Original Article

Stay or leave: Applying Approach-Avoidance Theory to virtual environments

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ABSTRACT Physical facilities, for example retail stores, have design characteristics that seem to say, 'come in', 'stay awhile' or even 'go away'. Just as physical facilities may invite or discourage interaction through their physical design, the same is true for web sites. Web sites draw us, engage us and even repel us. Web sites are fast becoming a primary means, in many cases 'the' primary means, of interacting with both current and prospective customers. Given the high impact of web sites on business models, even modest, incremental enhancements in usability promise dramatic benefits. The application of Approach-Avoidance Theory is well known in relation to physical environments. Its application to virtual environments is theoretically sound, practically applicable and fits very well in the accumulating research on web site design characteristics.

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INTRODUCTION

Physical facilities, for example retail stores, have design characteristics that seem to say,

'come in', 'stay awhile' or even 'go away'.¹ Just as physical facilities may invite or discourage interaction through their physical

design, the same is true for web sites. Web sites draw us, engage us and even repel us, and we have access to a body of research that will help us understand these phenomena.

We know that environmental attributes, such as design, stimuli and emotional states, directly affect behavior. We also know that these same attributes are closely associated with behavior within a web site.²⁻⁷

Environmental factors matter. These attributes have high, immediate and often irreversible impact. A person's first 50 milliseconds on a web site may be the primary determinant of most behaviors within the site.⁵ Whatever the micro timeline, it is well understood that first impressions dominant subsequent web site behaviors.^{1,3,5,8-10}

To offer help in precipitating desirable web site behavior, we will examine two vital research streams: web site design characteristics and Approach-Avoidance Theory. We examine the impact of web site design characteristics such as ease of use, interactivity and aesthetics on user emotions, their attitudes and ultimately their behavior. We then examine Approach-Avoidance Theory in order to apply insight about the relationship between emotions and behaviors in physical environments to web site environments.

RESEARCH ON WEB SITE DESIGN CHARACTERISTICS

Although numerous recent studies have examined the influence of web site design characteristics on Internet user emotions and behaviors,^{3-5,11-14} the general structure of this research has been somewhat varied. Some studies have explored user characteristics such as technological skill level, desire to find challenge and attention span, and their influence on web site usage behaviors.^{4,12,15,16} Additionally, other research² has examined site flow characteristics using click stream data to identify influences on user behavior. Finally,

some research has focused on web site aesthetics including factors such as colors, shapes, textures, graphic and sounds to identify their impact on web site usage.^{5,7,9,11,13,14}

Although the focus of this research has varied from user characteristics to design characteristics to aesthetics, all of it has identified that different users behave in different ways across different web sites. Unfortunately, studies have shown that many of these features are related. Web site design components may influence user satisfaction, web site flow and perceived beauty, making it difficult for any study to accurately identify true effect.^{7,9}

Web site research in general has investigated which design characteristics provoke emotional response and influence behaviors leading to web site success.^{5,6,17-24} To better understand what causes behavioral differences, it is important to understand a basic framework of web site research. Valacich *et al*¹⁴ argue that web site characteristics generally fit into three categories: structure, function and representation. Structure includes design artifacts such as web page organization, layout and flow that enhance a user's assessment of ease of use. Function incorporates web site interactivity or the amount of involvement or control a user has with a web site. Representation takes into account web site aesthetics such as colors, fonts, graphics and sounds. Finally, these three categories of web site design combine to influence user satisfaction.^{14,16}

Structure (Ease of use)

Internet users have different skill levels and different purposes for using the Internet. Internet behaviors have been classified as experimental (more exploratory in nature) or goal-directed (use for a specific purpose).^{12,15} Nielsen²² argues that owing to these user skills and behavioral differences, 'consistency is one of the most powerful usability principles'. Web site

designers should stay within the norms of other web site designs to ensure that these sites meet users' expectations.² Research has found that ease of usability becomes strained when users are unfamiliar with the design or structure of a web site.^{2,22} This is similar to Lutz and Kakkar's²⁵ finding that brick-and-mortar consumers who are overloaded with information and choices in the retail marketplace feel intimidated and often exit the environment.

Web site structure includes characteristics related to security, privacy, performance and purpose.^{9,14} Huber¹⁹ argues that the main objective of web site design is to lead the user down a path. Palmer⁶ states that navigation is the organization, layout and sequencing of content. Usability is particularly critical for a commerce web site where navigation includes obtaining product information to make decisions regarding purchases.^{9,19} To improve web site ease of use, designers should strive to maintain lower numbers of pages needed to complete a task.² Additionally, web sites must have clearly distinguished links that inform the user of the destination.²⁰ Furthermore, Huber¹⁹ calls for the importance of web site flow, and suggests effective use of headlines, photos and captions, and use of text on buttons to call for specific actions.

Function (Interactivity)

Web site function (or interactivity) also influences user satisfaction.^{14,19} Sautter *et al*¹³ and Novak *et al*¹⁵ found that design features that are consistent with physical environments are desirable for web site users. For example, users need to be able to engage in effective product search using search engine tools, product categories and suggestions just as they might use departmental separations, signs and employees in a brick-and-mortar retail environment. However, the level of interaction desired depends on the web site's purpose (experimental versus

goal-oriented).^{11,14} Web sites should consider effective use of search engines and directories to enhance the user's experience.^{3,11} Additionally, the level of interactivity should match the user's skill level and goal for the interaction. By matching desired interactivity and web site flow, a user's pleasure in the experience can be enhanced.^{12,13,15,17,18,20}

Studies of retail environments show that favorable placement of products creates positive shopper emotions. Shoppers feel pleasure and excitement when they are able to interact easily within the environment.¹⁰ Interaction within a physical setting also includes the service from salespeople. Similarly, E-tail web sites use shopping agents to create interpersonal interactions between the consumer and the web site.¹³ Shoppers in retail studies considered after-sales service in determining their overall emotional states.¹⁰ Service ratings for web sites include time to download items, time to move throughout the site, time to complete tasks and the effectiveness of tools available to the visitor.¹²

Representation (Aesthetics)

An evaluation of web site credibility surveying 2684 people found that the 'design look' is the most important factor people use to determine a web site's credibility.⁴ Representation (or aesthetics) includes all characteristics that stimulate user senses, initiating emotions. Colors, sounds, shapes and textures are some examples of aesthetics that make up a web site's 'design look'.¹⁴ Kim *et al*¹¹ measured user emotions using 13 design factors related to objects, background and the relationships among these factors. Results indicated that people feel tense when the shapes differ from the texture of the main image and when the shape of the title is plain.

Considering environmental psychology's theories asserting that first impressions highly affect behavior, current researchers strive to find what makes a web site appear

attractive or unattractive to users. Tractinsky *et al*⁷ and Tractinsky and Lowengart⁹ evaluated design factors associated with web site attractiveness. They identified two dimensions of aesthetics, classical (clarity of design) and expressive (creativity of design), that at high levels stimulate pleasure with a web site. Additionally, they found that people's perceptions of attractiveness remained constant regardless of the amount of exposure to the web site. However, too many aesthetic design components can be detrimental to web site usage. Research has concluded that a moderate amount of vividness is attractive, but that excessive stimulation on a web site overwhelms and can distract users, ultimately causing them to avoid these web sites.^{11,12,20}

User satisfaction

The ultimate goal of web site design is user satisfaction, but unfortunately this can be difficult to evaluate.^{5,7,13,16} Nadkarni and Gupta¹² found that satisfied users will return to a site and continue to visit it longer. Web site user satisfaction generally results from web site experience. However, user experience assessments can form based on navigation of one web site or during an entire Internet browsing session in which the user visits multiple web sites.^{15,19} To enhance user satisfaction, web site design should be familiar and easier to use.¹⁹ Hoffman and Novak¹⁷ provided a flow model based on a user's online experience. Novak *et al*¹⁵ empirically tested the flow model and added three usage variables: when the user started using the Internet, how much time the user spent on the Internet and how much the user expects to use the Internet in the future. They concluded that assessments of web site flow and user characteristics influence user satisfaction. Additionally, Chidley²⁶ found that user interest in electronic services is influenced by, among other things, experience and perceived relevance of the task.

Essentially, web sites determined to have high ease of use, high interactivity and moderate visual stimulation create high user satisfaction. Research has shown that users enjoy web sites that place more information displayed in an organized manner on one page versus information spread across multiple pages.^{2,5} Additionally, redundant or non-essential information is detrimental to user satisfaction. Numerous studies have concluded that information leads to satisfaction only when it is informative, relevant, concise and meets the absorption rate for that users' web site experience level.^{6,12,13,20}

APPROACH-AVOIDANCE THEORY

Our examination of web site design characteristics leads to a discussion of Approach-Avoidance Theory. Approach-Avoidance Theory is taken from environmental psychology, and examines stimuli including color, sound and brightness of physical environments, and individuals' arousal-seeking tendencies.^{8,10,25,27} Much of this research has been applied to brick-and-mortar retail settings, and establishes a link between individual emotions and behaviors within a physical environment. It is also a useful source of information in addressing issues raised by web site design characteristic research.

Approach-Avoidance Theory argues that emotions created by environmental stimuli directly influence the approach, avoidance and affiliation behavioral responses.^{1,25} Russell and Mehrabian¹ conducted studies measuring the capacity of the dependent variables of approach and desire to affiliate with an environment. Their measures of these two dependent variables are listed in Table 1, along with web site-adapted measures that will be discussed later. This stream has more recently been examined in a web site environment in the studies by Davis *et al*^{28,29} that identified

Table 1: Web site-adapted Approach-Avoidance measures

<i>Original items</i>	<i>Web-adapted items</i>
<i>Approach-Avoidance</i> How much time would you like to spend in this place? How much do you like this place? How much would you want to explore around this place? How much would you want to avoid looking around or exploring this setting? (reverse-coded) How hard would you try to avoid ever hanging around or exploring this setting? (reverse-coded)	<i>Approach-Avoidance</i> How much time would you like to spend on this web site? How much do you like this web site? How much would you want to explore on this web site? How much would you want to avoid continuing your visit or browsing this web site? (reverse-coded) How much would you try to avoid revisiting or passing time on this web site? (reverse-coded)
<i>Desire to Affiliate</i> To what extent is this a time when you would feel friendly and talkative towards a stranger who happens to be near you? Is this a time when you might try to avoid other people and having to talk to them? (reverse-coded)	<i>Desire to Affiliate</i> To what extent would you feel curious to interact with more than one activity on this web site? Is this a time when you might try to avoid interacting beyond the homepage of this web site? (reverse-coded)

Approach-Avoidance as a relevant shopping outcome of web site use based on internal states (emotion and cognitive assessments) precipitated by environmental cues (perhaps web site design characteristics).

Three emotional dimensions

Approach-Avoidance Theory examines the relationship between emotions and behaviors by measuring pleasure, arousal and opportunity to gain dominance experienced during an interaction with an environment.^{1,27} Pleasure is defined as the evaluation of feelings ranging between extreme unhappiness and ecstasy. The emotional state of pleasure includes feeling strong preference towards a stimuli, positive reinforcement, contentment and satisfaction.^{25,27} Arousal is defined as the active response to any physical stimulation that measures an organism's readiness.^{8,25} Arousal level ranges between calm and unresponsive to extremely alert.²⁷ Finally, dominance measures whether or not the individual feels controlling over or controlled by the environment.²⁵ At one end of the spectrum, submissiveness describes the individual feeling controlled by the environment, whereas the other end, dominance, is where the individual gains

mastery over the environment. Approach-Avoidance Theory argues that combinations of these three emotional dimensions influence behavioral response to all types of environments.^{1,25}

Approaching an environment

Research finds that above arousal and dominance, pleasure is the most important characteristic measuring one's desire to approach an environment. People approach environments where they feel pleasure and feel moderate arousal levels.¹ Russell and Mehrabian¹ proposed the pleasure-arousal inverted-U-hypothesis to show the relationship between the two dimensions. Figure 1 shows the effects of pleasure levels (unpleasant, neutral and pleasant) combined with arousal levels (low, moderate and high). Studies show that the pleasure-arousal inverted-U-argument is most accurate in neutral, pleasant environments.^{1,30} Additionally, people approach submissive environments more than dominance-eliciting environments. By approaching submissive environments, people are able to gain control over the situation.¹ Finally, studies using the Approach-Avoidance Theory to predict retail store behaviors find that people

Figure 1: Inverted-U Relationship.¹

approach products and places with high perceived value, demonstrating an influence of behavioral task on behavior.¹⁰

Avoiding an environment

People tend to avoid environments where they are not happy, bored or extremely aroused.³⁰ In addition, high levels of stress often result from lower levels of pleasure and dominance. Russell and Mehrabian¹ show that people avoid environments where they have no feeling of arousal or extreme levels of arousal. Interestingly, their results also show that users avoid environments where they feel in control. Russell and Mehrabian¹ interpret this finding as individual preference for submissive environments and avoidance of situations of dominance, which may lead to increased responsibilities. Unfortunately, interpreting responses to dominance levels is complicated because individual

characteristics and personalities influence whether or not that individual has a preference to be controlled by or in control of their environment.¹ Therefore, to understand the true impact of environmental dominance and avoidance behaviors it is important to understand the individual qualities of the user.

Affiliation with an environment

Previous environmental psychology studies have explored curiosity, stimulus and exploratory behaviors, and their relationship with arousal within an individual.^{8,31} Affiliation is one arousal behavior that results from engaging in any type of contact with another person.^{1,27,31} Approach-Avoidance research has found that desire to affiliate increases with pleasure, but dominance and arousal play a more significant role in determining desire to affiliate.^{1,27} Russell and Mehrabian¹ argue

that a person feeling dominant over and *negative* towards an environment is less likely to affiliate with that environment, whereas a person feeling dominant over and *positive* towards an environment has a stronger desire to affiliate with that environment. Additional research shows that arousal in *pleasant* settings increased affiliation and that arousal in *unpleasant* settings decreased affiliation.^{1,30} Based on these results, it is evident that interactions among the three emotional variables play a part in an individual's desire to affiliate (or become associated) with an environment.

INTEGRATING APPROACH-AVOIDANCE THEORY WITH WEB SITE RESEARCH

Davis *et al*'s^{28,29} research on the Stimulus-Organism-Response Framework incorporates the relationship between emotional influences and web site approach behaviors. They have introduced some of the key Approach-Avoidance variables into web site research. We believe that additional discussion of the integration of these two literature streams would prove useful in better understanding web site behaviors. Current research on web site aesthetics argues that visual stimuli can create pleasurable responses that are long-lasting and consistent.^{5,7} We argue, based on Approach-Avoidance Theory, that by generating pleasure in the environment, web site designers will increase approach and affiliation behaviors towards the web site. Consumer behavior studies on brick-and-mortar retailers support the significance of pleasure, arousal and dominance emotions in impacting consumption.^{1,32} Here we argue that these same findings can be supported in web site applications (see Table 1 for adapted Approach-Avoidance measures). Additionally, Sautter *et al*¹³ argue that the Internet can be a 'post-modern' exchange environment differing from brick-and-mortar retail environments mainly by having fewer time and place limitations.

Given the relative lack of limitations in the Internet environment, we feel that the ability to elicit approach or affiliation behaviors on a web site may be even greater than in the standard retail environment.

Approaching a web site

Approach-Avoidance Theory claims that people approach environments where they feel pleasure and other positive emotions. Havlena and Holbrook³² argue that individuals choose between similar alternatives based on emotional benefits, and will approach alternatives that provide positive emotional states. Novak *et al*¹⁵ evaluated arousal, control and positive affect as derived from Mehrabian and Russell's original theory in the cognitive flow model of web site usage, and found that positive emotion improves a user's experience. In addition, Mummalaneni²¹ found that the presence of pleasure and arousal emotions highly impacts user satisfaction. However, Approach-Avoidance Theory argues that at some point arousal becomes too intense and may actually lead to avoidance behaviors.¹ This point is critical for web site designers. Too much interaction or stimulation on a web site will lead to overstimulation and ultimately to avoidance behaviors. These findings support the conclusion that by creating web site designs that increase pleasure and maintain moderate arousal in a user, web designers can enhance approach behaviors towards that web site.

Additional variables that have been shown to positively impact emotions, thereby leading to greater approach behaviors, include web site purpose, user experience and user familiarity. Nadkarni and Gupta¹² studied the importance of perception of web site complexity in differentiating between experimental tasks and goal-oriented tasks, and found that web site design should complement their purpose. Similarly, Novak *et al*¹⁵ found that

the web site user experience positively correlates with fun, recreational and experiential uses of those sites. Finally, Jain, Mathur and Maheswaran³³ found that Approach-Avoidance behaviors are moderated by the user's expectations and task congruence. Therefore, web designers must consider whether a web site will be used for a more experimental or recreational purpose, or for a more goal-oriented purpose such as electronic commerce when determining design characteristics. In addition, Nadkarni and Gupta¹² found that user skill with a web site can be based on using familiar design attributes or repeated use over time. Furthermore, Updegraff *et al*³⁴ examined the affect of past experiences on users and found that positive past experiences have a stronger influence on user satisfaction than negative past experiences. Therefore, to create a web site environment that will produce approach behaviors, web designers should consider the emotional responses of pleasure and arousal, matching user skills or experience level with interactivity structures, and the user's task.

Avoiding a web site

Palmer⁶ argues that poor interface design is the most common factor leading to web site failure. When people find a web site to be unattractive or too complex, they will avoid using it and other sites with similar unattractive design features.^{7,12} Users avoid web sites with unpleasant aesthetics often perceived from poor legibility, inadequate font sizes and unpleasant contrasts. These features often inhibit users from performing their desired task on the site, leading them to end the visit and avoid the frustration in the future.^{12,20} Additionally, first impressions play a significant role in avoidance behaviors. Lindgaard *et al* argue that people who experience initial displeasure will seek to avoid the site in the future, regardless of subsequent pleasures gained from structure (ease of usability).⁵

In addition to Russell and Mehrabian's inverted-U relationship between pleasure and arousal where users engage in avoidance behaviors if bored or overstimulated, web site design and user purpose have a complex relationship with avoidance behaviors.¹ An inverted-U relationship between perceived web site complexity and task type shows that experimental users will avoid boring web sites and goal-oriented users will leave overwhelming web sites.^{12,13,15} In addition, users will avoid web sites where they experience long download delays upon entering the site or require additional software, such as Adobe's Flashplayer, to enter the main page.⁶ To create the most effective web site to minimize avoidance behaviors, designers should determine the appropriate site task type, and use aesthetic and functional tools to increase pleasure and arousal without causing too much anxiety for users.

Affiliation with a web site

Affiliation with a web site refers to the continued browsing through a web site's links and amount of interaction with that web site.¹³ Aesthetically attractive web sites and moderate levels of pleasure and arousal increase trust and social interaction, thereby influencing affiliation.^{7,9,13} Research shows that people prefer to browse web sites with short paths and less complex stimuli.^{2,31} Conversely, affiliation decreases when people feel dominant over a web site.^{1,2,30} For example, users spend less time per session as they gain control and experience within a web site² because they no longer feel curious to explore³¹ and often become bored. Additionally, web site user tasks impact affiliation behaviors.

Nadkarni and Gupta¹² found that goal-oriented users prefer straightforward informative interactions and experimental users enjoy features like animations that may only serve entertaining purposes. Therefore, Approach-Avoidance Theory

would argue that to increase affiliation with a web site (increased visits and browsing time), there should be a thorough understanding of the user's task, and that the web site must be designed in congruence with that task. Furthermore, web sites need to elicit emotional responses of pleasure and arousal without being overwhelming. To do this, web site function or interactivity needs to be consistent with the user's purpose on the site and flow needs to be clear, meaning that links are sufficiently labeled and produce efficient web site navigation.

Mummalaneni²¹ reports that a survey ranking 10 attributes of retail atmosphere conducted with 100 000 online shoppers found the most important attribute to be related to web site design. He found that some of the critical variables that lead online shoppers to avoid web sites include stress from cluttered web site design, poor product presentation, bad search engines and confusing processes. Fortunately, web site affiliation behaviors are relatively easy to measure using sale and traffic reports.^{9,13,21} Affiliation, also called 'stickiness', includes actual purchases, page views, click-throughs and the use of tools such as shopping agents.¹³ Approach-Avoidance Theory argues that obtaining affiliation requires acceptable levels of pleasure, arousal and dominance responses in a user.¹ By using web site success measures, we may be able to better understand user affiliation assessments.

IN CLOSING

It is generally accepted that website use is fast becoming a primary means, in many cases 'the' primary means, of interacting with both current and prospective customers. Given the high impact of websites on business models, even modest, incremental enhancements in usability promise dramatic benefits. Perhaps there is no greater application of the rule of first impressions than in website

interaction – the impact of design, good or bad, is immediate and consequential.

Understanding and applying good website design characteristics is a vital twenty-first century skill set. The impracticality of producing a 'one size fits all' design complicates the challenge. The diversity of uses and users will continue to grow, further complicating the process. The application of Approach-Avoidance Theory to virtual environments is theoretically sound and practically applicable. While Approach-Avoidance Theory may be a novel approach, it fits very well in the accumulating research on website design characteristics.

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