

Examining psychological effects of source cues and social plugins on a product review website

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Abstract

This study examines the psychological effects of heuristic cues on a product review website to gain a better understanding of online agency. A between-participants experiment of 458 college students confirmed the formation of more positive attitudes toward a product review website when an expert rather than a computer/website served as the source of product review information, specifically when the expert source was accompanied by a rating of four stars vs. one star. A product review authored by other users also induced more favorable attitudes toward the website when it was presented with a higher level of star ratings than a lower one. The study also revealed perceived authority and bandwagon heuristics mediated the relationship between the presence of social plugins and favorable attitudes toward the website via credibility perceptions. Findings not only underscored the power of the authority and bandwagon cues when users make quick judgments on product review sites but also discovered a theoretical path that explained the role of social plugins—a seal of credibility—on e-commerce sites. Theoretical and practical implications are also discussed for designing information-based websites.

Keywords:

Online agency; Perceived heuristics; Credibility; Product review websites

Introduction

Web 2.0, an ideological shift marked by user-generated content being continually modified by a community of participants rather than static content being created by individuals (Kaplan & Haenlein, 2010), has left its conspicuous trace on e-commerce (Leitner & Grechenig, 2008). Rather than manufacturers and providers acting as singular voices of information regarding their products and services, editors, consumers, and specialized websites are continually creating and contributing to online reviews. These reviews are widely available on sources such as Yelp, CNET, Consumer Reports, and Amazon.com and are referenced frequently. In 2012, for example, 78 percent of online Americans between the age of 18 and 64 reported that online reviews affect their purchasing decisions (MarketingCharts, 2012), and in 2014, 88 percent of individuals reported using online customer reviews to determine the quality of local businesses (Anderson, 2014). Online reviews have become so critical to purchasing decisions, in fact, that they have proven to influence consumers more than price and brand (ShareThis, 2014).

Since online reviews emerged, scholars have sought to uncover their power and effect (e.g., Chen & Xie, 2008; Chevalier & Mayzlin, 2006). The resulting literature suggests that factors such as product type (Bae & Lee, 2011), number of reviews (Duan, Gu, & Whinston, 2008), valence of reviews (Ivanova, Scholz, & Dörner, 2013), length of reviews (Chevalier & Mayzlin, 2006), and source of reviews (Chen & Xie, 2008; Cheong & Morrison, 2008; Wei & Lu, 2013) influence the effect others' opinions have on consumers. Little literature, however, looks at how source attributions (i.e., indications on whether or not ratings are generated by an editor, a consumer, or the website) interact with visual signals of ratings (e.g., star ratings) and sharing icons (e.g., social plugins). The purpose of this study, therefore, is to better understand these relationships through the lens of heuristic cues.

Literature review

Exploring information source and heuristic cues

Heuristics are relatively instant and less cognitively demanding judgment rules individuals use to help reduce complex problems into simpler, snap judgments (Chaiken, 1987; Fiske & Taylor, 2008; Kahneman & Tversky, 1972; Petty & Cacioppo, 1986). They are particularly helpful for interpreting information when individuals are not highly motivated to process a message (Chaiken, 1987). Blogs, online news websites, and electronic word-of-mouth (eWOM) sites all contain technological affordances that cue heuristics and help readers quickly interpret information (Sundar, 2008). Specifically, star rating systems on eWOM sites are among the visual cues consumers rely upon for identifying a product or service's quality. These value-laden cues offer consumers more than product descriptions and an evaluation of the pros and cons of a product or service; they provide a quick snapshot into what others think about the product or service and influence online purchases (Chen, 2008; Sundar, Oeldorf-Hirsch, & Xu, 2008).

The content source on product review sites serves as another heuristic cue. Thus, the question of "Who is the source of information?" becomes meaningful as source attribution influences information assessments (Sundar, 2008; Sundar & Nass, 2001). Depending on which source the information is attributed to (e.g., expert, lay person, user, consumer, computer/system, or website), outcomes of credibility and attitude formation differ (Go, Jung, & Wu, 2014; Sundar & Nass, 2001; Winter & Krämer, 2014; Xu, 2013). In some instances the user or reviewer who rated the product or service is identifiable. In other instances ratings are not labeled and appear to come from the website or computer itself. This study focuses on the impact of such heuristic cues on consumers.

Expert, website, and other users as sources of product review information

When the source of information comes from an official authority or expert, individuals process information using the authority heuristic (Sundar, 2008). This heuristic plays a role in users' source attribution of information online and affects how the information is subsequently evaluated. Research shows individuals make quick judgments about the credibility of a source based on whether or not it comes from an official authority or expert (Petty & Cacioppo, 1986).

To the extent the interface agent or even simply a website identifies itself as an authority of some sort, it is likely to directly confer importance, believability, and pedigree to the content provided by that source and thereby positively impact its credibility (Sundar, 2008, p. 84).

Likewise, messages that come from an authority figure are often considered more trustworthy and considered to be of higher quality (Todorov, Chaiken, & Henderson, 2002). For example, by examining the auto-generated news site Google News, Sundar, Knobloch-Westerwick, and Hastall (2007) found that the content author or news source, which was located just below the headline and lead, served as a heuristic cue.

This cue triggered the authority heuristic, helping individuals determine the news item's level of credibility. Even the domain name of a website can trigger the authority heuristic. In the context of e-commerce websites, when consumers considered purchasing wine from specialized websites such as wines.com rather than a more general consumer site like costco.com, the more specialized website was perceived as the more expert source (Koh & Sundar, 2010). Additionally, when examining the popular review website (i.e., Yelp), source expertise positively impacted perceptions of the review's helpfulness (Zhu, Yin, & He, 2014). Based on this line of research, it seems plausible that when individuals are not deliberately processing the text, an authority or expert source will trigger the authority heuristic and cause individuals to evaluate the information more favorably.

In the online environment, however, information is not always perceived as coming from an individual. It is often perceived as coming from a computer, machine, or technology device (e.g., iPod, phone, etc.). In these instances, the machine heuristic is used to process and judge information. When using this heuristic, the message is judged as being free from bias and even considered to maintain an objective and fair perspective (Sundar, 2008). Edwards, Spence, Gentile, Edwards, and Edwards (2013), for example, found that individuals with high Klout scores (computer-generated ratings measuring an individual's influence on social media) were perceived as being more credible sources than those with moderate or low Klout scores. These scholars attribute this finding to the machine heuristic.

In their early work on the source of news, Sundar and Nass (2001) found that when news stories were perceived as being selected by the computer terminal, they were thought to be of higher quality than when the same stories were selected by news editors or the receivers of the information. In this same study, participants reported that news stories were of higher quality when either a computer or some other user selected the news than when news editors selected the news stories (Sundar & Nass, 2001). Similarly, the present study expects that when the source of a product review is attributed to the website itself, individuals will evaluate the information more favorably than when an expert reviewer serves as the source.

Consumer-created content also has the potential to impact information-judgment processes. eWOM is "any positive or negative statement made by potential, actual, or former customers about a product or company, which is made available to a multitude of people and institutions via the Internet" (Hennig-Thurau, Gwinner, Walsh, & Gremler, 2004, p. 39). This form of communication is characterized as indirect public communication between consumers, typically in the form of an online rating or review (Lis, 2013). The value of eWOM from consumers is evident. Chen (2008) examined online book purchases and found consumer reviews to be more influential on consumer attitudes and purchasing decisions than expert reviews. Similarly, Cheong and Morrison (2008) found website users trust product information generated by other consumers more than product information generated by product manufacturers.

In addition, other scholars found when the source of information was other users, overall ratings toward the news stories were greater than when the source was news editors, an expert source (Sundar & Nass, 2001). Winter and Krämer (2014) found other users' opinions mattered more than experts' opinions when people gathered information from Web 2.0 venues such as blogs. However, for typical online news websites, the expertise of the information source has been found to induce stronger effects on positive evaluations of information than aggregated opinions from lay people (Winter & Krämer, 2014). Considering the nature of online product review websites to be open to everyone and resemble online forums where anyone can contribute, when users serve as a review source they are likely to elicit more positive psychological reactions from site users than expert reviewers.

The bandwagon heuristic and source cues

The bandwagon heuristic is triggered when a person perceives that something is popular or good for other people. When this occurs, the person also thinks it is good for himself/herself (Sundar, 2008). Therefore, website cues suggesting the popularity of a product or service are capable of activating a heuristic for users as they evaluate information and make purchasing decisions. For product review sites, the bandwagon heuristic can be triggered by the presence of star ratings as well as the number of consumer reviews.

Research confirms the positive effects of the bandwagon heuristic on online behaviors. Fu and Sim (2011), for example, found that online videos with higher view counts attract more future viewers than videos with initially lower view counts. Metzger, Flanagin, and Medders (2010) found that a larger volume of endorsements supporting an unfamiliar online source can overcome an individual's initial skepticism toward the source.

Specifically related to online reviews, Chen (2008) examined how bandwagon cues such as star ratings and sales volumes found on online book review sites affect prospective consumer attitudes as well as their decision-making processes. The findings indicate that consumers favored a higher rated book with more stars or a great degree of sales volume, clearly indicating the effect of the bandwagon heuristic on consumer evaluations. Similarly, Sundar et al. (2008) examined the effects of three bandwagon heuristic cues: star rating, number of customer reviews, and sales rank. These scholars found that these value-laden cues led to more favorable impressions of products when there was a high star rating, more customer reviews, and a high sales rank, indicating that other people were likely to buy the product. Hence, the increased bandwagon perception led to greater purchase intentions and more positive attitudes toward the product as well as increased perceptions of credibility, quality, and value.

As star ratings are almost always paired with source attribution, some might argue source attribution is not a strong heuristic cue when it accompanies star ratings. Although scholars tried to disambiguate this area of research, previous studies showed mixed findings. Go et al. (2014) examined both bandwagon and expert cues, finding the combination of a strong bandwagon cue (i.e., the number of recommendations) and a highly expert cue (i.e., reputable news source) yielded a positive effect on news readers' perceived credibility. When using either a strong bandwagon cue with a less reputable source or a weak bandwagon cue with highly expert source the perceived credibility was not much greater than when both cues were absent (Go et al., 2014). On the other hand, Xu (2013) found different results when examining the impact of bandwagon (i.e., the number of recommendations) and source credibility cues on sharing intention. When looking at the combined effect of these cues on social news recommendation sites (i.e., Digg.com) source credibility (i.e., reputation of news source such as New York Times) suppressed the positive effects of a strong bandwagon cue on sharing intention while a strong bandwagon cue boosted this psychological response. In this instance, source credibility did not play a significant role in increasing one's sharing intention regardless of valence of bandwagon cues (Xu, 2013).

Therefore, the present study formulates the following research question to probe the relationship between source attributions and star ratings.

RQ1. Which product review source (expert, website, or other users) will exhibit a more powerful influence on the decision-making processes for a product purchase when a visual cue signaling the product's popularity or a lack thereof (one- or four-star ratings) accompanies the review?

Effects of social plugins

In recent years, methods for sharing information online have evolved and increased. In addition to sharing web-based content via email, Internet users can distribute information to individuals and groups through social networking platforms (e.g., Facebook, Google Plus, LinkedIn, Pinterest, Tumblr, Twitter), social book-marking sites (e.g., Delicious, Digg, StumbleUpon, Reddit), as well as personal blogs and webpages. In fact, sharing information online has become such an integral part of the current Internet culture that social plugins—buttons allowing individuals to like and share website content to external sites with the click of a mouse—are placed right next to many online articles, photos, blog posts, news reports, press releases, and product ratings (Gerlitz & Helmond. 2013). These social plugins allow individuals to easily share content via Facebook, Twitter, Pinterest, LinkedIn, email, and other online platforms.

To better understand when individuals utilize these sharing tools, Raban and Rafaeli (2007) explored the effects the source of online information has on users' intent to share it. Participants were requested to publicly or privately share three types of weather information provided by an expert, an organization, or a private source. The study showed that when participants were asked to share the weather information privately, they were more likely to share information provided by an expert or private source rather than information shared by an organization. Based on these findings, the present study assumes that the source of online information influences whether or not individuals share it. Specifically, people will show greater intention to share information when they perceive it is generated by an expert or other people rather than a computer or machine that could possibly be associated with the organization. With this literature as a guide, we propose the following hypotheses:

H1. People are more likely to share product review information when it is attributed to an expert rather than a computer.

H2. People are more likely to share the product review information when it is attributed to other users rather than a computer.

To add to Raban and Rafaeli's (2007) study, the present research is also interested in discovering whether or not the mere presence of social plugins provides a visual cue that increases user intention to share information online. Chen, Lai, Goh, and Daud (2013) found that the presence of social plugins on e-commerce sites does have a positive impact on consumer purchase intention but the relationship between presence of social plugins and sharing intention is still unclear.

H3. When people find social plugins on a product review website they will have more favorable attitudes toward the product and the product review's webpage and have a greater purchase intention than when plugins are not present.

RQ2. Does the mere presence of social plugins influence users' intention to share information on a product review website?

The impact of heuristic cues on credibility

Individuals make quick judgments about the credibility of a piece of information based on whether or not the source of the information is an official authority (Berlo, Lemert, & Mertz 1970; Hovland & Weiss 1951; McCroskey & Teven 1999). If, in fact, the attributed source is deemed credible, then the source is often perceived as being competent, reliable, believable, trustworthy, or expert (Berlo et. al., 1970; Hovland & Weiss, 1951; McCroskey & Teven, 1999 ; Metzger, 2007). This is true for judgments made in both interpersonal

contexts and in the online environment, “with the same qualities marking credible sources” in both cases (Walthen & Burkell, 2002, p. 140; see also Nass & Moon, 2000).

When an individual perceives a source is credible, this positively influences the individual’s reception to the message the source is sharing. Sundar (2008) suggested that when prospective consumers encounter moments of active decision-making, the importance of a source has bearing on perceptions of the quality and credibility of the information. Walthen and Burkell (2002) identified the source of information as one of seven criteria that affect credibility judgments of online content. Lis (2013) also found that in the area of online recommendations, users rely on the perceived expertise and trustworthiness of the reviewer to determine the credibility of the review. Therefore, this study assumes that who or what is perceived as the source of information will ultimately influence perceptions of the information’s credibility (Sundar, 2008; Sundar & Nass, 2001).

To unpack the relationship between various types of information sources, credibility judgments, and subsequent user attitudes and behavioral intentions, this study adheres to Sundar’s (2008) theoretical MAIN model that outlines the key role of heuristics. As the literature suggests, bandwagon heuristics are triggered by bandwagon cues like star ratings. An expert sources triggers the authority heuristic (i.e., perceive authority), a website source triggers the machine heuristic (i.e., perceived objectivity), and utilizing other users as the source triggers the bandwagon heuristic (i.e., perceived bandwagon). However, these theoretical paths have not been tested in a holistic manner within the context of online product reviews.

Thus, this research explores the mediating effect that these credibility judgments have on the heuristics described. As shown in Fig. 1, all perceived heuristics triggered by the source cues (i.e., review sources and star ratings) are expected to influence perceptions of credibility and credibility is likely to affect attitudes toward the website, attitudes toward the product, and product purchase intention. For example, Cugelman, Thelwall, and Dawes (2008) found that perceived website credibility leads to more favorable attitudes toward a website. Other studies suggest that for e-commerce websites, credibility is directly related to purchase intention and behavior (McKnight & Chervany, 2002; Tan & Sutherland, 2004). Thus, the following hypothesis is proposed:

H4. Credibility will mediate the relationship between each heuristic cue—perceived authority, perceived bandwagon, and perceived objectivity—and attitudes toward the product, attitudes toward the website, and purchase intentions.

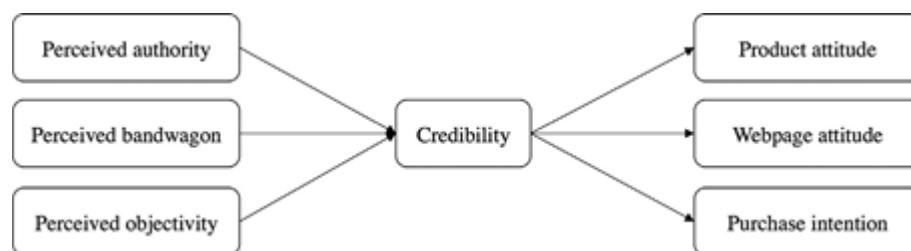


Fig. 1. Mediation model for Hypothesis 5.

Additionally, the influence social plugins have on credibility judgments has yet to be explored. Therefore, this research seeks to examine how this heuristic cue influences perceptions of credibility as well as any subsequent attitudinal and behavioral intentions that may result from the presence of these plugins.

RQ3. (a) *Which perceived heuristics—authority, bandwagon, and machine heuristic—will mediate the relationship between the presence of social plugins and credibility judgments?* (b) *When sharing options are present, does credibility influence the attitudes and behavioral intentions of those viewing a product review website (i.e., attitudes toward the product, attitudes toward the website, and purchase intentions)?*

Methods

Four hundred seventy-eight undergraduate students enrolled in communication classes at a large northeastern university participated in a 2 (star rating) \times 3 (source information) \times 2 (sharing options) between-subjects, online experiment. Students received course credit or extra credit for their participation. In total, 458 usable responses were obtained from participants (60% females; 40% males). Eighty-seven percent of the participants were Caucasian, with other races or ethnicities each comprising less than 1% of the sample. All participants were between the ages of 18–29. Recognizing the use of a college-age sample inherently limits the generalizability of this study's findings among other age demographics, it is worth noting the prevalence of looking for and researching product and service information online among this age group. Pew Research Center reports that of those who use the Internet, 24% have commented on product reviews and 78% have researched products or services online when considering a purchase (Jansen, 2010). Of the 18–29 year old Americans Pew surveyed, 77% conducted online research. This number was similar for people between the ages of 20–49 (80%) and 50–64 (81%). The prevalence of this activity declined for those 65 years of age and older (68%; Jansen, 2010). Although this current study cannot explicitly account for the differences in online experiences between younger and older age demographics, the prevalence of this behavior among a younger generation who uses the Internet increasingly more than any other age group (Fox & Rainie, 2014) warrants exploration and is therefore the focus of this research.

Stimulus material

The independent variables included the three heuristic cues: star rating, the rating source, and sharing options. When operationalizing star ratings each review was given a high or low number of stars indicting the product was an excellent deal (four red stars) or a poor choice (one red star). The source of the star ratings were shown to come from reviewers (expert source), online users (laypersons), or the website (machine) and said one of the following: “average user ratings”, “reviewer's rating”, or “website rating”. The ability to share the site's content with others was indicated by the presence or absence of sharing options. Sharing options consisted of social media sites or online tools that allow information to be easily spread or disseminated to others. These included plugins for Facebook, Stumbleupon, Del.icio.us, Newsvine, Yahoo! Buzz, Reddit, Twitter, Digg, Yahoo! Bookmarks, and Google Bookmarks (see Fig. 2).

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Product summary

Average User Rating:

★★★★★

Excellent

The good:

The TouchFlex cell phone features a spacious touch screen with customizable home screen, haptic (touch) feedback, and accelerometer. The Windows Mobile smartphone also offers Wi-Fi, GPS, Bluetooth, and EV-DO Rev. A support, as well as a 5-megapixel camera and robust multimedia features.

The bad:

You're limited to the preloaded widgets (applications). The onscreen keyboard is a bit cramped, and the touch features can be sluggish.

The bottom line:

Though slightly more expensive, Verizon customers looking for a touch-screen smartphone will get a better user experience and faster performance from the TouchFlex than the RIM BlackBerry Storm.

Specifications:

OS provided: Microsoft Windows Mobile 6.1 Professional; Installed RAM: 128 MB; Wireless connectivity: Bluetooth.

Price: \$99.00

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Product summary

Reviewer's Rating:

★☆☆☆☆

Poor

The good:

The TouchFlex cell phone features a spacious touch screen with customizable home screen, haptic (touch) feedback, and accelerometer. The Windows Mobile smartphone also offers Wi-Fi, GPS, Bluetooth, and EV-DO Rev. A support, as well as a 5-megapixel camera and robust multimedia features.

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Fig. 2. Stimulus web page examples: user source, excellent rating, and sharing options present (top) and expert source, poor rating, and no sharing options (bottom).

All participants were randomly assigned to one of 12 versions of a product review website. Randomization was done using an html script that assigned each participant to one of the conditions after they agreed to participate in the study. Table 1 identifies the number of participants assigned to each experimental condition.

Each stimulus mirrored a product review web page like those regularly found at CNET.com, a site that offers product reviews to help consumers make more informed decisions about the technology and electronics they are considering purchasing. For the purposes of this study, the name of the site was changed to *eTec Reviews* and the colors of the site were modified. Below the website banner, a large picture of the product—a haptic cell phone, a popular product among college students—with a fictional name (*TouchFlex*) dominated the page. The product rating (including star rating and rating source) appeared below the product picture to give readers insight into what the user, reviewer, or website thought of the product overall. Additionally, five sections of content were included. The first three sections briefly highlighted “the good”, “the bad”, and “the bottom line” regarding the product. A few key product specifications as well as the price of the phone were also included.

Table 1
Participants assigned to each experimental condition.

| | Star ratings | | | | Total |
|----------|-----------------------------|-----|---------|-----|-------|
| | 1 Star | | 4 Stars | | |
| | Presence of sharing plugins | | | | |
| | No | Yes | No | Yes | |
| Reviewer | 36 | 43 | 42 | 34 | 155 |
| Users | 38 | 37 | 39 | 31 | 145 |
| Website | 39 | 42 | 37 | 40 | 158 |
| Total | 235 | | 223 | | 458 |

Dependent variables

Product attitude consisted of seven items that asked participants to indicate their cognitive and affective perceptions about the stimuli viewed (Sundar et al., 2008). The seven items (e.g., “This product is of poor quality” and “I think this product offers great value for money”) were measured on a 7-point Likert scale anchored by 1 (*strongly disagree*) and 7 (*strongly agree*). All items were averaged to form an index ($\alpha = .83$, $M = 3.53$, $SD = 1.03$).

Web page attitude consisted of an index adapted from Kalyanaraman and Sundar (2006). Participants were asked to rate how well 5 adjectives (useful, good, favorable, pleasant, and likeable) described the product review web page. Participants rated each adjective on a 7-point scale anchored by 1 (*describes very poorly*) and 7 (*describes very well*). Ratings of all items were averaged to form an index ($\alpha = .92$, $M = 4.18$, $SD = 1.03$).

Purchase intention was measured by two semantic differential items adapted from Li, Daugherty, and Biocca (2002). Participants were asked how likely they were to purchase the phone based on the review they read. Both items were anchored by 1 (*unlikely/definitely not*) and 7 (*likely/definitely*). These two items were summed and averaged ($r = .87$, $M = 2.50$, $SD = 1.43$).

Sharing intention was assessed using four items asking participants to indicate how likely they were to share the product review information with friends, family, and other people. The items were anchored from 1 (*not at all*) to 7 (*very much*). Items were summed and averaged to form an index ($\alpha = .87$, $M = 2.67$, SD

= 1.38).

Potential mediating variables

Perceived authority was an index consisting of 6 items (competent, expert, knowledgeable, credible, influential, and authoritative) measured on a 7-point scale anchored by 1 (*describes very poorly*) and 7 (*describes very well*). Items were summed and averaged to form an index ($\alpha = .90$, $M = 3.89$, $SD = 1.43$).

Perceived objectiveness assessed whether the machine heuristic (Sundar, 2008) was cued by the independent variables. The index consisted of 5 items (fair, neutral, impartial, biased, and objective) measured on a 7-point scale anchored by 1 (*describes very poorly*) and 7 (*describes very well*) ($\alpha = .80$, $M = 3.82$, $SD = 1.05$).

Perceived bandwagon was measured by asking participants whether the manipulations elicited a bandwagon heuristic. To measure this heuristic, participants rated seven statements (Sundar et al., 2008). Of these statements, the first six asked participants what they thought other people would feel about the phone (e.g., “How likely is it that other people would think this is a good product?”). The responses were anchored by 1 (*very unlikely*) and 7 (*very likely*). The last statement asked participants how they thought other people would rate the product. Responses were elicited on a scale from 1 (*very negative*) and 7 (*very positive*). All items were summed and averaged to form an index ($\alpha = .91$, $M = 3.88$, $SD = .82$).

For *credibility* perceptions, participants rated how well 10 adjectives (e.g., honest, accurate, and reliable) described the product review web page on a scale anchored by 1 (*describes very poorly*) and 7 (*describes very well*) (Berlo et al., 1970; McCroskey & Teven, 1999; Metzger, 2007). Ratings of all adjectives were summed and averaged to form an index ($\alpha = .89$, $M = 4.40$, $SD = .93$).

Control variables

Task involvement was an index of four items from Kalyanaraman and Sundar (2006) assessing participants’ involvement with the experimental task (e.g., “I found myself responding strongly to this web page”). The items were measured on 7-point Likert scales with anchors of 1 (*strongly disagree*) and 7 (*strongly agree*) ($\alpha = .84$, $M = 2.65$, $SD = 1.21$).

Prior product involvement was an index of 10 items that measured participants’ attitudes toward touch screen cell phones prior to being exposed to the product review website that featured the phones (Zaichkowsky, 1985). Participants rated “touch screen cell phones” using 10 adjectives (e.g., important, useful, appealing, relevant) with a scale anchored by 1 (*describes very poorly*) and 7 (*describes very well*). Ratings of all adjectives were summed and averaged to form an index ($\alpha = .93$, $M = 3.56$, $SD = 1.13$).

Participants’ *product review use* prior to being exposed to the stimulus was captured with two question items: “How frequently do you refer to product review websites when you are considering purchases?” and “How frequently do you read product review websites, even if you are not going to purchase products?” Responses were measured on 7-point scales anchored by 1 (*never*) and 7 (*all the time*) ($r = .61$, $M = 3.05$, $SD = 1.47$).

Procedure

All participants were asked to read an informed consent form prior to taking part in the study. After students viewed an online consent form and agreed to participate with the click of a hyperlink button, they were directed to an online questionnaire and allowed to proceed. The first set of questions asked participants to indicate their familiarity with product review websites as well as haptic cell phones. After gauging participants’ prior experience, they were shown a product review for the cell phone and then asked to proceed with the remainder

of the questionnaire. At this time participants were directed not to go back and examine the review.

Results

Manipulation checks

In order to determine if respondents recognized the visual heuristic cues utilized in the study, participants were asked to identify the source of the star rating, the number of stars the product received, as well as the presence or absence of sharing options after reviewing the stimulus. In addition to these manipulation checks, and in an effort to ensure respondents reviewed the stimulus information, they were also asked to identify the product type.

When examining the source of the reviews, 52 percent of those who examined the review from an expert and 49 percent of the participants who examined the review from other users correctly identified their experimental condition. This is in contrast with the third group where 20 percent of those who examined the review from the website correctly identified their experimental condition. Additionally, respondents were asked to identify if they had a difficult time figuring out who provided them with the review information. Using a 7-point scale, participants neither strongly disagreed nor strongly agreed with this statement ($M = 4.01$, $SD = 1.68$), suggesting many participants paid attention to the source of the review.

Regarding the star ratings, 55 percent of the participants in the one-star condition reported that they viewed the review with one star whereas 72 percent of the participants in the four-star condition reported the review had four stars.

Lastly, when checking to see if participants recognized the presence of sharing plugins, they were asked to indicate how much they agreed with the following statements using a 7-point scale ranging from strongly disagree (1) to strongly agree (7): “The webpage I read had sharing options” and “The review page made it easy for me to share the review with others online (e.g., Facebook, digg.com, email, twitter.com, MySpace.com, etc.)” ($r = .66$, $p < .001$). Perceptions significantly differed between the two conditions ($t(414) = 5.91$, $p < .001$; $M_{no\ sharing} = 3.37$, $SD_{no\ sharing} = 1.23$; $M_{sharing} = 4.19$, $SD_{sharing} = 1.68$), with a lower mean desired for the no sharing condition than the sharing condition. Thus, manipulations of the source and star ratings were partially successful while that of the sharing applications was fairly successful.

Data analysis

To answer Research Questions 1 and 2 and then test Hypotheses 1, 2, and 3, a series of 3 (rating source: reviewer’s rating vs. user’s rating vs. website rating) \times 2 (star rating: one star vs. four stars) \times 2 (sharing option: sharing vs. no sharing) univariate analyses of covariances (ANCOVAs) on attitudes, purchase intention, and sharing intention were conducted. All ANCOVAs employed covariates of prior product involvement, task involvement, and prior experience with a product review website. Descriptive statistics associated with all outcome variables are summarized in Table 2. Mediation analysis was used to test Hypothesis 4 and answer the Research Question 3.

The impact of heuristic cues on attitudes, purchase intention, and sharing intention

The first research question examined the impact product review sources (expert, website, or other users) and visual cues that suggest the product’s popularity or a lack thereof (one- or four-star ratings) have on product attitudes, website attitudes, and purchase intentions. The data showed an interaction effect, revealing both the rating source and star ratings’ influence on webpage attitudes, $F(2, 441) = 3.17$, $p < .05$. Tukey HSD post-hoc analysis for the interaction showed participants in the expert ($M = 4.10$, $SE = .10$) and users’ source ($M = 3.93$, $SE = .11$) with a one-star rating reported the website as being less favorable than those in the four-star condition ($M_{reviewer's\ rating} = 4.56$, $SE = .11$; $M_{users' rating} = 4.32$, $SE = .11$). However, participants in the

computer/website source condition were not affected by star rating manipulation ($M_{one-star\ rating} = 4.14$, $SE = .10$; $M_{four-star\ rating} = 4.11$, $SE = .10$) (see Fig. 3). Expert source seemed to exhibit the greatest influence on the webpage attitudes. The data also found significant main effects for star ratings on both the product attitudes ($F(1, 441) = 31.89$, $p < .001$) and purchase intention ($F(1, 442) = 15.56$, $p < .001$). Specifically, with regard to the product attitudes, participants in the four-star condition showed more favorable attitudes toward the product ($M = 3.77$, $SE = .06$) than participants in the one-star condition ($M = 3.29$, $SE = .06$). In addition, participants in the four-star condition exhibited greater purchase intention ($M = 2.76$, $SE = .09$) than participants in the one-star condition ($M = 2.25$, $SE = .08$).

Hypotheses 1 and 2 explored whether or not specific source cues would influence the intention to share product review information when the information source was either an expert (H1) or user (H2) as opposed to a computer/website. The data failed to support these hypotheses.

Hypothesis 3 predicted the presence of social plugins would have a positive impact on product attitudes, attitudes toward the product review's webpage, and purchase intention. An analysis on attitudes toward the product showed a significant main effect for sharing options ($F(1, 441) = 6.72$, $p < .01$) such that participants in the sharing-option condition exhibited more favorable attitudes toward the product ($M = 3.64$, $SE = .06$) than participants who did not have the option to share the information ($M = 3.42$, $SE = .06$). Thus, Hypotheses 3 was partially supported.

Mediation analysis

Mediation analysis was conducted using Hayes' (2013) PROCESS, which allowed the investigators to assess indirect effects of potential mediators. Hypothesis 4 suggested credibility would mediate the relationship between each heuristic cue—perceived authority, perceived bandwagon, and perceived objectivity—and attitudes of the product, attitudes of the website, and purchase intentions. The data partially supported Hypotheses 4 such that credibility mediated the relationships (a) between perceived bandwagon effects and attitudes about the product, attitudes about the webpage, and purchase intention, as well as (b) between perceived objectivity and the three dependent variables. Fig. 4 shows a detailed analysis of these mediation processes. The hypothesis was not supported for perceived authority.

Table 2
Mean and standard error scores for dependent variables.

| | Dependent variables | | | Credibility | AP | AW | PI | SI |
|------------------------|---------------------|------------|------------|-------------|------------|------------|------------|-------------|
| | Heuristic cues | | | | | | | |
| | Authority | Bandwagon | Machine | | | | | |
| <i>Rating source</i> | | | | | | | | |
| Reviewer's rating | 4.05 (.08) | 3.87 (.06) | 3.87 (.08) | 4.47 (.07) | 3.53 (.07) | 4.33 (.07) | 2.48 (.10) | 2.77 (1.44) |
| User's rating | 3.83 (.08) | 3.90 (.06) | 3.80 (.08) | 4.40 (.07) | 3.48 (.08) | 4.13 (.07) | 2.54 (.11) | 2.48 (1.38) |
| Website rating | 3.80 (.08) | 3.87 (.06) | 3.79 (.08) | 4.35 (.07) | 3.58 (.07) | 4.13 (.07) | 2.49 (.10) | 2.65 (1.32) |
| <i>Star rating</i> | | | | | | | | |
| One star | 3.83 (.06) | 3.75 (.05) | 3.76 (.07) | 4.38 (.06) | 3.29 (.06) | 4.06 (.06) | 2.27 (.08) | 2.65 (1.46) |
| Four stars | 3.96 (.07) | 4.02 (.05) | 3.88 (.07) | 4.43 (.06) | 3.77 (.06) | 4.33 (.06) | 2.74 (.09) | 2.63 (1.32) |
| <i>Sharing options</i> | | | | | | | | |
| Sharing | 4.05 (.06) | 3.98 (.05) | 3.91 (.07) | 4.50 (.06) | 3.64 (.06) | 4.25 (.06) | 2.59 (.09) | 2.63 (1.32) |
| No sharing | 3.74 (.06) | 3.78 (.05) | 3.74 (.07) | 4.31 (.06) | 3.42 (.06) | 4.14 (.06) | 2.41 (.08) | 2.65 (1.46) |

Notes. Numbers in parentheses are standard error. AP = attitudes toward the product, AW = attitudes toward the product review webpage, PI = purchase intention, and SI = sharing intention. All variables were measured on 7-point Likert scales.

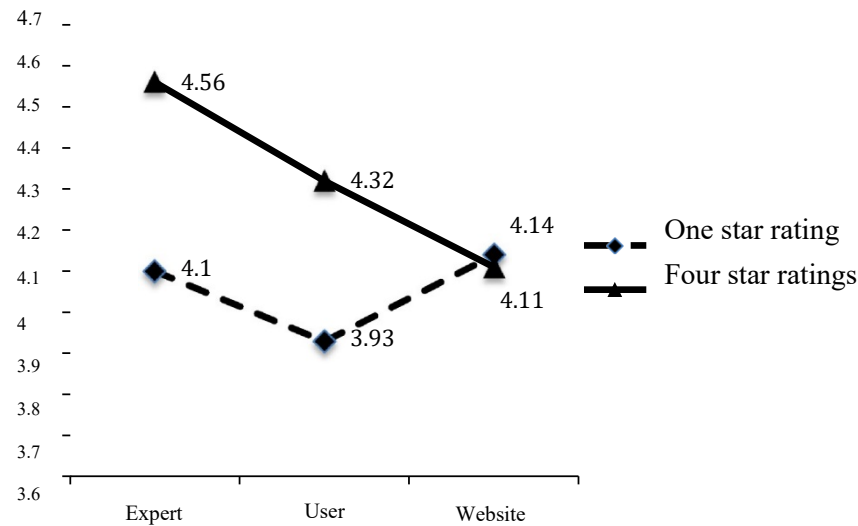


Fig. 3. The impact of review source and star ratings on webpage attitudes. $F(2, 442) = 3.21, p < .05$.

Research Question 2 explored a direct effect on the presence of social plugins and sharing intention. Although ANCOVA analysis did not reveal a direct effect between social plugins and sharing intention, additional analysis did reveal perceived authority and perceived bandwagon mediated the relationship between sharing options and sharing intention (see Fig. 5).

Furthermore, when examining Research Question 3, the data confirmed a two-step mediation effect through the two perceived heuristics (perceived authority and perceived bandwagon) and credibility between the sharing options and webpage attitude (see Fig. 6).

Discussion

This study illustrates the value of utilizing source cues as a trigger of heuristics in addition to presence of social plugins on product review websites. As the findings from the present study indicate, using an expert as the source

of the review information exhibited the greatest effect on participants' attitudes toward product review websites. However, this effect was dependent on the value-laden visual cue, star ratings (see Fig. 3). Furthermore, consistent with findings from previous studies (e.g., Chen, 2008; Chen & Xie 2008; Sundar et al., 2008), star ratings as a value-laden cue clearly exhibited a strong positive effect on users' attitudes toward the product, attitudes toward the website, and their purchase intention. Presence of sharing applications also had positive effects on users' attitudes toward the product. This study also confirmed the mediating effect of credibility between perceived heuristics (i.e., bandwagon and objectivity) and the cognitive and behavioral evaluation processes used when evaluating product reviews (Hypotheses 4). Last, when it comes to the use of sharing plugins, this research revealed the mediation mechanism for perceptions of heuristics and their impact on the judgment process via credibility.

Sharing as a venue of information aggregation and approval

One of the significant, innovative findings identified in the present study surrounds the effect social plugins or sharing applications can have on attitudes. Specifically, social plugins induced strong psychological responses from the participants in terms of their positive attitudes toward the product. The presence of social plugins increased participants' intention to share the product review information when the authority and bandwagon heuristics were present (Fig. 5).

In fact, the nature of initiating an action to share product review information online is different than customizing avatars (e.g., Kim & Sundar, 2012), blogging (Stavrositu & Sundar, 2012), or posting on online discussion forums (Kim & Sundar, 2011). Unlike these intensive, user-initiated online activities, the simple process of sharing product reviews by clicking social plugins only requires website users to play the role of a deliverer or another aggregator of information. Therefore, clicking a social bookmark application and delivering the information might be limited to psychological senses directly related to content-generating actions, but it still encourages users of product review websites to be a source of information. However, as the mediating effects of perceived authority and bandwagon showed (Fig. 5), the possibility of sharing the product review led participants to infer the information was credible thereby giving the website authority and the product review popularity. Thus, the presence of sharing options may have played the role of a "seal" or "endorsement" for instant, safe sharing of the review information (Sundar, Xu, & Oeldorf-Hirsch, 2009). This theoretical explanation is made more salient considering the mediating influence of bandwagon and authority perceptions on credibility and product attitudes (Fig. 6).

Given the online environment possesses excessive amounts of information, which is capable of overwhelming the user, it is not unreasonable to assume online users quickly scan information online. As a result, people use certain cues that readily tell them about the quality of a product, information, a service, etc. In fact, previous literature explored the effects of source cues on credibility and cognitive psychology in online information sharing (e.g., Kim & Sundar, 2011). Despite the increasing popularity of social plugins on most news and information websites, including product review sites, previous research has not investigated the role of plugins in terms of their impact on information credibility judgments. People have a tendency to confirm information is accurate, relevant, knowledgeable, and valid when the information is shared (Wittenbaum, Hubbell, & Zuckerman, 1999). Because shared information signifies the information is credible, it triggers positive attitudes toward the information. Therefore, the present study provided evidence that the mere presence of social plugins, even as an image before an actual sharing action, triggers the authority and bandwagon heuristic cues. In turn, these cues produce positive attitudes toward the website as well as further intention to share the product review information. Thus, social plugins are another type of information cue that leads people to make quick judgments when there is an overwhelming amount of information to process, a limited time to process the information, or just a lack of desire to judge the argument (Petty & Cacioppo, 1986).

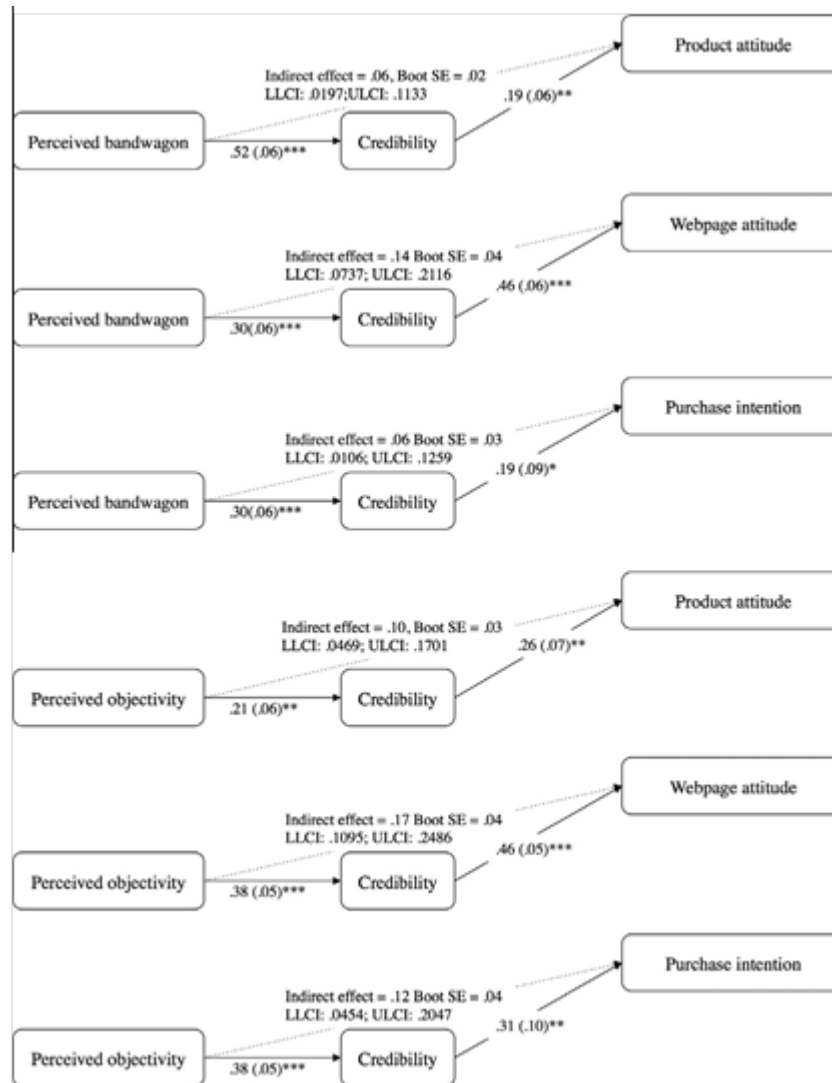


Fig. 4. Mediation analysis for Hypothesis 4. Note. * $p < .05$, ** $p < .01$, *** $p < .001$.



Fig. 5. Mediation effects of perceived authority and perceived bandwagon heuristics on the relationship between sharing options and sharing intention.

Who should rate products?

The present study suggests that for product reviews people largely base their decisions about product quality on the number of stars received on a review website. The findings showed that when the product review had more stars, participants rated the product and the website more favorably. Respondents were also more likely to indicate they would purchase the product. Because participants believed that the number of stars was a visual cue indicating aggregation of product reviews regardless of review source, they could perceive bandwagon power from the star ratings. A previous study by Sundar et al. (2008) showed star ratings' impact on bandwagon effects, but the study did not specify how the source impacted this effect and left the question, do bandwagon effects come from the expert, other users, or website itself? In this sense, the results from the present study confirmed bandwagon effects using star ratings should be attributed to an expert source to anticipate the best result in a product review website.

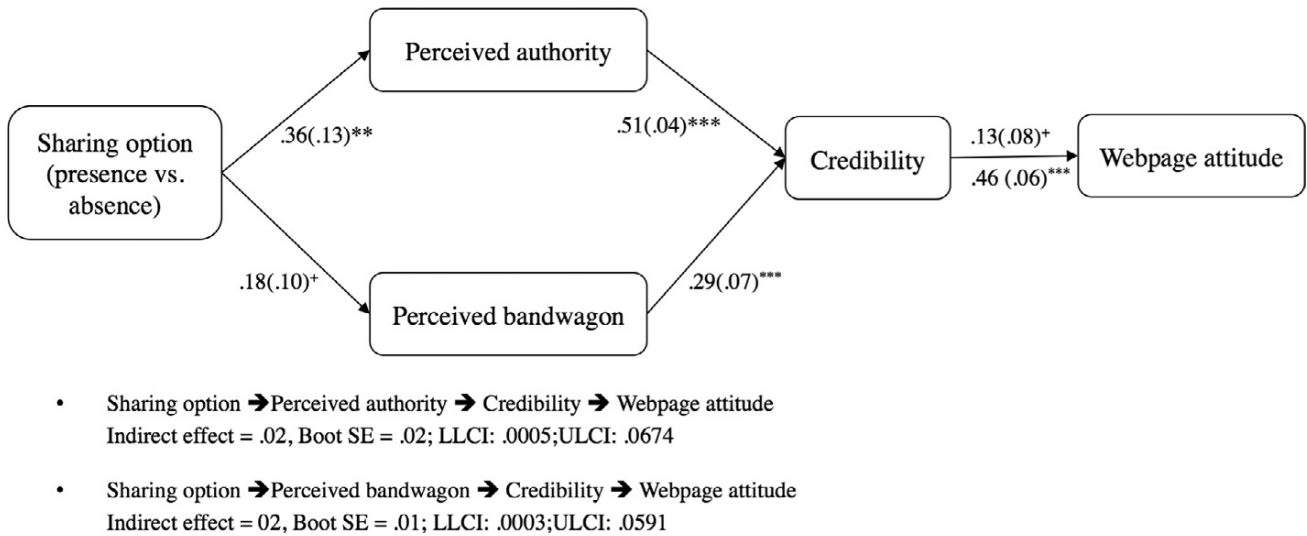


Fig. 6. A two-step mediation effect of perceived heuristics and credibility on the relationship between sharing options and webpage attitude. *Note.* [†] $p < .10$, $*p < .05$, $**p < .01$, $***p < .001$.

On one hand, because users of product review websites have a mental model (Payne, 2003) with which they expect a professional reviewer as a source of the online product review, they will exhibit more positive attitudes toward a product review site when a review is provided by the expert reviewer rather than other users. On the other hand, users showed relatively consistent favorable attitudes toward the site when the review information was attributed to the website itself, regardless of the level of star ratings (see Fig. 3). People tend to believe the objectiveness of computer-generated information (Edwards et al., 2013; Sundar, 2008). Therefore, when the participants in the present study perceived the source of the product review information the website—the more objective machinery source—they should have felt that the site was favorable no matter how many stars the product review received. In fact, the perceived objectiveness of a site appears to be critical in perceptions of credibility (Sundar, 2008). As confirmed in the mediation analysis (Fig. 4), besides perceived bandwagon, perceived objectivity led to positive evaluations of the product and the website as well as a willingness to purchase the product via credibility. Thus, it is likely that the innate objectiveness of the computer-generated information presented to participants influenced perceptions of the product review website.

The data from the present study did not directly confirm the link between the website source and perceived objectivity and its influence on the decision-making process, possibly because the majority of participants

in the website condition failed to identify the source of the product review. However, the participants in the website condition might not particularly attribute the source to the website because they have naturally accepted the website as the source of the product review unless alternate sources such as an expert reviewer or other users were conspicuously indicated. While empirical evidence from the present study leaves room for future research regarding the direct theoretical path between the review source and users' decision-making process for product purchases via perceived objectivity and credibility, it still shows the importance of the expert and the computer/website as sources of information on product review websites. However, as the results show, this all depends on availability of value-laden cues like star ratings.

Limitations and future research

The present study may have limited its ecological validity. Unlike an actual website, participants had no control over their browsing experience and could not click on links, tabs, or other functions that might be present on real web pages. This is particularly important for the sharing-options manipulation, which by its nature is a function affording user control. However, this limitation is offset to a degree because participants were informed that they would view a "screen capture" of a web page, therefore negating control of site contents. Also, it is possible that the placement of the sharing options adjacent to the stimulus product may have caused some participants to believe that the sharing options were a feature of the product itself and not an affordance of the web page. This may be an alternative explanation as to why participants in the sharing-options condition reported more favorable attitudes toward the product than those in the condition with no sharing options. A final limitation is that stimulus viewing time was not controlled. Participants could have skipped right through the stimulus page or they could have spent several minutes reading the review and browsing the web page. Thus, future studies should continue to examine the impact of sharing and social plugins on credibility perceptions and attitude formation in a live setting. This kind of study will allow participants to actually exert control over sharing options, thus aiding explanation into whether or not these affordances cues impact perceptions of authority and bandwagon simply by their presence or if their influence on credibility and attitude formation acts under some other mechanism. Researchers should also explore effects of sharing options in other contexts (e.g., news), other websites (e.g., a professional website vs. a layperson website), and among additional age groups. Finally, it would be relevant to explore whether the simultaneous presence of multiple star-rating sources presented all at once (i.e., expert, users, and the computer/website) impacts attitudes and behaviors differentially.

Conclusion

As the findings from the present study indicate, source cues help readers of online product reviews make quick judgments about product-related purchasing decisions by signifying the content's value and validating how much consumers can trust and rely on product review information. As a result, these cues influence consumer attitudes and behaviors when users of product review websites are contemplating making a purchase. Consumers look to these source cues, particularly expert sources with value-laden cues (i.e., star ratings), to determine the credibility of the information they review. In addition, social plugins on product review sites can be highly influential source cues.

The findings from this study are particularly informative for product review websites as they suggest incorporating a combination of source cues and star ratings can be more influential on consumer attitudes and behaviors than the tendency to simply overwhelm site users with more product information. Furthermore, this study also confirms how vital social plugins are to perceptions of credibility and generating favorable attitudes toward website information.

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