DO DEMOGRAPHICS MATTER? THE ROLE OF GENDER, AGE, SOCIOECONOMIC STATUS, AND ETHNIC IDENTITY ON WEBSITE PERSONALIZATION

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Abstract:

Every day, people are classified according to their demographics. Many options in life vary among these classification variables, such as governmental benefits, scholarship opportunities, and many more. In ecommerce, businesses are using these variables to provide a more customized experience for consumers, believing that increased sales can result from personalization. This research investigates this trend by exploring demographics and their impact in ecommerce. Based on social cognitive theory and task-technology fit, the demographics of interest are posited to have impacts on the perceived quality of a website and on the intention to reuse the website. Specifically, it is hypothesized that gender and age will have significant impacts, whereas ethnic identity and socio-economic status will not. Potential contributions are discussed as well as future directions.

Keywords: Demographics, ecommerce, social cognitive theory, task-technology fit

Introduction

Demographic variables can define every person's life. From age and gender to ethnicity, educational level or sexual preference, people can be described and subdivided based on their responses to these simple questions. These seemingly innocent queries, usually tacked on to the end of a survey or prominently featured on the Census, potentially have enormous power to dictate who, what, when, where, why, and how anything and everything should be accomplished from what the layout and where the features of a brand new house should include, to who should build a website to attract users of a specific gender (Moss & Gunn, 1999). In much of the literature on websites and website personalization, demographics are glossed over as if they are unimportant. Social Cognitive Theory [3] explains that people are different in all manner of ways, including learning styles and cognitive processes. In this paper, certain selected demographics, namely gender, age, socioeconomic status, and ethnic identity, will be expected to have a significant effect on a person's perception of website quality and their intent to reuse that site. These important analysis variables will dictate suggestions to website designers and future researchers of factors to consider when designing websites to their targeted demographics. To evaluate how these individual demographic characteristics interact with the website, this article draws from Goodhue and Thompson's [22] Task-Technology Fit (TTF) theory. TTF posits that the utilization focus (e.g., the technology's impact on utilization of a system) combined with the fit focus (e.g., how the task and technology affect performance), will provide a theoretical lens for understanding utilization and performance for a given information system (Wright, Valacich, and Wells, under review). Using TTF will provide valuable insight to research on website personalization.

Features classified as "personalization" are wide-ranging, from simple display of the end-user's name on a webpage, to complex catalog navigation and product customization based on deep

models of users' needs and behaviors [26]. Personalization of websites refers to automatically customizing interactive information systems based on user preferences [16]; [36]. It can be defined as the automatic adjustment of information content, structure, and presentation tailored to the individual [37]. Website personalization can also be referred to as customization or tailoring. The ability to personalize a websites is a feature that has been a part of many websites for years, and is continuing to diffuse throughout the Internet as a feature of websites. Most all e-commerce sites now provide such a facility. The onus is on the user to explicitly specify his or her preferences and, as a result, the content, structure, or presentation of the website is tailored accordingly.

Many ecommerce websites, such as Amazon.com, customize their website based on previous viewing and purchasing history for each individual user. Other sites use tracking cookies to determine characteristics of previous visits to the site, or use these tracking cookies to determine browsing history from other unrelated sites. This is known as the AI-based approach [36]. The template-based approach to personalization is predominately employed in the "my" sites such as My Yahoo! or My eBay [36]. This style involves the user choosing what features to be displayed and submitting the required information for customized content (e.g. a weather forecast based on postal code). Website users value personalized content, and providing personalization on websites seems quite profitable for web vendors. This win-win situation is however marred by privacy concerns since personalizing people's interaction entails gathering considerable amounts of data about them [25]. This punctuates the importance of more accurate personalization; if users are going to give out this personal information, they should expect that it will be for a positive exchange in that they are receiving something beneficial to them in return for their act of trust and faith.
However, these approaches to personalization do not take other important factors into account. Many sites look and feel as though users are considered as a singular, monolithic concept with no variation between them; granite pillars with buying power. Social Cognitive Theory argues that people are not all the same; they learn in different ways [7], differ cognitively by gender [7], personality [4], and culture [5].

To date, a primary focus of ecommerce website design research has centered on features that can best suit all the possible needs of the consumer [30]; [40]; [50]. To achieve a more robust and accurate personalization experience for a user, a web designer, and by extension, an organization, needs to know how people can be differentiated in their perceptions of website quality and their intentions to reuse the site. The two current techniques listed, the AI and template-based approaches, cannot personalize a page properly if the website designers do not know what options to have for the page based on the difference characterizations of the groups that are predicted to use the site, and it is impossible to include every possibility that a potential user might conceivably desire on a site.

The purpose of this study is to empirically determine what demographic factors, moderated by internet efficacy, have a significant effect towards perceived website quality and the user's intentions to reuse the site. The findings will generate suggestions of what features and characteristics web designers should include or withdraw to raise the perceived quality, and thus, the intention to reuse their website to the targeted segment(s). This study will focus on a public-facing website for a United States university with a utilitarian focus [43]. This study will contribute to the web personalization literature for both academics and practitioners by examining what demographic factors divide people into segments that are statistically significant to website quality. After determining the separate segments, suggestions for consideration when designing websites will be presented.

The research questions to be addressed are:

Q1) *Do the selected demographic factors separately significantly differ on perceived website quality?*

Q2) *Do the selected demographic factors have interactions which significantly differ on perceived website quality?*

Q3) *Do the selected demographic factors separately significantly differ on intention to reuse the website?*

Q4) *Do the selected demographic factors have interactions which significantly differ on intention to reuse the website?*

For this research, participants will be recruited from an undergraduate Business program at a US institution and use a snowball method to gain non-student subjects. The task will be to complete a survey that contains questions from two separate internet efficacy instruments [15]; [42], the WebQual Model [32], and demographic questions.

The remainder of this article is organized as follows: In the next section, the theoretical background is introduced and the separate variables are identified and justified. This is followed by an overview of the methodology of how the study will be performed. Section 4 discusses the expected findings and their implications. Section 5 will conclude the article with limitations and directions for future research.

Web Personalization

Web personalization is a topic that has been discussed and researched since ecommerce took off as a viable business model. Many ideas have been studied concerning this idea of personalization and customization. The effects of web personalization at different stages of decision making have been studied, with results that show that personalization agents can help users discover new products when forming their consideration sets, but once a decision has been made, the personalization agent has diminishing persuasive ability [23].

Web personalization is an important consideration for organizations to consider. A website is only a useful tool to both the organization and the users as long as the user stays on the site. It has been found that web designers have about 50ms to make a good first impression via visual appeal [31]. Visual appeal is an important characteristic of website quality, as contained in the WebQual model [32]. Longstreet (forthcoming), utilizing Cue Utilization Theory and the WebQual model, found that visual appeal is one of the more important characteristics of the WebQual model for judgments and perceptions of the website by users. Personalization of the website to the target audience is crucial for web designers to ensure the maximum likelihood of a user making a positive visual appeal decision, and thus deciding to stay on the website. Visual appeal is just one of the aspects to examine from the WebQual model that could be used for website personalization, but it is the most logical first step towards what the average users would consider “personalized”.

Task-Technology Fit

Task-Technology Fit theory has been applied to many different research streams. For example, it has been applied to describe and evaluate the outcomes of individual performance when utilizing information systems [13]; [18]. Task performance is enhanced when there is a fit between the task characteristics and the technology presentation [47]; [46]. Fit refers to the extent to which the technology is configured to support the needs of the task being performed. Figure 1 shows the TTF model. TTF proposes that the correspondence between the three key antecedents: task, technology, and individual characteristics, can lead to improvements in both utilization and performance (Wright et al., under review).

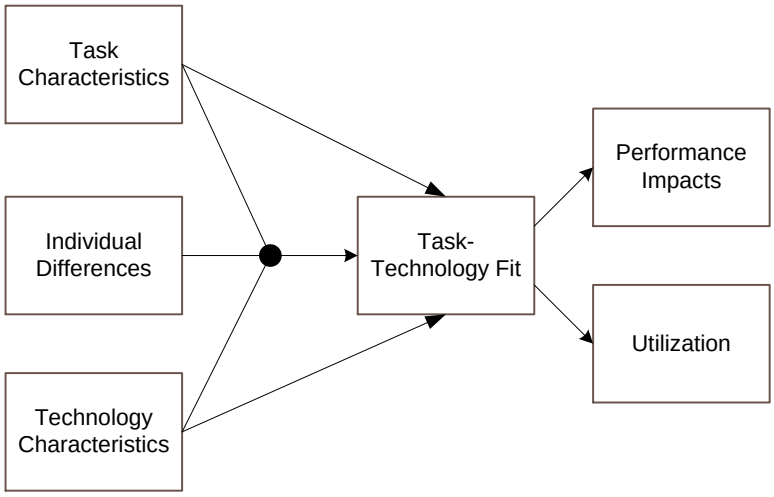

Figure 1. Task-Technology Fit [22]

There are noted challenges when attempting to apply TTF. In particular, the difficulty relates primarily to the issue of untangling the potentially complex interactions between the three antecedents to the fit construct (Wright et al., forthcoming). Also, the conceptualization of the fit construct is somewhat of a quagmire, and offers little guidance for practical application.

Even though these challenges exist, there is an opportunity to extend the TTF framework to offer an explanatory model for understanding demographic differentiation of groups of people on website personalization. This decomposed model interjects relevant constructs to the web personalization topic. Task Characteristics is modeled as Task Type since, for the purposes of this study, they have the same meaning. Technology Characteristics is modeled as Internet Efficacy, since in this study the technology is a website on the Internet, and a user's efficacy will affect the outcome variables. Individual Differences are being instantiated as Demographic Variables, since the demographics are the specific characteristics that this study is interested in. Performance Impacts relates to Perceived Website Quality, and Utilization relates directly to Intention to Reuse the Website. The conceptual model is shown in Figure 2.

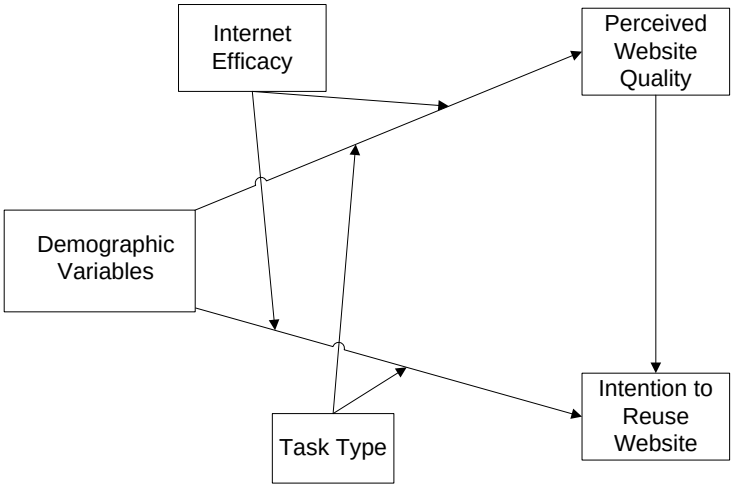

Figure 2. Conceptual Research Model

Social Cognitive Theory

Users are not a 'one-size-fits-all', monolithic concept looming in the ethereal void of the internet's many servers and switches. Users are (usually) people with all of the differences and similarities that you would expect from a large population of non-automaton sentient beings. Online users' individual characteristics vary greatly and these factors need to be taken into account in order to improve the usability of a system [6]. Different people have very different wants, needs, and desires in their lives. If we the people did not desire different things from our neighbors, there would be no variety in the choices we make and no options for differentiation. As we can all see from choices made and events partaken in during a single day, choices and options do exist. Social cognitive theory shows that people are different in many ways - from how they learn to how they perceive the world [3].

> *In social cognitive theory, people are agentic operators in their life course not just onlooking hosts of internal mechanisms orchestrated by environmental events. They are sentient agents of experiences rather than simply undergoers of experiences. …It is not just exposure to stimulation, but agentic action in exploring, manipulating, and influencing the environment that counts. By regulating their own motivation and the activities they pursue, people produce the experiences that form the neurobiological substrate of symbolic, social, psychomotor and other skills.* [4]

Social cognitive theory (SCT) is well suited to clarify human personal development, adaptation, and change in diverse cultural situations. People have changed little genetically over recent decades, but they have changed notably through rapid cultural and technological evolution in their beliefs, social roles, and styles of behavior. People live their lives in sociocultural situations that differ in their shared values, customs, social practices, and institutional constraints. Cultures are diverse and dynamic social systems, not static monoliths. There is substantial heterogeneity among individuals within both individualistic and collectivistic systems. In a series of cross-national

studies, girls had a higher sense of efficacy for academic activities and to resist peer pressure to engage in transgressive activities [4].

Compeau and Higgins [9] describe SCT as:

> *... based on the premise that environmental influences such as social pressures or unique situational characteristics, cognitive and other personal factors including personality as well as demographic characteristics, and behavior are reciprocally determined. Thus, individuals choose the environments in which they exist in addition to being influenced by those environments. Furthermore, behavior in a given situation is affected by environmental or situational characteristics, which are in turn affected by behavior. Finally, behavior is influenced by cognitive and personal factors, and in turn, affects those same factors.*

This idea of reciprocity between a person, their behavior, and their environment is shown in Figure 3.

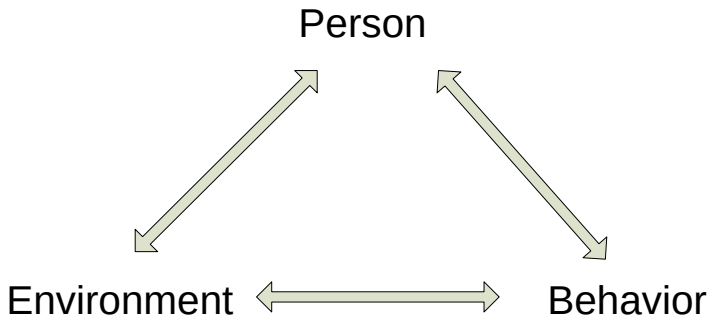

Figure 3. Triadic Reciprocality or Reciprocal Determinism [9]

Demographics

Demographics have already been shown to differentiate people towards their use of the internet. Wasserman and Richmond-Abbott [48] found that women access the web as frequently as men, but they communicate on the Internet differently than men, are online less than men, and utilize different types of websites than men. Demographic variables are important distinguishing points for understanding perceptions and intentions towards websites, and thus, website personalization.

Gender

Differentiation of gender roles is a sociostructural phenomenon, rather than merely an intrapsychic one [7]. If doing "girl things" and "boy things" had no differential social effects, gender labeling would lose its significance. Gender typing remains highly salient, because it makes a big difference in one's life experiences. Bussey and Bandura repeatedly show that the differences in genders and gender roles can come from many different social cognitive focuses. Gender roles can be learned in childhood from observing people and imitating the behaviors that resonate and hold the attention of the child the most.

Gender is a key demographic to be used for differentiation of people in their perceptions of websites. There has been much research over the years about differences between men and women in practically every discipline, from the obvious: biology and anatomy, to the more cerebral:

psychology and sociology. Many different theories have been proposed to explain differences in gender including Psychoanalytic Theory, Cognitive Developmental Theory, Gender Schema Theory, as well as miscellaneous biological and sociological theories (Bussey & Bandura, 1999).

Costa Jr., Terracciano, and McCrae [11] found that differences in gender are broadly consistent with stereotypes: Women reported themselves to be higher in Neuroticism, Agreeableness, Warmth, and Openness to Feelings, whereas men were higher in Assertiveness and Openness to Ideas. Four meta-analyses of gender difference literature from 1940-1992 was conducted by Feingold [17]. Feingold found that males are more assertive and have slightly higher self-esteem than females; females are more extraverted, anxious, trusting, and tender-minded. Gender differences in personality traits were generally constant across ages, years of data collection, educational levels, and nations.

These findings of differences extend into the technology adoption realm as well. The decisions made by males are more strongly influenced by their attitude toward using the new technology, whereas women are more strongly influenced by the subjective norm and perceived behavioral control [45]. They found that these findings were robust across income, organization position, education, and computer self-efficacy levels. In a study of over 300 students, approximately half women and half men, it was found that females had significantly higher computer anxiety than males [21]. Women and men also differ in their perceptions of e-mail [19]. Web designers need to realize that the same forms of communication on a website, whether it is textual, graphic, audio, etc., may be perceived differently by the sexes. A study by Moss and Gunn (2005) shows that the genders prefer websites that were created by their same gender: men preferred websites created by other men, and women preferred websites created by other women.

Based on these findings, it is hypothesized that there is a difference between the two genders:

H1: Differences in gender, moderated by internet efficacy, will have a significant impact on perceptions of website quality.

H2: Differences in gender, moderated by internet efficacy and mediated by perceptions of website quality, will have a significant impact on intentions to reuse the website.

Age

Age is a second key demographic to be used for differentiation of people in their perceptions of websites. Like gender, age has been well researched throughout many disciplines; age differences have been of particular interest in psychology, for example, for over seven decades [33].

Given that SCT posits that learning is shaped by social models and direct observation, it should hold that the longer a person has had to observe society and learn from it, the more that person has been shaped both from the external stimulus and internally through cognitive motivations. Based on this statement, the older that a person is, the more they have been exposed to throughout their lives compared to someone younger.

Concerning technology, Czaja and Sharit [12] state that it is commonly believed that older people in general have a higher level of discomfort with new forms of technology and are more resistant to using these new technologies than younger people. This belief often places older people at a disadvantage, because designers fail to consider older people as a potential user group when

designing technology [35]. These authors found that in general, older people perceive less comfort, efficacy, and control over computers than do younger people. The internet has typically been described as a young man's medium. Sorce, Perotti, and Widrick [41] found that when examining age alone, younger consumers search for more products online than did older consumers, and younger consumers are more likely to agree that online shopping is more convenient than older consumers.

Increased age has also been shown to be associated with difficulty in processing complex stimuli and allocating attention to task-relevant information [33]; [38]. The results of the study performed by Morris and Venkatesh [33] suggest that there are clear differences with age in the importance of various factors in technology adoption and usage in the workplace, and that age does have important influences on sustained usage decisions. Older people also have more difficulty than younger people with clicking and double-clicking computer mouse tasks.

Based on these studies, it is hypothesized that there is a difference between the age ranges:

H3: Differences in age, moderated by internet efficacy, will have a significant impact on perceptions of website quality.

H4: Differences in age, moderated by internet efficacy and mediated by perceptions of website quality, will have a significant impact on intentions to reuse the website.

Ethnic Identity

Ethnic identity is a third facet to the demographic concept. Whereas on many types of demographic questions, the respondent is asked for their ethnicity, ethnic identity should be differentiated from ethnic origin. The latter implies nominal, often dichotomous, and rather vague categories traditionally used for gathering census data [27]. Ethnic identity, on the other hand, is defined as the retention of features from an individual's culture of origin [28]. This is an important distinction given the multicultural makeup of many countries. A child could be raised in a country and culture completely different from the culture that is lived and practiced at home. That child's ethnic identity will most likely differ from his or her parents' identity given this situation of growing up in a different country.

Though there can be many differences between peoples of different ethnic identities, the literature in the IS field is lacking in published studies of differences based on ethnicity or ethnic identity.

Based on this lack of published information in the IS realm, it is hypothesized that there is not a significant difference between ethnic identities:

H5: Differences in ethnic identity, moderated by internet efficacy, will not have a significant impact on perceptions of website quality.

H6: Differences in ethnic identity, moderated by internet efficacy and mediated by perceptions of website quality, will not have a significant impact on intentions to reuse the website.

Socio-Economic Status

The fourth demographic to be included in the study is socio-economic status. Socio-economic status (SES) can be defined as an individual's position within a social structure. SES depends on a

combination of variables, including occupation, education, income, and wealth. SES is a comparison of the individual against the population of the specific country as a whole. Given that this study is primarily taking place in a western US university, the SES will be in comparison to the census data of the USA.

SES has been found to influence differences on a number of different situations, including physician's perceptions of patients [44], patient's utilization of physician's services [14], levels of happiness [20], and IQ scores of children born to and adopted by parents of differing SES levels [8]. SES has also been found to distinguish countries from one another, and even between separate cities and towns within a country or region [39]. In management, career-oriented mentoring has a greater relationship with promotion rate for people from the highest-level socioeconomic backgrounds than for those from lower-level backgrounds [49].

There is very little published information on the effects of SES on technology usage. This might be because studies have been ran with no significant effects found, or possibly SES has been overlooked by IS researchers in the realms of internet usage and technology adoption. It is believed that the former is more likely than the latter; in a generalized sense, perceptions of website quality and intention to reuse the site should not be effected by SES.

Based on this lack of published studies in the IS realm, it is hypothesized that there is not a significant difference between SES levels:

H7: Differences in SES levels, moderated by internet efficacy, will not have a significant impact on perceptions of website quality.

H8: Differences in SES levels, moderated by internet efficacy and mediated by perceptions of website quality, will not have a significant impact on intentions to reuse the website.

Internet Efficacy

SCT, and more specifically, self-efficacy, has been applied multiple times to studies in IS and to the Internet in general. Self-efficacy is defined as the belief that one has the capability to perform a particular behavior [9]. Bandura [2] found that the higher the level of induced self-efficacy, the higher the performance accomplishments of the individual. Compeau, Higgins, and Huff [10] found results in a longitudinal study that self-efficacy is a strong and significant predictor of affect, anxiety, and use even at one year later from the initial data collection point. These findings help provide evidence of the robustness of the SCT model of individual reactions to computing technology.

Internet efficacy, or the beliefs in one's capabilities to organize and execute courses of Internet actions required to produce given attainments, is an important factor to explain the user's decisions in internet use [24]. Simply, internet efficacy is the belief that one has the capability to perform a particular behavior on the internet. In a study utilizing SCT and internet efficacy, LaRose and Eastin [29] found a basic implication of uses and gratifications, that media exposure may be predicted from media gratifications, was upheld, and using variables from SCT improved the explanatory power of gratifications. Internet efficacy is a useful tool for understanding the inner cognitive beliefs of a website user that can positively or negatively impact and influence the user's level of success with their online task. A study of older adults found that the majority of the subjects who had a positive perception of usefulness, ease of use, and efficacy of the Internet or e-mail, used the

Internet or e-mail more often, and that computer or Internet experience increased perceptions of ease of use and efficacy of the Internet and reduced perceived complexity of navigation [1].

Given the wealth of published research finding self-efficacy to be an effective tool for explaining task outcomes, and with internet efficacy as an extension of that stream of research, it is being included in this study as a moderating variable on the demographic variables.

Research Model

The complete research model is shown in Figure 4. The demographic variables are clustered within a container for simplicity and ease of viewing. If this model were to be broken out into every actual arrow, all demographic variables will connect to both Perceived Website Quality and Intention to Reuse, and all of these connections from the demographic classification variables will be moderated by Internet Efficacy.

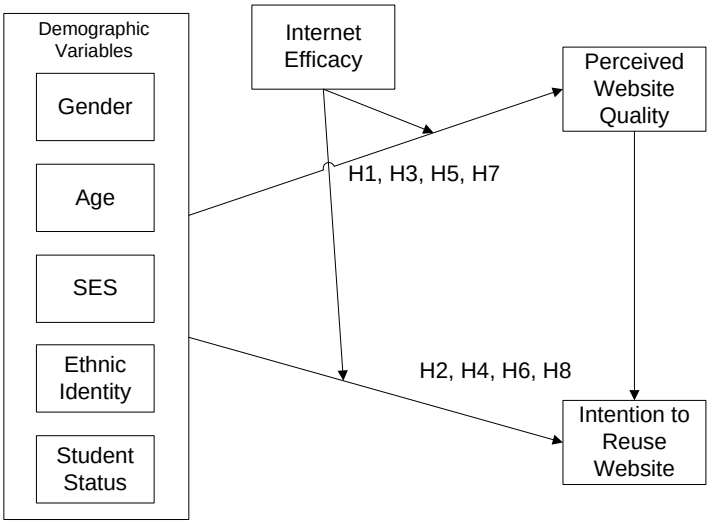

Figure 4. Research Model

Methodology

The research study will be a survey conducted both inside and outside of a US university. Subjects will be tasked with viewing the selected website for a period of at least one minute so that they can become somewhat familiar with the design, layout, and features of the website. The survey will be completed after viewing the selected website. This survey will contain the necessary demographic questions as well as measures of internet efficacy from two separate instruments that have been statistically verified through confirmatory factor analysis [15]; [42], and questions about perceived web quality and intention to reuse modified for this context from the WebQual model [32]. A pilot test will be ran with a separate group of undergraduate college students to verify the validity of the instruments as well as an initial test of the research model.

Subjects

The initial pool of subjects will include undergraduate college students from Business programs in a US university. The subjects that choose to become involved in the study will receive entry into a raffle for a $50 gift card. Additional recruitment of non-student participants will be via a snowball

technique; student participants will receive extra entries into the raffle for each non-student participant recruited. Subjects will be given the URL of the university's website to be examined, as well as the URL to the online survey instrument. The student subjects will be requested to recruit members with varying demographics to achieve the diversity required by this study.

Variables

The internet efficacy questions are Likert-type questions that will be placed on a seven-point scale (strongly disagree to strongly agree) as used by Eastin and LaRose [15], instead of the five-point scale as used by Torkzadeh and van Dyke [42], to allow for greater flexibility in answers from the subjects and consistency with the scale used in the WebQual model. The questions concerning Intention to Reuse the Website, as modified from the WebQual model [32] are Likert-type questions as well, and will number between 1 and 7 (strongly disagree to strongly agree). The items are provided in Appendix A.

Discussion/Conclusions

The results from the study should show that the demographic variables of Gender, Age and SES have a significant effect on the Perceived Website Quality and Intention to Reuse the Website. The classification variable Student Status should also be shown to have a significant effect, given the nature of this study and the selected instantiation of the technology as a university's website. If the data support the hypotheses, there will be a useful contribution to both academics and practitioners.

Reinforcement of the hypotheses will allow this study to add another extension to the TTF theory as it will be able to be applied to web personalization. This study will be a foundation for future studies into web personalization and demographic differences. These potential future studies could focus on other demographic variables as predictors of differences in perceptions of website quality. Costa Jr. et al. [11] found that contrary to predictions from evolutionary theory, the magnitude of gender differences vary across cultures. Studies of these demographics in different cultures could provide further insight. Other studies should focus on hedonic or a blend of hedonic and utilitarian sites [43], versus the purely utilitarian site used by this study. Another potential venue for future studies would be to apply this conceptual model to the multitude of TAM models.

This study is not without limitations. Given that this study is making use of undergraduate college students and random members of the population, SES may not have the same statistical effect that it could if this was a true random sample of the population.

Website designers will have a reference point for how to distinguish between groups of people when they create websites and features for the sites to be used for personalization by users. With a greater understanding of how the specified groups differ in their opinions and perceptions of a website, a more focused effort should be gained for targeting the correct segment of the population. Future studies geared towards practitioners should include testing more demographic variables to be able to further subdivide the population. Also, a determination of what specific factors appeal and do not appeal to the determined segments would be of use to practitioners.

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Appendix A –Survey Instrument Questions

Demographics:

What gender do you identify with?

What age bracket are you in? 0-17, 18-22, 23-30, 31-50, 50+

Which socioeconomic status percentile bracket are you in? 0-19, 20-39, 40-59, 60-79, 80-100:

http:/www.nytimes.com/packages/html/national/20050515_CLASS_GRAPHIC/index_01.html

What ethnicity do you most closely identify with? (List of ethnicities taken from US census)

Are you currently a student at a university or other higher education institution?

Internet Efficacy:

The first three questions are from [42]. All others from [15]

I feel confident…

surfing the World Wide Web (WWW)
browsing the World Wide Web (WWW)
sending information on the World Wide Web (WWW)
understanding terms/words relating to Internet hardware
understanding terms/words relating to Internet software
describing functions of Internet hardware
troubleshooting Internet problems
explaining why a task will not run on the Internet
using the Internet to gather data
learning advanced skills within a specific Internet program
turning to an online discussion group when help is needed

WebQual – Perceived Website Quality and Intentions to Reuse [32]

Perceived Website Quality:

Visual Appeal (VISUAL)

The Web site is visually pleasing.
The Web site displays visually pleasing design.
The Web site is visually appealing.

Emotional Appeal (EMOTION)

I feel happy when I use the Web site.
I feel cheerful when I use the Web site.
I feel sociable when I use the Web site.

Intention to Reuse the Website (Modified from original questions to fit the site):

If I needed information on higher education in the future, I would be likely to gain it from this Website.
If I needed information on higher education in the future, I would probably revisit this Website.
If I needed information on higher education in the future, I would probably try this Website.
I would recommend this Web site to a friend interested in information on higher education.