

Jennifer Rae Bulger. A Usability Study of Mental Health Websites with an Emphasis on Homepage Design: Performance and Preferences of Those with Anxiety Disorders. A Master's paper for the M.S. in I.S. degree. January, 2002. 71 pages. Advisor: Barbara M. Wildemuth.

This paper describes how five people with anxiety disorders interacted with three mental health websites. This study was designed to 1) explore the preferences of people with anxiety disorders with relation to the format of the homepages of the three sites used in the study, and 2) to determine how usable the three websites were for this user group with regard to task performance.

Overall, the participants preferred a simple and concise design for the homepage that was pleasing to the eye and easy to read. They also preferred a page with just the right amount of information (graphics, text, links) to make the page understandable without being overwhelming. Although the participants did have difficulties with various aspects of the sites tested, none of these could be explicitly attributed to the fact that the users in this case had an anxiety disorder.

Headings:

World Wide Web – Homepage

World Wide Web – Usability

Human Computer Interaction

Mental Health – Anxiety Disorders

A USABILITY STUDY OF MENTAL HEALTH WEBSITES WITH AN EMPHASIS
ON HOMEPAGE DESIGN: PERFORMANCE AND PREFERENCES OF THOSE
WITH ANXIETY DISORDERS.

by
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INTRODUCTION

User-interface design has become an increasingly important aspect of effective website development. One user population in particular is receiving more attention, that of people with disabilities. However, much of the World Wide Web's accessibility issues are concerned with people who have physical disabilities; little is known about accessibility issues pertaining to those with mental disabilities. Here I am referring to the mental disorders that include Mood Disorders (Depressive Disorders, Bipolar Disorder); Anxiety Disorders (Panic Disorder, Generalized Anxiety Disorder, Obsessive-Compulsive Disorder, etc.); and Personality Disorders (Borderline Personality Disorder, Paranoid Personality Disorder, etc.). Disorders not referred to here are the developmental disorders (Mental Retardation, Autism, Down's Syndrome), neurological disorders (Alzheimer's, Cerebral Palsy), and other cognitive disorders resulting from physical injury (brain or spinal cord) or disease (dementia).

Why is accessibility such an important issue for this distinct population? Mental health is a more prominent issue in society today than ever before, and the Internet plays an important role in the dissemination of information about mental disorders. While the stigma surrounding these disorders is still a great obstacle for many people, more are seeking professional help, including help from online resources. Budman (2000) offers several reasons for the use of computer-mediated communications (CMC) in behavioral health care. He defines CMC to include email, websites, and CD-ROM and DVD programs.

1. What is offered by CMC can be tailored to the needs of the individual –

CMC programs can be tailored to a specific individual's needs and preferences, whereas books or videotapes provide the same information to each person.

2. CMC is far less costly than face-to-face intervention or information –

The use of computers in behavioral health care is more time and cost efficient for clinicians, and can be administered in a quicker and more accurate way.

3. People tend to reveal more when interacting with computers than in face-to-face communications regarding embarrassing or sensitive information –

Budman cites several studies that found that people reveal more personal and/or embarrassing information when interacting with a computer compared to face-to-face interaction.

4. CMC information and intervention programs require much lower levels of commitment by program users, and CMC is always available and can be accessed conveniently, privately, and as needed –

Few people make use of treatment programs in the community, possibly due to a lack of motivation, inconvenience, embarrassment, or some other factors. CMC reduces these barriers because the programs are always available, they can be used anywhere the person can access the Internet or other required system, and they can be self-paced where the person can stop and start up again when they want.

5. Studies indicate better educational outcomes for children when CMC is used (and many aspects of child and adult behavioral health interventions involve education) –

The Software and Information Industry Association found that educational technology had significant positive effects on student achievement, student self-concept and attitudes about learning, and student-teacher interactions in the learning environment.

6. Greater standardization and objectivity are possible with CMC –

There is a general lack of consistency and standardization in behavioral intervention in the U.S. CMC programs are typically highly consistent and can be derived from an empirical knowledge base. They also give the clinician more flexibility in applying them as he or she sees fit (1291-1293).

An increasing number of people are accessing health information online. Fifty-five percent of American adults with Internet access have used the World Wide Web (WWW) to view health or medical information; twenty-six percent of these “health-seekers” have looked for mental health information. Twenty-one million health-seekers said they were swayed by the information they found online. Seventy percent of them were influenced on how to treat an illness or condition and twenty-eight percent said the information influenced their decision to see a doctor (Fox & Rainie, 2000). People who have a mental illness will be a major user group of websites providing this kind of information. Have the designers of these sites taken their needs into consideration and developed these sites for use by this population?

The research presented here entails a usability study of three mental health informational websites. To represent the user group of those with mental illness, people with Anxiety Disorders, specifically Generalized Anxiety Disorder (GAD) and Panic Disorder (PD), were chosen as a subset of this population. This is not a study of those afflicted with anxiety disorders; however, some literature about the disorders that were a part of the study will be reviewed to help in exploring any aspects of the websites that might be a barrier for people with these disorders. The emphasis here is on the ability of people to use these sites, especially those who are a part of the population for which they were designed. It is even more critical when those in the targeted population may have cognitive difficulties that can interfere with this ability.

RELEVANT LITERATURE

Two studies were found that are similar in nature, but not directly related to, the website usability study presented here.

Robertson and Hix (1994) examined the ability of adults with moderate developmental disabilities to use a personal computer. Interface design guidelines were formulated for this population by examining their ability to use a graphical user interface and several different input devices. At the start of their research, the authors admitted to being unable to find any existing guidelines regarding interface design and people with developmental disabilities.

Safford and Worthington (1999) compared computer anxiety in people with a severe mental illness (e.g. schizophrenia, bipolar disorder) and students at a community college. As was predicted by the authors, the individuals with a psychiatric illness had a significantly higher amount of computer anxiety than the college students. Two possible explanations given for this result were that the students had reported more computer experience than the individuals with mental illnesses, and the people with a mental illness may have had a higher level of general or trait anxiety as opposed to computer anxiety alone. There was no quantifiable data from the study that could affirm or refute either of these possibilities.

These two studies are related to the one presented in this paper because they both used subjects with some type of mental illness, though not the same disorders as those used in this study. People with a developmental disorder or a severe mental illness may face different issues when using a computer system because of the nature of these disorders. These two studies differ from this one because neither of them used the web in

their test procedures. The study testing computer anxiety used Windows applications, and the other involved games in a windowed environment.

The remainder of this section is divided into the major areas that are relevant to this study: usability, accessibility, GAD and Panic Disorder, human information processing, and the aspects of screen design explored in the interviews.

Usability

The following is a definition of usability that had been proposed within the International Standards Organization (ISO) as quoted in Booth (1989): “The usability of a product is the degree to which specific users can achieve specific goals within a particular environment; effectively, efficiently, comfortably, and in an acceptable manner” (p. 110). It would seem reasonable to assume that designers of websites and other systems would take measures to ensure that their products are usable by the widest audience possible; an audience that is, in most cases, very unlike the designer(s). But this is often not the case. Many do not have the expertise or an understanding of usability methods. This is crucial for systems whose majority of users are discretionary users, where people are often quick to judge a system based on the amount of effort they foresee having to put into achieving the results they want. This perception is “often enough to completely discourage system use, leading to system rejection, a common discretionary reaction” (Galitz, 1997, p. 68). This is especially important for people with disabilities who may require additional or different technologies than are assumed to be sufficient for the general public.

Accessibility

It is important to note, especially in the context of this study, some points that Alan Newell makes in his contribution to “Extra-Ordinary Human-Computer Interaction”

(1995). Everyone has ordinary and extra-ordinary abilities. Just because someone is deficient in one area (physical, sensory, or cognitive), does not mean he or she is deficient in all of these areas. We also have different sexual, cultural, political, and emotional characteristics that can affect how we use a human-computer interface. Extra-ordinary needs are only exaggerated ordinary needs – the way people with disabilities function varies from the “average”. This difference can be an extreme amount, or a very subtle amount.

This is obvious with physical disability. It is rare for people to have no motor control; some simply have significantly less motor control. This is also the case with cognitive dysfunction. A mentally handicapped person has lower abilities, not no abilities. A person who has aphasia following a stroke cannot remember the names of objects, but most human beings exhibit mild symptoms of this nature, particularly under stress (Newell, 1995, p. 8).

As stated earlier, the literature regarding accessibility is directed primarily towards people with physical disabilities; however, some recognition is given to cognitive disabilities. Examples of these conditions are usually in the form of developmental disorders or neurological disorders. The book “Extra-Ordinary Human-Computer Interaction” (Edwards, 1995) addresses computer interface issues faced by people with physical disabilities and how these are being resolved through the use of systems such as speech synthesizers for people who are blind and intelligent systems for people with speech and language disabilities.

The World Wide Web Consortium’s Web Accessibility Initiative (2001) has identified a number of disabilities where those afflicted might require special assistance in web use: visual, hearing, physical/motor, speech, and cognitive and neurological (e.g. dyslexia, ADD, Down’s Syndrome, learning disabilities). Mental illness is also explicitly addressed here. Characteristics of mental illness that could act as barriers to web use

include difficulty focusing on information and difficulty with blurred vision or hand tremors caused by medications. Elements that could pose problems include distracting visual or audio elements that cannot be turned off and pages with absolute font sizes that cannot be enlarged.

Chisholm, Vanderheiden, and Jacobs (2001) also present guidelines for accessibility to web content and suggest the means for achieving them. Examples include the proper markup of tables for use by accessible browsers and the misuse of tables for page layout (Guideline 5), which poses problems for those using screen readers; and designing with features that allow users to interact with their choice of input or output devices including a keyboard, mouse, voice input, head wand, etc. (Guideline 9). Some of the guidelines improve accessibility not just for those with apparent disabilities, but for all users. For example, guideline 13 states, “Provide clear navigation mechanisms”, and guideline 14 says, “Ensure that documents are clear and simple”.

Generalized Anxiety Disorder and Panic Disorder

People with Generalized Anxiety Disorder (GAD) and Panic Disorder (PD) were the user group defined for this study, but because all of the participants reported having GAD or some generalized anxiety (GA), the literature reviewed in this section will primarily focus on GAD rather than PD. The literature reviewed here will be relevant to both disorders because they are similar in that “both diagnostic groups experience considerable anxiety, but only PD patients exhibit an additional fear of the anxiety symptoms themselves” (McNally, 1992, p. 737). Rapee (1996) states that “panic attacks” and “chronic anxiety” should be seen as different labels for the same basic emotion, differing possibly along such parameters as temporal features and intensity” (p. 83).

Anxiety disorders are the most common of the mental disorders. The prevalence of anxiety disorders for adults in the U.S. is estimated at 16.4%; Generalized Anxiety Disorder is estimated at 3.4%, and Panic Disorder at 1.6%¹ (U.S. Dept. of Health and Human Services, 1999).

All human beings experience some anxiety; it serves a function in our survival. We are programmed to experience this “intensely unpleasant emotion” in response to something we perceive as dangerous or threatening to motivate us to take some action that will reduce the anxiety and prevent it from re-occurring. The problem here is not the anxiety itself; the problem is that it draws cognitive resources away from other tasks, so that the person is primarily focused on the anxiety. Actions taken to reduce the perceived danger will reduce the anxiety; however, if the danger is not reduced, then the anxiety will persist. If the danger is misconceived, the anxiety response will be inappropriate and no action can be taken to alleviate the anxiety. The person may remain in this anxious state long after the danger is gone, and will react to new experiences in a misguided way, perceiving danger where there is none (Beck, Emery, & Greenberg, 1985).

The Diagnostic and Statistical Manual of Mental Disorders (DSM-IV-TR) is the authoritative source for clinical definitions of mental disorders; it defines Generalized Anxiety Disorder as

Excessive anxiety and worry (apprehensive expectation), occurring more days than not for a period of at least 6 months, about a number of events or activities. The individual finds it difficult to control the worry. The anxiety and worry are accompanied by at least three additional symptoms from a list that includes restlessness, being easily fatigued, difficulty concentrating, irritability, muscle tension, and disturbed sleep.... Although individuals with Generalized Anxiety Disorder may not always identify the worries as “excessive”, they report subjective distress due to constant worry, have difficulty controlling the worry, or experience related impairment in social, occupational, or other important areas of functioning....The intensity, duration, or frequency of the anxiety and worry is far

out of proportion to the actual likelihood or impact of the feared event. The person finds it difficult to keep worrisome thoughts from interfering with attention to tasks at hand (American Psychiatric Association [APA], 2000, p. 472-473).

The worry often revolves around everyday life circumstances or activities and the focus of the worrisome thoughts can change from one thing to another. The physiological effects of a substance or a medical condition do not cause these symptoms. They are also not associated with symptoms caused by other anxiety disorders or phobias (Social Phobia, Panic Disorder, Obsessive-Compulsive Disorder) (APA, 2000).

Panic Disorder is defined as

The presence of recurrent, unexpected panic attacks followed by at least 1 month of persistent concern about having another panic attack, worry about the possible implications or consequences of the panic attacks, or a significant behavioral change related to the attacks... In addition to worry about panic attacks and their implications, many individuals with panic disorder also report constant or intermittent feelings of anxiety that are not focused on any specific situation or event. Others become excessively apprehensive about the outcome of routine activities and experiences, particularly those related to health or separation from loved ones (APA, 2000, p. 433-435).

Panic attacks are periods of sudden, intense “apprehension, fearfulness, or terror, often associated with feelings of impending doom” when no evidence of real danger is present. Symptoms including “shortness of breath, palpitations, chest pain or discomfort, choking or smothering sensations, and fear of ‘going crazy’ or losing control are present” (p. 429). Internal (physiological) or external (feared object or situation) triggers can initiate attacks. The panic attacks are not a result of the physiological effects of a substance, and are not caused by another mental disorder (APA, 2000).

Beck et al. (1985) list some cognitive symptoms of anxiety disorders. These include sensory-perceptual symptoms such as hypervigilance, self-consciousness, feeling of unreality, blurring of objects, and a “hazy or “cloudy” feeling. Thinking difficulties

include confusion, inability to recall important things, difficulty in concentration, inability to control thinking, distractibility, blocking, difficulty in reasoning, and a loss of objectivity and perspective (p. 23).

There are several types of theories concerned with the nature of anxiety including behavioral, cognitive, psychoanalytic, and biological theories. This paper will focus on the cognitive approach to anxiety because we are concerned with human information processing and how the websites tested may affect it.

Before exploring the literature, it is necessary to understand the distinction between state anxiety and trait anxiety made by many researchers in this area. Spielberger (1985) defines state anxiety as a “transitory emotional state” and trait anxiety as “relatively stable individual differences in anxiety proneness as a personality trait”(p. 176). Eysenck (1992) theorizes that state anxiety, rather than trait anxiety, determines processing efficiency since state anxiety is determined by trait anxiety and situational stress. While state and trait anxiety are easily distinguished conceptually, they are not easily distinguished empirically because they correlate highly with each other.

Three broad areas of information processing affected by anxiety are attention, memory, and performance. Each of these will be addressed as the major characteristics of GAD and generalized anxiety (GA) are discussed. GA is a trait that can be found in everyone to some degree. GAD refers to a specific set of symptoms defined in the DSM-IV-TR. The focus in the anxiety literature is usually on high levels of GA. GA and GAD are assumed to overlap a great deal, but this has yet to be confirmed through empirical investigation. However, many of the psychological factors pertinent to GA are applicable to GAD (Rapee, 1991).

People with GAD and generalized anxiety are characterized by hypervigilance.

This is an involuntary focus of attention on stimuli perceived as threatening, which limits the person's ability to focus on tasks by using a large part of their cognitive capacity; restricting the amount available for other tasks (Beck et al., 1985). Hypervigilance can be exhibited in different ways:

- general hypervigilance, where the person focuses on task-irrelevant stimuli, also known as distractibility;
- excessive environmental scanning, or rapid eye movement through the visual field;
- specific hypervigilance, where the person focuses on threat-related rather than neutral stimuli;
- broadening of attention before detection of a threatening, task-irrelevant stimulus; and
- narrowing of attention when a threatening, task-irrelevant stimulus is being processed (Eysenck, 1992, p. 43).

This narrowing of attention towards threatening stimuli or concerns “leads to runaway, out-of-control, intense worry” that is difficult to control effectively (Barlow, 1991, p. 6).

The selective attending to threatening stimuli is commonly evaluated using the modified Stroop test, where participants are told to name the color of words falling into threatening and non-threatening categories. Mathews and MacLeod (1985) performed this experiment and found that generally anxious participants were slower than the control group in color-naming any of the words presented, but more so for the threat-related words.

The other major characteristic of people with GAD and people with high trait anxiety is the propensity to worry. One study reported results where people classified as “worriers” had longer response times than “non-worriers” to a categorization task

simulating an ambiguous decision-making process. The study also concluded that worry “expanded the boundaries of the category”. The results were said to reflect the main concerns of people who worry--those of personal evaluation and fear of failure (Metzger, Miller, Cohen, Sofka, & Borkovec, 1990, p. 86-87).

Worry about task performance can have a detrimental effect on the resources of the working memory system, where information is concurrently processed and stored temporarily. The worry will result in the application of additional processing resources in an effort to reduce it by improving performance (Eysenck, 1992). Many studies found that worry and anxiety are associated with poor problem orientation, which may interfere with the problem-solving process (Dugas, Letarte, Rheaume, Freeston, & Ladouceur, 1995; Ladouceur, Blais, Freeston, & Dugas 1998; Ladouceur et al., 1999). Dugas et al. (1995) expressed problem orientation as “immediate cognitive-behavioral-affective reactions to problematic situations”, and problem-solving skills as “articulating goals, generating solutions, making decisions, and implementing and verifying solutions”(p. 117).

Eysenck (1992) states, “It is widely accepted that high trait-anxious individuals tend to perform cognitive and motor tasks at an inferior level to low trait-anxious individuals. This inferior performance is especially likely to occur when the task is difficult or complex and when it is performed under stressful conditions” (p. 125). He also notes that, because performance on any task is affected negatively in the presence of stress or state anxiety and high levels of state anxiety will impair all aspects of information processing, the findings in this area are not of high relevance. To determine the areas of information processing that are impaired by anxiety, it is necessary to study

less stressful conditions. High levels of anxiety are more detrimental to internal processing efficiency than performance effectiveness; however, this is difficult to test because processing efficiency is not easily measured. Mayer (1977) studied high and low-anxious subjects' performance on automatic or "rote" tasks and higher cognitive tasks where their test session was either controlled by the experimenter or was self-paced. He found that high-anxious individuals performed much worse than the low-anxious subjects on the cognitive tasks. The high-anxious group performed better in the self-paced session than in the session controlled by the experimenter.

It has also been found that those with clinical and non-clinical anxiety will interpret ambiguous words in a threatening way compared to those not experiencing anxiety (Eysenck, 1992). In a study of anxiety and the interpretation of ambiguity (specifically homophones having both neutral and threatening spellings, e.g., Die/Dye), clinically anxious participants interpreted homophones in the more threatening way. The authors relate this interpretation to common ambiguous events such as remarks made by others or bodily sensation, stating, "because ambiguous events of this type are very common in everyday life, it becomes plausible that such an interpretive bias is involved in provoking or maintaining anxiety states" (Mathews, Richards, & Eysenck, 1989, p. 33).

Human Information Processing

There are three major components of the human information processing system: the perceptual system, the cognitive system, and the motor system. This section contains a brief discussion of the aspects of the cognitive system relevant to this study and their application to human-computer interface design tying together the cognitive difficulties

people with anxiety disorders have with how the elements of websites can help or hinder this system. The motor system will be touched upon briefly because it does have implications for interface design, and is a factor for people with mental illness.

The following material summarizes Mayhew's (1992) discussion of the human information processing system. Card, Moran, & Newell (1983) provide a more in-depth look at the components of what they call the "Model Human Processor" and its abilities and limitations.

The cognitive system relies on both short-term memory and long-term memory to hold and process information. Short-term memory (STM) can store only a minimal amount of information and processes it at a very slow rate, holding up the entire information processing system. Miller (1956) calculated the capacity of STM to be seven plus or minus two units. Grouping or "chunking" information into patterns that are easier to remember allocates less space in STM. Some of the factors that affect our ability to hold and use information in STM include the amount of distraction present, the complexity of the task, and the amount of information to be remembered.

Information passes from STM into long-term memory (LTM), which can store an unlimited amount of information for an infinite amount of time. Retrieving stored information helps us to learn new information; however, storage and retrieval can be slow and cumbersome, often making this process difficult.

The primary processes of the cognitive system that are of importance to designers are selective attention, learning, problem solving, and language. Selective attention is the ability to voluntarily focus on items of interest (channel), while involuntarily being aware of what is happening outside of this channel. Human-computer interfaces can facilitate

this process through the use of different display techniques to focus user attention on various types of information, allowing for easier comprehension and scanning of the page. Examples of these techniques include boldface, color, and fonts. Other techniques that can grab the user's attention are blinking objects or animation, or the use of beeping noises or other sounds.

Learning requires the use of many processes including memorization, rule learning, and the acquisition of complex mental or motor skills. It is facilitated by analogy, or information that we are already familiar with, which makes it easier to learn and remember new information. Learning is also facilitated by the structure and organization of the information i.e., information that can be grouped into smaller, associated pieces rather than many unassociated pieces, is more easily stored in STM. Avoiding arbitrary words or jargon and new concepts that are unnecessary will make the learning process easier for the user. Information presented in an organized and coherent fashion will reduce the cognitive load on the user's memory and processing capabilities.

Problem solving involves storing new information in LTM and applying previously acquired knowledge to tasks or problems. The latter implies that our view of new information or problems will be a function of previous experiences and, therefore, will be different for each person. People often choose suboptimal problem-solving strategies for low-priority problems because an optimal strategy would also require many cognitive resources. An example would be estimating a sales discount rather than calculating the exact amount. People tend to learn better with practice; the more often something is seen or used, the easier it is to remember or learn. A system requiring more effort to learn than the user is willing to give will be used rarely or not at all. Designers

should understand potential users and the tasks that they might perform. Also, since user performance improves with practice, a system should accommodate novice and expert users so that new users don't become lost and frustrated, and experienced users aren't bored.

Because human languages and communication are so complex, it is critical that designers take this into consideration when building an interface. The way we use words, construct sentences, and the way we communicate with others all apply to interface design. The following are ways in which designers can alleviate language problems:

- using synonyms to account for the many different ways that users will express something;
- presenting all the information that users will need to complete a task, but excluding irrelevant information;
- providing enough context for users as they move about in a system so they know where they are, where they've been, and where they can go;
- simplifying things for novices, but providing more complex options for experts; and
- presenting an interface that is friendly and cooperative for discretionary users.

The final component of the human information processing system is the motor system. It is important for people with a mental illness, in particular, because some medications can cause shakiness in the arms or hands. Designers should attempt to minimize the amount of motor movement required to interact with a system because they can fatigue the user and require additional concentration; this includes head, eye, arm, hand, and finger movements. Targets on the screen can be highlighted when a pointer is placed on them to increase accuracy, and organizing screens to minimize scanning and searching will help decrease eye movements.

An important concept of human information processing is that of mental models as discussed by Norman (1988). He defines mental models as “our conceptual models of the way objects work, events take place, or people behave...these models are essential in helping us understand our experiences, predict the outcomes of our actions, and handle unexpected occurrences” (p. 38). Both designers and users have conceptual models of how a system should work. Since these two groups are only in contact with the system and not each other, it is critical that the designer consider the user’s model as much as possible. If users are not given the appropriate model of how the system works, they will supply their own models, which will more than likely be inappropriate.

Screen Design Factors

Homepages

The homepage is the entrance into a website. Although users may enter a site on a lower-level page, the homepage will more often than not be the first page the user encounters. Therefore, it is critical that the homepage make a positive impression so the user will remain on the site rather than clicking on another site. A homepage should be able to answer these questions in the first few seconds that a user spends on it:

- What is this?
- What do they have here?
- What can I do here?
- Why should I be here - and not somewhere else? (Krug, 2000, p. 101)

Singh and Dalal (1999) liken web home pages to advertisements in that they perform the same functions of informing and persuading; to create an “ideal customer” who, from a web context, will “hold positive beliefs and attitudes toward a site and sponsor, will frequently visit the site, buy products if available, and will spread positive word-of-mouth advertising about the site”(p. 92). A study comparing user’s comprehension of

cognitively designed homepages vs. non-cognitively designed homepages found that the former were comprehended better and faster. The cognitively designed pages were ranked high on structure, clarity, readability, and ability to identify major categories of information, ability to identify relationships between major categories of information, and ability to identify detailed categories of information. These pages were described as “simple”, “organized”, “structured”, and “clear”, where the non-cognitively designed pages were described as being “confusing”, “overwhelming”, “busy”, and “unstructured” (Dalal, Quible, & Wyatt, 1999).

Nielsen and Tahir (2001) give the following advice to designers of homepages:

- show the company name and/or logo in a reasonable size and noticeable location;
- emphasize the highest priority tasks so that users have a clear starting point on the homepage;
- use customer-focused language. Label sections and categories according to the value they hold for the customer, not according to what they do for your company;
- repeating identical items, such as categories or links, on the homepage in order to emphasize their importance actually reduces their impact. Redundant items also clutter the page; all items lose impact because they are competing with so many elements;
- spell out abbreviations, initialisms, and acronyms, and immediately follow them by the abbreviation, in the first instance;
- don't provide multiple navigation areas for the same type of links, this can fragment and complicate the interface;
- use graphics to show real content, not just to decorate your homepage; and
- keep external ads (ads for companies other than your own) as small and discreet as possible relative to your core homepage content (p. 10-29).

In addition, homepages should be short and concise, allowing users to access the most important information without having to scroll down the page (Horton, Taylor, Ignacio, & Hoft, 1996, p.116).

Information Overload

Too much information is bad, too little information is bad; one of the raging debates in screen design is how much information to display, an even bigger issue for homepages.

Long web pages that require users to scroll are a big problem, especially when important information is located farther down the page that is not immediately visible to users. Nielsen listed “Long Scrolling Pages” on his “Top Ten Mistakes in Web Design” in 1996. He stated that only 10% of users scroll beyond the first screen of information. This is less of a problem today because people are getting more experienced with web pages. However, he still advises designers to keep scrolling to a minimum, depending on the design trade-offs involved, and to display all navigation options on the first screen of the page (Nielsen, 1997).

The number of links on a page is also related to information overload. Khan and Locatis (1998) investigated the effect of link density and link display on information retrieval in a hypertext format. The results showed that fewer links displayed in list form rather than embedded in text produced the best search performance. More links provided more opportunities to make mistakes and added to the users’ cognitive load. Zhu (1999) reached the same conclusion, revealing “a significant relationship between the number of links and cognitive overload and disorientation” (p. 351).

Menu Design

Menus provide some clear advantages over other screen interaction styles, especially for novice and discretionary users. They help make the system easier to learn, provided there are clear instructions and choice labels, because it should be obvious to the user what can be done and how to do it. They are also easy to remember because they require the use of recognition memory rather than recall memory; users do not have to memorize and retain any semantic or syntactic knowledge of a menu to use it (Mayhew, 1992).

One of the fundamental decisions in menu design that will affect its usability is the breadth vs. depth tradeoff in the menu structure (Paap and Roske-Hofstrand, 1988). The advantages of having more options per menu are that the user will need to traverse fewer menus or pages to reach their goal, reducing the opportunity to get lost in the site structure. The disadvantage of greater breadth is a more densely packed menu, which may create confusion for the user. The advantage of more levels in a menu is fewer choices per menu. The disadvantages of more depth include more clicks to reach the desired information and an increased inability to predict what is beneath a menu category (Galitz, 1997). Miller (1981) performed one of the earliest studies on the depth/breadth issue. He concluded that an increase in breadth is preferred over an increase in depth; however, a balance must be maintained between the two. A study performed by Larson and Czerwinski (1998) indicated that designers should strike a balance between the number of categories for their information and the number of items displayed on each page. This requires paying more attention to layout, semantics, and labeling. Mayhew (1992) states that when the items in the menu are complex and/or the items cannot be

grouped meaningfully, the optimal breadth is no more than 10 items per screen. If the items are not complex and they can be grouped meaningfully, and the users will be infrequent/casual users, optimal breadth is 11-20 items per screen. Anything greater than 20 items can be used if the users are frequent/expert users and the other conditions are the same. Farkas and Farkas (2000) also favor breadth over depth; “the burden of having to negotiate more levels of depth is worse than scanning a longer list of links” (p. 345).

Another important decision is the organization of the menu options. The ordering of menu choices depends on what and how much information is going to be contained in the menu. Menu items with a natural sequence should be displayed in that form (e.g. numbers, temporal items). A small number of options should be listed by the order in which they are used, the frequency of use, or the importance of the item. If none of these orderings apply, then an alphabetic list is recommended. Alphabetic ordering is viewed as being the best choice for a large menu (Galitz, 1997). In a comparison of five types of menu organization with two different types of targets, McDonald, Stone, and Liebelt (1983) found that, for both target types, the category-within-category menu produced the shortest response times, and the random organization menu type produced the longest.

Links

Many authors agree that menu links should be logical and distinct, and that link headings should communicate clearly what will be found underneath. Also, descriptions should be used when labels may be unclear (Farkas & Farkas, 2000; Galitz, 1997; Mayhew, 1992; Nielsen, 2000a). Ambiguous link labels can lead users down the wrong path, or to a dead end, taxing a user’s patience (Fleming, 1998). One way to avoid this is to use link titles--an explanation that will popup when the link is scrolled over. Link titles

should not be used as a replacement for comprehensible headings and/or context; users should be able to understand the meaning of a link without having to scroll over it (Nielsen, 1998a).

Links should be designed so that they look like something that is clickable, especially in the case of images (Horton, 1994; Johnson, 2000). Providing link cues such as underlining or the raised “button” appearance is very important. Text labels should be used for graphics that are not icons in order to indicate a link; used with both graphics and icons, they can help guide the user to the desired location. However, if the page is too complex for users to notice the links, the efforts previously mentioned will be in vain. The most important links on a page should be viewable on the first screen, this way the links will not be missed because the user did not scroll down the page. In this case, a visual cue should be used (Farkas & Farkas, 2000).

Page Layout

How the information is presented on a webpage can make or break a user’s success with it. Dondis (1973) explores the various techniques of visual communication in “A Primer of Visual Literacy”. Galitz (1997) presents some of these standard principles in the context of web design; a few of the principles that can help create a webpage that is pleasing to the eye include balance, regularity, economy, simplicity, and groupings. A balanced page has an equal “weighting” of screen elements on each side of both vertical and horizontal axes. Regularity is a uniformity of screen elements achieved by using consistent spacing for rows and columns. Economy is the use of the minimum amount of display styles to convey the information to the user. Screen complexity can be minimized by optimizing the number of elements on the screen, but only to the point that

the information on the screen is still presented in a clear manner. Reducing variation on the screen by minimizing the number of alignment points makes for a less complex design. Grouping related information through the use of space, borders, and consistent backgrounds will help the user realize which information is related.

Web pages should be designed to facilitate scanning because users will not take the time to read entire pages that may or may not be of any use to them. Nielsen (2000a) found that 79% of users scanned web pages instead of reading them word-for-word. Dividing a complex page into separate zones lets users identify the type of information in each zone, allowing for easier scanning of the page (Horton et al., 1996, p. 405).

The use of frames on web pages is an important and controversial issue. Nielsen listed “Using Frames” as number one on his “Top Ten Mistakes in Web Design” in 1996, the reason being that they disrupt the user’s model of the web page by preventing the use of bookmarks, preventing the referencing of the page URLs, and disrupting the printing of the page. Since that time, some of these problems have been alleviated in the more recent browser versions. More importantly, frames make it more difficult for users to predict what information will appear and where it will appear when they click on a link. Nielsen (2000a) also states that a page without frames provides “more flexibility in accommodating different users” (p. 87). He does relent by saying that frames are acceptable for long directories and alphabetical listings.

Color

Galitz (1997) provides a thorough chapter on color; some of the main points are summarized below. When used properly, color can provide a way of enhancing the usability of a website by helping the user determine which information on the screen is

related through grouping the information, tying together information that is spatially separated on the screen, calling attention to certain information, or increasing the aesthetic appeal of a site.

Because of its ability to capture attention and show semantic relationships between information, inappropriate use of color can cause misunderstandings and impair user performance. The use of too many colors on a screen can slow users down. Four different colors is the maximum that should be displayed on one screen. Another problem with color is that a proportion of the population has trouble discriminating certain colors; about eight percent of males and 0.4 percent of females have some form of this deficiency. There are also differences in cultural interpretations of colors to consider.

Many authors caution against relying on color to convey relationships between information (Galitz, 1997; Chisholm et al., 2001). Galitz recommends designing a screen in monochrome before adding color. Similar colors should be used to display similar information; contrasting colors for unrelated information. Also foreground and background colors should be as different from each other as possible; red/green and yellow/blue are good contrasting combinations (Galitz, 1997; Murch, 1985).

Language

Because it takes longer to read from a screen than a paper document, and since users tend to scan web pages, the language on a website should be concise, simple, and clear. The amount of words used on a webpage should be kept to a minimum (Krug, 2000; Nielsen, 1998b). This will reduce the noise level of the page, make the useful content stand out, and shorten the length of the page (Krug). Nielsen also advises designers to keep sentence structures simple and to avoid complex words.

RESEARCH METHODS

There were two goals in this study. The primary goal was to explore the preferences of people with anxiety disorders with relation to the format of the homepages of the three mental health websites selected for this study. The secondary goal was to determine how usable the three websites were for people with anxiety disorders with regard to task performance.

Three websites were tested in the usability study. Participants were interviewed while interacting with the websites; the interview consisted of (1) five tasks to complete for each site, and (2) preference questions pertaining to various aspects of each homepage. Data collected includes whether tasks were completed successfully or not, the time it took participants to complete a task, and the preference data recorded from the interviews. The next sections will describe the methods in greater detail.

Participants

Generalized Anxiety Disorder and Panic Disorder were chosen from the class of anxiety disorders because of the pervasive and persistent nature of the anxiety in these disorders (as opposed to specific phobias caused by exposure to certain objects or situations, e.g., spider phobia or obsessive-compulsive disorder).

Five people took part in the study. They were recruited through an advertisement in The Daily Tar Heel, the campus newspaper of the University of North Carolina at Chapel Hill. In addition to the advertisement, flyers were posted around the campus. Five participants were thought to be a sufficient number because of the qualitative nature of this research; the preference information was the most sought after data. Nielsen (2000b) states that five users are all that is needed to find 85% of usability problems.

All of the participants were female. Four of them were between the ages of 18 and 29; the fifth was between the ages of 40 and 49. Three of the participants were undergraduates, one was a graduate student, and the fifth had a high school diploma; none of the students were enrolled in the School of Information and Library Science. All of the participants reported having GAD or generalized anxiety; four people were experiencing depression, and four reported having panic disorder or panic attacks. One participant also reported having obsessive-compulsive disorder. All but one was currently taking medication for these disorders. All participants used the WWW every day, and all of them reported searching for mental health information on the Web less than once a month or not at all (except one participant who searched for this information once a week). None of the participants had visited any of the study sites prior to the test.

Websites

As a preliminary study, the designers or webmasters of six mental health informational websites were surveyed via email regarding any usability testing or other research about potential users that might have been done for their sites. The survey questions were designed to find out what was done, what the results were, and any reasons for not doing tests or research. See Appendix A for the survey questions.

The websites that were used for this portion of the research were:

- Internet Mental Health – <http://www.mentalhealth.com>
- Mental Help Net – <http://mentalthelp.net>
- National Alliance for the Mentally Ill – <http://www.nami.org>
- National Institute of Mental Health – <http://www.nimh.nih.gov>
- National Mental Health Association – <http://www.nmha.org>
- The Center for Mental Health Service's Knowledge Exchange Network (KEN) – <http://www.mentalhealth.org>

These sites were identified via a web search. The Google search engine was used to search for the terms mental health. Five of the six sites listed above appeared on the first results page; the sixth website was known from previous research.

The sites tested in the usability study were chosen from the six listed above. The basis here for site selection was to capture the most diverse homepage layouts. Two of the six sites were excluded because the type and amount of information they contained did not conform to the rest of the sites. The number of text, links, and graphics on the remaining four sites were then tallied as a reference tool for choosing the sites to be included. One or more consecutive lines of hyperlinked text, excluding embedded links, were counted as a link element. Each item in a link menu was counted once. Included were hyperlinked graphics (image maps, icons, logos, etc.). Graphics encompassed all images, including those that were hyperlinked. This included banners, but not buttons or other images that serve as vehicles for link headings alone. Icons on buttons were counted as graphics. Text elements were defined as one or more consecutive lines of text that were not hyperlinked, but may have contained hyperlinked text. Objects not included in the tally were form elements (buttons, text fields, drop-down boxes, etc.). The results are shown in Table 1:

Table 1. Content analysis of candidate websites

Website	Text elements	Links elements	Graphics elements	Total
Internet Mental Health	15	31	4	50
Mental Help Net	39	124	20	183
National Institute of Mental Health	29	48	4	81
Knowledge Exchange Network	7	48	25	80

Internet Mental Health and Mental Help Net represent the two extremes with regard to the total number of objects on the homepage; both are dominated by links and both have more text than graphics. The Knowledge Exchange Network was selected over the National Institute of Mental Health because it had more graphics than text making the test set more diverse.

Thus, the following sites were tested in this study:

- Internet Mental Health – <http://www.mentalhealth.com>
- The Center for Mental Health Service’s Knowledge Exchange Network (KEN) – <http://www.mentalhealth.org>²
- Mental Help Net – <http://mentalhelp.net>²

Refer to Appendix B for screen shots of each site.

Internet Mental Health was started by a psychiatrist, and is designed “for anyone who has an interest in mental health”. Its creators describe it as “a free encyclopedia of mental health information” (Internet Mental Health website - “Our Purpose” page). KEN is a service provided by The Center for Mental Health Service, which is a part of the Substance Abuse and Mental Health Services Administration (SAMHSA) in the U.S. Department of Health and Human Services. KEN was designed for “users of mental health services and their families, the general public, policy makers, providers, and the media” (KEN website – “Contact Us/About KEN” page). Mental Help Net was started by a psychologist, and was developed as a “website on the topic of mental health as a free service to the worldwide mental health community of professionals and laypeople” (Mental Help Net website – “MHN Mission Statement” page).

Procedures

The usability study was conducted in the School of Information and Library Sciences’ Interaction Design Lab on the campus of the University of North Carolina at

Chapel Hill. Two video cameras were used: one to capture the on-screen interaction between the participants and the websites, and the other to capture a profile view of the participants' facial expressions. The test sessions were also audio taped. The websites were viewed in Netscape Navigator 4.7, with a screen resolution of 1024 x 768.

Participants took part in the study individually, and were compensated at a rate of \$12 per hour. After filling out the consent form, participants were informed about the format of the test session (see Appendix C for the consent form). They were given a pretest questionnaire to fill out (see Appendix D). Participants were asked for their doctor's name and how long they have been receiving treatment as a way to prevent people from misrepresenting themselves. It was felt that requesting medical records was an invasion of their privacy and wasn't necessary since the health status of the participants was not the focus of the study. When they were finished with the questionnaire, participants were then seated at the workstation where the test would take place. The format of the test consisted of semi-structured interviews where the test monitor sat beside the participants while the interview was taking place, allowing for additional questions and discussion. Questions and tasks were read aloud (See Appendix E for interview questions). No stimuli were presented to evoke anxiety in the participants; they were tested as if they were in a natural setting. Participants were not allowed to use within-site search engines to find information, but could use search mechanisms involving drop-down boxes with a controlled vocabulary. They were also instructed not to go outside of the site to complete a task.

Task Descriptions

Some of the tasks were consistent across all three sites; some varied by site depending on the type of information available on that site (see Appendix E for explicit tasks). The first task for each site required participants to search for a single word on the homepage. One of these tasks asked in the interview was “Find the word ‘symptoms’ on this page without using any search mechanisms”. All of the targeted words could be located in the initial screen area of each page so scrolling would not be necessary. All sites carried this task, but the word to be located varied for all three sites. The purpose of this task was to see how quickly participants were able to do a visual search on the page to see if the word density of the page made a difference. The rest of the tasks asked for some specific piece of information within the site. The next three tasks were the same for each site. They were:

- 1) What are the major characteristics of generalized anxiety disorder?
- 2) What is the mailing address for this site?
- 3) Does this site link to the website of the National Mental Health Association?

The fifth task varied for each site because not all of the sites carried the same information. An example from the final task is “Which drugs may interact with Valium?”

RESULTS

This chapter reviews the results of all aspects of the study and is divided into the following sections: a summary of the responses received from the website designer surveys; the task data analyzed by site and individual task times, along with an analysis of the initial links that participants used to start their search; and the preference data resulting from the interviews, categorized by website.

Survey Results

Only two completed surveys were received. The responses from the other four sites were as follows: one organization did not respond, one declined to participate, the webmaster of one of the sites was no longer with the organization, and the person in charge of another website had been with the organization for a short time and did not know much of the background of the website. The answers to the interview questions from the two sites that did respond are summarized below.

One organization stated that they did not perform any research on the characteristics of potential users or any usability testing of the site because of a “complete and total lack of resources”. In response to the question about accommodations for people with disabilities, they said that “simple” things had been done for those with physical disabilities, such as the use of alt tags and large fonts. They also stated that they were aware of a few principles including “overall design needs to be as simple as possible”, and “liberal use of ‘homey’ graphics and design elements help people to feel that the site is less sterile”. They did mention taking requests from users to make changes and accommodations to one of the sections in the site.

The other organization stated that they do analyze their log files to get a “general” idea of who is visiting the website. They also did usability tests; however, these tests involved internal staff only and they did not perform any tasks--they were just asked to browse the site. Changes were implemented as a result of these tests, but no specific examples were given in the response. They did state that they were not familiar with usability research as an option for their current site, but will hire usability experts to perform tests for the redesign of the site. They will also add a survey to gather

characteristics about users. Regarding accommodations made on the current site, they said that their site is 508 compliant³, and they have an initiative to put their publications in a format that is easier to read.

Task Data

The quantitative data analyzed from the usability tests include which tasks participants completed successfully and the amount of time it took to complete them. The mean, minimum and maximum completion times are summarized for each site in the table below (see Appendix F for individual participants' completion times).

Table 2. Mean, (Min/Max) task time per site*

Task	Internet Mental Health	Mental Help Net	KEN
1) Word search	25 (12/55)	16 (3/55)	21 (10/35)
2) GAD	94/47 ^a (25/280)	85 (25/220)	115 ^b (62/234)
3) Mail	19 (12/35)	47 (11/113)	48 ^c (15/89)
4) NMHA	77 (21/190)	80 ^d (38/116)	175 ^e (44/306)
5) Varied	90 (63/120)	85 ^f (7/262)	153 ^g (129/173)
Sum of means	305/258 ^h	313	512

*All times are in seconds.

^aThe task time for one participant was especially long because she had to restart the task when she reached a dead end and could not get out. The first mean includes this time, the second mean excludes this time. The maximum time includes the task time mentioned above.

^{b,c,d}One person did not complete the task or completed it incorrectly; n=4.

^eThree people did not complete the task or completed it incorrectly; n=2.

^fOne person found the information on a previous task. The minimum time includes this time.

^gTwo people did not complete the task or completed it incorrectly; n=3.

^hThe first summation includes the time footnoted in (a); the second excludes it.

The mean completion times for Internet Mental Health and Mental Help Net seem to coincide, except for the Mail task. The mean times for KEN were greater for tasks two through five than on the other two sites. The tables listing each participant's time on all tasks (see Appendix F) show that KEN had the most instances where participants were not able to complete the tasks in a reasonable amount of time or completed them incorrectly, especially tasks four and five.

The initial links that participants clicked on for each task were examined to see what link headings they thought would lead them to the correct information. The ideal initial link led to the shortest known path to the required information; not clicking on this link does not necessarily mean that the participants did not successfully complete the task. Also, the preference data and other problem areas discovered during the tasks will be examined for each website.

Internet Mental Health

All of the participants, except one, predicted Internet Mental Health to be easy to use based on their first impression of the homepage because it seemed clear and looked easy to browse. The exception here was a participant who wore bifocals; she stated that the font was not large enough and that the page looked "busy".

The only task where someone did not click on the correct initial link was the task asking to find the major characteristics of generalized anxiety disorder (GAD). The correct link was "Disorders", and the participant clicked on "Diagnosis". This link led to a "subscription area" allowing those who sign-up to access various areas such as the online diagnosis, a quality of life measurement, and research materials. This subscription

area is located on another website (a different URL), but this site has the same format as Internet Mental Health, including the logo, making it difficult to realize that this is another website. The entire toolbar containing the back button and the standard menu options disappeared (this was likely to be due to how the browser was interpreting JavaScript; the toolbars did not disappear in Internet Explorer) leaving the participant in a dead end. The browser was closed and reopened, and Internet Mental Health was loaded again. This added an excessive amount of time onto the task (see Table 2, above).

Mental Help Net

Three of the participants predicted this site to be difficult to use because the homepage was long and overwhelming. One person thought it would be easy because the information on the page was broken up well and a lot of it was listed up front. One person also thought the site would be easy, but only if you knew what you were looking for. At the end of the interview, there were mixed reviews of the site. The participant that thought it would be easy because of the way the information on the homepage was broken up, also thought it was easy afterwards. Two people thought the site was difficult to use, including the other person who predicted it would be easy. They said there were too many words on the page and it took too long to find information. The remaining participants thought the site was in-between easy and difficult. One said it was a little confusing and the other felt that she had to go through several pages to get to what she wanted.

For the task asking for the characteristics of GAD, one participant completely skipped over the “Anxiety/Panic” heading under the “Problems” category, and clicked on the “more” link. She was able to complete the task.

The link to the National Mental Health Association (NMHA task) was located under the “Associations & Organizations” link. One participant clicked on the main heading for “Professional Resources”, and another clicked on a community icon located at the left side the page. The second participant did not complete the task.

The question about the online discussion boards (Varied task) was a problem for some participants in terms of what to look under. The discussion boards were listed under “forums”; three people clicked on “chat” because they did not know what “forums” meant or they confused chat with a discussion board. All the participants were able to complete this task.

KEN

All of the participants thought that KEN would be easy to use because it looked concise and wasn't overwhelming. At the end of the interview, everyone agreed that the site was very difficult to use. KEN seemed to cause the most problems as far as participants not knowing what link to start their search with.

The task that asked for the mailing address for the site (Mail task) caused some confusion, especially in the sense that it seemed that they did know what site they were on. The correct address was located under the link “About KEN”. Only one of the participants clicked on that link initially. One looked under a link to SAMHSA, the Substance Abuse and Mental Health Services Administration; another looked under the “Services Locator” link, which searches for services in particular states; two people looked under “The Center for Mental Health Services” link. All but one were able to recover and find the correct address; this participant identified the address for The CMHS as being the address for KEN.

The task asking for non-traditional methods in treating mental disorders (Varied task) also plagued participants. No one clicked on the correct initial link to find this information. One person clicked on “What’s New”, another clicked on “Mental Health at HHS” (Health and Human Services), and three clicked on “CMHS Programs”. Two people did not complete this task correctly. The correct page link was “Consumer/Survivor Info”.

The correct initial link for the task asking for the NMHA link was “Links”. One person looked under “Professionals”. She did not complete the task, but neither did two other people who started with the correct link.

There were two major problems that users faced on this site. Two of the tasks sought information on the “Consumer/Survivor Info” page, which was linked directly from the homepage. It was also linked to the “Mental Health Information” page. Many participants looked for information under the “Mental Health Information” link, but as soon as they realized that what they needed was not explicitly on that page, they left. Many who did look at the “Consumer/Survivor Info” page for the first time, glanced at it and also left. Participants did not know what “Consumer/Survivor Info” meant or what they could find there. The second major problem had to do with the task of finding the link to the National Mental Health Association. Most of the participants clicked on “Links”, and then “Mental Health Resources on the Internet”, which were the correct choices. This led to a page containing a large menu of links covering various topics with no explanation of what could be found underneath, some of these were “Accessibility”, “Anxiety”, “Education”, “International”, “Marriage & Family”, and “State Planning”. Each of these links to another page of links relevant to the particular topic. Several of the

participants did not realize this and when they did not see the National Mental Health Association, they left the page and did not even bother to click on any of the links. They stated that they thought the link would lead to a page with information about that particular topic, not another page of links. To the credit of the designers, there was a link for Associations, and the link to the NMHA was located here. It was also located under other categories on this page such as “Advocacy/Consumers/Survivors”, “Depression”, and “Managed Care”. The NMHA link was not in the “Anxiety” category. So, not only were the links on the homepage ambiguous, but many on the internal pages were also.

Preference Data

The following summarizes the responses to the interview questions where participants were asked about their likes and dislikes of the homepages. Some of the comments are directed at internal pages, and will be labeled to reflect this. The tables provided for each site summarize the responses to the following interview questions:

- Do you think this page should have more graphics, less graphics, or do you like it the way it is?
- Do you think this page should have more links, less links, or do you like it the way it is?
- Do you think this page should have more text, less text, or do you like it the way it is?

Internet Mental Health

Four of the five participants preferred to use this site because they thought the information was easier to access than on the other sites. One participant disliked this site, saying she “wouldn’t spend five minutes here” and would move on to another site.

Table 3. Interview responses for Internet Mental Health

Participants	Graphics	Links	Text
Participant A	Way it is	Way it is	Less
Participant B	Way it is	Less	Way it is
Participant C	Way it is	Way it is	Way it is
Participant D	More	Less	Way it is
Participant E	Less	Way it is	Less

Organization. Several participants liked the organization of the links on this page; they said it seemed like the more important links were listed first or they were ordered by frequency of usage. One person called the page “text-booky”; another thought the links were laid out in an order similar to a research book, with the introduction at the beginning and the index at the end.

Some thought the less important categories such as “Magazine”, “Books”, and “Awards” should have been placed further down on the page or made less prominent. One participant thought that some of these categories were unnecessary; another thought they could be consolidated into the other categories.

Amount of information. A couple of participants thought the page had a good balance of information; comments included “not too cluttered” and “not too in-depth”. One participant mentioned that she liked the fact that the page almost fit on one screen. On the other hand, some people thought the page had too much information on it for a homepage; this was mainly due to the amount of text underneath the links. One participant said there was too much text and she didn’t want to read it; another said she didn’t bother to read the captions while she was performing the tasks. Another comment made was that the amount of text was fine, but there should be more graphics to guide the

user because the menu captions were not helpful; however, several participants liked the explanations of the link headings. One participant thought the page looked too “busy” for someone looking for quick information. Someone else said that the amount of links was “overwhelming”; this was due to the navigation links located on the left frame of the page.

Most of the participants felt that some of the internal pages were too long and they had to keep scrolling to find something. One of these was the page devoted to Valium, which was accessed for one of the tasks, but this observation can be applied to many of the specific medication pages. Each medication page does have anchors at the top for the categories listed on the page, but only one or two people used them. This may have been because they did not know the meaning of the category labels. Another problem page was the “Internet Links” page, which is extremely long. This page was accessed for the NMHA task. Some participants spent much of their time just scrolling on this page to find the link to the National Mental Health Association. This page also had anchors to the categories on the left frame of the page, and most people did not use these either. Again, this may have been because they did not know where to look.

Menus. Most of the participants thought the menu headings were clear and did not have any problems with the menu design, except for the participant who looked under “Diagnosis” instead of “Disorders” for the characteristics of GAD. She did not think the menu captions were helpful, stating that she would have a hard time deciding where to start on that page. She felt that it would have been helpful if specific disorders were listed under the “Disorders” category that she could click on directly. The rest of the

participants either said that they did not read the captions at all or that they felt the categories were explained well.

Language. For the most part, participants did not seem to have a problem with the language on this page, or on the rest of the site. One person said the text was written so that “regular people” can understand it. There was an issue with some of the language used on the “Medications” page where they found the information for the “varied” task on this site (drug interactions with Valium). It contained category headings such as “Pharmacology”, “Indications”, and “Contraindications”. The correct information for that task was listed under the sub-heading “Potentiation of drug effects”. What does potentiation mean? This may have contributed to the amount of scrolling done on this page, as mentioned above.

Colors. There were mixed feelings about the colors used on the page. A couple people liked the contrast of the dark blue and gold. One participant did not like the blue/gold combination, but said the page was easy to read. Another person found the white text “distracting”. The woman who wore bifocals did not like the white text on the dark blue background because it was more difficult for her to read. She would have preferred it if the colors were reversed. She also said that the font used on the page was not large enough for her to read.

Page layout. Participants found the “Greek head” located in the upper-right side of the homepage and other pages to be unnecessary and some found it distracting. They wondered if it had anything to do with the site.

Some didn’t like the use of frames on the homepage because it contained links that were redundant with the main menu. Participants tended to focus on and use the

menu in the larger frame rather than the navigation frame on the left side of the page. One person thought the left frame was easier to see than the main frame. Everyone thought the frames on some of the internal pages were useful and convenient because the left frame turned into a long alphabetical listing of medications or disorders allowing them to easily find what they were looking for, although several people scrolled for a couple of minutes to find the correct item. One person commented that there should be a search option so they did not have to browse that long list. On the disorders page, the left frame contained an option to change from an alphabetic listing to a categorical list; none of the participants used this function, probably because they had a specific disorder to look for.

Another problem addressed on the homepage were the two columns that made up the main navigation menu. Some participants commented that they would rather it be in one column, making it easier to read across.

Mental Help Net

The participant who disliked Internet Mental Health preferred Mental Help Net because she felt the information was more accessible from the homepage.

Table 4. Interview responses for Mental Help Net

Participants	Graphics	Links	Text
Participant A	Less	Less	Less
Participant B	Less	Less	More
Participant C	Way it is	Less	More
Participant D	Way it is	Way it is	Way it is
Participant E	Less	Less	Way it is

Organization. A couple of people thought the information on this homepage was well organized because of the way it was grouped under broader headings (in boldface)

with more specific topics underneath. The woman who preferred this site to the others said it seemed to “understand what somebody like me would be looking for”; by that she was referring to herself as a layperson. One participant felt the page would be easy if you knew what you were looking for. Another said that the organization was “hard to follow” and she had “no idea what goes where”.

Amount of information. Comments made by participants describing this homepage include “a lot of stuff crammed together”, “overwhelming”, “a lot going on”, and “way too busy”. Most of the participants felt that the page was too long and there were too many links, making it difficult to find what they were looking for. One person said that it took too long to find information on the page because she had to look closer to find something. Someone else said “for the homepage, it’s kind of nicer if you can fit more of it in the one screen, instead of having to scroll up and down”. A couple people did like the way a lot of the information was listed up front; however, some felt that text could be used to clarify the link headings.

Menus. One of the participants that didn’t mind the amount of information on the page thought the menus were broken up well. Someone said that they thought there should be more levels for the menus because there were too many links on the homepage. As mentioned previously, a couple of people thought the menus could use some text, but the others felt that the link names were clear enough and they didn’t need a description. They said the links were more descriptive and they had a better idea of where they were going.

Language. Most of the participants did not have any problems with the language on the homepage or any other pages they looked at, except for the few who had trouble

with the use of “forums” on the homepage where the discussion boards were located. One person said that she “never would have called it that”.

Colors. One of the participants thought that the colors themselves were fine, but there were too many different ones. Another participant said they made the page more readable. Someone else felt that the colors were not aesthetically pleasing; she said it seemed like “they didn’t put much thought into the aesthetics of the page”. Another person liked the way colors were used to make the links and headings stand out.

Page layout. A few people disliked the blank space at the bottom of the page. They felt that the information at the bottom should be moved up and the articles and larger graphics should be moved to the bottom of the page. One person said that they might see the blank space and think that it was the end of the page.

A few people had problems with the graphics at the top of the page or the objects down the left side of the page. One participant disliked having the two columns on the left side of the page for the news sections and the icons. She said it made the news sections hard to read because they were listed vertically. One participant didn’t like the clipart at the left of the page and thought the “Humor!” and “Gift Store” sections were “cheesy”. Several people didn’t like the graphics at the top of the page and most found the dynamic ad distracting.

KEN

KEN had the poorest performance data of the three sites (see Table 2), and all of the participants felt that it was very difficult to use compared to the other two sites. The link headings on the homepage were too ambiguous, and caused the participants much grief because they did not know which links to choose to find the information asked for.

Table 5. Interview responses for KEN

Participants	Graphics	Links	Text
Participant A	Way it is	Way it is	Way it is
Participant B	Way it is	Way it is	More
Participant C	Way it is	Less	More
Participant D	Way it is	Less	Way it is
Participant E	Way it is	Way it is	More

Organization. A couple of participants thought that the identity of site was unclear; this was evident when they were working on the third task (What is the mailing address for this site?). One person said, “It’s not completely clear to me whose webpage this is because there are so many logos on the page”. While they were completing the tasks, someone else said they weren’t sure when they were in KEN, or an external website. Someone else mentioned that there was no evident hierarchy to the organization; she couldn’t tell what was more important on the page.

Amount of information. Several people said that the page needs more information to help the user, that the amount of information was deceiving because it looked like enough. A few people felt that more text was needed to explain link headings. The other participants thought there was enough text, but the link headings needed to be clearer.

Menus. The major problem for the participants was the link headings; they did not know where to look for information. This applies to both the homepage and some of the internal pages that contained ambiguous link headings. The links on the homepage did have pop-up link titles, but they seemed to offer little assistance. For example, the

“Consumer/Survivor Info” link had the title “Consumer/Survivor Information”, and the “Mental Health Information” link had the title “Mental Health Information”.

Several people commented on the appearance of the links; they liked the buttons that contained the links and the icons. They also said this made it easier to tell that they were links.

A couple of people pointed out that the links on the bottom of the page were confusing for them because most of the links were redundant with the ones in the main menu, but there were some on the bottom that were not listed in the main structure. These included “Accessibility”, “Highlights”, “Surgeon General Report” and “Discrimination & Stigma”. Someone suggested that they put only the links on the bottom that were not listed in the main menu. One person also said the menu on the bottom was hard to read because the links were so close together.

Language. Participants did not seem to have any problems with the language except for that used for the link headings.

Colors. Everyone liked the colors on the page, especially the colors used for the link buttons. Someone said that the colors helped the links stand out against the white background.

Page layout. For the most part, everyone liked the appearance of the page. Several people said that it was easy to look at and not overwhelming. One person felt there was too much white space on the page; she said that it looked “unworked on”. Another person said she couldn’t tell if the hyperlinked graphics on the left side of the page belonged to this site or to an outside site; she also didn’t know if they were the same links as those on the main menu.

Summary of Preference Data

The participants' preferences can be summarized into the following:

- A simple design with pages that are pleasing to the eye and easy to read.
- A homepage with just the right amount of information (graphics, text, links) to make the page understandable without overwhelming the user.
- Shorter pages that do not require a lot of scrolling, especially for the homepage.
- Menus with options that are ordered in a meaningful way and/or have an evident hierarchy.
- Category headings that clearly identify what information is underneath.
- Meaningful grouping of information.
- A clear identity to the homepage.
- A minimal number of colors that differentiates information and contrasted well.
- Language that the user can identify with.
- Graphics that are purposeful to the site.

DISCUSSION

Concerning the results of the site designer survey, the “complete and total lack of resources” response that the first organization gave as their reason for not testing their sites can be classified into any of the first four reasons or “excuses” that people give for not doing usability tests (Krug, 2000):

- We don't have the time.
- We don't have the money.
- We don't have the expertise.
- We don't have a usability lab.

- We wouldn't know how to interpret the results (p. 145).

The response from the second site was a little more encouraging because they were planning on testing their site in the future.

The primary research presented here evaluated the usability of three mental health informational websites based on participants' preferences of the homepage of each site, and the results of task performance on the websites. Four participants agreed that they would rather use Internet Mental Health because the site was more intuitive. One participant preferred Mental Help Net because the layout and architecture of the site was easier for her to use. This was an unexpected result because most of the participants chose Internet Mental Health as the site they would rather use. It was not surprising that the participants found the KEN website difficult to use because the ambiguous menu structure made it difficult to navigate.

Because of the small sample size, it was not possible to assign statistical significance to any of the findings; that is, to say that one site outperformed another. Some general observations can be made from the task performance and preference data. Most of the participants preferred a simple design for the homepage, because they all liked the appearance of the conciseness of the KEN homepage. It also seemed to be the least daunting in terms of the use of color, large or distracting graphics, and the layout. Participants seemed to prefer a page that had the least amount of information necessary to convey ideas. None of the participants thought that any of the pages should have more links than were already on the page. A few people thought some of the pages should have more graphics or text, but these were occasions where the links themselves did not provide enough context for the participants to easily find what they were looking for.

The results of the tasks were as expected. Although the participants did have difficulties with various aspects of the sites tested, none of these could be explicitly attributed to the fact that the users in this case had an anxiety disorder. The problems that the participants had with the sites could have easily been problems for someone without an anxiety disorder, or without a mental illness for that matter. Some of the participants were visibly frustrated if they could not easily find the information requested, but that would be considered a typical reaction from someone struggling with a task. Therefore, the responses and performances of the participants in this study should not be interpreted as the traits of people with anxiety disorders, or anyone with a mental illness. This population was chosen as a representative user group of these websites; the population was also chosen based on the general characteristics of people with anxiety disorders because there may have been a chance that these characteristics would have posed as a barrier for website use. However, no such effects were found.

One factor that could have affected the results is the participants' attitudes towards the web and/or computers. Participants were not asked if computers were a source of anxiety for them; this could have had an effect on their performance. Also, being placed in a test-taking type of situation may have been another source of anxiety or worry for them. All of the participants except one reported taking medication for anxiety at the time of the test; one could speculate that this would have a positive effect on their performance. Three of the participants were taking medications classified as SSRIs (Selective Serotonin Reuptake Inhibitors). Hindmarch (1998) states that "under certain circumstances, some SSRIs are associated with an improvement in objective measures of cognitive function without any increase in psychomotor speed, i.e. the effect is 'mental-

alerting' and not simply one of arousal or activation" (p. 91). Further web-based research with this audience is called for in order to understand design characteristics that can best serve them.

CONCLUSION

Some specific recommendations to the designers of these websites arise from the results of this study. The homepage of Internet Mental Health could remove the "Greek head" in the upper right corner; or the graphic could be made smaller if it gave some meaning to the rest of the site. The page could also remove the navigation frame on the left side of the page, since it does not consistently appear on the internal pages. The designers of the Mental Help Net site could definitely shorten the page. This could be easily accomplished by moving the bottom of the page up to fill in the blank space in the page, and removing the large graphics at the top or reducing their size. The news briefs could be expanded in the left column to make them easier to read; this could be done by removing the icons or relocating them elsewhere on the page. The KEN homepage, without a doubt, should rename their link headings or at least provide more descriptive link titles or some short text for explanations of the links. They should also make it obvious to whom the homepage belongs. Because other organizations are also involved in providing this service, their logos should be shown but should be less prominent, and the relationships between the organizations made clear.

The findings of the performance and preference data were consistent with the screen design issues discussed in the relevant literature section, except for the participant who preferred the Mental Help Net site. This result differed somewhat from the literature because she preferred a long and densely populated page.

One of the limitations of this study is that there was no control group used to test the sites--a group of users who did not have anxiety disorders, or a mental illness.

Another limitation and one of the focuses for further research would be to employ user groups from the various populations that would be interested in mental health websites. These groups would include not just people who have a mental illness, but friends and family members who know someone with a mental illness and professionals/researchers working in the field. According to Nielsen (2000b), you should test with more than the recommended five users when there are “several highly distinct groups of users”.

The points made throughout this paper should drive home the idea that organizations need to perform usability studies on their websites to allow access to a wider audience. These studies should include members from all groups of potential users, especially when the potential users may have disabilities of any kind. Why aren't people with mental illnesses being included in this crucial phase of interface design? From the results of the site survey, it seems that mental health organizations aren't doing much usability testing at all. The one case where some preliminary research resembling usability tests was performed, the “users” were people internal to the organization. This is often the case when site designers and/or other staff involved in the design process (including the executive decision makers) don't have the knowledge of what constitutes an informative and reliable usability study. Hopefully, now that a great deal of attention is being brought to web access for people with disabilities, especially through the Americans with Disabilities Act, users with mental illnesses will play a greater role in this process of product accessibility.

NOTES

¹These statistics are best estimate 1-year prevalence rates based on Epidemiologic Catchment Area (ECA) and National Comorbidity Study (NCS) for adults ages 18-54.

²Since the time of this study (late August, early September 2001), the homepages of these sites have changed significantly.

³Section 508 of the Rehabilitation Act requires “federal agencies to make their electronic and information technology accessible to people with disabilities” (U.S. General Services Administration, 2002, “About 508” page).

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APPENDIX A - Survey Questions

- Was a specific target audience(s) in mind when you started designing the web site? If so, who were they?
- Was any preliminary research (not involving live participants) done on characteristics of potential users? If so, what was done?
- If not, were there specific reasons for not doing so?
- If so, what were they?
- Were any usability studies performed using this web site?
- If so, who were the participants of the study?
- Please describe briefly how the study was conducted (setting, what the participants did, what data was collected).
- What, if any, conclusions did you draw from the study?
- If you did not perform usability tests on the web site, were there specific reasons for not doing so? If so, what were they?
- Were any accommodations made on the site for people with disabilities (mental or physical)?

Appendix B – Screen Shots

Internet Mental Health - <http://www.mentalhealth.com>

Internet Mental Health - Netscape

File Edit View Go Communicator Help

Back Forward Reload Home Search Netscape Print Security Shop Stop

Bookmarks Location: <http://www.mentalhealth.com/> What's Related

INTERNET Mental Health

Internet Mental Health

Knowledge must be shared
Effective, well-researched treatments exist for most mental disorders, yet the majority of people who have severe mental illness are not treated. Our goal is to improve understanding, diagnosis, and treatment of mental illness throughout the world.

Thought for the Day from The Talmud:
"Happy is the person who performs a good deed: for this person may tip the scales for the world."

Introduction
Our purpose, helpful tips, how to contact us.

Disorders
Authoritative descriptions of the 54 most common mental disorders including: diagnosis, treatment, and research findings.

Discussion
Web Communities: Join in discussions on [Bipolar Disorder](#), [Depression](#), and [Schizophrenia](#).

Medications
Authoritative descriptions of the 72 most common psychiatric drugs including: indications, contraindications, warnings, precautions, adverse effects, overdose, dosage, and research findings.

Diagnosis
Online diagnosis of the 37 most common mental disorders (including: Anxiety Disorders, Mood Disorders, Schizophrenia, Eating Disorders, Personality Disorders, Attention Deficit Disorder, and Substance Use Disorders).

Quality of Life
Online assessment of an individual's quality of life (i.e., social functioning, vocational functioning, mental health and physical health). Weekly reassessment using this scale can accurately monitor an individual's progress or response to therapy.

Research
The latest research findings for each psychiatric disorder and medication.

Internet Mental Health (www.mentalhealth.com) copyright © 1995-2001 by Phillip W. Long, M.D.

Internet Mental Health - Netscape

File Edit View Go Communicator Help

Back Forward Reload Home Search Netscape Print Security Shop Stop

Bookmarks Location: <http://www.mentalhealth.com/> What's Related

INTERNET Mental Health

Introduction
Our purpose, helpful tips, how to contact us.

Disorders
Authoritative descriptions of the 54 most common mental disorders including: diagnosis, treatment, and research findings.

Discussion
Web Communities: Join in discussions on [Bipolar Disorder](#), [Depression](#), and [Schizophrenia](#).

Medications
Authoritative descriptions of the 72 most common psychiatric drugs including: indications, contraindications, warnings, precautions, adverse effects, overdose, dosage, and research findings.

Magazine
Mental health news, magazine articles, booklets, stories of recovery, letters, and editorials.

Books
Two books, "Our Lives with Schizophrenia" and "Our Lives with Depression", document the personal experiences of individuals recovering from schizophrenia and depression.

Quality of Life
Online assessment of an individual's quality of life (i.e., social functioning, vocational functioning, mental health and physical health). Weekly reassessment using this scale can accurately monitor an individual's progress or response to therapy.

Research
The latest research findings for each psychiatric disorder and medication.

Internet Links
Links to other mental health sites.

Awards
Special recognition we have received.

Help
How to find information on our site and on the Internet.

Index

Translate from: (Expect 5% translation error)

How Others Rate Us

No Corporate Sponsors

Internet Mental Health (www.mentalhealth.com) copyright © 1995-2001 by Phillip W. Long, M.D.

Document: Done

Mental Help Net – <http://mentalhelp.net/>

Mental Help Net... Welcome! - Netscape

File Edit View Go Communicator Help

Back Forward Reload Home Search Netscape Print Security Shop Stop

Bookmarks Location: <http://mentalhelp.net/> What's Related

The award-winning guide to mental health, psychology, & psychiatry online, sponsored by **CMHC Systems**

MHN
Mental Help Net

0% Intro then 9.9% Fixed APR
Capital One 60-Second Online Response go

Friday, August 31, 2001 Number of resources indexed: 9,300

HEALTH from HealthScout

Search MHN: Go! [Help](#) [Advanced](#)

This Week in the News:

Testosterone May Stave Off Alzheimer's damage
Women are up to three times more likely than men to get Alzheimer's disease -- and a group of Canadian researchers think they know why. The key, they say, is the male hormone testosterone. Their new study shows testosterone can protect the brain from cell death related to Alzheimer's. [More](#)

Practice Doesn't

Community can help you to feel better
Join Us!

FORBES.COM BEST OF THE WEB FAVORITE

New! Mental Health Video!
by Healthology

Psychology Today
HAPPINESS
FREE TRIAL CLICK HERE

Learn About Disorders & Treatments GO!

Problems:
[Abuse](#)
[ADHD/ADD](#)
[Anxiety/Panic](#)
[Bipolar Disorder](#) (Mania)
[Depression](#)
[Eating Disorders](#)

Free, Online Books:
[Psychological Self-Help](#)
[Self-Help Sourcebook OnLine](#) (Support Groups)

Services:
[Find a Therapist!](#) (Clinician Yellow Pages)

Document: Done

Mental Help Net... Welcome! - Netscape

File Edit View Go Communicator Help

Back Forward Reload Home Search Netscape Print Security Shop Stop

Bookmarks Location: <http://mentalhelp.net/> What's Related

Always Make Perfect
If you like to learn a new skill by repeating it until you've got it down, you might be deluding yourself into thinking you know more than you actually do, a new study says. [More](#)

Shapes, Sounds Help Dyslexic Kids Learn Words
Scientists can help dyslexic children read better with an ironic new method that doesn't involve the printed word. Finnish researchers say audiovisual drills that employ shapes and sounds can improve scores in children with the reading disorder. [More](#)

Do One Thing and Do it Well
If you think you're saving time by doing more than one thing at once, think again. Multitasking, that buzzword born in the 90s, actually slows you down. A new study finds that it adds as much as 50 percent to the time needed to complete the tasks, says this Hartford [Psychologist](#).

Medications
[OCD](#)
[Personality Disorders](#)
[Schizophrenia](#)
[Sleep Problems](#)
[Suicide Help](#)
[More...](#)

Resources:
[Symptoms List](#) (by disorder)
[Mental Health Terms Glossary](#)
NEW (Psychological and Psychiatric terms)

Find an Online Therapist
[Find Clinics and Treatment Facilities](#)

Research:
[Help out with a Research Study!](#)
[Visit the Research Forum in our Community](#)

Community:
[Forums](#)
[Chat](#)
[Opinion Polls](#)

Search Our Professional Resources GO!

Professional Topics:
[Diagnostic Criteria](#)
[Medication Information](#)
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Don't Suck in That Gut

Slow down. Take a deep breath. That simple folk wisdom is also powerful science. Research has shown that people under stress are more likely to get sick. Their wounds take longer to heal. They're more apt to be depressed, have high blood pressure and suffer heart attacks. People who learn to control their stress, on the other hand, reap a host of health benefits. [More](#)

Relaxing Helps Rosacea Patients See Less Red

If you have rosacea, the acne-like skin disorder that afflicted W.C. Fields and former President Bill Clinton, try not to worry about it. Emotional stress plays a major role in triggering flare-ups, finds a new survey by the National Rosacea Society. And people with rosacea report that minimizing anxiety and regularly using stress-busting techniques

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 A component of [Substance Abuse and Mental Health Services Administration](#)
 If you have comments or questions regarding this site, please send an email to ken@mentalhealth.org

Document: Done

Appendix C – Informed Consent Form

A Usability Study of Mental Health Websites with an Emphasis on Homepage Layout

Introduction to the Study:

I am inviting you to take part in a research study that tests the usability of mental health informational websites. My name is Jennifer Bulger, and I am a Master's degree candidate at the School of Information and Library Science at the University of North Carolina at Chapel Hill. This study will be a part of the research for my Master's paper.

Many of the World Wide Web's accessibility issues revolve around people with physical disabilities; little is known about accessibility issues pertaining to those with mental disabilities. The outcome of this study may have implications for future design of mental health websites to ensure increased accessibility to these sites, and to serve as a reminder that people with mental disorders make up a significant part of the population using these sites.

Purpose:

The purpose of this project is to evaluate the usability of selected mental health informational websites. The results of the study may have implications for future design of mental health websites to ensure broadened accessibility to these sites.

What Will Happen During the Study:

1. You will be asked to complete a questionnaire asking some background information about yourself and your use of computers.
2. You will be asked to complete five tasks on each of three websites. The tasks will involve finding specific information on the websites.
3. After the tasks have been completed for a particular site, I will ask you a series of questions pertaining to your opinion of the site.
4. Your interactions with the websites will be videotaped while you are performing the tasks. Your responses to the interview questions will be audio taped.
5. The entire test is expected to last about an hour; however, you will be compensated for all the time spent in the session, at the rate of \$12 per hour.
6. If you have any questions or concerns about being in this study, you can contact me via email at: bulgj@ils.unc.edu or by phone: (919) 967-5052, or contact my research advisor, Dr. Barbara Wildemuth at: wildem@ils.unc.edu or (919) 962-8072.

Your Privacy is Important:

- I will make every effort to protect your privacy.
- I will not contact your doctor/therapist for any reason.
- Records containing your personal information or performance/ responses recorded during the test will be coded with an identifying number rather than your name.
- The only people who will view the videotapes or interview transcripts received from the study will be my faculty advisor and myself.
- I will be the only one who has access to the paper containing your code number.
- During the study, all videotapes and paper records containing your personal information will be kept in a locked cabinet (for approximately six months), and will be accessible only by my Faculty Advisor and myself. I will not use your name or any other personal information in any of the information I get from this study or in any of the research reports.
- When the study is finished any paper or taped records containing your personal information and the paper containing the coded names will be destroyed.
- The data from the study will be generalized in such a way that it cannot be linked to particular persons.
- Should you at any time decide to not be in the study, I will immediately destroy any personal information I have about you.

Risks and Discomforts:

I do not know of any personal risk or discomfort you will have from being in this study.

Your Rights:

- You decide on your own whether or not you want to be in this study.
- You will not be punished or treated any differently if you decide not to be in the study.
- If you decide to be in the study, you will have the right to stop being in the study at any time.

Institutional Review Board Approval:

The Academic Affairs Institutional Review Board (AA-IRB) of the University of North Carolina at Chapel Hill has approved this study. If you have any concerns about your rights in this study you may contact the Chair of the AA-IRB, Barbara Davis Goldman, PhD at:

CB# 4100, 201 Bynum Hall
 University of North Carolina at Chapel Hill
 Chapel Hill, NC 27599-4100
 (919) 962-7761
 Email: aa-irb@unc.edu

I have had the chance to ask any questions I have about this study, and they have been answered for me. I have read the information in this consent form, and I agree to be in the study. There are two copies of this form. I will keep one copy and return the other to the investigator.

Signature of Participant

Date

Appendix D – Pretest Questionnaire

1. What is the highest education level you have completed?
 Some high school
 High school diploma
 Some college
 Two-year degree
 Four-year degree
 Beyond a four-year degree
2. About how often do you use a computer?
 More than once a day
 Once a day
 Once a week
 Once a month
 Less than once a month
3. What do you usually use it for?
4. Where have you used a computer?
5. How often do you look for information on the World Wide Web (WWW)?
 More than once a day
 Once a day
 Once a week
 Once a month
 Less than once a month
6. How often do you look for mental health information on the WWW?
 More than once a day
 Once a day
 Once a week
 Once a month
 Less than once a month
7. If you have looked for mental health information on the WWW, where have you done this?

Background information:

8. Age: _____
9. Gender: Male Female

10. Occupation: _____

11. Current Disorders:

12. Doctor's name: _____

13. Medications:

Appendix E – Tasks and Interview Questions

Internet Mental Health

1. (Word) Find the word therapy on this page without using any search mechanisms.
2. (GAD) What are the major characteristics of Generalized Anxiety Disorder?
3. (Mail) What is the mailing address for this site?
4. (NMHA) Does this site link to the website of the National Mental Health Association?
5. (Varied) Which drugs may interact with Valium?

Mental Help Net

1. (Word) Find the word symptoms on this page without using any search mechanisms.
2. (GAD) What are the major characteristics of Generalized Anxiety Disorder?
3. (Mail) What is the mailing address for this site?
4. (NMHA) Does this site link to the website of the National Mental Health Association?
5. (Varied) What online discussion boards are available at this site?

Knowledge Exchange Network

1. (Word) Find the word discrimination on this page without using any search mechanisms.
2. (GAD) What are the major characteristics of Generalized Anxiety Disorder?
3. (Mail) What is the mailing address for this site?
4. (NMHA) Does this site link to the website of the National Mental Health Association?
5. (Varied) What are some non-traditional methods to treating mental disorders?

Interview Questions for all sites

1. Have you visited this site before today?
2. Do you think this site would be easy or difficult to use based on your first impression of this page? Why or why not?
3. Do you think the information on this page is organized logically? Why or why not?
4. Do you think this page should have more graphics, less graphics, or do you like it the way it is?
5. Do you think this page should have more links, less links, or do you like it the way it is?
6. Do you think this page should have more text, less text, or do you like it the way it is?

7. Do you think the language used on the site is confusing or clear?
8. How do you feel about the colors used on this page?
9. Is there anything on the page that you found distracting?
10. Do you think there is too much information on this page, too little information on this page, or do you like it the way that it is?
11. Do you think there are too many objects on this page, too few objects, or do you like it the way it is? By objects, I mean graphics, text, and links.
12. Is there anything that isn't on this page that you think should be on it?
13. Is there anything you would change about the layout of the objects on the page? Why?
14. What do you like most about this page? Why?
15. What do you like the least about this page? Why?
16. Do you think this site is easy or difficult to use based on your interaction with this page? Why?
17. Of the three sites you worked with today, which one would you prefer to use? Why?

Appendix F – Individual Task Completion Times

Internet Mental Health

Tasks	Participant A	Participant B	Participant C	Participant D	Participant E
Word	55	32	8	12	19
GAD	45	44	74	280 [†]	25
Mail	16	19	35	12	14
NMHA	190	34	73	67	21
Varied	96	120	63	99	74

[†]the task time for this participant was especially long because she had to restart the task when she reached a dead end and could not get out

Mental Help Net

Tasks	Participant A	Participant B	Participant C	Participant D	Participant E
Word	13	4	55	6	3
GAD	220	46	69	25	66
Mail	27	53	32	113	11
NMHA	60	116	N/C*	106	38
Varied	262	30	7 [‡]	83	42

* N/C = task not completed or completed incorrectly

[‡]this participant found the information on a previous task

KEN

Tasks	Participant A	Participant B	Participant C	Participant D	Participant E
Word	19	19	10	21	35
GAD	96	67	234	N/C*	62
Mail	71	N/C	15	89	16
NMHA	306	44	N/C*	N/C*	N/C*
Varied	N/C*	157	173	129	N/C*

* N/C = task not completed or completed incorrectly