Gender Differences in Social Networking Presence Effects on Web Based Impression Formation

Shailaja Venkatsubramanyan  
*San Jose State University, venkat_s@cob.sjsu.edu*

Timothy R. Hill  
*San Jose State University, hill_t@cob.sjsu.edu*

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Gender Differences in Social Networking Presence Effects on Web-based Impression Formation

Shailaja Venkatsubramanyan
Department of Information Systems
San Jose State University
One Washington Square
San Jose, California, 95192-0244
venkat_s@cob.sjsu.edu

Timothy R. Hill
Department of Information Systems
San Jose State University
One Washington Square
San Jose, California, 95192-0244
hill_t@cob.sjsu.edu

ABSTRACT
As the Web continues to expand its role in gathering information, making decisions and social interaction, a host of issues arise around the phenomena of how people form impressions of others in this new medium. We argue that the Web fundamentally changes the way we find and use information and that those changes give rise to tangible and significant effects in impression formation. We have proposed a model of impression formation that reflects existing schools of thought but also accounts for Web impacts and in this paper, we explore the impact of social networking presence, as revealed by search engine results, on subjects’ favorability ratings of potential team partners otherwise unknown to them. Experiments revealed differences between genders in that females tend to be more favorably impressed than males by target personas that had a presence on online social networks.

Keywords

INTRODUCTION
With growth in the use of computers and the Internet, we now live in a world where there are two spheres of existence - a physical sphere and a digital sphere. Many now rely on the Web as a reflection of reality for finding facts. For example, many people turn to the Web to get the address of a store rather than consult traditional yellow pages in a book form. This existential dichotomy between our physical and digital spheres of existence gives rise to a number of issues. One interesting issue is that people are able to perceive others and form opinions about them based simply on the information available about those people on the Web. This begs the question: “Are our perception processes and outcomes (such as impressions and decisions) fundamentally altered by the use of this new medium and if so, how?”

While it may be tempting to characterize the Web as essentially equivalent to traditional print media as a basis for forming impressions, Web-based information clearly differs in several aspects: the sources are far greater in number, easier to access, highly searchable, amenable to aggregation, have a longer lifespan because of the nature of the Web, and have less integrity than the print form due to the lack of publishing controls on the Web. Despite the integrity issue, the Web has become an important source of information for decision making, some of which may have material and tangible impacts. Indeed, there have been news reports of employers turning down potential employees based on entries about them on sites such as mySpace and Facebook (Finder, 2006).

We examine this issue in greater detail using two new concepts: ePersona and ePerception. ePersona refers to searchable digital information about a particular person from a variety of sources – personal homes pages, social and professional networking sites, organizational home pages, news articles, blogs and so on. We use the term ePerception to refer to the perception formed by people about others depending primarily if not exclusively on the ePersona.

We have developed a model of impression formation that incorporates the concepts of ePerception and ePersona and we explore the model experimentally using Web search results about a person as a surrogate for ePersona. In this study, we explore how the presence or absence of social networking in an ePersona can lead to ePerception effects and how those effects differ by gender.

Given the news reports that employers are being swayed in hiring by the results of Web searches on applicants, we see that what we call ePerception plays a role in pragmatic and significant decision processes and thus these questions take on...
practical significance as biases can lead to tangible suboptimal outcomes. We set out then motivated to improve our understanding of the ePerception phenomenon and thereby provide some insight of value to managers as they grapple with their use of the Web and the factors that may lead them, unconsciously, astray of the best decisions they can make.

In this paper, we first describe the research background and then present a model as a framework for empirical investigation of the ePersona and ePerception concepts. Next we develop the research question and we describe the experimental methodology for an empirical study designed to address the research question, followed by a discussion of results and their interpretation. We conclude with a summary and a discussion of the implications and directions for further research.

BACKGROUND

In existing models of impression formation, the perceiver is the person forming an impression, while the target is the person about whom impression is formed. People form impressions about others based on primary (or direct) and secondary (or indirect) sources of information. Primary sources of information include personal interactions (face to face or otherwise) including both verbal and behavioral cues. Secondary sources of information include sources such as hearsay (opinions expressed by others), photographs, voice recordings, official records, news articles, biographies, and others, now including Web-based information.

Traditional models are grouped into two main categories: trait-based and stereotype-based. In the trait-based models, such as Asch’s Configural Model and Anderson’s weighted-average model, various traits of the target come together in the perceiver’s mind to form a unified impression (Brewer, 1988). According to Asch, there are two types of traits – central traits (traits that have a strong effect on interpretation of other traits) and peripheral traits (traits that did not significantly affect subjects’ impressions of the perceived personality). Other researchers have found a primacy effect where traits that appear first have more impact in final impression (Widmeyer and Loy, 1988).

These existing perception models provide a foundation upon which to model ePerception and ePersona as extensions to account for the effects of the technology artifacts imposed by the Web as a new medium that “changes the game.” We argue that fundamental differences in the medium affect the processes and can lead to altered outcomes, thus we have proposed including factors related to search and presentation particular to the Web. One such factor is the phenomenon of social networking, enabled by the web, taking on meaning and impact heretofore unknown. We look to the literature on the related concept of social presence in technology-supported communication media.

Short, Williams and Christie (1976) worked on the idea that a medium’s social effects are principally caused by the degree of social presence that it affords to its users. Social presence refers to a communicator’s sense of awareness of the presence of an interaction partner. This is important for the process by which a person comes to know and think about other persons, their characteristics, qualities and inner states (Short et al., 1976). Thus increased presence leads to a better person perception. According to Walther’s social information processing theory (1992), communicators strive to develop positive and meaningful relationships, and that social cues and information about individuals are necessary for that to happen.

Research related to social presence in the digital realm focuses on the interaction of workplace productivity and social presence. Thie and van Wijk investigated the nature of the interface a shared virtual environment (SVE) should have in order to maximize performance on a decision task (Thie and van Wijk, 1998). Sallnas, Rasmus-Grohn and Sjostrom’s experimental study demonstrated that haptic force feedback as a part of interaction in a collaborative desktop virtual environment increased perceived social presence (Sallnas, et al., 2000). Wheeler argued that social presence is an important feature of any successful digital learning environment (Wheeler, 2005). Tanis and Postmes studied the effect of the quantity of information about a person overall on the impression formed (Tanis and Postmes, 2003). Finally, Stutzman’s work tries to provide a link between levels of identity disclosure on Facebook (a social networking website) and social need-state, providing important insight into how social and informational need-states motivate use of social network websites (Stutzman, 2009).

Our work focuses on whether the mere presence or absence on social networking websites can lead to a better or worse perception on the part of the perceiver. In other words, does having a Facebook, Friendster or MySpace account convey something about one’s personality to Internet users? And if so, would gender lead to differences in valuing social networking as an ePerception factor, given that gender enculturation may result in differing attitudes about the value of social activity?

Geffen and Straub (1997) set out to extend the Technology Acceptance Model (Davis, 1986) to account for gender differences. They found that “women and men differ in their perceptions…of email and suggested a “need to realize that the same mode of communication may be perceived differently by the sexes. And Richardson and Swan (2003) studied the role of social presence in online courses and found that women perceived a higher degree of social presence than men. Thus there is evidence to expect that women may value social networking more highly when forming impressions through ePerception.
RESEARCH MODEL AND QUESTION

Recognition of the uniqueness of the Web can be seen in emerging studies of impression formation in the digital age (Hancock, 2001; Jacobson, 1999; Markey and Wells, 2002; Walther, 1997; McKenna and Bargh, 2000). In this paper, we focus on the role of people as passive observers of information, and impressions formed without personal interactions. We believe that with the emergence of the Web, traditional models of impression formation will have to be updated to accommodate for factors unique to this new paradigm. This section describes a new model that builds on the fundamentals espoused by the traditional models of perception and extends them to account for differences effectuated by the digital information domain as explained in the previous section.

Figure 1 depicts the model focused on how searching the Web to find out about people affects the impression formation process. This model focuses on the Web search process, and this paper focuses on experiments conducted to see the effect of social presence conveyed to subjects through Web search pages.

As shown in the figure, there is a perceiver and a target as in traditional perception models (Brewer, 1988). The characteristics of both the perceiver and the target feed into a traditional impression formation process. In the digital domain, perceiver characteristics go beyond traditional notions of personality, emotional state, and social characteristics and extend to factors such as level of information literacy, online experience and comfort level and search skill expertise. For instance, a study conducted by Ford, Miller and Moss (Ford et al., 2005) concluded that cognitive styles, levels of prior Internet experience and perceptions, study approaches, age and gender affect retrieval effectiveness.

The perceiver could be influenced by inherent existing stereotypes. Emergence of new primary stereotypes and traits not addressed in the traditional models since information in a site such as blogger.com or MySpace may not provide typical stereotypical clues. In addition, characteristics of the target such as those described in the five-factor structure of personality (Watson, 1989) or traits such as age, race or gender may not be apparent or may be deliberately misrepresented on the Web (Cornwell & Lundgren, 2001).

The target and the ePersona are shown as separate entities since the ePersona could be affected by factors beyond the characteristics, behavior and control of the target. Besides, factors such as popularity, trust, reputation and perceived

![Figure 1: Web-based Perception Model: ePersona and ePerception](image-url)
currency of the source, links between pages, and appearance of a Web page, e.g., production quality of the information (e.g. picture clarity of images or videos) could also affect the ePersona.

The searchability effect refers to the impact of the search process and products of the search process on the decision making process. Filtering the search results provides input with respect to the effect of searchability, while perusing the search results provides input with respect to the characteristics of the information source about the target. The perceiver considers all these inputs to finally form an impression of the target, which is then fed into a relevant decision making process (such as hiring the target for a prospective employment position).

The research model provides a framework for empirical investigation of the impact of the Web on impression formation. The two main research areas in this model are – (a) How do characteristics of the web page itself impact impression formation; and (b) Does the search process using a standard search engine, by itself, affect impression formation. Our study of the literature revealed that the first question is currently being studied in some quarters (Vazire and Gosling, 2004). Studies related to the second question, however, are absent in current research literature. In this particular project, we focused on the effect of presence or absence on social networks as conveyed through search results on impression formation. Our research question is thus:

Does the presence or absence of social networking activity, in and of itself, affect impressions formed through ePerception and if so, do gender-based enculturation differences in valuing social engagement result in ePerception differences across gender due to social networking activity levels?

We address the above question with the following experimental hypotheses:

H1x: The level of social networking activity apparent in search results for a target ePersona, as indicated by the number of social networking-based results, will, in and of itself, affect ratings of:
   a) desirability
   b) confidence in the desirability rating
   c) commitment to excellence
   d) ability to work as an effective team member
   e) ability to manage multiple tasks
   f) ability to handle conflict
   g) interest in working with people
   h) ability to manage anger
   i) ability to take direction
   j) curiosity
   k) ability to adapt to new situations
   for the target ePersona as a potential project teammate.

H2x: The level of social networking activity apparent in search results for a target ePersona, as indicated by the number of social networking-based results, will, in and of itself, affect ratings of the following differently for males and females:
   (same factors as above)
   for the target ePersona as a potential project teammate.

The experiment described below was designed to test the above hypotheses.

**EXPERIMENTAL METHODOLOGY**

The objective of the experimental evaluation is to test the hypotheses regarding the influence of the content and quantity of social networking pages on the impression formed by a perceiver.
The experimental plan involved using university students to evaluate ePersonas in the context of potential team members for a class project. We used 58 subjects, which included 29 males and 29 females. We provided two sets of subjects (both sets containing males and females) with Google search pages. One set was shown a page where the target was present on several online social networks (Persona A). In the case of the other set, the target had no presence on social networks (Persona B). Neither ePersona conveyed any other information about the target other than the fact that the target was in San Jose and enrolled in San Jose State University. The names of personas were masked using the surrogate “SearchName” to avoid gender and ethnicity biases. None of the links on the search results page worked. This was done to ensure that subjects focused purely on the search results page. If any link was clicked upon by the subject, a pop up message saying “DNS server is down. Please try again later” was produced. The reason for disabling links was to ensure that impressions were formed purely based on the search page. Verbal and written instructions were given to the subjects. They were explicitly told that these were search results about actual students, and that some of the results may not be relevant to the target. The reason for including non-relevant results was to make the search results look more realistic.

After looking at the search page, subjects were asked to estimate the number of minutes spent on the task to get an estimate of the amount of cognitive effort exerted. Any correlation between the nature of the sets and the impression formed was studied. Various aspects of impression formation were included in the subject evaluation form. These include (a) commitment to excellence, (b) ability to work as an effective team member, (c) ability to manage multiple tasks, (d) ability to handle conflict, (e) interest in working with people, (f) ability to manage anger, (g) ability to take direction, (h) curiosity, and (i) ability to adapt to new situations.

Subjects were also asked to rank the desirability of the target as a potential team member. A five point Likert (Likert, 1932) scale ranging from “-2” (very unfavorable impression) to “+2” (very favorable impression) was used for each of these factors. Subjects were also asked about the desirability of the target as a potential team member. Also included in the rating was the question:

“If you are forced to make a decision at this point with no further information, would you select this person to be on your team – yes or no?”

Answers to this yes or no question were coded in the form of 1 or 0 for analysis purposes. On a scale of 1 to 5, subjects were asked to indicate how confident they felt about their decision. Subjects were asked to provide qualitative feedback as answers to these two questions:

(a) What kind of teammate would the student be?

(b) What do you think influenced your decision?

Demographic information was also collected about the subjects, which included factors such as age, gender, major, number of team projects worked in the past, number of computer related courses, number of years of computer experience, number of years of searching the www, frequency of search use, and Web search skill self rating.

EXPERIMENTAL RESULTS AND ANALYSIS

Together, the qualitative and quantitative experimental results provide a rich and intriguing picture of how subjects perceived the target e-Personas and the differences between the genders with respect to the effects of the level of social networking on desirability as a teammate.

A representative sampling of responses to the open-ended feedback questions listed above provide some insight into the thought processes behind the numbers serves as a manipulation check, confirming that subjects were reacting to the factor manipulations:

“Given the affiliations with such sites as Friendster, MySpace, and Facebook, as well as a personal webpage, the candidate teammate is an open person who likes to network with others using these websites. This shows that candidate teammate is active on the Internet, very social, and very likely easy to get along with, since people I know on these websites are very nice.”

“The high results in sites for social networking influenced my decision because if I am going to be working in a team project that is worth a large portion of my grade, he or she must be sociable.”

“Since it seems the person keeps in touch with others, I believe that a teammate with this quality would be useful when trying to have a group meeting.”
The results from our study indicate that females in general gave higher marks for desirability – irrespective of whether they were shown Persona A or Persona B. Another interesting point to note was that there was a general trend for desirability ratings to be higher for older subjects. However, no significant difference was seen with respect to the presence or absence of the target in social networking sites when it came to the rating for general desirability and the question of including the target in the team.

Overall, we found that the means for all surrogates for impressions such as “desirability”, “effective team member” and so on were higher in case of group Persona A as opposed to Persona B. Table 1 shows the traits that were significant in impression formation for a combined group of males and females:

<table>
<thead>
<tr>
<th>Independent Variable</th>
<th>Dependent Variable (subject perception)</th>
<th>Mean rating for group with Social Networking results</th>
<th>Mean rating for group with NO Social Networking results</th>
<th>dF</th>
<th>F</th>
<th>Significance</th>
<th>Result Significance (90% level of confidence)</th>
<th>Result Significance (95% level of confidence)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of social networking sites in results</td>
<td>Interest in working with people</td>
<td>0.829</td>
<td>0.304</td>
<td>1</td>
<td>3.15</td>
<td>0.081</td>
<td>S.</td>
<td>N.S.</td>
</tr>
<tr>
<td>Curious</td>
<td>0.63</td>
<td>0.17</td>
<td>1</td>
<td>3.53</td>
<td>0.065</td>
<td>S.</td>
<td>N.S.</td>
<td></td>
</tr>
</tbody>
</table>

Table 1: Traits significant for the combined group of males and females

Thus results provide no support for most of the first set of hypotheses (H1x) but some near significant support for H1(g) and H1(j), indicating differences in ratings of both interest in working with people and curiosity, based on level of social networking in the target ePersona. The first of these, interest in working with people is expected, given the nature of social networking sites. The second, curiosity, is, ironically, curious and we may only speculate on the link to social networking at this point as an indicator of desire to reach out and discover more about other people.

For testing the second set of hypotheses, those related to gender differences, the results were broken down by gender. The analysis indicates significance for females in ratings for three traits—interest in working with others, curiosity and adaptability to new situations, with three others, effectiveness, ability to manage multiple tasks and confidence in the decision that are close to being significant (see Table 2).

<table>
<thead>
<tr>
<th>Independent Variable</th>
<th>Dependent Variable (subject perception)</th>
<th>Mean rating for group with Social Networking results</th>
<th>Mean rating for group with NO Social Networking results</th>
<th>dF</th>
<th>F</th>
<th>Significance</th>
<th>Result Significance (90% level of confidence)</th>
<th>Result Significance (95% level of confidence)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of social networking sites in results</td>
<td>Interest in working with people</td>
<td>1.3</td>
<td>0.75</td>
<td>1</td>
<td>3.49</td>
<td>0.085</td>
<td>S.</td>
<td>N.S.</td>
</tr>
<tr>
<td>Curious</td>
<td>0.67</td>
<td>-0.18</td>
<td>1</td>
<td>6.76</td>
<td>0.015</td>
<td>S.</td>
<td>S.</td>
<td></td>
</tr>
</tbody>
</table>
Adaptability to new situations  |  0.55  |  0.00  |  1  |  5.45  |  0.027  |  S.  |  S.  
Effective team member  |  0.72  |  0.27  |  1  |  2.09  |  0.159  |  N.S.  |  N.S.  
Manage multiple tasks  |  0.44  |  0.09  |  1  |  2.46  |  0.128  |  N.S.  |  N.S.  
Confidence in the decision  |  3.22  |  2.54  |  1  |  2.23  |  0.14  |  N.S.  |  N.S.  

<table>
<thead>
<tr>
<th>Independent Variable</th>
<th>Dependent Variable (subject perception)</th>
<th>Mean rating for group with Social Networking results</th>
<th>Mean rating for group with NO Social Networking results</th>
<th>dF</th>
<th>F</th>
<th>Significance</th>
<th>Result Significance (90% level of confidence)</th>
<th>Result Significance (95% level of confidence)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of social networking sites in results</td>
<td>Excellence</td>
<td>-0.18</td>
<td>0.417</td>
<td>1</td>
<td>2.63</td>
<td>0.116</td>
<td>N.S.</td>
<td>N.S.</td>
</tr>
<tr>
<td>Interest in working with people</td>
<td>0.85</td>
<td>0.18</td>
<td>1</td>
<td>1.97</td>
<td>0.17</td>
<td>N.S.</td>
<td>N.S.</td>
<td></td>
</tr>
</tbody>
</table>

Table 2: Traits significant for females

By contrast, when analyzing the results for males only, there were no significant differences in ratings for traits that influenced impression formation, with ratings differences for only two traits close to being significant (see Table 3).

Table 3: Traits significant for males

Thus we find support for H2(g), H2(j) and H2(k) in that females showed significant differences in ratings of these factors (interest in working with others, curiosity and adaptability) based on level of social networking while males did not.

There is some support for H2(b), H2(d), and H2(e) in that females showed near significant differences in rating of these factors (confidence in decision, effectiveness, and ability to handle multiple tasks) based on level of social networking while males did not.

Lastly, there is some support for H2(c) due to finding near significance for males negatively associating higher levels of social networking with lower ratings of commitment to excellence as a potential teammate. This curious result suggests a very different basic perspective on the value of social networking levels as perceived by males and females at least in this one trait aspect. Though females did not show a significant or near significant positive difference for this particular trait, they did for several others suggesting an overall positive association while the only male near difference was negative.

Parallels can also be drawn between our results and Geffen and Straub (1997) who showed that males and females respond differently to email as a medium of communication since females attach more value to intimacy and solidarity.

The results of our study have practical implications. First, when it comes to online impression management, it is important to be aware of the perceiver’s characteristics. Our study shows that the gender of the perceiver has to be taken into account if one is trying to effectively manage the impression formed. Second, studies related to online teaching have shown that students’ perception of social presence lead to greater perceived learning, and maybe even instructor satisfaction with the...
course (Richardson and Swan, 2003). We believe that gender probably plays a significant role in that equation, and needs to be given its due in such studies.

Of course, the reach of the implications is limited by several factors. First, since the subject pool was drawn from university students, the age range, experience level and, in especially, the pre-disposition to Web based technologies, social networking sites, in particular, are not fully representative of the broader population of managers that we seek to address. Furthermore, the experimental scenario involving the evaluation of a potential teammate is akin to but far less extensive than the evaluation process for an actual organizational recruitment. Lastly, the inability to follow the search links to dig further into the results limits the realism of the exercise but is necessary to maintain experimental control but in our favor, we note the well-known tendency to limit research beyond the first page of search results.

Demographic information collected was also analyzed but no significant differences were revealed across levels of any of these factors with respect to the relationship between the independent and dependent variables being studied.

CONCLUSION

This project focused on whether presence of social networks websites leads to more positive impressions being formed about those participating in those sites. Our results suggest that presence in social networking in and of itself may impact ePerceptions of target ePersonas and that those differences may be affected by gender.

With regards to future work, we believe there is a lot of interesting research to be done about impact of the search process itself on impression formation. For instance, the proportion of reliance placed on search results as opposed to documents pointed to by results. This would depend on how much reliance subjects place on the titles and synopses as opposed to the actual pages pointed to by the results. Second, lack of domain knowledge, noise in the search results due to a query term popularity (e.g. when the target’s name is very common), and insufficient disambiguation by the search engine could present filtering difficulties that may be expected to bias a decision maker negatively by requiring more cognitive effort. Third, previous studies have shown that mental fatigue can also play a role in impression formation. In the case of a recruiter conducting searches about multiple people, mental fatigue may affect the impressions formed about candidates evaluated later in the Web browsing session.

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