

ON TRUST IN THE INTERNET: BELIEF CUES FROM DOMAIN SUFFIXES AND SEALS OF APPROVAL

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ABSTRACT

Beliefs about the validity and reliability of Internet web-site information is important to both the user and to the success of a site. The present study examined aspects of reported trust of the Internet. A total of 247 participants (171 undergraduate students & 76 non-students) were asked a series of questions. In general, participants reported trusting only 55% of the information they found on the Internet. Students and non-students differed in their trust of .gov and .edu domain suffixes as well as several seals of approval (e.g., Verisign, Trust-e). In addition, the ratings of several fictitious seals were judged as trustworthy at levels as high or higher than actual seals. Participants who use the Internet for more hours per week showed significantly more trust for some domain suffixes and seals of approval than those who use the Internet for fewer hours. A similar pattern was seen for both students and non-students. Implications for erroneous beliefs and use of information on the Internet are discussed.

INTRODUCTION

Many people around the world use the Internet to acquire information on various topics. Some of the information is of high quality but unfortunately some is not. Trust is becoming an important factor with respect to the Internet since anyone can put anything on a website. Search engines reference many sites, some of which may not give valid or reliable information as sites vary on their accuracy, comprehensiveness, and currency.

E-commerce has developed faster than the means of protecting consumers from those who wish to exploit them. Those who steal private information or run fraudulent sites may affect people's beliefs in the trustworthiness of this new and growing medium. Novice users may not realize that they need to be critical of the information that they send and receive. New or less frequent users of the Internet may not yet have developed a basis on which to filter out unreliable sites. Novices' lack of experience with the WWW may allow others to take advantage of or exploit them. Persons with more experience may (a) have greater trust generally (according to George, 2002), (b) have less trust generally, or (c) may be better able to discriminate the difference between a trustworthy site and one that is not.

A survey evaluating the credibility of web sites found that consumers reported the "design look" of the site as being the most important indication of its

credibility (Stanford, 2002). Other indications of credibility were its association with less credible sites, spelling errors and lacking references. Fogg (2002) conducted another survey and found that site design was again the most important determinant of a sites perceived credibility followed by layout, while company recognition and reputation were reported to be much less important.

Another feature that could potentially increase the credibility of a site are seals of approval. Seals of approval are created by organizations that require a company or some other entity to follow a set of protocols or standards when handling consumer information. Websites that conform to the necessary standards can use an organization's seal. The seals are intended to convey the message that some minimal standards are being met. A company potentially benefits from a seal of approval by enhancing the credibility of their website.

This study examined people's trust of information on the Internet. First, a general question about trust was asked. Second, two characteristics of sites that may relate to perceived credibility were investigated. One was domain suffixes (.com, .net, .org, .gov, and .edu) and the other was seals of approval. Third, demographics that may relate to Internet trust were investigated.

Table 1
Mean Ratings of Trust as a Function of Hours on the Internet and Occupation for Domain Suffix Trust (SD in Parentheses)

Suffix	Internet/Week Usage Hours		Occupation		Mean
	Low(<15)	High(>15)	Non-Student	Student	
.edu	74.9 (21.3)	80.4 (16.9)***	71.4 (22.3)	80.6 (16.9)***	76.8
.gov	73.3 (23.9)	78.7 (17.6)**	70.3 (23.6)	78.7 (19.3)***	75.3
.org	63.5 (23.3)	64.0 (21.3)	64.3 (22.8)	63.5 (21.9)	63.8
.net	50.8 (18.8)	49.2 (21.7)	50.7 (20.7)	49.6 (20.2)	50.1
.com	46.8 (21.7)	47.1 (21.3)	47.9 (23.3)	46.6 (20.6)	47.1
Mean	61.9	63.9	60.9	63.8	

Note: Higher scores indicate greater levels of trust

** $p < .01$. *** $p < .001$

METHOD

Participants

A total of 297 volunteers from the Raleigh, North Carolina and near by areas participated. Data was collected as part of an ergonomics class project in which undergraduates solicited 10 persons to complete the survey. Due to incomplete data, 14% of the original surveys were not included in the analyses described below. The resulting sample consisted of 171 undergraduate students and 76 non-students ($M = 26.34$ yrs, $SD = 11.58$), including 125 males and 122 females.

Materials and Procedure

Each participant was asked to complete a multi-topic survey that included items on demographics (e.g., age, sex, occupation) and Internet trust. Participants were asked to:

- Estimate how many hours per week they use a computer to connect to the Internet (including email) over the past year.
- Give a percent rating to what extent they trusted the information on the Internet/World Wide Web in general.
- Rate the domain suffixes .gov, .edu, .com, .net, and .org indicating the extent to which they would trust the information on a site with that suffix.
- Rate a set of seals of approval (shown in Table 2) indicating the extent to which they would trust the

information associated with them. Seven were from web-based organizations and three were fictitiously constructed by the experimenters: (d) Accu-Chek, (h) Web Verification Assurance System, and (i) Honest and Integrity on the Web. The fictitious seals were included to determine if they might be as credible as seals that are actually used.

Ratings were based on 100 percent scales with the following anchor descriptors: (0%) "Would not trust at all," (50%) "Would trust about half," and (100%) "Would trust completely."

RESULTS

Participants reported trusting 55% ($SD = 16.4$) of the information on the Internet in general. On average, the participants reportedly using the Internet 25.4 hours per week ($SD = 30.8$). This distribution of hours per week was positively skewed, having a median of 15 hours. A median-split was used to divide participants into two groups according to hours of Internet usage (i.e., more vs. less than 15 hours per week). This variable was used in subsequent analyses.

Suffix Trust

Table 1 provides the means and standard deviations for domain suffix for participant occupation (student vs. non-student) and Internet usage hours per week: (low < 15 vs. high > 15). A 2 (hours usage) x 5 (domain suffix)

Table 2

Mean Ratings of Trust as a Function of Hours on the Internet and Occupation for Seals of Approval (SD in parentheses)

Trust Seals	Internet/Week Usage Hours		Occupation		Mean
	Low (<15)	High(>15)	Non-Student	Student	
(a) 	49.5 (27.1)	58.8 (25.9)**	43.9 (30.5)	59.0 (23.7)***	52.8
(b) 	47.2 (28.0)	50.0 (25.0)	39.3 (24.5)	52.9 (24.3)***	47.4
(c)  Make privacy your choice™	43.2 (26.1)	46.3 (24.4)	38.7 (26.3)	47.5 (24.3)**	43.9
(d) 	42.5 (25.7)	43.0 (24.8)	38.6 (26.6)	44.7 (24.4)	42.2
(e)  Health On the Net Foundation	40.8 (24.8)	43.1 (24.3)	38.2 (24.6)	43.7 (24.3)	41.5
(f)  customer certified	38.3 (23.9)	44.8 (25.0)*	35.9 (27.1)	44.3 (23.1)**	40.8
(g) 	40.8 (26.8)	41.7 (25.5)	38.9 (28.8)	42.3 (24.7)	40.9
(h) 	40.7 (24.9)	40.8 (24.2)	35.0 (25.8)	43.3 (23.5)**	40.0
(i) 	40.2 (24.0)	39.6 (25.0)	36.3 (25.3)	41.5 (24.0)	39.4
(j) 	34.6 (23.5)	38.9 (24.0)	30.7 (25.5)	39.7 (22.5)**	36.0
Mean	41.8	44.7	37.6	45.9	

Note: Higher scores indicate greater levels of trust; ■ Indicates fictitious icon & trust symbol

* $p < .05$. ** $p < .01$. *** $p < .001$

mixed-model analysis of variance (ANOVA) showed a significant main effect of domain suffix, $F(4,980)=205.41, p < .0001$ and the interaction, $F(4, 980)=2.62, p < .05$, but not a main effect of hours usage,

$F(1, 245)=1.07, p > .05$. Tukey's Honestly Significant Difference (HSD) test on the domain suffix means showed that participants trusted .edu ($M=76.8$) and .gov ($M=75.3$) significantly more than the other suffixes, but

these two did not differ significantly from each other. The domain suffix .org ($M=63.8$) was trusted significantly more than .net ($M=50.1$) and .com ($M=47.1$). The latter two, .net and .com, were not significantly different. Tests of simple effects revealed that participants who report using the Internet more than 15 hours a week also reported greater trust of the domain suffixes .edu ($M=80.4$) and .gov ($M=78.7$) than participants who reported using the Internet less than 15 hours a week, .edu ($M=74.9$) and .gov ($M=73.3$). The remaining comparisons were not significantly different.

A 2 (occupation: student vs. non-student) x 5 (domain suffix) mixed-model ANOVA showed a significant main effect for domain suffix, $F(4, 980)=157.26, p<.0001$ and the interaction, $F(4, 980)=6.47, p<.0001$, but not the main effect of occupation, $F(1, 245)=1.85, p>.05$. Tests of simple effects revealed that students reported greater trust of .edu ($M=80.6$) and .gov ($M=78.7$) than non-students, .edu ($M=71.4$) and .gov ($M=70.3$). The remaining comparisons were not significantly different.

Seals of Approval

Table 2 provides the means and standard deviations for Internet seals of approval for Internet usage hours per week (low < 15 vs. high > 15) and participant occupation (student vs. non-student). A 2 (hours usage) x 10 (seals of approval) mixed-model ANOVA showed a significant main effect for seals of approval, $F(9, 2205)=24.36, p<.0001$, and the interaction $F(9, 2205)=2.39, p<.01$, but not the main effect of student, $F(1, 1245)=1.28, p>.05$. Tukey's HSD test showed that participants reported that they trusted (a) Verisign ($M=52.8$) significantly more than all of the other seals. The (b) Health Web Site Accreditation ($M=47.4$) and (c) Trust e ($M=43.9$) were trusted significantly more than all of the remaining seals. This latter set did not significantly differ from one another, except that the lowest (j) Scambusters ($M=36.0$) was rated significantly lower than seals (d) Accu-Chek ($M=42.2$), (e) Health On the Net Foundation ($M=41.5$), and (f) BizRate.com ($M=40.8$). Test of simple effects revealed that participants with more online hours each week reported greater trust of (a) Verisign ($M=58.8$) and (f) Bizrate.com ($M=44.8$) than those with less hours each week., Verisign ($M=49.5$) and Bizrate.com ($M=38.3$). The remaining comparisons were not significantly different.

A 2 (occupation: student vs. non-student) x 10 (seals of approval) mixed-model ANOVA showed significant effects for both main effects and the interaction; trust seal, $F(9, 2205)=17.08, p<.0001$, occupation, $F(1, 245)=9.19, p<.01$, and interaction $F(9, 2205)=2.93, p<.001$. Tests of simple effects revealed that students,

compared to non-students reported greater trust of (a) VeriSign ($M=59.0$ vs. 43.9), (b) Health Web Site Accreditation ($M=52.9$ vs. 39.3), (c) Trust e ($M=47.5$ vs. 38.7), (f) BizRate.com ($M=44.3$ vs. 35.9), (h) Web Verification Assurance System ($M=43.3$ vs. 35.0), and (j) Scambusters.org ($M=39.7$ vs. 30.7). The remaining comparisons were not significantly different.

DISCUSSION

The results show that reported trust of Internet web sites differed as a function of domain suffix and seals of approval. For the domain suffixes, .gov and .edu were rated the highest and .net and .com were rated the lowest. This finding is sensible in that most information posted by government agencies is accurate and based on considerable internal and external review. The .edu finding also makes sense in that these websites are domains of higher education institutions. The finding that .com and .net are lowest probably reflects their commercial nature and the fact that some businesses may not always provide reliable and valid information. The finding that .org is in the middle may reflect people's differing experience with (not-for-profit) organizations with respect to the reliability and accuracy of the information they provide.

Additional findings indicate that participants who had greater Internet usage had greater trust of .gov and .edu domain suffixes than participants with less Internet usage. The same pattern was found for students versus non-students, who tended to overlap with the above-mentioned usage categories (i.e., students using the internet more than non-students). This pattern might be explained by differences in exposure to the Internet. Persons who use the Internet more may have, over time, learned to trust the quality of information for .gov and .edu sites more than persons who have used the Internet less.

As mentioned earlier, some research suggests that the quality of the user interface of the Web site is a major determinant of a person's initial establishment of trust (Aubert, Dewit, & Roy, 2001). However, some of the best (and also some of the worst) interfaces are found in .com websites, which in this study were rated lower than .gov and .edu. The latter two domains tend to have more basic interface designs. Thus, some cues about trust apparently arise from aspects beyond simple interface quality as Aubert et al. (2001) suggested. According to the present results, trust beliefs are cued at least partly by domain suffix.

Seals of approval also showed effects on Internet trust. The highest trust ratings were for VeriSign. However, this seal and the ones that follow, only received moderate levels of trust. Interestingly, the

fictitious seals that were inserted in the set were rated as high or higher than some of the actually used seals. This suggests both a lack of discrimination and a hesitancy to assign substantial creditability based simply on the seals.

Other analyses showed that persons who use the Internet to a greater extent reported greater trust for VeriSign and BizRate.com than persons who used the Internet to a lesser extent. These two seals are frequently used by reputable Internet vendors. Previous research suggests trust emerges through a long-term relationship between a person and another entity, in this case, the Internet (Goldsmith & Lafferty, 2002). Thus, it seems with these two seals, familiarity and their association with good companies may breed the development of trust. Students versus non-students showed a similar pattern but also yielded additional significant differences with students trusting Trust e, BizRate.com, Web Verification Assurance System, and ScamBusters.org more than non-students. While the explanation of familiarity and a good company fits three of these seals, the Web Verification Assurance System seal is fictitious. Thus, students seem to be more trusting even to the extent of trusting a fake seal. Indeed, the seals of approval results tend to show that people who report greater Internet use have somewhat higher levels of trust than those who report using the Internet less.

The relatively moderate levels of rated trust indicates, at least some level of appropriate skepticism, and for good reason, since some Internet companies have violated their trust seal policies (George, 2002). Companies that use the Internet need to convince consumers that the information they give is valid and reliable and the consumer's personal information will not be disclosed. The seals of approval potentially give assurances, but this would only develop and become stronger if seals of approval are based on valid criteria that are actually upheld.

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