Trust and Mistrust of Online Health Sites

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ABSTRACT
Do different design and information content factors influence trust and mistrust of online health sites? Fifteen women faced with a risky health decision were observed while searching the Internet for information and advice over four consecutive weeks. In some sessions their searches were unstructured, whilst in other sessions they were directed to review specific sites, chosen for their trust design elements. Content analysis of concurrent verbalisations and group discussion protocols provided support for a staged model wherein design appeal predicted *rejection* (mistrust) and credibility of information and personalisation of content predicted *selection* (trust) of advice sites.

Author Keywords
Trust, credibility, health, social identity, Internet, computer-mediated communication.

ACM Classification Keywords
H3.3 [Information storage and retrieval]: *search processes*; K4.1 [Public Policy Issues]: *computer related health issues*.

INTRODUCTION
There are between ten and twenty thousand health-related sites available on the Internet and it has been estimated that over 21 million people have been influenced by the health information provided therein [25]. Young people in particular are turning to the Internet rather than to a family doctor or a parent to get health information and advice, and the appeal of the Internet is particularly strong for those people who wish advice on important but sensitive matters [18]. However less than half of the medical information available online has been reviewed by doctors [25] and few sites provide sufficient information to support patient decision-making with many also heavily jargon-laden and difficult to read [30].

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There have been numerous detailed assessments of the quality of health information on the web embracing diverse topics such as Viagra, rheumatoid arthritis and diabetes. Eysenbach et al [12] carried out a systematic review of health website evaluations and noted that the most frequently used quality criteria included accuracy, completeness and readability and design. *Accuracy* referred to the degree of concordance of the information provided with the best evidence or with generally accepted medical practice. *Completeness* was generally calculated as the proportion of a priori-defined elements covered by the website and *design* covered subjective design features such as the visual appeal of the website and its layout. Readability formulas were also used to establish the reading level of a document. In their review, the authors noted that 70% of the studies concluded that quality is a problem on the Internet.

The large body of research on online health advice belies the fact that very little is known about how health consumers seek advice. Almost all of the existing studies have evaluated the quality of information and advice available on the Internet from a medical perspective [30]. This is a problem, because we know that ordinary consumers search for and appraise information in a different way to experts. They are more likely to be influenced by the attractiveness of the design [31] and they will begin their search for advice from a general information portal [3] – which means that they gain access to information indiscriminately. Eysenbach & Köhler [11] noted that consumers (as opposed to experts) failed to check the authorship or owners of the website or read disclosure statements, despite suggesting these as important quality markers beforehand. However their study made use of an experimental search task and the authors suggested that people in a 'real setting' with a greater stake in the outcome may well pay more attention to the content of the websites, in terms of markers of quality.

There is thus a real need for systematic explorations of the ways in which people evaluate the trustworthiness of health information and advice online. However, there is a useful literature about the way in which consumers evaluate the trustworthiness of non-health information available to them

in an e-commerce context - see Grabner-Krauter, S. and Kaluscha for a recent review [15].

Based on this literature we can assume that various factors are likely to govern the extent to which individuals feel they can trust health advice online. Firstly, they may be influenced by the look and feel of the site – trusting, for example, those sites rated high in visual appeal and mistrusting those sites with poor visual design or with unprofessional errors. Secondly, they may be influenced by the branding of the site or by presence of familiar or images or trusted logos. Thirdly, they may be influenced by the quality of information available on the site, trusting those sites with greater perceived expertise, and fourthly, they may be influenced by the extent to which the advice is personalised to the individual – i.e. the extent to which the advice appears to come from and be directed to similar individuals (i.e. those with a shared social identity).

Although we know that these various factors are influential, there is disagreement about their relative importance in fostering trust. For example, some researchers argue that consumer trust (or a related construct, credibility) is primarily driven by an attractive and professional design [13, 31] or is influenced by the presence or absence of visual anchors or prominent features such as a photograph or kitemark [15, 28, 32]. Others argue that trust reflects the perceived competence, integrity predictability and/or benevolence of the site [2, 22, 19] and a few authors also highlight the importance of personalisation in the formation of trust judgments [3,4].

The picture becomes clearer when a staged model of trust is adopted in which users engage in some fast preliminary assessment of a site, before moving on to a process of in-depth evaluation of the information available in a selected few sites, and then finally developing a long-term trusting relationship with a particular site. The first two stages make sense when one considers that most users have to engage in a rapid screening process of the large numbers of sites accessed via a general search engine but can then spend longer getting to know a handful of sites in greater depth. They also reflect different cognitive processes or activities identified in the literature and roughly divided into a *heuristic* or *affect*-based stage where an initial trust impression is formed, and (ii) an *analytic* stage where a decision to engage properly with the site is made [3, 21]. It remains to be seen whether or both heuristic and analytic processes are employed effectively in a healthcare context to underpin a preliminary stage of (i) *intention to trust* and a later stage of (ii) *trusting activity* [22].

The final long-term relationship stage has been rather overlooked in the trust literature, although it was originally proposed in the Cheskin/Sapient report [6] and also appears in MoTEC (a Model of Trust for E-Commerce) [9,10], where the authors described a stage of trust maintenance, wherein the consumer develops an informal habit-like relationship with the vendor.

Sadly there is little empirical evidence for a staged model of trust in e-commerce (although it can be found in the managment literature) quite simply because most published studies of trust do not investigate the act of trusting, but rather investigate the intention to trust. In other words the online trust literature suffers from some of the same methodological problems as the health information literature – few studies involve real consumers engaged in real tasks. In a recent review of over thirty papers on trust in e-commerce, only two of the cited papers involved users who actually went on to buy a product [15]. Many of the experimental studies on trust recruited students to the task and most of studies of genuine consumers involved hands-off, no-purchase (and in some cases no interaction) evaluations.

In a recent critique of the trust literature, it has been argued that these methodological biases have led to a skewed understanding of the way in which trust develops in an online context and further, that genuine consumers viewing information and advice over longer periods of time are less likely to be influenced by the visual appeal of a site, and more likely to be influenced by relationship issues such as the degree of personalisation of a site, and the extent to which the site reflects their own social identity [4]. The online community literature stresses the importance of social and personal identities in the formation of long-term relationships [26, 20].

The current study is part of a longer-term project which aims to fill the gap in our knowledge of the ways in which real-world consumers evaluate information and advice online. Fifteen women at various stages of the menopause were observed searching for information and advice online over a four week period. This paper reports the outcome of observations and discussions during that period, and acts as an empirical test of the first two stages in the three-phase model outlined above. The third, relationship phase will be investigated in a subsequent diary study and six-month follow-up interview which will also explore the extent to which the women were influenced by the advice they encountered online, and the ways in which they integrated this advice with other sources.

The Menopause

Mid-age is often a time when women reassess their lives and the menopause can provide a focus for the consideration of health and lifestyle issues. During this time, women can be faced with a number of risky health decisions. Deciding whether to take prescribed medication or alternative remedies is one such decision.

Hormone Replacement Therapy (HRT) has been available in the UK since 1956. The treatment involves implants, pills, patches or creams containing oestrogen and (unless the woman has had a hysterectomy) progestogen to replace the natural hormones which cease to be produced after the

menopause. HRT is usually prescribed to relieve menopausal symptoms such as hot flushes, night sweats and sleep problems but it is also recommended by doctors to those patients at risk of osteoporosis.

However, HRT also increases the risk of two serious conditions: deep vein thrombosis (DVT) and breast cancer. Indeed part of the Women's Health Initiative study (WHI) was stopped early in 2002 because the risks were perceived to outweigh the benefits when they reported a large increase in breast cancer cases (http://www.whi.org)

The decision to take HRT is therefore complex and the uncertainty about its risks and benefits makes the decision more difficult [17]. The media and social contacts are often a woman's major source of information about HRT and the menopause [16]. More recently a number of specialized websites have appeared dedicated to women's health issues and to the menopause in particular [23]. Reed & Anderson [27] examined the ownership of menopause related websites in terms of their quality. They recommended pharmaceutical websites highly in terms of accuracy.

METHOD

Fifteen women at various stages of the menopause participated in the study (41-60 years, mean 49). All the women were interested in finding out more about the menopause and all used the Internet at least once a week although they had different degrees of confidence with respect to being online.

Each participant attended a total of four 2-hour sessions held in an Internet café in Newcastle-upon-Tyne, UK. During all four sessions, participants used the Internet to search for information and advice on the menopause, followed by a group discussion with a facilitator. Participants were told to freely surf the web during sessions 1 and 4, and were directed to specific web sites during sessions 2 and 3. These specific sites were chosen for their trust design elements.

Earlier focus group work had identified a number of issues that people anticipated would be important in terms of trusting online health advice. The issues were primarily content and provider based. They included the site being provided by a well- known organization, contact details on the website, simple easy to understand language and up-to-date information. These requirements are in line with those found by Eysenbach & Köhler [11]. They found that consumers reported wanting a reputable source of information, a professional layout and some sort of endorsement or quality seal. In this current study, the sites that the participants were directed to in weeks 2 and 3 contained various provider, content and design features varied for trust.

The participants were asked to record their perceptions of each site visited in a logbook and use this information during the discussion sessions. In addition, participants engaged in concurrent verbal protocols as they searched through some of the sites. The group discussion themes were developed in line with the research questions and were piloted during earlier focus groups. The discussion guide covered the following main areas: 1) current information sources, 2) search strategies, 3) liked and disliked websites, 4) first impressions and 5) revisiting websites.

All discussions and verbal protocols were transcribed and subject to content analysis. At the end of the fourth week the participants were given diaries in order to record their ongoing information and advice searches and were invited to take part in a follow up interview. An overview of the study procedure is shown in Table 1.

Week	1 hour Concurrent		10 minutes	50 minutes
1	Free web search	Verbal protocol	Break	Group discussion
2	Directed search to specific sites	Verbal protocol	Break	Group discussion
3	Directed search to specific sites	Verbal protocol	Break	Group discussion
4	Free web search	Verbal protocol	Break	Group discussion

Table 1. Overview of study procedure

RESULTS

Search strategies and effectiveness

During the unstructured sessions participants used a variety of search engines and portals to search for menopause information and advice. None of the participants used medical portals as a starting point for their searches, although a number of participants tried to guess the web address of the National Health Service (NHS) (without success). During week 1 the participants looked at between 2 and 6 sites. In total, more than 40 sites were visited during the first session.

The search strategies used by the participants varied according to specific areas of interest. To begin with participants carried out simple searches using single keywords. They soon modified their searches making use of explicit Boolean operators (in most cases "AND") and regularly altered search terms to alter the search engine results. The participants tended to work through the search results choosing to click on ones that sounded promising. They looked for certain keywords and source identifiers. Several participants limited their search engines to the co.uk versions to ensure UK relevant information.

The participants reported that they had been successful in finding the kind of information and advice that they were searching for. In general the participants preferred websites

that were specifically based around the menopause as opposed to women's health sites or general health and medical sites.

Content analysis of transcripts

The transcripts of the verbal protocols and the discussion groups were analysed for emerging themes concerning markers used by the participants to assess the trustworthiness of the online health advice. A coding scheme was developed in accordance with the aims of the research, the discussion guide and the emerging and recurring themes. In this paper we summarise those aspects of discussion relevant to the selection of sites. Responses were firstly coded according to the selection or rejection of sites and then in terms of design and content issues. A number of themes relating to the first impressions of the website and characteristics of trustworthy sites emerged.

Rejection of Websites

Participants discussed their first impressions of a website. There were two factors that led them to reject or mistrust a website quickly. These are summarized in table 2, with numbers included to give an indication of relative importance. The overwhelming majority of comments related to the design of the website.

Type of factor	Specific aspects of the site	Weighting (see legend)
Design	Inappropriate name for the website Complex, busy layout Lack of navigation aids Boring web design especially use of colour Pop up adverts Slow introductions to site Small print Too much text Corporate look and feel Poor search facilities/indexes	94%
Content	Irrelevant or inappropriate content	6%

Table 2. Factors relating to the rejection and mistrust of websites. The final column shows the number of times a factor was mentioned as a percentage of the total number of comments about rejection.

The look and feel of the website was clearly important to the participants. Visual appeal, plus design issues relevant to site navigation appeared to exert a strong influence on people's first impressions of the site. Poor interface design was particularly associated with rapid rejection and mistrust of a website. In cases where the participants did not like some aspect of the design the site was often not explored further than the homepage and was not considered suitable for revisiting at a later date. One participant mentioned that an instant rejection could also occur if the website was completely irrelevant and not related to the topic of interest at all.

> you have thrown a word in and you've come up with a website and its nothing in terms of what you are looking for and *you come straight out* ….you get a lot of stuff which has absolutely got no relevance and you think well how did I get to this screen (female, 53 years old)

However, as table 2 shows the main reason that websites were rapidly rejected was due to the design of the interface. Design issues affected first impressions and could lead to the mistrust of a website.

> It's so clinical, so pasty, lots of white lots of pale blue obviously trying to be gentle on the eye (female, 48 years old, verbal protocol)

> the banners, when they are trying to sell you something or click down here for your free whatever, you just get turned off (female, 49 years old)

Negative comments in the group discussion also related to poor interface design:

> And one of them I didn't like the colour of. I couldn't wait to get out it was an insipid green backdrop it just put me off reading it (female, 53 years old)

> There was just nothing I liked about it at all. I didn't like the colours, the text, the layout (female, 52 years old)

> I found the screen too busy I couldn't quite latch onto anything straight away (female, 66 years old)

An example of a mistrusted site is shown in Figure 1.

Figure 1. An example of a mistrusted and rejected website.

This site illustrates some of the features associated with mistrust including choice of colour, unusual layout (right hand side menus), and a corporate look and feel. Participants were also influenced by the website' name. A good name was specific and to the point but was not patronizing or too gimmicky. A poor name was not trustworthy and could lead to a rapid rejection of the site.

> Well I didn't like it, I think it was possibly the name but I didn't hold out any confidence in something called Netdoctor at all, it sounds more like an IT company to me (female, 41 years old)

Participants thought that the visual appeal of the site was important, poor visual appeal did not encourage further exploration.

> It's a very visual thing, anything that's covered in ads and pop ups and stuff like that I'm just not interested (female, 48 years old)

Selection of websites

The participants mentioned a number of factors in terms of the sites that they had chosen to explore in more depth. The themes are summarized in table 3. Trust was an important feature of the selected websites. The participants liked sites that contained a great deal of information but that was presented in such a manner that an individual could quickly pinpoint their own specific areas of interest. The participants' selection of websites to explore and revisit was also dependent on the assessment of the content in relation to their own personal angle.

Table 3 indicates that content factors were more important than design features in describing trusted or well-liked sites.

Type of factor	Specific aspects of the site	Weighting
Design factors	Clear layout Good navigation aids Interactive features e.g. assessment tools	17%
Content Factors	Informative content Relevant illustrations Wide variety of topics covered Unbiased information Age specific information Clear, simple language used Discussion groups Frequently asked questions	83%

Table 3. Positive features about selected, trusted sites

The favourite sites were usually described in terms of their content.

> I found an absolutely marvellous site I was really, really taken with it, it went into so such clear explanations and with a breakdown of the different, oestrogen, progesterone, testosterone and what they actually do and how they link together all along the way it kind of encouraged you at the beginning to work through the site progressively if you wanted to get like a whole raft of background knowledge and then it would help you make decisions, it was great (female, 48 years old)

Participants trusted the selected sites because they demonstrated an in-depth knowledge of a wide variety of relevant topics and put forward unbiased clear information. Participants were more likely to trust the information if they could verify it and cross check it with other websites.

> If I'd read something about that information before that sort of backed it up I would be more likely to trust it (female, 55 years old)

Most individuals preferred sites that were run by reputable organizations or had a medical or expert feel about them. They trusted the information on such websites especially when the credentials of the site and its authors were made explicit. Sites that indicated that the advice originated from a similar individual was also well received. Most participants showed some distrust of the advice and information on websites sponsored by pharmaceutical companies or those explicitly selling products.

Participants were looking for sites that were written by people similar to themselves, who shared similar interests. In this way advice feels personalized for them. Figure 2 illustrates some of the features of a trusted site. Project Aware is a "website by women for women." The site is split into menopause stage specific areas. The site covers a wide variety of relevant topics and provides links to original research materials. The language is clear and simple and the layout out is easy on the eye.

Figure 2. A trusted website

Although the participants were all interested in the menopause, they all had their own personal agendas and interests. One participant, for example, had a pre-existing condition, which prevents her from taking HRT. She searched for and selected sites, which gave her information and advice relevant to her condition and was particularly interested in alternative remedies.

> I can't take HRT that's my thing, that's the angle like you, everybody comes at it from their own angle (female, 48 years old)

Another participant had been through the menopause and felt that a lot of unanswered questions remained. She was searching through websites trying to find information and advice that matched her own experiences. The participants were keen to read about other women's experiences on website discussion boards although they did not feel immediately comfortable posting their own messages to the site.

> There was a case where someone was given it [HRT] and it did sort of relate to how it happened to me, it was good to know that I wasn't alone (female, 60 years old)

> "I'm not always looking for a medical opinion, I think its nice to read about other people's experiences, see how everyone else is coping (female, 49 years old)

One other participant was currently taking HRT but was keen to know more about the risks and benefits in terms of deciding whether or not to stay on the drugs.

> I know that I look at it and I have a slight HRT drugs bias I am on HRT and I am interested in finding out more about it I'm interested in seeing what the risks are (female, 52 years old)

Revisiting websites

Participants expressed their desire to revisit a number of the sites that had found or had been directed to over the course of the study. Reasons for revisiting a site included a change of symptoms or new information reported in the media. Participants talked about information rich sites, sites that you could become immersed in and the importance of bookmarking good sites.

> [This site] has a special interest to me personally and I'm absolutely fascinated…I shall definitely, definitely visit it again and take quite a lot of notes from it very, very useful (female, 41 years old)

SUMMARY AND DISCUSSION

This work is concerned with the issue of how trust develops in an online health context. As reported in the introduction, almost all studies of online health advice have evaluated the quality of information and advice available on the Internet from a medical perspective. In this study it has been shown that consumers, especially those with an interest in the health topic, search for and appraise information in a different way to experts. Reed & Anderson [27] recommended that women search for health information regarding the menopause on pharmaceutical websites because of the high levels of accuracy on such sites. The participants in our study, however, mistrusted sites sponsored by pharmaceutical companies and disliked sites with a corporate look and feel.

In their recent review of trust literature Briggs et al [4] have suggested a three-stage model of the process of trust development. In this paper we have reported on the first two stages of this model. During the first stage participants carried out a rapid screening process rejecting sites they did not trust. Mistrust was found to relate to poor design appeal. The participants were less likely to trust sites that contained adverts, pop up surveys or that were poorly laid out. Poor design gave a negative first impression and the name of the website could lead participants to mistrust the site and its authors intentions.

The selection of sites was based on trust. Participants trusted sites that provided informative content on a wide range of relevant topics. The information was trusted if it was unbiased and if the information on such sites was supported by research articles or original sources. Sites that were selected contained a variety of content features including Frequently Asked Questions (FAQs) and a section on hints and tips. Trusted sites were selected by the participants for further examination. This second stage of trust development relied more heavily upon a careful evaluation of website content. The participants were quick to notice website sponsorship, (even if buried in the small print), currency (how up-to-date the information was), any information biases, cultural differences or inconsistencies.

The participants trusted sites that reflected their own social identity. They liked sites that were written by women and those that they felt were specifically for women like themselves. Although there was not time during the four-week study for the participants to develop proper relationships with any of the websites they were already showing preferences for sites that reflected their own social identity. Social identity appears to be an important part of the trust process even during the early stages of trust formation a point which has not been fully recognized within the e-commerce literature on trust.

As predicted the participants in our study, with a greater stake in the outcome of their web searches, paid close attention to the content of selected sites and were careful and critical evaluators of the information. We can presume that for these users - faced with genuine health risks associated with taking the online advice - involvement with the site was high. This is important when we consider trust and reflects the work of Chaiken [5] who described two experiments that show that the degree of *involvement* in an issue affects processing strategy - those participants with low involvement adopted a heuristic approach to evaluating a message and were primarily influenced by its attractiveness, whereas those with high involvement adopted a systematic approach - presenting more arguments to support their judgment. Our results are also consistent with a number of other studies in the persuasion literature that show that people use cognitively intense analytical processing when the risks involved are great, or the task is particularly engaging, whereas they use affect or other simple heuristics to guide their decisions in low risk situations when they lack the motivation or capacity to think properly about the issues involved [7,21,24].

Future Work

We are concerned with exploring a three-stage model of trust as shown in figure 3. In this paper we have reported upon the first two stages of trust development The third stage, that of maintaining trust is a longer-term process is one which is unlikely to develop over a four week period, but it is also one where social identity influences may become more important. Many health decisions are subject to review based on changes in personal circumstances or the publication of new research findings. As such consumers are likely to revisit websites over a period of months to re-examine information and advice.

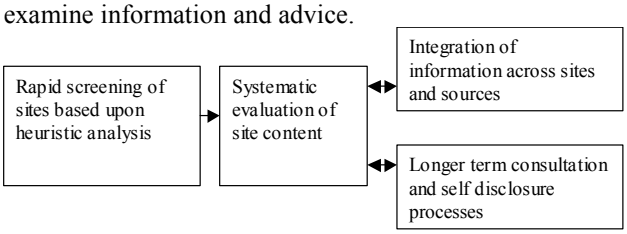

Figure 3. Staged model of trust

To investigate the longer-term process of maintaining trust the participants in this study have been given diaries to keep over a number of months and have been invited to take part in follow up interviews. It is anticipated that this data will allow us to examine the process of maintaining trust. We would predict that long term engagement with a health website is more likely to be influenced by issues such as the degree of personalisation of a site and the extent to which the site reflects the participants own social identity. As noted above, the participants were already starting to select and trust sites on the basis of the extent to which they were written by like-minded people and were targeted at people like themselves. Relationship building through involvement in discussion boards, however, was limited in our study, and is something that is more likely to develop over time in a more private setting. The diary and interview data will also allow us to examine the extent to which information and advice sought online is integrated with other sources of advice from friends and family, doctors, and government health campaigns. Finally, it should be possible to examine the extent to which the participants genuinely acted upon the advice sought during this four-week study.

CONCLUSION

Our work provides evidence for a staged model of trust in which visual appeal influences early decisions to reject or mistrust sites, whilst credibility and personalization of information content influences the decision to select or trust them. These findings overcome methodological criticism that many studies of online trust do not engage real users with genuine concerns. They also reconcile troublesome contradictions in the trust literature with respect to the importance of visual design and information content. The methodology employed here would seem a useful one for further investigations of trust although it is worth asking whether participants in a focus group setting might be tempted to make socially desirable responses when discussing content factors in the selection of sites. We have no reason to believe this to be true - the discussions genuinely reflect the logged behavioural data and participants were happy to stress the importance of design features in website trust (rather than try to impress others with careful considerations of site content). Nonetheless this is an issue that will be addressed explicitly in the individual follow-up interviews.

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