Do Credibility Cues Affect the Persuasiveness of a Web Site?

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I. BACKGROUND
It is thought that one way that internet users determine the quality of a website is to look for so called 'credibility cues' [1–3]. These cues can either be positive: the presence of a date, reference list, independent site certification; or negative: the presence of advertisements or broken links.

Previous studies have demonstrated that varying these cues can affect how user's rate online health information [4], [5]. To date however there has only been one study that investigated whether the presence/absence of these cues affected the persuasiveness of a health website [6]. The outcome measure of this study (N=85) was self reported alcohol consumption; the cues investigated included advertisements, a donation button, Health On the Net certification and pharmaceutical sponsorship. At on-week follow-up the study found a greater decrease in self reported weekly alcohol consumption in the high credibility group (1.3 units) than in the low credibility group (0.6 units) at one week follow-up.

There are a number of weaknesses in this study, the use of self reporting to measure alcohol consumption has been found to be unreliable [7]. Despite having 85 participants, only 22 reported alcohol consumption rates above the UK Government’s recommended limit. Finally the experiment was conducted in a highly structured environment, not representative of the conditions under which a participant is likely to engage with a behaviour change web site.

We explore whether a study can be conducted that improves on the design used by Harris et al [6] by:

1. Using a larger participant group
2. Allowing participants to explore in the intervention under natural circumstances
3. Measuring the target behaviour directly
4. Implementing a more comprehensive set of credibility cues

Organ donation registration was chosen as an ideal behaviour to target because the key behaviour (registration) can be directly performed via the internet. In addition, the intervention developed would provide a direct benefit to the public by increasing the number of registered donors.

II. AIMS
The aim of this research was to:

1. Develop an organ donation intervention encouraging students to make an informed decision about whether to register as an organ donor.
2. Instantiate two versions of this site, one containing positive credibility cues (see below) and the other containing credibility negative cues.
3. Evaluate the effectiveness of each version of the intervention by measuring registration rates.

III. HYPOTHESIS
More students will register as an organ donor through the site containing positive credibility cues.

IV. METHOD
Theoretical domain interviews with 10 Dundee University students were used to identify key concerns, attitudes and expectations about joining the organ donation register [8]. A persuasive website was then assembled adding content gathered through Google search to address those identified issues. The site was verified for accuracy by Dr Stephen Cole, Clinical Lead for Organ Donation at Ninewells Hospital & Medical School and is also a member of the UK Academy of Royal Colleges Donation Ethics Group.

Participants were randomised to receive one of two versions of the site; the 'High Credibility' site received the same content as the 'Low Credibility' site but with the following positive cues:

- University logo
- Https encryption
- The domain extension "computing.dundee.ac.uk" used to indicate that it was hosted by the University of Dundee School of Computing
- Physical and digital contact details
- Privacy Statement
- Date/time of page creation
- Third party certification
- Programming standards badges
- Referencing details

These credibility cues were absent from the 'Low Credibility' site. In addition the following negative cues were present:

- Google Adsense advertisements
- A broken navigation link entitled "Additional information"
- The domain extension ".com" to imply it was a commercial site.

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Credibility cues were selected based on a comprehensive literature review of over 600 abstracts of which 283 papers were read in full. This review identified 135 relevant papers including 86 user studies. Credibility cues explored in the literature were included in the study design as long as they did not affect a) degrade the quality of the content (e.g. misspellings) or b) represent unrealistic web design practices (e.g. stripping colours and formatting). This literature review will be reported as part of a PhD. Further background on credibility cues can be found by reading the works of Fogg et al [1], [9–13].

A manipulation check was conducted by presenting both versions of the site to 3 postgraduate students unfamiliar with the research. The students were able to identify the differences between the sites and indicated that the high credibility site appeared more credible.

Following the manipulation check, the study website was brought online and recruitment emails were sent to Dundee and Warwick students successively. Students had 4 weeks in which to enrol in the study. Eligibility criteria for participants were defined as being either:

- Not currently members of the NHS Organ Donor Register,
- or did not know what the register is
- or were unsure whether they were registered.

During the 4-week windows, 889 students participated and were randomised to one of two versions of the intervention.

Because credibility cues were present on all pages of the intervention site including the study information and consent pages, a measure of recruitment rates was included to assess any impact credibility might have on the decision to participate in the study.

V. RESULTS

In total 336 (37.8%) participants registered through the intervention website. This included 37.76% of participants registered in the positive cues intervention, 37.78% registered in the negative cues intervention (p=0.944 Chi squared=0.000 using a 2x2 contingency table) see Table I.

<table>
<thead>
<tr>
<th>Credibility</th>
<th>Registering</th>
<th>Not Registering</th>
</tr>
</thead>
<tbody>
<tr>
<td>High Credibility</td>
<td>176</td>
<td>290</td>
</tr>
<tr>
<td>Low Credibility</td>
<td>160</td>
<td>263</td>
</tr>
</tbody>
</table>

Table I - Registration Rates

Credibility cues also had no effect on recruitment rate (p=0.469 Chi squared=0.523 using a 2x2 contingency table) see Table II.

<table>
<thead>
<tr>
<th>Credibility</th>
<th>Participating</th>
<th>Not Participating</th>
</tr>
</thead>
<tbody>
<tr>
<td>High Credibility</td>
<td>466</td>
<td>637</td>
</tr>
<tr>
<td>Low Credibility</td>
<td>423</td>
<td>540</td>
</tr>
</tbody>
</table>

Table II - Participation rates for visitors to the study website

Website feedback indicated that the cues had a negative effect for a small minority of participants with 3 of the 31 site feedback comments describing unprofessional or untrustworthy appearance e.g. "The Website doesn’t seem so professional so I am weary[sic] of applying through here. There is no logo or society which is affiliated with this which adds to my uncertainty. The website looks very amateurish. Donating an organ is a big deal... I doubt people would do it through this website”

VI. CONCLUSIONS

The presence of credibility cues did not significantly affect the success of the intervention. This finding is interesting because it is the first time credibility cues have been explored with an objectively measured health behavior (registration as an organ donor). This study calls into question whether students are as critical of websites in practice as they are when asked directly.

In order to defend the null result it must be established that the credibility manipulations were successfully implemented and that the intervention developed was itself effective. The credibility manipulations used in the study website were based on a substantial literature review into perceived credibility of web sites. This combined with the manipulation check and the small number of site feedback comments specifically mentioning credibility cues demonstrates that the manipulations were successfully implemented.

The effectiveness of the intervention itself is harder to justify as no control intervention was used. A proposal has subsequently been submitted to the Chief Scientists Office for a 4 month project to compare the effectiveness of the intervention site with the current National Health Service Organ Donation website.

Credibility cues as described in this report can be referred to as surface credibility [14] and do not take into account the credibility gained from the referrer i.e. a link followed on a university email. It is possible that this form of credibility overrides surface credibility cues or that such cues are only evaluated when the content being examined is not understood or contradicts the readers views/knowledge [15].

As far as the authors are aware there has yet to be a study in which adult participants are unaware of a site's origins or that they are participating in a research study, although Eastin et al [16] did use a deceptive search engine (which returned the study results regardless of search terms) with elementary school children.

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