What Can E-Health Do for You? The Influence of Perceived Affordances for Use of Medical Websites

Personal Portfolio Project
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Background

As the rate of chronic diseases increases, there are escalating needs for disease management healthcare in the United States. However, healthcare providers have limited resources (e.g., time) to meet the needs of a growing population plagued by diseases that require continued care and maintenance (e.g., diabetes, obesity). This culminates into a healthcare environment that demands greater efficiency in patient communication. Many healthcare providers and facilities are hoping that e-health, defined as digital media and online communication technologies, will be a solution (Eysenbach, 2001). Digital media provides an outlet that can potentially broaden communication outreach, allowing information to be disseminated beyond the current constraints of the medical system.

Patient portals, electronic medical records, and healthcare provider websites represent some of the existing digital communication tactics. While many of these have good intentions, there is only minimal success for adoption of these technologies. The lack of attention given to the influence of the design of these online communication methods is likely a contributing factor for the minimized success. The initial interface design, often equated to visual appeal or visual aesthetics in e-health, has been shown to have a significant impact on emotional and rational judgments, along with involvement, perceived usability, trust, and credibility of a website (Creusen & Snelders, 2002; Hazzenzahl, 2004; Lavie & Tractinsky, 2004; Lindgaard, Fernandes, Dudek, & Brown, 2006; Tuch, Presslaber, Stocklin, Opwis, & Bargas-Avila, 2012).

Utilizing J.J. Gibson's Affordance Theory, as an ecological perspective for the communication of action possibilities, this project proposes to study the influence of designed affordances on perceptions of, attitudes towards, and adoption of electronic healthcare sites (Gibson, 1986). In an electronic environment a user must rely on the screen or interface design to reveal the function or purpose of a site (Norman, 1999). This design is comprised of perceived affordances, or action possibilities revealed through the digital display (Norman, 1999). While many scholars have theorized on the conceptual value of perceived affordances for human-computer interaction (Hartson, 2003; Lu & Cheng, 2013; Pols, 2012), there is a lack of empirical evidence that supports proposed conceptual models for digital media design and its impact on the communication process.

In order for medical websites to be able to achieve their goal of alleviating the human demand for tasks that can be done efficiently and effectively online (e.g., prescription refills, making appointments, getting lab results), the website experience must meet or exceed the patient’s expectations of the alternative methods. Indeed the online experience must replace the physical experience, or connective auditory experience of human interaction through the phone (Varlander, 2007). Therefore, it is critical to study and understanding what visual features are required to meet the audience’s expectations and
compensate for any factors that are no longer associated with the human facets of communication (Varlander, 2007). Transferring the communication online means that the design must now function as the emotive or responsive partner in the interaction, which must logically gain user’s evaluations of credibility, expertise, and trust of the website for effective communication (Thorlacius, 2002). Therefore, a model that incorporates both functional and experiential aspects of the communication process are necessary to fully gauge the utility of websites to function as supplements to human connections and increase efficiency in the medical system (Varlander, 2007). Jakobson’s communication model is one such model that can be used to develop a method to analyze if the site provider’s intended message is received by the target audience, along with any additional unintended effects that may influence use of the medical website (Jakobson, 1960).

Working with medical content experts at Austin Regional Clinic (ARC), a local health provider, this study will test beta website designs to better understand how a user perceives affordances for electronic healthcare sites. The application of affordance theory, Jakobson’s communication model, and subsequent evaluations of interface designs to gain insight on design options that do (or do not) reveal action possibilities to their patients will greatly benefit ARC’s digital communication efforts.

Problem Statement

Health care providers turn to online communication technologies to help meet patient’s needs, however, attempts to increase online communication between patients and providers have been met with limited success. Furthermore, there is currently a lack of research to indicate what factors are influential in the successful adoption or failure of e-health.

Solution Statement

Research methods that investigate the role of design in e-health adoption represent a critical next step for online health communication efforts. There is a need to better understand how design factors may influence patient’s adoption of technology, as the digital design of e-health likely functions as the gateway to information access and use of the technology.

Solution In Detail

This research will serve as a process of discovery. It is intended to be a method to gain empirical evidence to guide the practices of health communication scholars and practitioners in the design and development of e-health. Utilizing the theoretical perspective of affordance theory and Jakobson’s communication model, this research will highlight the necessary steps that can be undertaken to understand the usefulness of e-health from the patient’s perspective. Furthermore, this process considers the provider’s communication intentions and implications of the design code, making it a robust approach to aid designers, developers, and health communicators.

Theoretical Perspective

Functionality can be observed at first glance through affordances, a term originally introduced by James Gibson (1979), which describes how an object reveals its action possibilities to the viewer through
its features that afford or support a function (Gibson, 1986; Norman, 2002). J. J. Gibson posits in his affordance theory that objects reveal their affordances through the viewer’s perception of its attributes. Thus, action possibilities are neither objective (e.g., inherent in the object) nor purely subjective (e.g., exist solely from the viewer). Affordances come into existence through a combined relationship of the objective properties and subjective perspective, creating an interaction that reveals the action possibilities of an object to a viewer. Gibson’s perspective has strayed from the work of many visual complexity theorists, as affordances are not a measure of complexity, but entail finding the right balance of revealing properties in the specific display settings (Donderi, 2006).

Traditional communication methods, such as printed health materials, lend themselves as illustrative example of affordances. The amount of information contained in a book is easily determined by its thickness. Additionally, the dimensions and choice of either hard cover or paperback give further cues as to what the printed information will be able to offer the viewer. Hard cover, large volumes may offer meticulously detailed reference materials; while a truncated paperback may be more likely to afford concise information, pleasure, or entertainment. A pamphlet indicates a quick reference or an extremely condensed information source for the viewer, which may appeal in certain situations where limited attention is available. If this same pamphlet is laminated or printed on high gloss cardstock, one is likely to consider this information worth keeping, as the production process indicates that it is more valuable than a single use item. However, screen-based communication does not have the same physical variation of objects to reveal functionality or purpose. Therefore, given that we are not judging by the physically revealing properties, how exactly does one make an instant evaluation of what possibilities the object holds for them?

It is the design that must allow for viewers to decipher the differences among reference materials or opinions of a novice for online health information. Screens have become the great equalizer for the delivery of information, taking away many affordances and cues that were inherent in their printed counterparts. Thus, screen-based delivery is putting the onus on the health consumer to determine a great number of things, which may require more of an investment of time and cognitive resources as the at-a-glance physical properties are gone. Fortunately, individuals are still able to judge online information quickly without the physical cues that constituted many affordances. Affordances are never completely present or absent, but instead exist is state that is either more revealing or less as an indication of how it may be used by the viewer.

Affordances can be seen in virtual objects or as on-screen representations of potential action. The overall design and aesthetic presentation of the display reveals much about the message creator or site provider. This holistic impression is instrumental in the first impression, as well as specific design elements that may be attended to after more time. Visual depictions of health information are designed to reveal the meaning intended by the creator. This process relies on “a common sharing of perceptual process and image affordance” and does not necessarily consist of true depiction (Barry, 1997). Imagery that is designed to aid in information transfer can be manipulated to emphasize elements and attract viewers to the information it affords for visual communication, which could include health information (Barry, 1997). Additionally, buttons and links are often the objects that must be engaged for navigation of e-health information. These interactive tools benefit from having an appearance that indicates their function. Even though the viewer will not actually depress a virtual button, shading and shadows that give the visual reference to its physical world counterpart may help viewers attribute meaning to the
object. The higher the affordances or revealing properties of objects, the more likely users will have reduced errors, increased identification of objects, and most importantly reduced frustration and confusion. If links, buttons, or other areas that are intended for interaction do not display affordances to the viewer, additional barriers for the user are being created.

**Methods**

The proposed method is a multi-step process of inquiry. The first phase in this process must be to establish the needs, wants, and appraisals of patient for either in-person/over the phone or online interactions for prescription refills, scheduling appointments, or getting lab results. This would be followed by the development and execution of a survey to allow for evaluation of potential website designs, as well as serve as a further exploration of uncovered issues.

To uncover the needs and wants of e-health users, the first phase of this process focuses on efforts to explore all possibilities from the perspective of the patient. The first phase of the study will consist of gathering writing samples from a select sample of ARC’s target population. Participants will be instructed to write an account of a previous experience with a medical website (e.g., a different health care provider’s website or a pharmacy website, such as CVS) and describe their experience, successes or failures, and emotions associated with the process. Having the targeted e-health users write reflections of past experience of similar technology use will be instrumental to avoid the information paradox, as it is unlikely that individuals are able to articulate needs and wants prior to the occurrence of an event (Varlander, 2007). These writing samples will then be analyzed for emergent themes that lead to both close-ended and open-ended survey questions. Dimensions of Jakobson’s communication model will also be added at this stage to ensure that multiple factors are accounted for in the survey design, even if not included in the initial reflection writings.

Following, the first survey will be used to evaluate the effects of design changes for perception of “cognitive affordances and sensory affordances” and the dimensions of the Jakobson’s communication model (Hartson, 2003; Jakobson, 1960; Thorlacius, 2002; Varlander, 2007). Investigating the descriptive or informational function of the website is the primary objective for this process that uses affordance theory to interpret Jakob’s communication model. This is the function that reveals the perceived capabilities of the site. If patient’s do not perceive the intended function or capabilities of the website, then all hopes for technology acceptance are lost. Additionally, the other dimension of Jakobson’s communication model regarding the addresser’s intention, context of the message, the message itself, the code for interpretation, perceptions of the addressee, and overall aesthetic interpretations will be explored (Jakobson, 1960). Participants will be given three static prototypes of ARC’s website and answer close-ended and open-ended items developed from phase 1 of the study.

**Participants**

Previous experience with the health care system is likely an influential factor of whether or not a patient is willing to use medical websites as an alternative to face-to-face interactions (Varlander, 2007). Experience likely increases a patient’s knowledge, familiarity, or comfort with the complex health care system and will therefore be investigated as a predictive factor of technology acceptance. Therefore, it will be necessary to recruit participants that have familiarity with the health care system as well as
participants that are new to the system to allow for exploration of this personal variable with the communication model.

**Similar Existing Solutions**

Many conceptual models for the study of affordances have been developed, primarily in human-computer interaction studies. These conceptual models generally function as descriptive devices that allow for the classification of affordance type or design effects on audiences (Crilly, Moultrie, & Clarkson, 2004; Lu & Cheng, 2013; Pols, 2012; Seet & Goh, 2012; Xenakis & Arnellos, 2013), with an emphasis on the fact that prototyping is critical to the design process to identify user experience preferences (Seet & Goh, 2012). They recognize the variety of psychological processes that are involved with the interpretation of affordance by including constructs of emotion, cultural influences, information processing, memory, and action (Still & Dark, 2013; Xenakis & Arnellos, 2013; You & Chen, 2007). Some have even suggested affordances do more than simply offer action possibilities, rather they invite behavior, which allows for the role of agency to be considered (Withagen, de Poel, Araújo, & Pepping, 2012). However, the largest shortcoming of these conceptual models for use by health communication scholars and practitioners is the lack of direct applicability to the design process that largely influences effective communication online.

**How the Proposed Solution is Better than Existing Solutions**

While many scholars have developed conceptual models to guide investigations of how design reveals affordances, there is a lack of empirical evidence or a process to test these models. Combining the theoretical perspective of affordance theory with Jakobson’s communication model provides scholars and practitioners an effective way to understand affordances communicated through a medical website.

**Who I am**

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Allison is a doctoral student in the Department of Advertising at the University of Texas at Austin. Allison’s research interests focus on how visual and interactive design influences health and science communication, including health and wellness campaigns and environmental science communication. Allison's long-term research goals focus on identifying the role of visual and interactive design, in strategic communication, as tools that aid in favorable perceptions and message engagement.

Before beginning her research career in the PhD program, Allison gained professional industry experience in a variety of visual design roles. Her experiences range from commercial photography in the food and product promotion market to interactive and print design in the health care industry, along with serving as an instructor of digital photography, graphic design, and media arts and animation courses.
References


Lesson 14: Project - Personal Portfolio Website. Web Lab | Project. Overview. Students have spent a lot of time throughout the unit working on their Personal Website. In the final couple of days students finalize their websites. They work with peers to get feedback, put the finishing touches on the websites, review the rubric and reflect on their process. To cap off the unit, they will share their projects and also a overview of the process they took to get to that final design. Purpose. Project portfolio management refers to the centralized management of one or more project portfolios to achieve strategic objectives. It is a way to bridge the gap between strategy and implementation, and ensures that an organization can leverage its project selection and execution success. PPM is generally used by organizations to identify the potential returns on a project. These cookies do not store any personal information. Non-necessary. Non-necessary. Project showcase with personality â€“ Hank has done a lot of different things, and the homepage of his website shows them off with minimalism and a bit of humor. Itâ€™s a great example of how your personal website can serve as a â€œhome baseâ€ for your various projects. John Green. Making a personal website is essential for impressing recruiters, sharing your portfolio, and building your brand. Here's how to create one in 5 easy steps. The Internship Experience: Weeks 3 + 4.