artist or band, statute or even color combination.

Demographics

Sex and race exhibit different needs and behaviors either through physiological differences and/or social programming. As a result, website perceptions may vary.

Element order

Placement of elements that show content and information flow.

Element placement

Strategic positioning of objects that maximize meaning, understanding and use.

Element proximity

Object grouping or separation that infers a related or unrelated association. Closely related objects appear to be related to one another as opposed to separated objects that appear unrelated to others.

Element varieties

Varied objects of type, size and content.

Generational Groups

Each group of aging individuals is defined by certain characteristics for the time period in which they live apart from their parents and/or children. These groups can

be correlated to certain clothing preferences/choices, available technology, changing social norms as well as other defining factors that shape society. These groups may be more adept than other groups at certain functions based on exposure and other technological advances for the time period in which they matured. Therefore, website design and objects may be influenced by or have influence on these time-aged groups.

Graphics-to-text Ratio

Ratio of space used for graphics and that space used for text.

Images and Graphics

A picture, whether real or fictitious, that represents an object or shape. This could be a line, a hand drawing, camera picture, etc.

Layout

Format and design of element placement.

Luminance

Lightness or how bright a color is from light to dark.

Moderate Text

The use of text is neither exclusive or completely inclusive in regards to the presence of images and graphics. An even, balanced mixture of both text and graphics is sought.

Navigation

The ability to identify, locate and find objects and content easily within a website.

Navigational cues

Objects that infer information related to locating and/or finding content within a webpage/website.

Predictable site behavior

Website performs as intended.

Privacy Statements

Consumer information regarding the use and preservation of personally identifiable information collected by the business.

Quantity of each element

Number of a particular object of similar type.

Return Policy

Consumer information regarding the return of merchandise purchased from the business.

Saturation

Intensity of a color.

Secured Transactions

Security measures taken, but not necessarily limited to encryption, to ensure the safe and secure transmission and delivery of a monetary or personally identifiable information transaction.

Securing Personal Information

Security measures taken to preserve and protect personally identifiable information that has been collected and stored by the business or its associate.

Social Cues / Presence

An object that gives the perceived inclusion of a real person(s) interacting with the user of a web page during the user's visit or that may convey information of a human contact experience that is beyond the symbol itself. This may be a pop-up chat box, avatar, user reviews or emoticon.

Social Proof

Evidence that the content provided and is validated through customer reviews and/or analysis independent of the website creators.

Symmetry

Visually even and balanced.

Typography

Type and size of font used to represent the text content.

Usefulness

The website provides the user with the expected outcome of its use.

Visual Guidance

Object use and placement to illicit an intuitive response to facilitate expected user behavior.

Working Links

Hyperlinks that transport the user to the appropriate webpage that has content related to the perceived or suggested intent of the link.

APPENDIX B. COMPLETE LIST OF ELICITED CONSTRUCTS

EMERGENT	IMPLICIT
Similar items	Something totally out of contrast.
Similar group of people involved	making user feel that he/she is interacting with a person
used to control the color of an application	to know if text is more important (like news website, where text is important)
similar	a part of layout
Evidence of content	Interchangeably used
out of context	out of context
one is used to help in another	linked
linked	out of context.
linked, one is helpful to another	can be helpful to the above text
securing information	add a security
content appeal	number of elements
Capture attention	social grouping
image placement	visual appearance
content	Content representation
Site usefulness	content
Expected result	color
site specific	visual appeal
Content	Content
singular	social
predictable/expected	Social
deal with the separation of different elements	(implied to be) more than one
fulfill expected/specified rules	subjective/dependent on the group
what people expect to see	focus on variety of one element
unified	are usually not bound by rules
expected/important	what creates expectations on what to see
used to organize content	vary
comply with specific expectations	unexpected/not a concern
used to assure/fulfill expectations or maximize meaning	dictate preferred content
dealing with the amount and diversity of elements	organized but arbitrary
about color	has no particular purpose/just exists?
about the positioning and the design of the elements on the page	about security
symbolic and/or visual representations	the default/standard for everyone
about the information collected from the user	about spacing
regarding the productivity/significance of the web page	the element itself to be positioned
design concerning the background of the user	about the user's background
about the placement and formatting of the page's elements	about color
about the security and trust the webpage provides	about the color/display of the page
talks about elements	about the layout and spacing of the elements on the page
human related	defined color spaces
defines about color	the layout and designing
relative places of entities	something about authentication
can deal with websites	about sites
security	about space between graphics and text
relating around websites	is open and not related to any placement
helps in identifying contents easily	can be related to people
used for providing catchy contents	about color
	about colors
	diversity
	just display of contents in a specific way

AGGREGATED CONSTRUCTS

EMERGENT	IMPLICIT
<p>can be correlated with website open to any user with many possibilities</p> <p>a normal thing found in most websites</p> <p>Involve formatting images/webpages that change the color to appeal to users</p> <p>Both involve the thought as to where a certain item should be placed and why</p> <p>The images will be designed to match the demographic group that is trying to be reached with the page</p> <p>show the true "color" of the website with its meaning and purpose</p> <p>Guide the user to what they need</p> <p>Involve how different demographics view the page</p> <p>Shaped around the target audience and the typical cultural background that they would want the information from</p> <p>the site</p> <p>People or groups that provide that the data given is either truthful or not</p> <p>diverse</p> <p>real</p> <p>Overall look of a webpage</p> <p>The content</p> <p>Predictable</p> <p>Collectable Information</p> <p>Necessary</p> <p>Used to help understand a website</p> <p>Varies less</p> <p>More Important</p> <p>different</p> <p>involve real people</p> <p>related to color</p> <p>similar</p> <p>Involve image or picture</p> <p>related to identity</p> <p>specifies spaces</p> <p>specified space</p> <p>strategic positioning of elements</p> <p>provides assurance</p> <p>The ability to restrict access to certain information</p> <p>A website design that takes into account those from an older or younger generation.</p> <p>Deals with how many pictures versus how much text is involved on a website.</p> <p>deal with how the website looks and feels.</p> <p>seals deal are different in different sections of the world and demographics are different with different sections of the</p> <p>population this is how they are similar</p> <p>which information is hidden from public view</p> <p>can be used to help the user navigate through a site</p> <p>how to identify different sections of the same items</p> <p>cultural groups enjoy seeing different colors more than other social groups</p> <p>certain age groups expect to see certain elements placed in a certain position when not placed there can confuse them</p> <p>objects within a website</p> <p>related to how the website performs</p> <p>they are both related to colors</p> <p>related to layout and placement within a webpage</p> <p>digital elements within a webpage</p>	<p>open to anything</p> <p>hidden information/not for most of public viewing</p> <p>Shows that the information is based on certain groups</p> <p>the layout of the webpage itself</p> <p>This is a type of element that a creator would want to understand so they can put it in the best location</p> <p>the location on the website</p> <p>Keeps information hidden for user specific data</p> <p>is a personal preference of the creator</p> <p>being able to move through the website</p> <p>a personal preference of the creator</p> <p>is the location of different elements throughout the site</p> <p>set</p> <p>artificial</p> <p>More related to color used</p> <p>Outlines</p> <p>Unpredictable</p> <p>Uncollectable Information</p> <p>Unnecessary</p> <p>Who you're trying to help understand</p> <p>Varies more</p> <p>Less Important</p> <p>similar</p> <p>behavior</p> <p>related to space</p> <p>different</p> <p>involves categorised information</p> <p>color</p> <p>outcome</p> <p>ability to perceive</p> <p>predefined</p> <p>influence website use</p> <p>The ability to see the website views</p> <p>What the current normal behavior is for website design</p> <p>dealing with how colors appear on a website</p> <p>what is shown on a page such as which exact pictures are shown.</p> <p>this is more of a look and feel of a site.</p> <p>which color scheme is considered normal according to society</p> <p>can be a distraction to the user depending on the color.</p> <p>how many pictures compared to how much text is on a page.</p> <p>has no impact on cultural aspects of a society</p> <p>to many seals can confuse any person regardless of age group.</p> <p>related to compliance or approval seal</p> <p>they are both related to individual or group influence on design elements</p> <p>related to content design/balance within a webpage</p> <p>related to webpage object types</p> <p>a non-physical element that needs to be considered for web design</p>

AGGREGATED CONSTRUCTS

EMERGENT	IMPLICIT
social aspects to be considered	digital aspect related to color
a non functional characteristic for a webpage	related to digital elements within a webpage
related to digital/physical elements to be considered for a webpage	social aspect that needs to be considered
physical/digital elements	a social element
digital/physical elements	a social element
unique	repetitive
interaction	static
content	view
message	attention
content	location
words	background
usability	standards
presentation	audience
content	preference
authenticity	preference
measurable	unmeasurable
influenced by the social world	no influence
descriptions of color	a description of space
fixed	pictorial
moveable	immovable (stay the same)
readable	unreadable
design strategies	a design goal
varied perceptions	fixed perceptions
varied	fixed
influenced	fixed;uninfluenced
Physical	Non-physical
How you go about understanding your audience	Matters that you can use to understand an audience
How you alter colors	Space between the objects in a page
How you organize info on the page	The actual information on the page
Organization of things on the page and content	Who this information would be presented to based on attributes
Based off of website concerns	Before concerns are brought up
How much this helps someone	Not applicable to how much it helps rather, who is helping (if seal is a company)
Feasible for usability of the site	Has nothing to do with usability
How the site looks	Who the site would be based for
Who we are trusting the site to (important to different generations)	Where these seals may be located
both pertain to the quality of an element	pertains to seals
related to people	pertains to a site quality
pertaining to visual attraction	more logical
more about visuals	deal with positioning
more artistic	seem more logical
seem to be concerned with likability	more logical
more artistic	concerned with logical aspects
more personable	concern with logical
more human	more robot-like
more artistic	deal with quantities

AGGREGATED CONSTRUCTS

APPENDIX C. GROUPED CONSTRUCTS OF SELECTION PROCESS

EMERGENT	IMPLICIT	RESEARCHER NOTES
LIKENESS (4) Similar items similar different unique	Something totally out of contrast. different similar repetitive	Antonym Antonym Antonym Contrasting - duplication
VARIANCE (4) unified Varies less varied measurable	vary Varies more fixed unmeasurable	Antonym Antonym Antonym Antonym
QUANTITY (2) singular diverse	(Implied to be) more than one set	Antonym (needs clarification) Contrasting - related to quantity, unclear
PERCEPTIONS (5) varied perceptions more artistic influenced by the social world about the security and trust the webpage provides Used to help understand a website	fixed perceptions concerned with logical aspects (more formal) no influence the layout and designing Who you're trying to help understand	Antonym Contrasting - related to design, concept may be unclear Antonym Contrasting - related to perceptions to layout Contrasting - Target vs goal
MEANING/PURPOSE (3) used to assure/fulfill expectations or maximize meaning (maximize purpose) show the true "color" of the website with its meaning and purpose provides assurance	has no particular purpose/just exists? [No particular purpose] Keeps information hidden for user specific data influence website use	Contrasting - related to purpose/meaning Contrasting - related to meaning, concepts not clear Contrasting - perceptions, assurance of use vs influence to use, needs clarification
PREDICTABILITY (2) Predictable predictable/expected	Unpredictable subjective/dependent on the group	Antonym Contrasting - expected vs dependent (needs clarification)
DESIGN (12) related to color interaction what people expect to see about color content appeal How you alter colors they are both related to colors Capture attention used for providing catchy contents related to how the website performs comply with specific expectations fulfill expected/specified rules	related to space static what creates expectations on what to see about spacing visual appearance Space between the objects in a page related to content design/balance within a webpage Content representation just display of contents in a specific way they are both related to individual or group influence on design elements organized but arbitrary are usually not bound by rules	Contrasting - related to design Contrasting - related to design Contrasting - related to expectations Contrasting - related to layout Contrasting - related to appeal Contrasting - design aesthetics Contrasting - design, color vs content balance Contrasting - related to content Related - content, concepts not clear Contrasting - design, influence vs performance, needs clarification Contrasting - organized vs arbitrary (needs to be clarified) Contrasting - specific rules vs no bounds (needs clarification)

PROCESSED CONSTRUCTS

EMERGENT	IMPLICIT	RESEARCHER NOTES
PLACEMENT (4) about the placement and formatting of the page's elements relative places of entities about the positioning and the design of the elements on the page moveable	defined color spaces is open and not related to any placement the element itself to be positioned immoveable (stay the same)	Contrasting - design, placement vs color Contrasting - related to placement Antonym
SOCIAL (4) more human cultural groups enjoy seeing different colors more than other social groups more personable real	more robot-like has no impact on cultural aspects of a society concern with logical (more logical) artificial	Contrasting - related to interaction, social aspects Contrasting - culture, impact of color vs no impact Contrasting - related to perceptions Antonym
IMPORTANCE (3) Necessary More Important [Important] Based off of website concerns	Unnecessary Less Important [Not Important] Before concerns are brought up	Antonym Antonym Contrasting - pre concerns vs post concerns
USABILITY & NAVIGATION (3) Feasible for usability of the site can be used to help the user navigate through a site readable	Has nothing to do with usability can be a distraction to the user depending on the color. unreadable	Contrasting - related to use Contrasting - related to navigation, needs clarification Antonym
AUDIENCE (4) Shaped around the target audience and the typical cultural background that they would want the information from the site How the site looks A website design that takes into account those from an older or younger generation. design concerning the background of the user	a personal preference of the creator Who the site would be based for What the current normal behavior is for website design about the layout and spacing of the elements on the page	Related - preference, demographic targeted or creator Related - aesthetics vs demographic target (target is subset of aesthetics) Contrasting - specific group use vs general normal use Contrasting - design, toward user vs toward layout spacing
ACCESS / INFORMATION CONTROL (3) The ability to restrict access to certain information open to any user with many possibilities Collectable information	The ability to see the website views hidden information/not for most of public viewing Uncollectable information	Contrasting - access to information, concepts unclear Contrasting - related to information, concepts not clear Antonym
HELPFUL (2) How much this helps someone [helpful] one is used to help in another	Not applicable to how much it helps rather, who is helping (if seal is a company) [Indifferent] out of context	Contrasting - related to help (needs clarification) Contrasting - related to help (needs clarification)

SELECTED AND CLARIFIED CONSTRUCTS

provides assurance
predictable/expected
used to assure/fulfill expectations or maximize meaning [maximize purpose]
[concerned with capturing] ~~Capture~~ attention

influence website use
subjective/dependent on the [target] group
has no particular purpose/just exists? [No particular purpose]
[concerned with] content representation

PROCESSED CONSTRUCTS

EMERGENT	IMPLICIT	RESEARCHER NOTES
<p>[related to] relative [placement] phases of entities items</p> <p>more humanistic / personable</p> <p>More important [important]</p> <p>can be used to help the user navigate through a site [useful for navigation]</p> <p>Shaped around the target audience and the typical cultural background that they would want the information from the site</p> <p>How much this helps someone [helpful to site visitor]</p> <p>about the [Associated with] security and trust the webpage provides</p>	<p>a-open and not related to any placement [items]</p> <p>more robot-like / impersonable</p> <p>Less important [Not important]</p> <p>can be a distraction to the user depending on the color. [distraction to navigation]</p> <p>[Shaped by the] a-personal preference of the creator</p> <p>Not applicable to how much it helps rather, who is helping [if seal is a company]</p> <p>[helpful to site owner]</p> <p>the [Associated with] layout and designing</p>	
<p>FINAL CONSTRUCTS</p> <p>Maximize purpose</p> <p>Predictable/Expected</p> <p>More important</p> <p>Concerned with capturing attention</p> <p>Related to relative placement of items</p> <p>More humanistic / personable</p> <p>Useful for navigation</p> <p>Shaped around the target audience</p> <p>Helpful to site visitor</p> <p>Associated with security and trust</p>	<p>No particular purpose</p> <p>Subjective/Dependent on target group</p> <p>Less important</p> <p>Concerned with content representation</p> <p>Open and not related to any placement of items</p> <p>More robot-like / impersonal</p> <p>Distraction to navigation</p> <p>Shaped by the personal preference of the site designer</p> <p>Helpful to site owner</p> <p>Associated with layout and designing</p>	

PROCESSED CONSTRUCTS

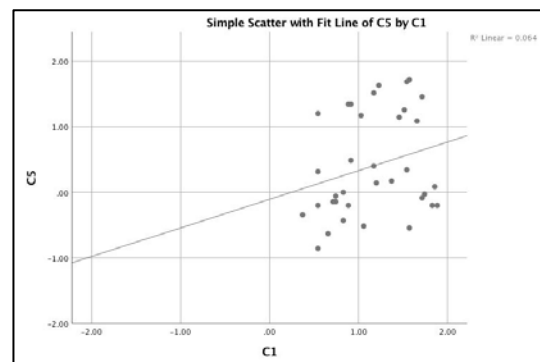
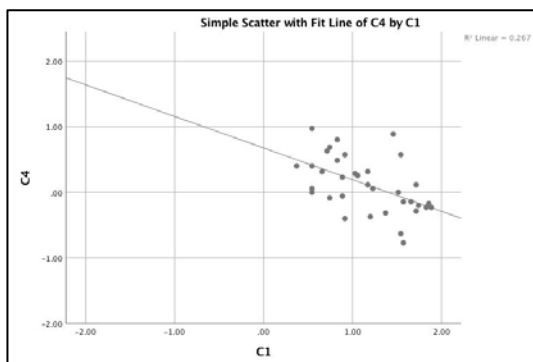
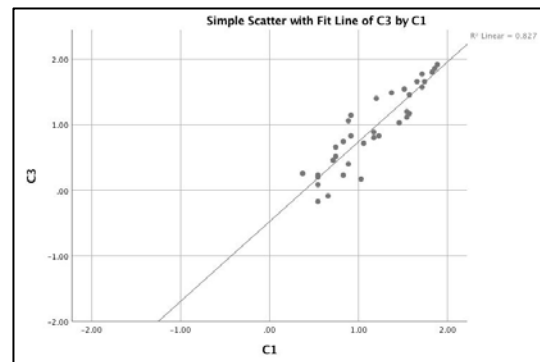
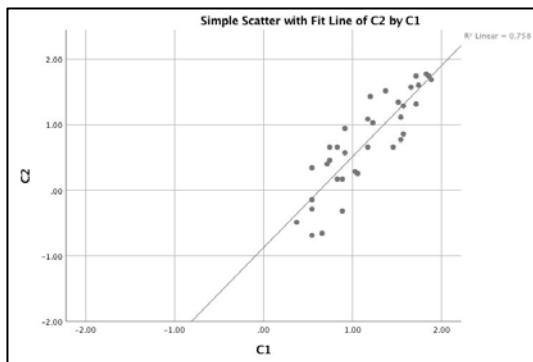
APPENDIX D. AGGLOMERATION SCHEDULE

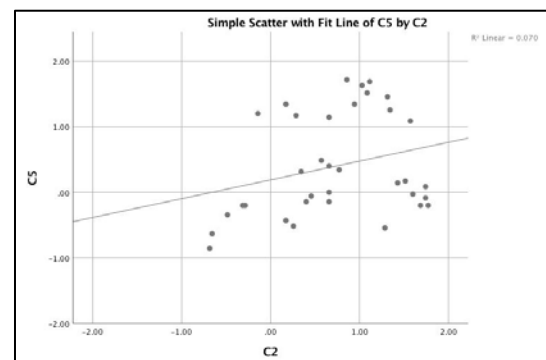
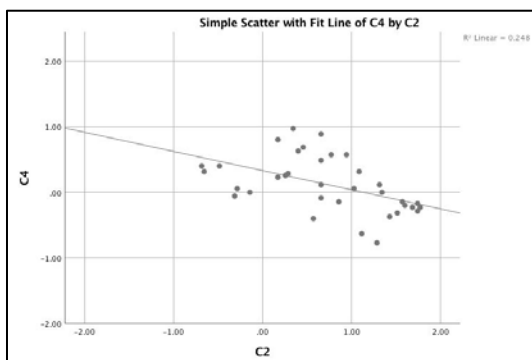
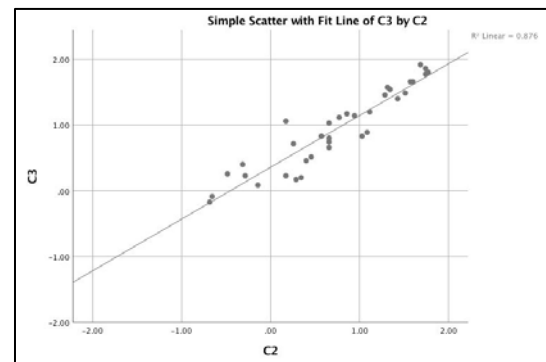
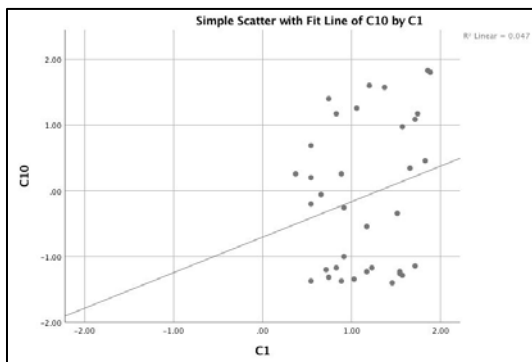
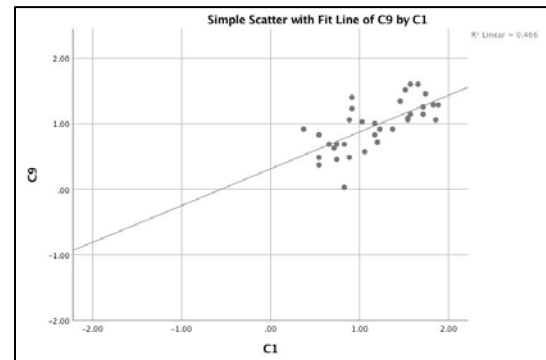
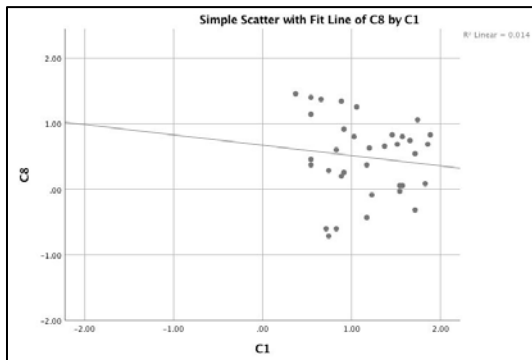
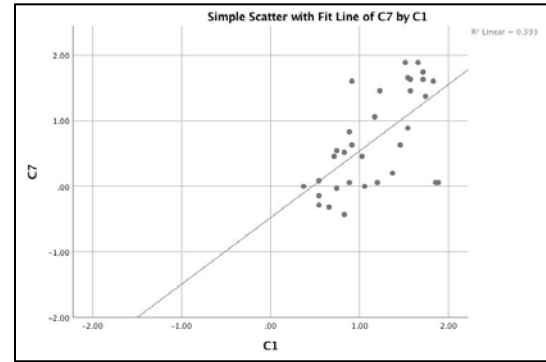
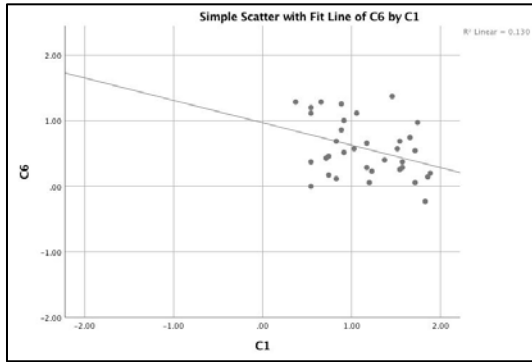
Stage	Cluster Combined		Coefficients	Stage Cluster First Appears		Next Stage
	Cluster 1	Cluster 2		Cluster 1	Cluster 2	
1	13	14	.056	0	0	6
2	34	35	.169	0	0	15
3	10	11	.171	0	0	9
4	7	9	.204	0	0	16
5	32	33	.228	0	0	15
6	12	13	.252	0	1	25
7	16	17	.332	0	0	14
8	18	19	.380	0	0	17
9	8	10	.579	0	3	16
10	20	26	.646	0	0	22
11	23	24	.738	0	0	23
12	4	21	.824	0	0	20
13	1	2	.846	0	0	21
14	15	16	.877	0	7	17
15	32	34	.965	5	2	29
16	7	8	1.064	4	9	26
17	15	18	1.176	14	8	30
18	29	30	1.193	0	0	24
19	25	27	1.363	0	0	23
20	4	5	1.408	12	0	25
21	1	6	1.785	13	0	27
22	20	22	1.858	10	0	30
23	23	25	1.878	11	19	29
24	29	31	2.016	18	0	31
25	4	12	2.448	20	6	28
26	7	28	2.829	16	0	31
27	1	3	2.952	21	0	28
28	1	4	3.590	27	25	32
29	23	32	3.747	23	15	33
30	15	20	3.824	17	22	32
31	7	29	4.894	26	24	33
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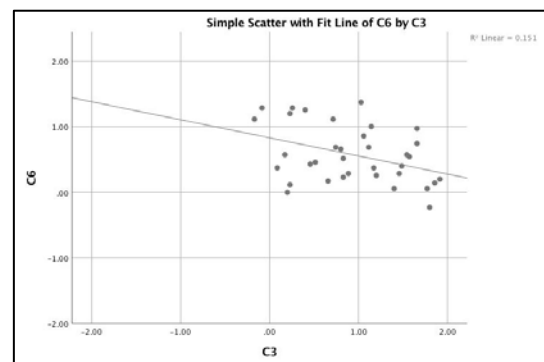
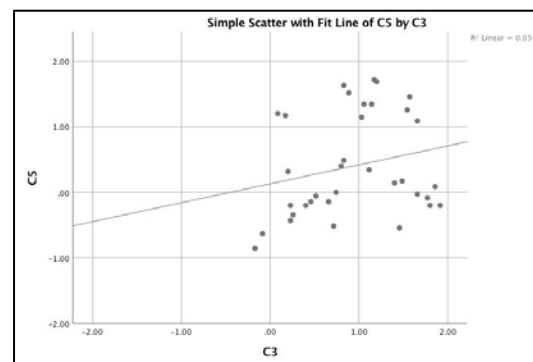
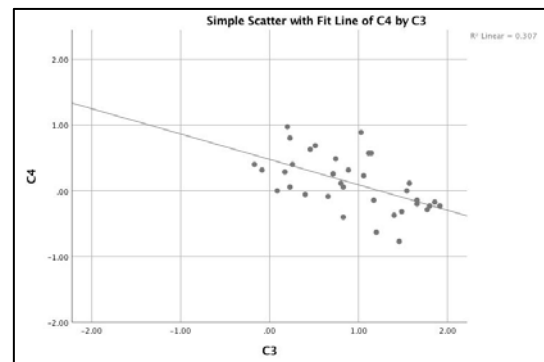
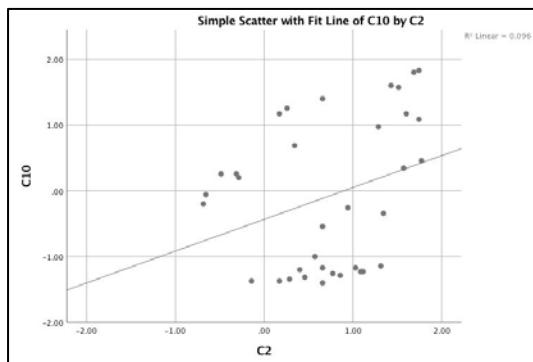
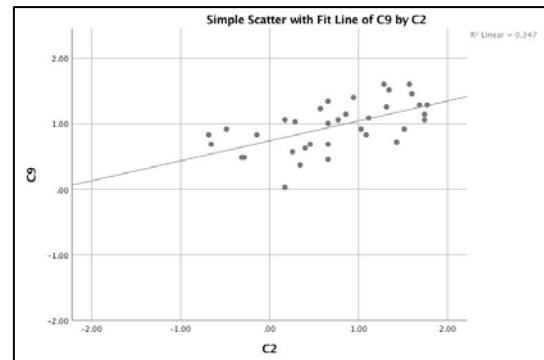
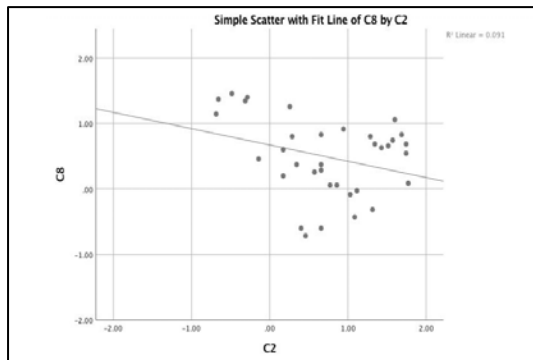
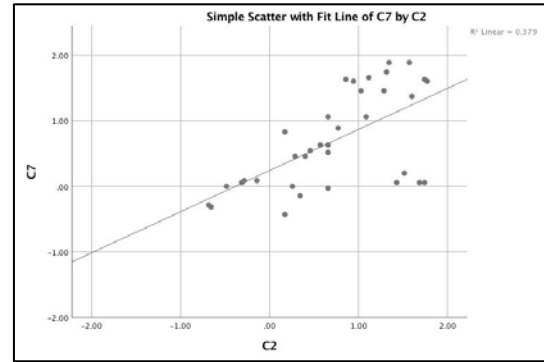
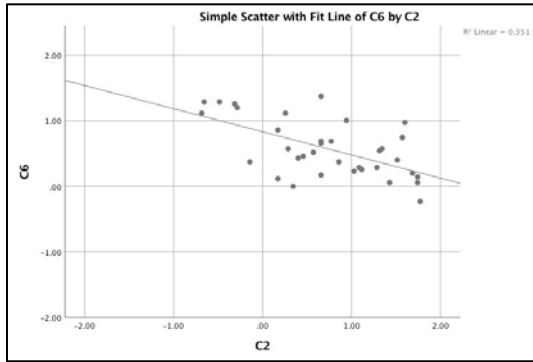
APPENDIX E. SCATTER PLOTS OF CONSTRUCTS

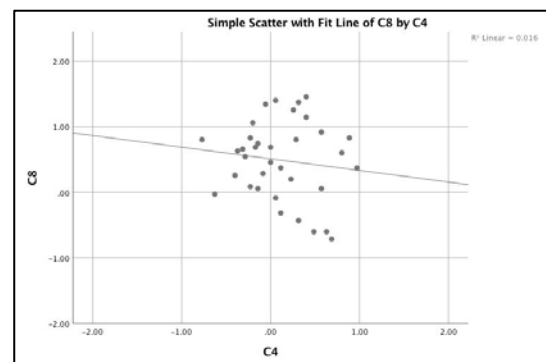
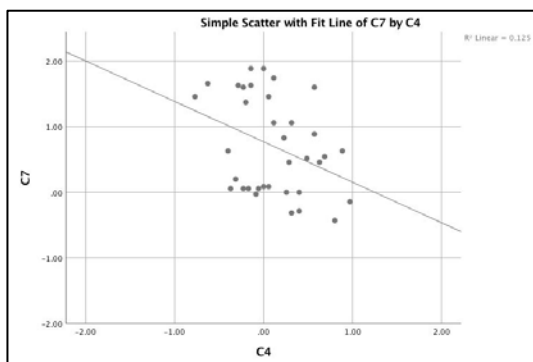
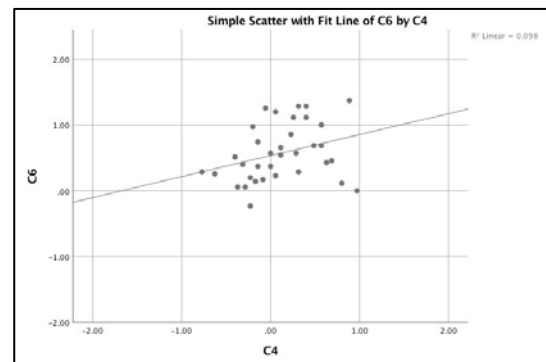
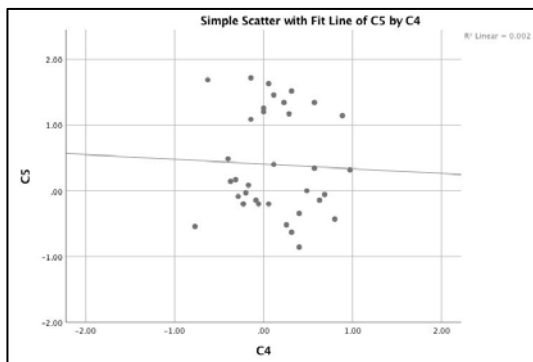
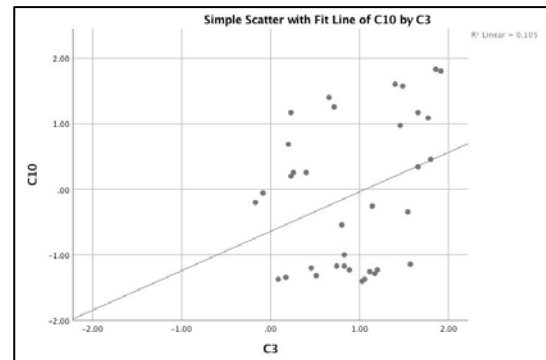
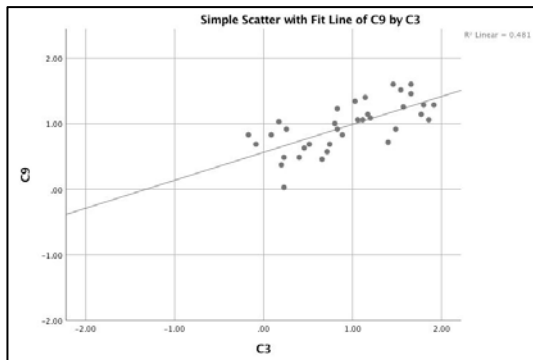
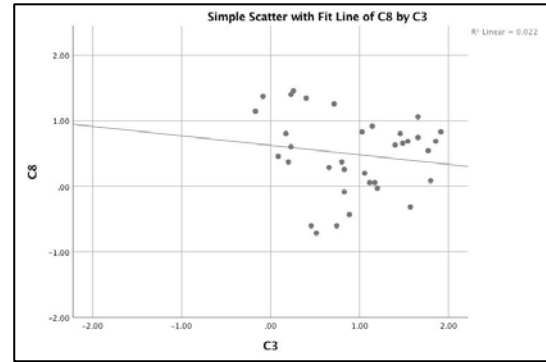
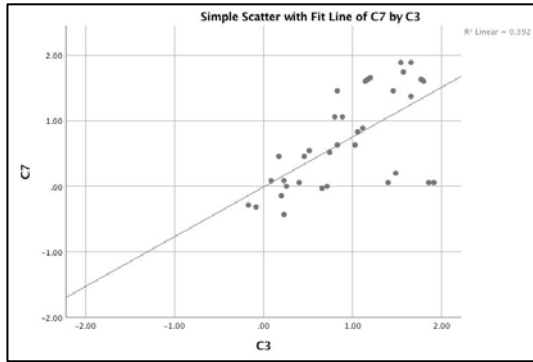
Constructs

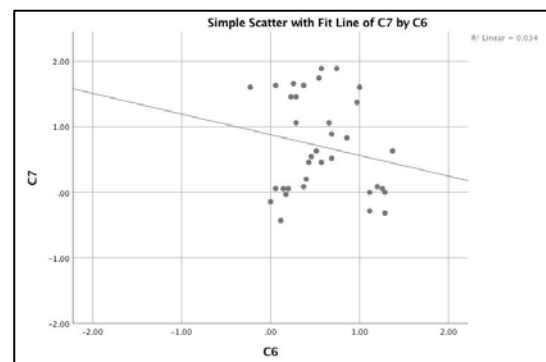
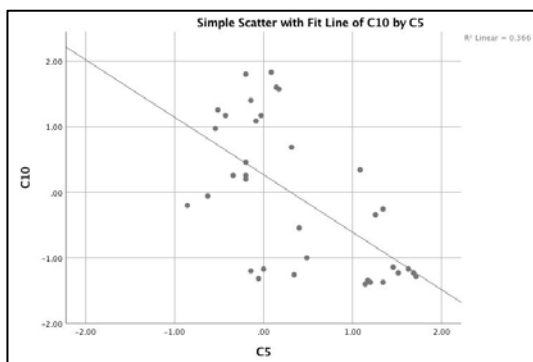
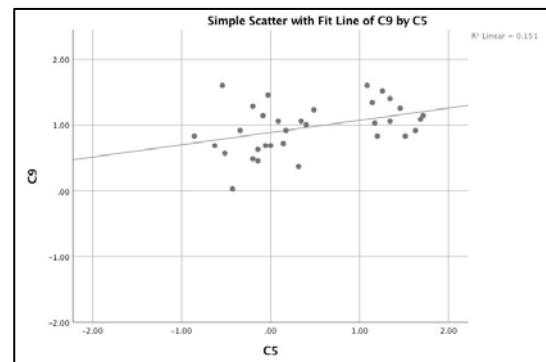
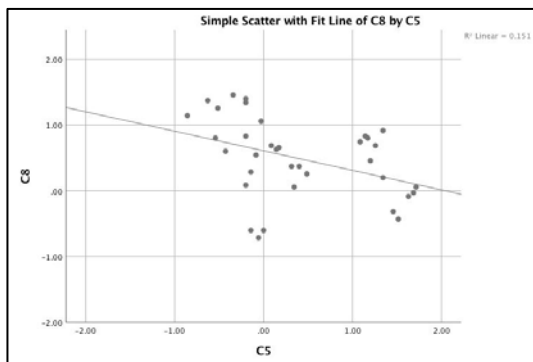
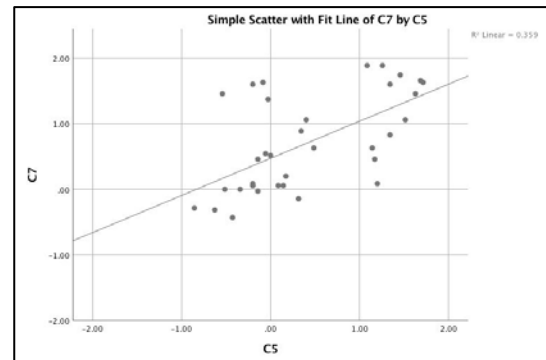
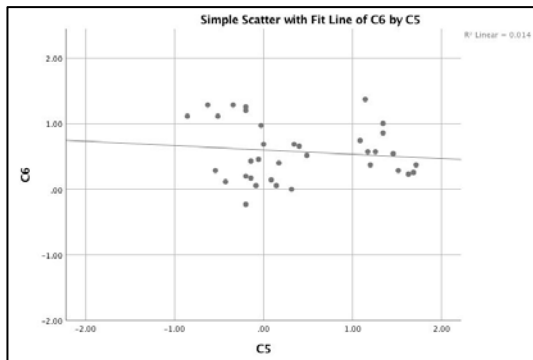
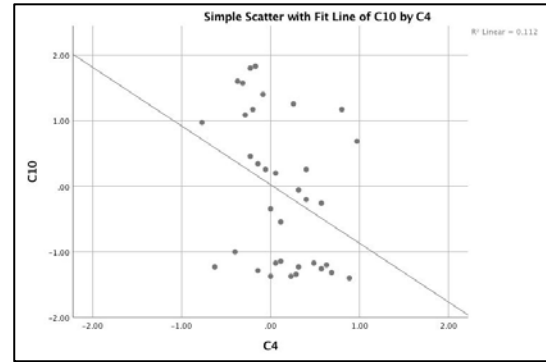
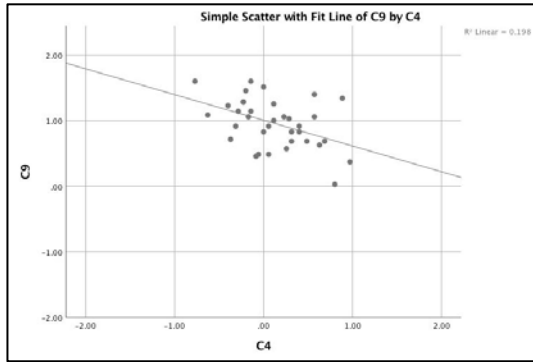
- C1 Maximize purpose ... No particular purpose
- C2 Predictable/Expected ... Subjective/Dependent on target group
- C3 More important ... Less important
- C4 Concerned with capturing attention ... Concerned with content representation
- C5 Related to relative placement of items ... Open and not related to any placement of items
- C6 More humanistic / personable ... More robot-like / impersonal
- C7 Useful for navigation ... Distraction to navigation
- C8 Shaped around the target audience ... Shaped by the personal preference of the site designer
- C9 Helpful to site visitor ... Helpful to site owner
- C10 Associated with security and trust ... Associated with layout and designing

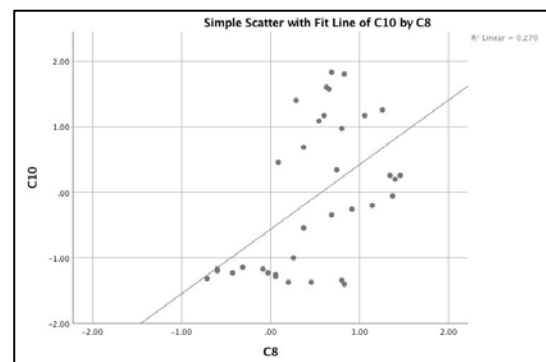
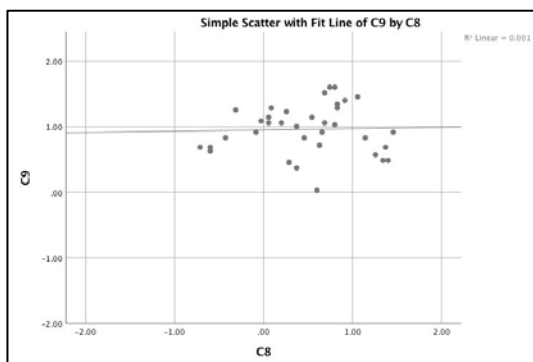
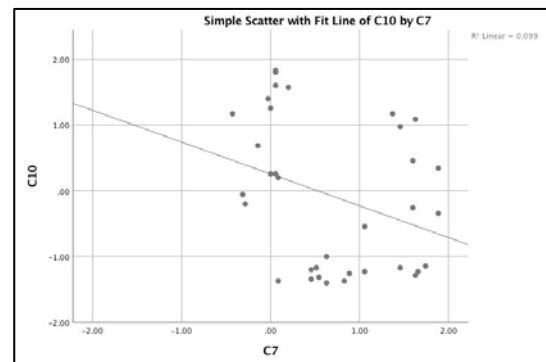
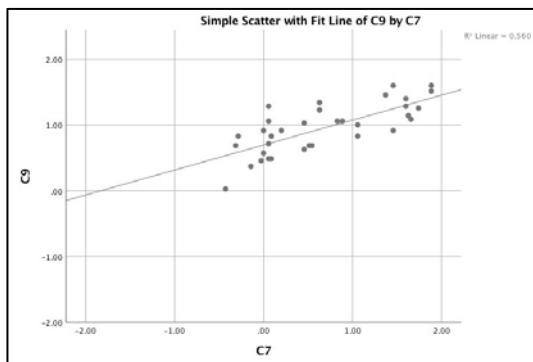
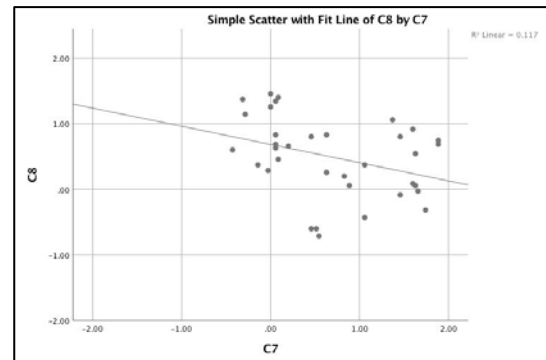
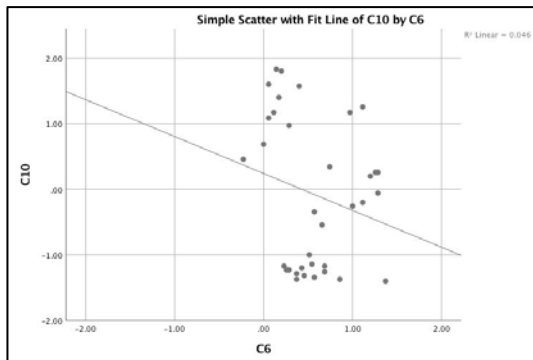
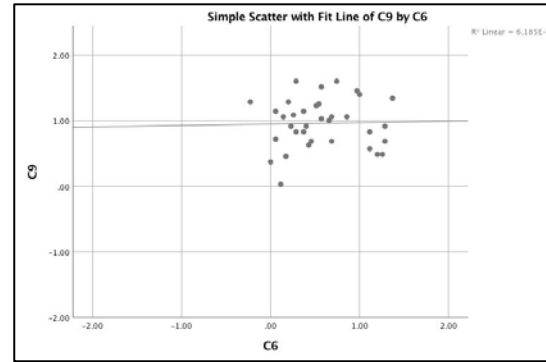
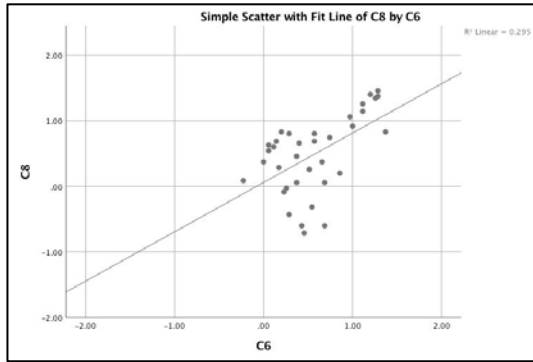


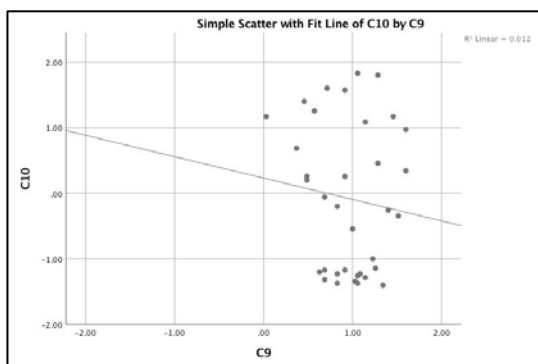












APPENDIX F. PARTICIPANT INSTRUCTIONS – STAGE 1

INSTRUCTIONS

Using the software program, Idiogrid, you will be provided with 10 sets of three randomly selected website design elements out of 35. Each set of three elements will be provided to you for evaluation before the next set is shown. For each set, you will choose two of the three elements that you find similar and contrast it with the third. In doing so, find a single word or phrase that best describes the two similar elements and provide it in the space provided. Next, find a single word or phrase that best describes the contrasting aspect of the third element as it relates to the two similar elements. For example:

Three elements: cherry, orange, banana

Similar:

Orange

Banana

Description: Thick outer skin

Contrast:

Cherry

Description: Thin outer skin

Complete the process for all 10 sets of the website design elements. If you are unclear as to the meaning of a website design element, please review the list of definitions and/or explanations provided at the back of these instructions for clarification.

Once completed, STOP and retrieve the task administrator.

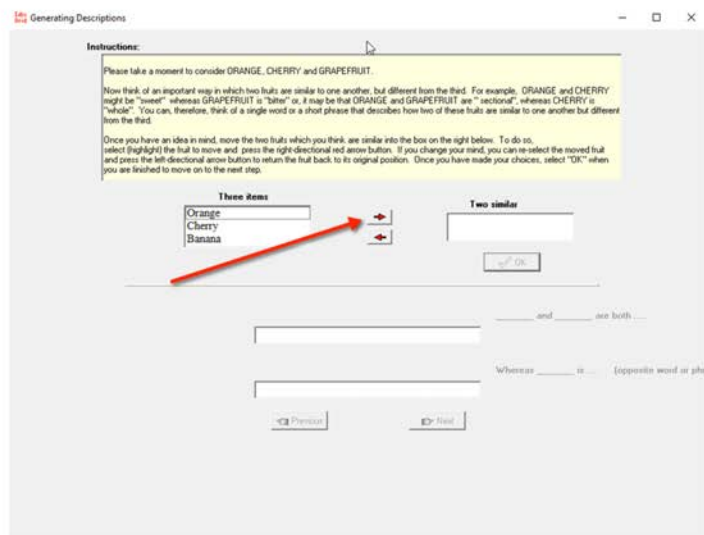
A detailed, step-by-step process regarding the instructions is provided on the following pages.



Read the welcome screen and click *OK* when completed.



Read the instructions provided. In summary, you will be presented with three website design elements. Select two of the website design elements that are most similar and move them to the right. To do so, select the element you wish to move to the right and then click on the red, right point arrow. Do the same for the second element that is most similar to the first.



When both similar elements have been selected and moved, click **OK**.

Generating Descriptions

Instructions:

Please take a moment to consider ORANGE, CHERRY and GRAPEFRUIT.

Now think of an important way in which two fruits are similar to one another, but different from the third. For example, ORANGE and CHERRY might be "sweet" whereas GRAPEFRUIT is "bitter" or it may be that ORANGE and GRAPEFRUIT are "sectioned", whereas CHERRY is "whole". You can, therefore, think of a single word or a short phrase that describes how two of these fruits are similar to one another but different from the third.

(Once you have an idea in mind, move the two fruits which you think are similar into the box on the right below. To do so, select (highlight) the fruit to move and press the right-directional arrow button. If you change your mind, you can re-select the moved fruit and press the left-directional arrow button to return the fruit back to its original position. Once you have made your choices, select "OK" when you are finished to move on to the next step.

Three items

Cherry

Two similar

Orange
Banana

OK

and are both ...

Whereas is ... [opposite word or phrase]

Previous Next

Review the instructions provided on-screen. In summary, you will describe the similar elements with one word or a phrase. Type that in the space provided (1). Then describe the third element as different or opposite from the two similar elements. Type that into the space provided (2). When completed, click **Next** (3).

Generating Descriptions

Instructions:

Now, in what way are Orange and Banana similar to one another yet different from Cherry?

Type the word or short phrase that you are thinking of in the first long box provided below.

Then fill in the second long box below with a word or short phrase that is **opposite** of what you typed in the first box.

Press the "Next" button when you are finished.

Three items

Cherry

Two similar

Orange
Banana

OK

Orange and Banana are both ...

Whereas Cherry is ... [opposite word or phrase]

Previous Next

1 Thick skin

2 Thin skin

3 Next

Choose the description (1) that you provided that is more positive or desirable.
Click OK when completed (2).

Choose One

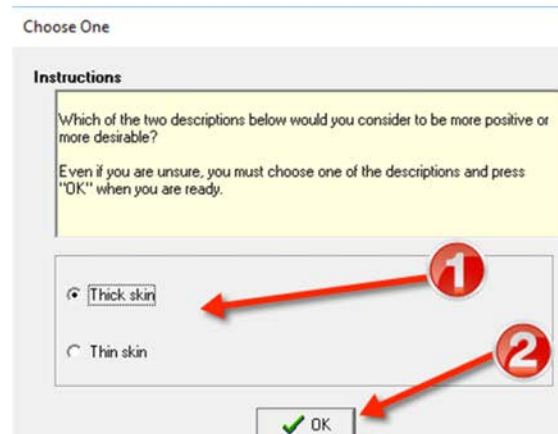
Instructions

Which of the two descriptions below would you consider to be more positive or more desirable?

Even if you are unsure, you must choose one of the descriptions and press "OK" when you are ready.

☒ Thick skin

☐ Thin skin



Once all of the sets of website design elements have been evaluated, you will be notified that that the 'description generation phase' has been completed. **STOP** and retrieve the task administrator. Do **NOT** click on **OK**.

Generating Descriptions

Instructions:

Now, in what way are **Apple** and **Orange** similar to one another yet different from **Banana**?

Type the word or short phrase that you are thinking of in the first long box provided below.

Then fill in the second long box below with a word or short phrase that is **opposite** of what you typed in the first box.

Press the "Next" button when you are finished.

Three items: Banana

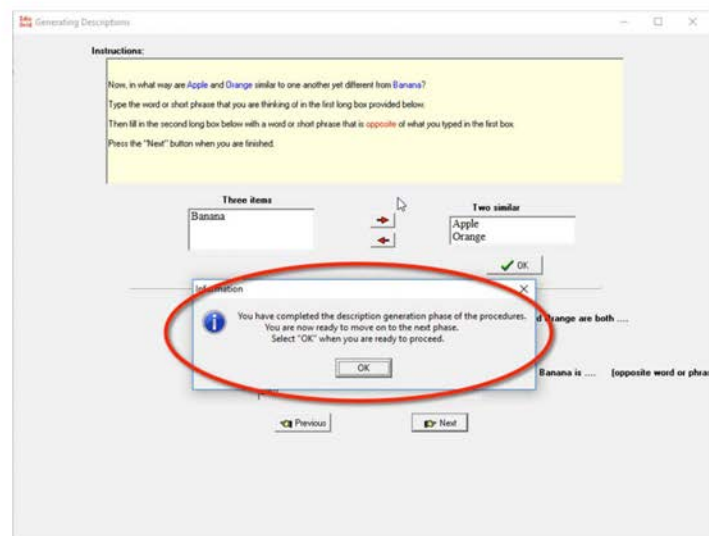
Two similar: Apple, Orange

Information

You have completed the description generation phase of the procedures. You are now ready to move on to the next phase. Select "OK" when you are ready to proceed.

if Orange are both

Banana is [opposite word or phrase]



APPENDIX G. PARTICIPANT INSTRUCTIONS – STAGE 2

INSTRUCTIONS

Using the software program, Idiogrid, you will be provided with 35 website design elements and 10 pairs of polar characteristics (eg. Dry vs Juicy). Each design element will be rated on each pair of polar characteristics as it relates to trust in website design. The scale provided is a five-point rating scale with the center point being neutral. It will be presented in a linear fashion displaying five check-boxes. The software will present only one design element and one pair of polar characteristics at a time until all elements have been rated for each pair. To rate the design element, select the box in the row (scale) that best represents what you think about the design element in relation to the polar characteristics provided. For example:

Rate **Banana** on the scale below.

Neutral
↓
Juicy ☐ ☐ ☐ ☐ ☐ Dry

The mouse may be used exclusively to select the check-boxes. However, a set of keys on the keyboard will also be marked to represent the row of check-boxes as an alternative to the mouse. Pressing the associated key will make your rating selection. Once a rating selection is made, the [NEXT] button must be clicked or the [ENTER] key pressed to move on to the next element. Complete the process for all website design elements. At any time, you may go back and change your selection. If you are unclear as to the meaning of a website design element, please review the list of definitions and/or explanations provided at the back of these instructions for clarification.

Once completed, STOP and retrieve the task administrator.

Below is a set of screenshots that will show you what to expect in regards to the process. The depicted screenshots have been taken from an example and may vary slightly from the actual information to be displayed.

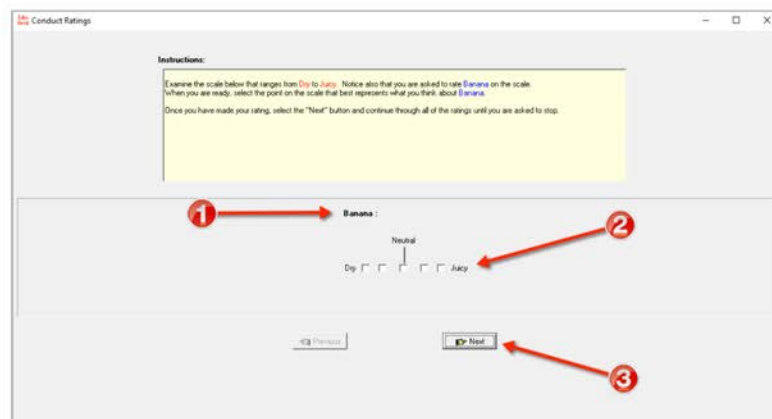
A detailed, step-by-step process regarding the instructions is provided on the following pages.



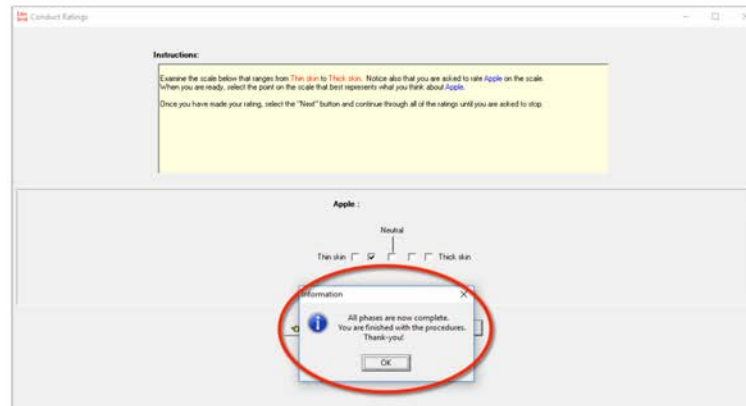
Read the welcome screen and press OK when completed.



Review the instructions provided on-screen. In summary, you will be presented with a website design element (1) along with a rating scale (2). That scale will have a pair of opposing characteristics with one of the characteristics at each end. Rate the displayed design element by selecting one of the check-boxes that best represents your feelings toward that design element. When you have selected the check-box, click on *Next* (3) or press the *[ENTER]* key to move to the next evaluation. Continue to evaluate all design elements with the provided characteristics until all have been completed.



Once all the website design elements have been rated, you will be notified that that 'All phases are now complete.' **STOP** and retrieve the task administrator. Do **NOT** click on *OK*.



APPENDIX H. IRB APPROVAL LETTER



Office of Research and Sponsored Programs
1 UNF Drive
Jacksonville, FL 32224-2665
904-620-2455 FAX 904-620-2457
Equal Opportunity/Equal Access/Affirmative Action Institution

MEMORANDUM

DATE: March 30, 2017

TO: Chris LaValley

VIA: Dr. Karthikeyan Umapathy
Computing

FROM: Dr. Jennifer Wesely, Chairperson
On behalf of the UNF Institutional Review Board

RE: Declaration of Exempt Status
IRB#1026639-1: "Conceptual Model of Website Design Elements that Influences Credibility and Trustworthiness"

UNF IRB Number: 1026639-1
Exemption Date: 3-30-2017
Status Report Due Date: 3-30-2020
Processed on behalf of UNF's IRB *HC*

Your project, "Conceptual Model of Website Design Elements that Influences Credibility and Trustworthiness," was reviewed on behalf of the UNF Institutional Review Board and declared "[Exempt](#)" [Category 2](#). Although data in your study will be confidential rather than anonymous, your project was declared Exempt based on the understanding that any disclosure of participant responses outside of the research will not place participants at risk of criminal or civil liability or be damaging to their financial standing, employability, or reputations. If you obtain information that could put participants at risk, please promptly notify the IRB as this may affect the review type for your project.

Based on the [UNF IRB Standard Operating Procedures](#) regarding exempt projects, the UNF IRB no longer reviews and approves exempt research according to the [45 CFR 46](#) regulations. Projects declared exempt review are only reviewed to the extent necessary to confirm exempt status. Please contact a research integrity administrator if you have questions about the review type for your project.

Once data collection under the exempt status begins, the researchers agree to abide by these requirements:

- All investigators and co-investigators, or those who obtain informed consent, collect data, or have access to identifiable data are trained in the ethical principles and federal, state, and institutional policies governing human subjects research (please see the [FAQs on UNF IRB CITI Training](#) for more information).
- An informed consent process will be used, when necessary, to ensure that participants voluntarily consent to participate in the research and are provided with pertinent information such as identification

of the activity as research; a description of the procedures, right to withdraw at any time, risks, and benefits; and contact information for the PI and IRB chair.

- Human subjects will be selected equitably so that the risks and benefits of research are justly distributed.
- The IRB will be informed as soon as practicable but no later than 3 business days from receipt of any complaints from participants regarding risks and benefits of the research.
- The IRB will be informed as soon as practicable but no later than 3 business days from receipt of the complaint of any information and unexpected or adverse events that would increase the risk to the participants and cause the level of review to change. Please use the [Event Report Form](#) to submit information about such events.
- The confidentiality and privacy of the participants and the research data will be maintained appropriately.

While the exempt status is effective for the life of the study, if it is modified, all substantive changes must be submitted to the IRB for prospective review. In some circumstances, changes to the protocol may disqualify the project from exempt status. Revisions in procedures or documents that would change the review level from exempt to expedited or full board review include, but are not limited to, the following:

- New knowledge that increases the risk level;
- Use of methods that do not meet the exempt criteria;
- Surveying or interview children or participating in the activities being observed;
- Change in the way identifiers are recorded so that participants can be identified;
- Addition of an instrument, survey questions, or other change in instrumentation that could pose more than minimal risk;
- Addition of prisoners as research participants;
- Addition of other vulnerable populations;
- Under certain circumstances, addition of a funding source

To submit an amendment, please complete an [Amendment Request Document](#) and submit it along with any updated documents affected by the changes via a new package in IRBNet. If investigators are unsure of whether an amendment needs to be submitted or if they have questions about the amendment review process, they should contact the IRB staff for clarification.

Your study was declared exempt effective 3/30/2017. Please submit an [Exempt Status Report](#) by **3/30/2020** if this project is still active at the end of three years. However, if the project is complete and you would like to close the project, please submit a [Closing Report Form](#). This will remove the project from the group of projects subject to an audit. An investigator must close a project when the research no longer meets the definition of human subject research (e.g., data collection is complete and data are de-identified so the researcher does not have the ability to match data to participants) or data collection *and* analysis are complete. If the IRB has not received correspondence at the three-year anniversary, you will be reminded to submit an [Exempt Status Report](#). If no [Exempt Status Report](#) is received from the Principal Investigator within 90 days of the status report due date listed above, then the IRB will close the research file. The closing report or exempt status report will need to be submitted as a new package in IRBNet.


CITI Training for this Project:

Name	CITI Expiration Date
Mr. Chris LaValley	11/14/2019
Dr. Karthikeyan Umapathy	7/12/2018

UNF IRB Number: 1026639-1
Exemption Date: 3-30-2017
Status Report Due Date: 3-30-2020
Processed on behalf of UNF's IRB *HC*

All principal investigators, co-investigators, those who obtain informed consent, collect data, or have access to identifiable data must be CITI certified in the protection of human subjects. As you may know, **CITI Course Completion Reports are valid for 3 years**. The CITI training for renewal will become available 90 days before your CITI training expires. Please renew your CITI training when necessary and ensure that all key personnel maintain current CITI training. Individuals can access CITI by following this link: <http://www.citiprogram.org/>. Should you have questions regarding your project or any other IRB issues, please contact the research integrity unit of the Office of Research and Sponsored Programs by emailing IRB@unf.edu or calling (904) 620-2455.

This letter has been electronically signed in accordance with all applicable regulations, and a copy is retained within UNF's records. All records shall be accessible for inspection and copying by authorized representatives of the department or agency at reasonable times and in a reasonable manner. A copy of this memo may also be sent to the dean and/or chair of your department.

UNF IRB Number: <u>1026639-1</u>
Exemption Date: <u>3-30-2017</u>
Status Report Due Date: <u>3-30-2020</u>
Processed on behalf of UNF's IRB 

VITA

Chris LaValley is detective with the Jacksonville Sheriff's Office in Jacksonville, Florida. He has been working for the Sheriff's Office for the last 24 years and is currently assigned to the Computer Forensic Investigations Unit. He has been conducting computer forensic examinations for the last 13 years. He has a Bachelor of Science degree in Biology and an Associate of Arts degree with a focus on business and accounting. He also holds a Certified Information Systems Security Professional (CISSP) certificate in addition to multiple computer forensic related certifications. He enjoys working with computers and learning new technologies.