Scholars of computer-mediated communication have long been interested in the way in which interpersonal impressions form among computer users. Early Internet research explored how people used text-based social information to form impressions of others. However, sociotechnological systems now allow users to present themselves in a variety of forms. The first study found that when textual and photographic cues were presented alone, the principle of textual primacy predicted results; however, Study 2 found when cues were presented together in the context of a Facebook profile, the data were consistent with a visual primacy—negativity perspective such that photographs more strongly influenced judgments of social orientation, and textual cues influenced social orientation judgments when accompanied by an introverted photograph.


People utilize social networking technologies to accomplish tasks such as selecting a potential mate, purchase goods and services, facilitate social meetings, and engage in various forms of social support, among many others. Although previous research in computer-mediated communication (CMC) has carefully examined impression formation in interactive textual dyadic exchanges (e.g., Hancock & Dunham, 2001; Walther, 1993), less work has examined how cues in the context of a social networking environment affect impression formation. Social networking platforms and Web sites that utilize social networking technologies provide an interesting venue to study impression formation in CMC because they allow researchers to begin to understand how a perceiver can make sense of cues about a target to form impressions of that target and complete daily tasks.

Previous research has explored several different types of cues that may exist in social network environments such as self-generated, other-generated, and system-generated cues (Tong, Van Der Heide, Langwell, & Walther, 2008; Utz, 2010; Walther, 2012).
Van Der Heide, Hamel, & Shulman, 2009; Walther, Van Der Heide, Kim, Westerman, & Tong, 2008), the types of strategies that computer users avail themselves of when reducing interpersonal uncertainty (Antheunis, Valkenburg, Peter, 2010; Ramirez, Walther, Burgoon, & Sunnafrank, 2002), and the effects of visual cues (i.e., profile photos) on friendship initiation (Wang, Moon, Kwon, Evans, & Stefanone, 2010). This work builds on previous research by examining how two types of cues shown to affect social judgments in social networking Web sites (photographs and textual self-disclosures) presented alone or together affect the way perceivers form an impression of a target.

Impression formation in the context of social networking Web sites raises new questions about how people form focused impressions of a target in the face of a veritable (and literal) wall of cues about a target's identity. Traditionally, impression formation processes have been examined by exploring how an impression of a target develops quickly (and accurately) on the basis of few cues about the target (e.g., Albright, Kenny, & Malloy, 1988; Ambady & Rosenthal, 1993). Previous work in CMC has focused primarily on the effects of text-based cues such as self-disclosures, friends' testimonials, and system-based information (Tong et al., 2008; Walther et al., 2009) or has examined the accuracy of photographs (Hancock & Toma, 2009). However, on Facebook as well as many other Web sites, viewers form impressions based on textual and visual cues in concert. This work seeks to address how people form impressions in cue-laden environments by examining how textual and photographic cues affect impression formation in the context of Facebook.

Study 1

Textual versus visual cue primacy

Both textual primacy and visual primacy seem viable theoretical mechanisms for predicting impression formation in CMC. On one hand, by virtue of their unambiguous nature, people judging a target individual may put more weight on direct, verbal self-disclosures. However, it is also possible that visual cues may be more memorable and influence impressions more strongly than a person's verbal self-disclosures. This research turns to a discussion of these competing perspectives.

Textual primacy

Textual cues may influence impressions of a target more strongly than visual cues because they are more distinctive than photographic cues. Van Der Heide (2008) has suggested that distinctive cues (cues that can be taken to mean one, and only one, thing) should be more likely to affect impressions because they are easy to interpret. For instance, if a person disclosed that they were “extremely sociable,” such a cue would be a more distinctive indicator of extraversion than if they used many words to describe themselves. Although both verbosity and direct self-disclosures are cues that have been indicative of extraversion in CMC (Marcus, Machilek, & Schütz, 2006; Utz, 2010; Walther et al., 2009), it is difficult to attribute such direct
self-disclosures of extraversion to characteristics other than extraversion, while one may attribute verbosity to other personal or situational characteristics. Similarly, textual disclosures may be more distinctive than photographic cues because they are more difficult to interpret in a number of ways. For example, it is difficult for an observer to attribute anything other than sociability to the statement, “I am an extrovert,” while a photograph of a target having fun with people at a party could be presented by either an introvert or an extrovert. Relative to photographic cues, textual cues may be more distinctive than photographs because they are easier to interpret.

Earlier research exploring nonverbal communicative processes shows some empirical support for textual primacy. For example, Howe (1989) explored how visual, vocal, and verbal content present in a filmed interaction between the target and another individual affected participants’ judgments about a target’s superiority. This research found that the primary mechanisms by which participants made superiority judgments arose from the verbal and vocal content of filmed interactions, while visual information from those interactions did not potently influence superiority judgments. Howe concluded that “verbal and vocal information [are] given greater prominence” (p. 270). In three studies exploring the effects of the relative importance of visual and verbal cues on impressions of personality and affect, Ekman, Friesen, O’Sullivan, and Sherer (1980) found that observers’ judgments of targets did not favor the visual channel over the verbal channel. Ekman et al. concluded, “claims in the literature that the face is most important or that the nonverbal-visual channel is more important than the verbal-auditory channel have not been supported” (p. 276).

These findings suggest verbal content has more influence than visual content. Applying these findings to an impression formation context suggests a textual primacy effect, where a lack of explicitness of photographic cues leads those cues to be of less judgmental value than verbal cues.

Walther (1992) theorized that, although many nonverbal cues may be filtered out of text-based communication, users of CMC adapt to the medium and can encode social information into their text-based messages. Applying this to a social networking environment, one should expect that the self-disclosures that a user makes might convey extra verbal information, information that may have been conveyed kinesthetically or vocally in a traditional face-to-face self-disclosure. Moreover, this perspective also suggests that observers may place special weight on textual–verbal information as they expect to compensate for the lack of vocal and kinesic information by decoding the textual manipulations offered by a target. If this was the case, one might expect text-based cues to be especially potent influencers of impression judgments.

Consistent with this perspective the following interaction hypothesis is posited:

H1: In social networking Web sites, there is an interaction between verbal and photographic cues on social orientation judgments such that verbal self-disclosures produce more extreme social orientation judgments in the direction of their valence (higher social
Visual primacy

Although it is reasonable to expect textual cues to influence impression judgments more strongly than photographic cues, it is not without empirical precedent to expect that the opposite might be true: Visual cues may enjoy primacy over textual cues. Research studying the effects of visual and verbal cue systems has shown evidence of a visual primacy effect (DePaulo, Rosenthal, Eisenstat, Rogers, & Finkelstein, 1978). In terms of initial impression formation, visual primacy refers to the relatively stronger effect of visual cues on impression judgments than verbal or vocal cues. Early visual primacy work specified that the visual channel was more important than vocal or verbal channels (Argyle, Alkema, & Gilmour, 1972; Mehrabian & Wiener, 1967). In a review of findings, Posner, Nissen, and Klein (1976) report a number of examples of visual primacy in terms of both perceptual and memory tasks. They suggested that people pay greater attention to visual cues than verbal cues. Burgoon (1994) also suggests that visual primacy represents an important bias in the process of impression formation. She argued that observers often use visual cues and may neglect verbal cues causing an “overreliance on visual information” (p. 250). Similarly, advertising researchers have found that although participants focused for longer periods of time on the textual components of print ads, photograph recognition was exceptionally high even after less time was spent gazing at the photograph (Rayner, Rotello, Stewart, Keir, & Duffy, 2001). Other research in this vein found that, even after a significant time delay, photos are more memorable than text (Shepard, 1967).

Thus, the visual primacy perspective offers a hypothesis that competes with the textual primacy hypothesis. Instead of textual cues carrying more impression-bearing information than photographic ones, the visual primacy perspective suggests that photographs are more influential than textual cues.

H2: In social networking Web sites, there is an interaction between verbal and photographic cues on social orientation judgments such that photographs produce more extreme social orientation judgments in the direction of their valence than do verbal self-disclosures.

Method

Participants and design

Participants (N = 84) were students in undergraduate communication courses at a large public university in the midwestern United States. Participants were randomly assigned to one of four experimental conditions. In these four conditions, stimuli reflected differences in the mode of social orientation cue (photographic vs. textual) and the valence of the social orientation cue. As such, the design of the study was a 2 (mode of cue: photographic vs. textual) × 2 (valence of cue: introversion vs. extraversion).
Stimuli
Extraversion was photographically represented by presenting participants with a photograph that depicted an individual socializing with a number of friends (behavior associated with extraversion). Introversion was photographically represented by an image of an individual who was sitting alone on a park bench. In both cases, photographic stimuli alone were presented to participants. Participants were left to form an impression of the target after being informed that the photograph in question was a photograph of the target.

Textual presentations of social orientation were manipulated in a similar fashion to Walther et al.’s (2009) self-disclosures of extraversion or introversion. Participants in the textual cue to extraversion condition were informed that the target claimed: “I am a very sociable person, I’m happiest hanging out with a big group of my friends.” In the textual cue to introversion condition, participants were informed that the target claimed: “I’m not a big people-person, I’m happiest curled up in my room with a good book.”

Dependent measure
The dependent measure of interest for this study was social orientation judgments. Commonly, this variable is referred to as extraversion; however, this research names the variable social orientation and refers to high and low quantities of social orientation as extraversion and introversion, respectively. Although photographic cues heavily influence personal characteristics such as physical attractiveness (Raines, Hechtman, & Rosenthal, 1990; Zuckerman, Miyake, & Hodgins, 1991), a target’s core personality characteristics are influenced by a wider range of cues (Burgoon, 1994). Thus, using social orientation as a judgmental criterion allows for a direct test of the primary aims of this research: to assess whether textual or photographic cues more strongly influence social orientation judgments. Social orientation was assessed using a version of the extraversion subscale of Costa and McCrae’s (1991) NEO-Five Factor Inventory (NEO-FFI; a measure used to assess individuals’ personality traits) adapted for observers (see Walther et al., 2009). This scale consisted of twelve 7-point Likert-type questions such as, “This person really enjoys talking to people” and “This person usually prefers to do things alone” (reverse-scored). These 12 items were averaged to generate a composite score for overall social orientation judgments of the target. This scale achieved a Cronbach’s $\alpha$ of .94.

Manipulation check
To assess the efficacy of the inductions, participants made social orientation judgments about the target that ostensibly produced each statement or photograph. The manipulation check was conducted with the same participants and the same social orientation dependent variable as in the main study, but it examined only whether extraverted cues produced higher social orientation judgments than introverted cues in each of the cue-type conditions (i.e., textual extraversion cues compared with textual introversion cues and photographic extraversion cues compared with photographic introversion cues). Participants ($n = 42$) rated targets who
were photographically presented as extraverts to have significantly higher social orientation scores ($M = 5.25, SD = 0.68$) than those who were photographically presented as introverts ($M = 3.73, SD = 0.59$), $t(40) = 7.68, p < .001, \eta^2 = .60$. Participants ($n = 42$) rated targets who were textually presented as extraverts to have significantly higher social orientation scores ($M = 5.34, SD = 0.66$) than those who were textually presented as introverts ($M = 2.67, SD = 0.68$), $t(40) = 12.97, p < .001, \eta^2 = .80$. Thus, the cue valence induction was successful for both verbal statements and photographic depictions of extraversion/introversion.

Results

Hypothesis 1 predicted an interaction between the valence of a target’s social orientation self-presentation and the mode of self-presentation, such that textual extraversion or introversion cues should more strongly influence social orientation judgments than photographic extraversion or introversion cues. Hypothesis 2 also predicted significant interaction, but argued that, instead of textual statements producing the strongest influence on social orientation judgments, photographs would most strongly influence social orientation judgments. Because Hypotheses 1 and 2 as well as two manipulation check analyses all utilized the same dependent variable, a Bonferroni correction was used. This procedure suggested using a critical $p$-value of .0125. All the results from Study 1 (both hypothesis tests and post hoc Least Significant Difference [LSD] analyses) were robust to this correction. The effects of cue valence (extraverted vs. introverted) and type of cue (photographic vs. textual) on social orientation judgments were assessed using a two-way analysis of variance. Analyses revealed a significant interaction effect between cue mode and cue valence on social orientation judgments, $F(1, 80) = 16.56, p < .001, \eta^2 = .17$.

To interpret whether this specific interaction effect was consistent with Hypothesis 1, the data were analyzed using a post hoc least significant difference test. These analyses indicated that there was no significant difference in social orientation judgments between the textual extraversion ($M = 5.34, SD = 0.66, n = 21$) and photographic extraversion ($M = 5.25, SD = 0.68, n = 20$) cues, $p = .63$. However, there was a significant difference between textual introversion and photographic introversion cues such that textual introversion cues produced judgments of lower social orientation ($M = 2.67, SD = 0.68, n = 21$) than did photographic introversion cues ($M = 3.73, SD = 0.59, n = 22$), $p < .001$. This suggested partial support for Hypothesis 1. The analyses associated with Hypothesis 1 and their subsequent results obviate separate analyses for Hypothesis 2, because the pattern of means was not consistent with the Hypothesis 2 prediction for textual and photographic extraversion cues and was the opposite of what Hypothesis 2 predicted for textual and photographic introversion cues. Thus, the data were partially consistent with Hypothesis 1 but not consistent with Hypothesis 2.

Discussion

This study found that textual introversion cues had a significantly stronger impact on social orientation judgments than did photographic introversion cues. However,
the results for Hypothesis 1 were mixed; although the data showed that textual introversion cues had a stronger influence on extraversion impressions than did photographic introversion cues, neither text-based nor photographic extraversion cues were significantly better predictors of social orientation judgments than the other. These results are consistent with a textual primacy explanation for negatively valenced (i.e., introversion) cues.

Although a textual introversion cue had a stronger influence on social orientation judgments than did a photographic introversion cue, it may or may not be the case that text-based cues have more influence on impressions than photographic cues when they are presented amid other pieces of social information. Online venues, and social networking Web sites in particular, provide an opportunity to look at the effects of photographic and textual cue systems together, as they natively appear on the Internet. Thus, another study was conducted to address the following question: Will introverted textual statements continue to carry more weight when those cues are accompanied by other impression cues? Designing a study to address this question requires a setting wherein one can examine cue weights in a realistic setting where both text and images are integrated onto one platform. Thus, the second study utilized the same social orientation textual and photographic cues as they would naturally appear in one popular social networking Web site: Facebook.

The second study also considered an additional area of interest: The significant difference in social orientation judgments between textual and photographic introversion, but not extraversion, cues. Significant differences in social orientation judgments between text-based and photographic cues to extraversion/introversion were only found between cues that depicted introversion. Thus, the second study was conducted to determine the effects on impression formation when cue valences and modes are mixed (i.e., when introverted images are placed next to extraverted text and vice versa).

**Study 2**

A second study was conducted to extend the findings from the first study in a number of ways. The second study seeks to determine the effects of both photographic and text-based extraversion cues in concert. Also, the second study seeks to understand the results of the first study’s finding that text-based cues were particularly potent when a target textually self-disclosed that she was introverted.

**The negativity effect**

Previous research has demonstrated that observers assess cues associated with introversion as “negative information” (Walther et al., 2009). This finding is consistent with much previous research suggesting that extraversion is associated with a number of positive outcomes and judgments. For instance, credibility judgments (McCroskey, Hamilton, & Weiner, 1974) and leadership perceptions (Bass, 1990) are positively associated with social orientation. Consequently, it seems likely that the presentation
of cues to introversion may well be perceived as negative information, which is parsed according to the negativity effect.

Recent research suggests that negatively valenced cues may have a particularly strong impact on impressions of a profile owner. For instance, one study that explored the effects of self-generated extraversion cues and photographs (extraverted vs. introverted) of the target’s friends on perceptions of a target’s popularity and social attractiveness on the Dutch social networking site Hyves found that for targets with highly extroverted friends, having a greater number of friends did not affect social attractiveness judgments; however, the more introverted friends a target had, the less socially attractive the target became (Utz, 2010). Other recent work (Walther et al., 2009) provided empirical evidence supporting the negativity effect insofar as they predicted social orientation impressions of a target. In their test of warranting theory (Walther & Parks, 2002), Walther et al. found that the negativity effect successfully predicted judgments of a target’s social orientation.

The negativity effect suggests that negative information has greater impact in the impression formation process (Kellerman, 1984). For example, Klein (1991) showed that perception of weakness in presidential campaigns in 1984 and 1988 was a better predictor of election outcomes than perceptions of strength. Kellerman (1989, p. 150) reasoned that negative information is “weighted more heavily in impression formation and decision making because it is less frequent,” a claim based on correspondent inference theory (Jones & Davis, 1965).

The correspondent inference theory (Jones & Davis, 1965) suggests that nonnormative behaviors influence impression formation more than normative behavior. When someone evaluates another person, they are less likely to base their judgment on normative behavior, because it is not very informative. That is, one cannot tell if the behavior is simply a product of the current context (i.e., the behavior should be situationally attributed) or whether the behavior in question arises because of some unique characteristic of the target (i.e., the behavior should be dispositionally attributed). Instead, observers will base their impression judgments of others on nonnormative behavior—the behavior that is deemed not expected given the context—to better judge an individual’s personality. This information is expected to be more valuable, for it represents an individual’s personality rather than acts of conformity to a situation. According to Kellerman (1984, 1989), because positive and complimentary statements are expected and negative statements are not expected, negative statements about an individual are weighed more heavily in the evaluation of an individual.

Research in CMC has shown that negative information can affect social judgments to a greater degree than positive information (Dindia & Huber, 2009; Walther & D’Addario, 2001; Walther et al., 2009). For example, in a study examining the effects of emoticons on perceptions of chat messages, negative messages or emoticons shifted the interpretation of that message in the direction of the negative message element (Walther & D’Addario, 2001). A conceptual replication of this study using graphical emoticons instead of text-based emoticons suggested that this negativity effect is
relatively robust (Dindia & Huber, 2009). Recent research (Tong et al., 2008) has also explored the curvilinear relationship between the number of friends a target has on a social networking Web site and the social attractiveness that observers attribute to that target. Consistent with the explanation of the negativity effect arising because information is nonnormative, targets were judged to be most socially attractive when they had a number of friends, which was approximately at the modal number of friends reported by participants in the sample. If negative information is indeed informative because it is nonnormative, Tong et al.’s results may well be the product of a negativity effect.

Although the negativity effect may offer insight into why the results of Study 1 varied with respect to introversion cue-related social orientation judgments but not extroversion cue-related social orientation judgments, it is also necessary to recall the discussion of cue primacy from Study 1 to consider the effects of photographic versus text-based cues on impression formation. In Study 1, the data suggested that textual cues were stronger predictors of social orientation judgments than were photographic cues. This suggests that Study 1 data might be best described by distributing the negativity principle onto the textual primacy hypothesis. Such a distribution would predict that (a) textual cues enjoy primacy over photographic cues and (b) negative information is more informative than positive information. That is, textual cues influence impression judgments more strongly than photographic cues, and negative cues influence judgments more strongly than positive cues. Neither textual primacy nor negativity effects alone adequately predict impression judgments. Instead, these effects must be taken together. Such a prediction would conform to both the negativity and textual-primacy principles. Accordingly, the following textual primacy–negativity hypothesis is offered:

**H3:** Perceivers’ judgments of a target’s extraversion are greatest when a verbal cue and a photographic cue depict extraversion, are significantly lower when a verbal cue depicts extraversion but a photographic cue depicts introversion, are lower still when a verbal cue depicts introversion but a photograph depicts extraversion, and are lowest when both verbal and photographic cues depict introversion.

Although the data from Study 1 were not consistent with a visual primacy effect, it is possible that when these cues are presented in the context of an actual social networking Web site—rather than as isolated cues—photographs may have a greater effect on impressions than do textual cues. Much of the work that shows visual primacy effects has utilized an experimental approach where multiple cue systems provided information about a target (see Posner et al., 1976). It may be the case that visual primacy effects are most prevalent when there are a variety of cues that compete for a perceiver’s attention. Further, if this was the case, it seems likely that the most poignant effects for these cues should occur when the cues provide negative information about a target. Consequently, it is possible that participants’ judgments of the target may be more influenced by photographic extraversion cues than textual extraversion cues. Again, this work argues that neither visual primacy nor
negativity alone is an adequate predictor of the impression judgment process. Thus, this research offers a hybrid visual primacy–negativity hypothesis that conforms to both the visual primacy and negativity principles:

**H4:** Perceivers’ judgments of a target’s social orientation are greatest when a verbal cue and a photographic cue depict extraversion, are significantly lower when a photographic cue depicts extraversion but a verbal cue depicts introversion, are lower still when a photographic cue depicts introversion but a verbal cue depicts extraversion, and are lowest when both verbal and photographic cues depict introversion.

**Method**

**Participants and design**

Participants (\(N = 195\)) were undergraduate communication students in a large university in the Midwestern United States. Participants received course credit in exchange for participation in the study. Participants were randomly assigned to one of eight experimental conditions using a javascript program (Burton & Walther, 2001). Experimental conditions reflected differences in the extraversion depicted by both text-based and photographic cues on a Facebook profile. As such the design of the study was a 2 (photographic cue: extraversion vs. introversion) \(\times\) 2 (text-based cue: extraversion vs. introversion) between-subjects factorial.

**Stimuli**

Experimental stimuli were comprised by a mock Facebook profile of a person who was, ostensibly, a student at the university where the research was conducted. Each version of the experimental stimuli varied from other versions in terms of the extraversion depicted by the profile photograph and the textual self-disclosure of extraversion depicted by the “about me” portion of the profile. These inductions were identical to the textual and photographic inductions from Study 1. Except for the manipulation of the profile photograph and the “about me” statement in each profile, experimental stimuli were identical.

**Dependent measure**

As in Study 1, the dependent measure of interest for this study was social orientation judgments. Extraversion was assessed using Walther et al.’s (2009) adaptation of Costa and McCrae’s (1991) extraversion subscale from the NEO-FFI. This scale consisted of twelve 7-point Likert-type questions such as, “This person really enjoys talking to people” and “This person usually prefers to do things alone” (reverse-scored). As in Study 1, these items were averaged to form an overall composite extraversion judgment. Study 2 used the same scale as in Study 1. This scale achieved a Cronbach’s \(\alpha\) of .92 and was judged to be acceptably reliable.

**Results**

Hypothesis 3 predicted that text-based cues would have the strongest impact on social orientation judgments and that these effects would be especially salient when
Table 1  Planned Contrast Analysis Weights, Means, and Standard Deviations for Study 2

<table>
<thead>
<tr>
<th></th>
<th>Extraverted Photographic Cue</th>
<th></th>
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<tr>
<td></td>
<td>Extraverted Textual Cue</td>
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<td>Introverted Textual Cue</td>
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<tr>
<td>Hypothesis 3</td>
<td>+2</td>
<td>−1</td>
<td>+1</td>
<td>−2</td>
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<tr>
<td>Hypothesis 4</td>
<td>+2</td>
<td>+1</td>
<td>−1</td>
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<tr>
<td>(M)</td>
<td>5.54&lt;sup&gt;a&lt;/sup&gt;</td>
<td>5.45&lt;sup&gt;a&lt;/sup&gt;</td>
<td>4.16&lt;sup&gt;b&lt;/sup&gt;</td>
<td>3.36&lt;sup&gt;c&lt;/sup&gt;</td>
</tr>
<tr>
<td>((SD))</td>
<td>(0.89)</td>
<td>(0.86)</td>
<td>(0.84)</td>
<td>(0.84)</td>
</tr>
<tr>
<td>(n)</td>
<td>58</td>
<td>40</td>
<td>46</td>
<td>51</td>
</tr>
</tbody>
</table>

Note: Means with different superscripts differ significantly from one another, \(p < .05\).

Text-based cues were negatively valenced (i.e., they suggested that the target was introverted). A planned contrast analysis was conducted (see Table 1 for contrast analysis weights for both Hypotheses 3 and 4) to assess this textual primacy–negativity effect. This contrast analysis assessing cell means (Table 1) was significant, \(t(191) = 8.08, p < .01, \eta^2 = .25\). Following the suggestion of Keppel and Wickens (2004), an analysis of the residual explained variance was conducted to determine if this set of contrast weights adequately described the effect of the study manipulations on the dependent variable. This analysis showed that there was still a significant amount of variance that was not accounted for by the planned contrast weights suggested by Hypothesis 3, \(F(2, 191) = 79.80, p < .01\). This suggests that while the contrast weights hypothesized here are consistent with the pattern that was observed, the findings for this pattern of means do not definitively rule out alternative explanations. Thus, there was mixed support for Hypothesis 3.

Hypothesis 4 predicted that photographic cues would have the strongest impact on social orientation judgments and that these effects would be strongest when photographic extraversion cues were negatively valenced. A planned contrast analysis was conducted to assess this hybrid visual primacy–negativity hypothesis. The planned contrast analysis was significant, \(t(191) = 14.87, p < .01, \eta^2 = .54\). Further, an analysis of the residual explained variance suggested that this set of planned contrasts adequately described the overall explained variance present in the model. After accounting for the variance described by the hypothesized effect, little variance in the dependent variable remained, \(F(2, 191) = 1.96, p = .14\). This suggested that the theoretically predicted pattern of means in Hypothesis 4 were very consistent with the observed pattern of means; Hypothesis 4 was supported.

The data were analyzed using a post hoc least significant difference test to pinpoint the precise point of weakness in the model posited by Hypothesis 3. In the conflicting cue conditions (where either photographic or textual cues indicated extraversion, but the other cue indicated introversion), Hypothesis 3 predicted that a textual extraversion cue paired with a photographic introversion cue should produce higher social orientation judgments than a textual introversion cue paired with a
photographic extraversion cue. Hypothesis 4 predicted the opposite. With respect to these predictions, pair-wise comparisons were consistent with Hypothesis 4 but not Hypothesis 3 (Table 1); a photographic introversion cue produced lower social orientation judgments when paired with a textual extraversion cue than when a textual introversion cue was paired with a photographic extraversion cue.

General discussion

Consistent with the visual primacy–negativity hypothesis, the findings for study two suggested that targets whose Facebook profiles contained an extraverted profile photograph were judged to have a significantly higher social orientation than were targets whose profiles contained an introverted profile photograph. However, verbal self-disclosures of extraversion or introversion did not have a significant impact on social orientation judgments unless they were paired with a photographic introversion cue. When participants viewed a Facebook profile containing a photographic introversion cue, target’s textual self-disclosures did seem to affect a perceiver’s judgments of a target’s social orientation.

Taken together, the results of these studies offer a number of new insights into the process of impression formation as it occurs online. First, Study 1 found that textual self-disclosures in isolation can more strongly influence social orientation judgments than photographs. However, Study 2 found that when the same cues are presented simultaneously in the context of Facebook, with all other profile information remaining constant, photographs have more impact on judgments of extraversion than do textual self-disclosures. Further, both studies offered evidence of a negativity effect and suggested that negative information may have a complex relationship with the way textual and photographic cues are processed and used to form social judgments in CMC.

Previous research that explored visual primacy effects among multiple cue systems has led to conflicting theoretical accounts of the primacy of visual cues. On one hand, some scholars have made the argument that the case for the effect of visual primacy on social judgments has, at best, been overstated (Ekman et al., 1980; Howe, 1989). Other scholars have argued that visual primacy is strongly indicated by empirical findings and adequately predicts impression judgments in a variety of contexts (see Burgoon, 1994; DePaulo et al., 1978). The findings presented here suggest that the strongest theoretical approach to these perspectives in a real-world context (where multiple cues may influence an observer’s judgments) lies in combining visual primacy with the negativity effect (Jones & Davis, 1965; Kellerman, 1984, 1989). This approach was supported by the data and offers the most complete interpretation of results. Specifically, photos enjoy primacy when it comes to the social judgments made about others in a social networking context. When photographic cues are positive, there is little cause for an observer to question his or her judgments about that person’s characteristics. However, when photographic cues are negative, text-based self-disclosures can significantly affect an observer’s judgment of a target. Moreover,
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this research illustrates that an isolated cue may not necessarily arouse the same types of social judgments as the same cue presented in context.

Limitations
One limitation of this work surrounds the difficulty of ensuring equivalent cue strength between visual and verbal cue systems (see Howe, 1989). Examining Studies 1 and 2 separately, it is not possible to determine whether results arise because of the hypothesized inductions or whether photographs or textual self-disclosures affected impression judgments because they were stronger than one another (i.e., the textual introversion self-disclosure was a stronger indicator of introversion that was a picture of person sitting alone on a park bench). Future research should endeavor to more clearly match the strength of these intermodal inductions.

Although the above limitation does raise questions for this research, the findings from Studies 1 and 2, taken together, seem to suggest that this limitation did not impede the ability of this work to make important conclusions about the nature of textual versus photographic cues. Although it may have been the case that cue inductions (textual vs. photographic) were not equal in strength, the conflicting findings between Study 1 (which found that textual self-disclosures more strongly influenced impressions than did photographs) and 2 (which found that the same photographs from Study 1 more strongly influenced impressions than did the same textual self-disclosures from Study 1) seem to suggest that the theoretical assertions of this piece remain robust to this limitation.

A related limitation was that this research utilized single-message/single-photograph inductions. Because of this design choice, it is difficult to determine whether the findings of this study are generalizable to all photos and text or whether they arise because of the specific photos and text utilized by this study. Burgoon, Hall, and Pfau (1991) argued that single-message designs, such as the one used in this research, lack generalizability. Although this methodological choice is a limitation for this research, Burgoon et al. also note that well-controlled, single-message designs can be quite valuable for generating new theoretical perspectives and can prove quite useful for future meta-analyses. Consequently, future research should seek to replicate these findings using a wider variety of stimuli and dependent variables within designs, and the results of such work should be meta-analyzed to better assess the generalizability of the phenomena this research has documented.

Another limitation is that the photographic extraversion cues may not have provided the same amount of information about the target as did the photographic introversion cues. Research on the reduction of uncertainty after exposure to photographs of a target has shown that observers tend to choose as more informative those photographs that either imply or show social interaction taking place over photographs that do not feature any social interaction (Berger & Douglas, 1981). Consequently, it is possible that photographic extraversion cues—because those photographs displayed social interaction, whereas introverted photographs did not display this interaction—were more informative than photographic introversion cues.
cues. Such an explanation may help explain why, in Study 2, participants who viewed the extraverted Facebook profile photograph rated the target to be highly extraverted regardless of the textual self-disclosure made by the target even while the textual self-disclosure made by the target with the introverted photograph was potent. Participants may have viewed the less social, introverted photograph as less informative. Consequently, they may have looked for alternative information to satisfy their uncertainty, rendering textual self-disclosures made by the target a valuable indicator of sociability. Future work should explore the competing hypothesis that suggests that photographic informativeness predicts whether observers will utilize textual cues, instead of the visual primacy–negativity hypothesis that predicted these results in the current work.

One final limitation concerns the one-shot nature of both studies. According to Walther’s (1992), social information processing theory (SIPT), one should not expect impression formation to occur quickly via text-based interactions alone (such impression development via text channels should be expected to occur only over time). Given that the present studies only allowed an observer a single exposure to relatively little textual information, the findings may not be surprising. Research exploring relational development in CMC has shown that over time the effects of photographic cues have different effects on affinity (Walther, Slovacek, & Tidwell, 2001). This research found that in short-term groups, the presence of a photograph was beneficial for levels of relational affinity; however, for long-term groups, levels of relational affinity declined when photographs of participants’ group members were available. Other research exploring uncertainty reduction in a social network setting has shown that the factor that most keenly reduces interpersonal uncertainty, and in turn social attraction, is interactive uncertainty reduction, which can only occur over time (Antheunis et al., 2010). Given these findings, one might expect a reduced effect of photographs on impressions if participants were allowed to interact with the target for an extended period of time.

Future directions
These studies also suggest some interesting implications for the development of SIPT (Walther, 1992). SIPT was designed to provide an account of relational communication in CMC, and at the time of SIPT’s conception, CMC was primarily carried out by text-based interactions. However, the technological landscape has changed somewhat since the inception of SIPT. Presently, social networking Web sites (e.g., Facebook or Myspace), professional networking Web sites (e.g., LinkedIn), online dating services (e.g., Match.com or eHarmony), and even some e-commerce sites (e.g., eBay or Amazon) all provide a context where, after a short amount of time, initial impressions can form. Although the present studies’ findings and other research (Tong et al., 2008; Utz, 2010; Walther et al., 2008, 2009) indicate that even very slight textual variations on social networking Web sites influence impression formation even after very limited exposure to a target, SIPT offers little theoretical guidance about how various text-based cues may be more or less influential in terms

of initial impression formation in CMC. Given the ubiquity of these platforms, this is one important area for future theoretical development. Utilizing carefully controlled microlevel inductions in experiments allows researchers to carefully examine the characteristics of text-based cues that grant them more or less impression-bearing weight. This research provides an important step in that direction by illustrating how some textual cues can vary in terms of the amount of information they provide to an observer, even in a one-shot social networking encounter. Future research that even more clearly describes the mechanisms by which textual and photographic cues are more or less influential in terms of their impression-bearing capacity is needed.

Another area for theoretical growth on the basis of this work concerns the juxtaposition of negative and positive cue valences with normative and nonnormative cues. The second study utilized positive and negative cue valences; however, these cue valences may have been confounded with a normativity component. Because of this, it is difficult to determine if the negativity effect observed in the data is a result of negative valence of cues or whether negative cues were more informative because they were nonnormative. Future research should employ designs that allow for the disentangling of these two related variables. Such research would allow for the possibility that a nonnormativity effect is independent of a negativity effect. Much of the research carried out on the negativity effect has suffered from this challenge, and consequently, it is possible that many nonnormativity effects have been misdiagnosed as negativity effects or vice versa. Moreover, it is possible that, after controlling for the effect of nonnormativity on impression judgments, observers actually display a preference for positive information about a target consistent with Walther’s (1996) hyperpersonal framework. Consequently, more research on these effects is needed.

Online dating Web sites constitute one setting where photographic and textual cues, in concert, contribute to initial impressions that set the stage for future relational development. Designed to provide self-presentation opportunities for individuals with specific relational goals, people evaluate others through a critical assessment of personality cues provided (Toma, Hancock, & Ellison, 2008). For a sender, the potential for future interaction encourages strategic decisions between self-enhancement or accuracy in self-presentation, leaning toward more self-enhancing presentations (Hancock & Toma, 2009). Previous research (Ellison, Heino, & Gibbs, 2006) suggested that people who utilize dating Web sites carefully attend to subtle cues in others’ presentations and take similar care in crafting their own messages. Therefore, even minor discrepancies between photographs and textual information may be very important. The results of this study indicate that the greatest concern lies in negative photographic self-presentations.

This research suggests it may be that the critical evaluation of any discrepancies between a photograph and accompanying textual information occurs only when the photograph does not represent what the evaluator deems as positive for the context of the self-presentation. For dating Web sites, where “moderate inflation” of one’s self-presentation is the norm (Ellison et al., 2006), variations in the impressions
formed in this context may arise most prominently from social information that is idiosyncratic. It is possible that if observers perceive a profile photograph to be within an acceptably normal range of attractiveness, observers may be unlikely to probe the characteristics of the target; however, deviations from normality—either positive or negative—may be suspect and lead to a further examination of the target’s idiosyncrasies.

Ellison, Toma, and Hancock (2009) suggest that one area in need of research attention is in understanding how different normative expectations of self-presentation arise in various online contexts. Although previous research on impression formation in CMC has explored how elements of self-presentation affect impressions, less work has focused on how normative expectations for self-presentational behavior may change the way that the same cues are interpreted across a number of online contexts. One related theoretical perspective, Burgoon and Jones’ (1976) expectancy violations theory suggests some future directions. Expectancy violations theory (Burgoon, 1978; Burgoon & Jones, 1976) suggests that violations of normative proxemic nonverbal behavior have differential relational effects depending on one’s interpretation of the violator as being highly rewarding or not. It seems possible that online social information, like personal space cues, may be violated either positively or negatively. Thus, in an online dating context, one might expect that normative expectations for self-disclosure (photographically or textually) and the degree to which one believes another person a potentially rewarding partner should affect how one perceives social information and engages in subsequent relational communication. This suggests that one factor that heavily influences how social information is perceived online is the context in which that social information arises. The same cues may well lead to different impressions on the basis of contextual norms. For instance, it may be very normative for young man to post a bare-chested profile photograph of himself flaunting his muscular physique on a social networking site dedicated to body building, whereas the same profile photo at Match.com may be perceived as a negative expectancy violation and may be unlikely to land the suitor many dates.

Future work should seek to understand the different normative goals, structures, and conventions presented by different online venues and should explore questions such as these: How are personality judgments made online when such judgments are influenced by, and dependent on, the normative expectations of self-presentation on any given Web site? Do photographs or textual descriptions of products matter more in eBay auctions? If an observer’s goals primarily concern professional evaluation, how does this affect the types of cues that inform impressions of a target?

**Acknowledgments**

The authors thank three anonymous reviewers for their helpful contributions to this article.
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레이스북에서의 효과 형성에 있어 언어적 대 사진적 자기 표현의 효과들

Brandon Van Der Heide, Jonathan D. D’Angelo, and Erin M. Schumaker

요약

컴퓨터 매개 커뮤니케이션을 연구하는 학자들은 어떻게 개인적인 효과들이 컴퓨터 사용자들 사이에서 형성되는지를 연구하여 왔다. 초기 인터넷 연구들은 어떻게 사람들 다른 사람들의 효과를 형성하는데 있어 텍스트에 근거한 사회적 정보들을 사용했는지를 연구했다. 그러나, 사회 기술적 시스템들은 사용자들이 그들을 다양한 형태로 표현하도록 허용하고 있다. 첫번째 연구는 텍스트와 사진적 단초들이 따로 표현되었을 때로서 텍스트 우선 원칙이 결과를 예측하였다. 그러나 두번째 연구에서는 이러한 두가지 요소들이 레이스북 프로파일의 문맥상에서 함께 표현될 때, 데이터들은 시각 우선순위와 일치하는 것으로 나타났는데, 이는 사진들이 사회적 동향의 판단에 더 강하게 영향을 미치는 것임을 보여주고 있다. 텍스트 단초들은 내향화된 사진에 의해 수반될 때 사회적 동향 판단에 영향을 주는 것으로 나타났다.
L’effet de la présentation de soi verbale ou photographique sur la formation des impressions sur Facebook

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Les chercheurs en communication par ordinateur s’intéressent depuis longtemps aux manières par lesquelles les impressions interpersonnelles se forment chez les utilisateurs d’ordinateurs. Les premières études sur l’Internet ont exploré les manières par lesquelles les gens utilisaient des informations sociales textuelles pour se faire une impression des autres. Cependant, les systèmes sociotechnologiques permettent maintenant aux utilisateurs de se présenter dans une variété de formes. La première étude a révélé que lorsque les signes textuels et photographiques étaient présentés en isolation, le principe de la primauté textuelle permettait de prévoir les résultats. Cependant, l’étude 2 a révélé que lorsque les signes sont présentés ensemble dans le contexte d’un profil Facebook, les données étaient cohérentes avec une primauté visuelle – perspective de la négativité, alors que les photographies influençaient plus fortement les jugements d’orientation sociale et que les signes textuels influençaient les jugements d’orientation sociale lorsqu’ils étaient accompagnés d’une photographie de type introverti.

Mots clés : communication par ordinateur, formation des impressions en ligne, sites de réseautage en ligne, primauté visuelle, primauté textuelle, effet de négativité
Die Wirkung von verbalen und fotografischen Selbstdarstellungen auf die Eindrucksbildung bei Facebook


Schlüsselbegriffe: computervermittelte Kommunikation, Online Eindrucksbildung, soziale Netzwerkseiten, Vorrang des Visuellen, Vorrang des Textes, Negativitätseffekt