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Full Length Research Paper

What makes a difference in on-line impressions? Avatars, attribution, and cognitive processes

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This study examined how perceivers with initial negative expectations about a chat partner developed their final expectations in text versus avatar-based settings, and which computer-mediated communication (CMC) environments exhibited higher attributional confidence in these impressions. Experimental conditions indicated that when participants attributed the person's negative behaviors to the situational contexts, they perceived the person's reactions to strangers less negatively, as opposed to those who attributed to the person's negative actions to the person's dispositions, regardless of the degree of cognitive busyness. On the other hand, participants formed negative impressions regarding the person's reactions to new relationship, regardless of what information they had and how distracted they were. No significant difference in attributional confidence existed as a function of cognitive busyness conditions within different CMC situations. Interestingly, participants who received the graphic-based identity cues were more likely to identify that the female's situation changed her attitudes toward strangers than those who received the text-based cues. In person perception through online communication environment, avatar messages could provide more personal and positive information to explain a person's unexpected, negative behaviors.

Key words: Impression, confirmation bias, cognitive busyness, avatar, attribution.

INTRODUCTION

In an on-line chat room, users encounter their conversation partners in a casual manner and interact through the exchange of messages usually without knowing each other. During the conversation, the interacting subjects form the first impressions of each other based on a rudimentary cue of their partner's digital identity, such as their nickname, avatar, email address, etc. The identity cues can be achromatic, simple text messages or colorful, dynamic figures with facial expressions and gestures like Disney's cartoon characters.

As the communication is going on, a perceiver in computer-mediated communication (CMC) attends to the first several sentences by which he or she may figure out their chat partner's background information, mood, and characteristics. In this process, each person's degree of devotion to the conversation affects his or her forming an overall impression of conversation partner. For instance, each perceiver during the interactions could be distracted by other background or situational condition. We see our fundamental contribution in this paper as the bringing together of cognitive social psychology theory and research on modes of communication to elucidating the impression formation process in on-line chat. These two research traditions have largely existed in isolation from each other. By bringing them together, we expect to reveal how crucial cognitive tendencies affect and interact with communication modes to determine online impressions in chat rooms.

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Theory suggests that if perceivers describe a target person as “insincere” or “greedy” from their own observa-

tions, their negative expectations about the target become the basis of generalized negative attributions. With negative expectations, perceivers worry about the target’s next course of actions and try to protect themselves from potential risk and vulnerability. Having to interact with the target adds to the urgency of self protective motivation (Darley et al., 1988; Harris and Perkins, 1995), and studies show the perseverance of expectancies in various conditions (Epley and Kruger, 2005; Harris, 1991).

Related to forming impressions, on-line representations including nicknames, avatars, and self-descriptions have received significant research attention recently (Jacobson, 1999; Kim, 2001; Lee and Nass, 2002; Nan et al., 2006; Nowak and Rauh, 2005; Wallace, 2001). These studies show that different modes of digital identities influence on person’s perception.

The purpose of this experiment was to examine when perceivers confirm or disconfirm their negative expectations about a chat partner in a synchronous chatting system. Three independent variables have been chosen: (a) type of attribution (to situational vs. dispositional factors), (b) Busyness (cognitively non-busy vs. cognitively busy condition), and (c) CMC (text-only based vs. avatar-plus-text based mode). In this study it was assumed that communicating participants' perceptions of the target would be influenced by the attributional bias, by the kind of identity cues and by how distracted they were during the interactions.

Attributional process

People easily conclude that their target has a certain disposition from observing only a single vivid behavior or a small sample because their cognitive systems are tuned to move easily and spontaneously from acts to dispositions (Gilbert, Pelham, and Krull, 1988; Jones and Davis, 1965). Interpersonal expectations also color a perceiver’s views of the target and guide the perceiver’s behavior toward the target (Snyder, 1984). Darley and Gross (1983) found that even though the target’s presentation is ambiguous, perceivers use demographic cues to interpret the target’s uncertain academic capabilities as high or low.

Interpretation of a target’s behavior and attributions of target’s personal characteristics maybe seen as two aspects of the same cognitive process. Perceivers spontaneously search for reasons, particularly when outcomes are negative or unexpected (Weiner, 1985). When a perceiver regards a target’s behavior as negative, the perceiver has a desire to know *why* the target chose this undesirable action. For instance, when spouses act hostilely to their mates, their negative behaviors cause troubles in their relationship, thus their undesirable actions need to be explained to maintain a good relationship (Murray and Holmes, 1993). Negative results make people anxious and depressed, especially unexpected negative outcomes are more surprising and salient, and tend to trigger attributional processes. Two major factors in attributions are prior expectations and the perceiver’s interaction goals. As Jones (1990, p. 241) has summarized it, “Once an expectancy is established, it is likely to be maintained because there is a bias toward perceptual confirmation.” A tendency emphasizing self-fulfillments has been demonstrated by the results of experimental studies (see Miller and Turnbull, 1986; Snyder, 1984, for review). In fact, experimental studies were extremely well designed to maximize the potential existence of self-fulfilling prophecies. For this study, we concentrate mainly on perceiver factors among various mediating variables, because perceivers may act to confirm their expectancies regardless of targets’ responses to them (Darley and Fazio, 1980).

Perceiver expectations: Perceivers interpret targets’ behaviors to be consistent with their prior expectations. A number of studies show how perceivers form an initial impression of a target and maintain their beliefs (Christensen and Rosenthal, 1982; Eden and Shani, 1982; Farina, Allen and Saul, 1968; Rosenthal and Rubin, 1978). In general, when perceivers have predetermined judgmental bias (that is, stereotypes) about their targets, they take whatever the target does as confirming their expectations unless the behavior is dramatically and repeatedly in violation of their expectations (Epley and Kruger, 2005; Snyder, 1984). For example, people who ride motor cycles are perceived to be “wild,” even though it is possible that a person may choose to ride a motor cycle for financial, environmental, or many other reasons. Because of the tendency of perceives to persist with negative impressions once formed, we needed a powerful event to induce them to give a situational interpretation to the target person’s behaviors. We chose to have the target female have the traumatic experience of a recent rape because we believed that this would both lessen the tendency to interpret her suspicious of others as dispositional and because it might engage the perceivers in more thoughtful attributions.

Interaction goals: Unlike the effects of perceptual biases, perceivers’ specific interaction goals can modify the perceivers’ perceptions about a target. Initial expectations are more likely to be disconfirmed when perceivers with negative expectations try to form an accurate impression of the target (Neuberg, 1989), when perceivers have the goal of establishing a good relationship with their interacting partner (Snyder, 1992), and when relationships between perceivers and targets are constrained in the long-term commitments, or when perceivers have more

powers than targets (Miller and Turnbull, 1986). In this study we instructed the participants to form as accurate impressions as possible and led them to anticipate interacting online with the target person.

These studies elicit a question of *when* perceivers' expectancies are more likely to be confirmed or disconfirmed (see Olson, Roese and Zanna, 1996; Snyder, 1992, for review). Based on meta-analysis of expectancy effects, Harris (1991) found that when perceivers view a target as negative, sometimes they treat the target negatively based on their negative expectations (reciprocity) or sometimes they treat the target more positively (compensation). Especially, Harris (1991) argued that more study is needed to find an answer to the question about when perceivers will confirm or disconfirm their negative expectations about the target. A possible answer could be captured through analyses of variables mediating expectancy effects. To interpret expectancy effects clearly, we review distraction effects of cognitive busyness condition, a significant variable to intensify confirmation of negative expectations.

Impression formation under cognitive busyness: Harris and Perkins (1995) found that when perceivers interact with a target to solve a given problem, cognitively busy perceivers respond to the target more negatively than cognitively non-busy perceivers. One possible explanation for this tendency is that cognitively busy perceivers are more likely to spend less effort in evaluating situational reason to correct their previous assessment of the target even though they were more likely to pay attention and memorize situational information (Gilbert, Pelham, and Krull, 1988; Gilbert and Osborne, 1989; Krull and Erickson, 1995). However, impaired perception by cognitively busy perceivers can be adjusted. When perceivers have detailed information about the target and are motivated to use this to understand the target, initial impression maybe revised (Krull and Erickson, 1995). To investigate distraction effects and expectancy effects in the context of attributional processes, the following hypotheses are proposed.

H1. Participants in a situational cue condition will form more positive expectations regarding the target's "reactions to a new relationship" than those in a dispositional cue condition.
H2. Participants in a situational cue condition will form more positive expectations regarding the target's "reactions to new people" than those in a dispositional cue condition.
H3. Participants in a situational cue condition will be more willingly to converse with the target person than those in a dispositional cue condition.

Among mediating variables of expectancy effects, when perceivers consider their target as a casual conversation partner rather than as a possible teammate for a cooperative work, the tendency to form the negative expectation becomes stronger. Darley et al. (1988) show that perceivers in a conversation situation are likely to confirm their prior negative thoughts rather than attempt to develop an accurate impression of the target In this age of the Internet, online chatting has become an excellent medium for meeting and interacting with others who are initially complete strangers. Currently, a study is needed to investigate how perceivers with an initially negative expectancy of a chat partner develop and perhaps change their impressions. Next, we review studies of synchronous chat interaction, a new place in which people make contact with each, relatively unconstrained by considerations of space and time.

Text- vs. avatar-based communication cue

Online chatting methods can be divided into text-only based and graphic-based communication, with the main difference between the two methods being the use of avatars. An avatar is a visual self-representation of users in a virtual world. Based on 3-Dimensional environments, participants can express "happiness" by making their character do an upbeat be-bop dance, or "anger" by making their avatar lash its arms or wave its fists with a few click of control keys. This animated character's movements can be transformed social-emotional information. Jacobson (1999) found that using a simple nickname in chat rooms had no role in forming impressions; rather it was interpreted as uptight, boring and uncreative by other users, while an avatar shaking its hands meant as nice, warm and sociable.

In a study about avatar-based social networking chat service, "Sayclub" in Korea, Kim (2001) found that different aged groups had distinguishable desires to give their characters features. For example, teenagers focused on decorating their avatars rather than reflecting their real psychological characteristics. Females in their twenties and males in their twenties and thirties tried to match their physical appearances to their characters. Lastly, the tendency of females in their thirties was not fixed; some of them wanted to have a fantastic visual form while some wanted to make a realistic figure. Interestingly, all participants had strong attachments to their cyber characters, and they considered their avatars as their alter egos in a cyberworld.

On social influence, avatar influenced a perception of communicating partners (Lee and Nass, 2002). Lee and Nass (2002) conducted a study on how seeing other participant's decision making process plays a role in making one's own decision, when the subject was given three different forms of communication: text, text with stick figures, and text with visual characters. Participants agreed with their partners' decisions that were repre-

sented by simple textboxes more than those represented by stick figures or visual characters, whereas participants

perceived their partners to be more competent, trustworthy, and socially attractive when represented by animated characters than by motionless figures or textboxes (Lee and Nass 2002 study 1). In this study perceivers saw the animated characters as more friendly and sensitive when anthropomorphic figures were provided. Unlike avatar-based chatting, in text-based environments users divulge their information by selecting verbal symbols like ID, nickname (a.k.a. nick), profile, self-description, etc.

A nick is a single form of associated words, and it can be a fundamental element to decode gender of users before participants get to know each other (Wallace, 2001). For example, if a nickname, “Wild-Foxy” enters a chatroom, other members might recognize this user’s gender easily. At the same time, it may lead others to perceive this person to be a promiscuous party lover. Male users might make suggestive remarks toward her from his biased stereotypes. In fact, it is important what type of nicknames users choose when they have a chance to create their digital identity by themselves because the nick is the first clue showing some sides of persona in anonymous cyberworld before they start a conversation.

In contrast to nicks, there is no limit on lengths, styles, and themes of a profile and a self-description. As more informative resources, the profile may include a member’s real name, location, birth date, gender, and others (Waskul and Douglass, 1997), and the self-description is a self presentation making claims to a persons place in their joint social worlds (Goffman, 1959). The description becomes more in depth as the users list their favorite wise remarks, ideal mate, career, hobbies, views of life, prior marital experiences, etc. Profiles and descriptions offer users more time to write contents, thus when others view unfinished sentences and repetitious spelling errors, this tendency to judge negatively become more serious (Jacobson, 1999).

Previous studies provide resources to explain the effectiveness of graphic images that reveal more personal characteristics (Kim, 2001; Lee and Nass, 2002; Nan et al., 2006; Nowak and Rauh, 2005). The more personal the self-presentation of one communicator, the more it invites reciprocation by the target of the communication (Sillaars and Vangelisti, 2006).

Another mediating factor is the degree of ambiguity of the incoming information. Epley and Kruger (2005) emphasize that ambiguous messages via e-mail have a huge impact on maintaining initial impressions and stereotypes. Gilbert and Krull (1988) demonstrated that perception from nonverbal behaviors is more cognitively automatic than perception from verbal behaviors. Intriguingly, multitasking perceivers are more confident of inferences drawn from both verbal and nonverbal behaviors than perceivers engaged in only one task (Gilbert et al., 1988).

The literature review thus far suggests the following two hypotheses which we propose to test in this study, and raise two interesting questions which we will pursue: H4a. Participants who receive a target’s identity in the form of avatar-based cue will exhibit higher attributional confidence than those who receive the target’s information in the form of text-based cues.

H4b. Participants in a cognitively busy condition will exhibit higher attributional confidence than those in a non-busy condition.

RQ1. Do the variables of cognitive business and attributional cues interact in the perceiver’s judgments of the “target’s likely reactions to new relationships?"

RQ2. Do the variables of cognitive business and attributional cues interact in the perceiver’s judgments of the “target’s likely reactions to new people”?

METHODS

Participants

Participants (N = 207) were recruited from three different undergradduate communication courses at a large southeastern university. Only eighteen to twenty-five years old participants who have used the Internet for at least four months were randomly assigned to participate in this 2 (Attributional condition; disposition vs. situation) x 2 (Busyness; cognitively non-busy vs. cognitively busy) x 2 (CMC; text-only vs. avatar-plus-text) experiment. Focusing on a subset of college students is reasonable as young college students are major users of online virtual games and chatting (Kim and Davis, 2009). Participants volunteered to attend one twenty-five minute experimental session in return for extra credits issued with the permission of instructors for the courses. Informed consent and debriefing were provided and the procedures were approved by the university’s institutional review board.

Background information: The participants' Internet usage patterns were examined in four categories; (1) hours using the Internet, (2) reason for using the Internet, (3) time spent chatting and (4) instant messenger use. Among the 207 college students, 35.3% (*N* = 73) of the subjects use the Internet from five to ten hours in a week and another one third (32.4%, N = 67) of the subjects use the Internet from ten to twenty hours in a week. When the subjects were asked to mark one, primary reason for using the Internet, 72% (N = 149) of the subjects said they used the Internet for e-mailing and instant messaging, while about one-sixth, 15.5% (N = 32) of the subjects stated homework for school. About weekly experience levels of chatting, 42% (N = 87) of the subjects spent about one to five hours chatting with someone, while 17.9% (N = 37) of the subjects used roughly five to ten hours. Among all the subjects queried, an overwhelming percentage, 90.8% (*N* = 188), use AOL’s instant messaging service.

Instructions

Upon their arrival at the computer laboratory, a female experimenter greeted the participants and provided them with a concise oral introduction to the experiment. The experimenter then escorted each subject to a seat facing a computer monitor with the written

instructions showed on the computer screen, with the complete written instructions appearing before them on the monitor. During the experiment, individual participants clicked the "right arrow" button on the computer screen unlocking the remaining experimental materials. The written instructions explained that this study examined the way people perceive a person in online chatting, and that participants would view 14 screens with information about a young woman. They were told that the participant's goal in viewing the screens was to accurately estimate personality of the woman in various situations. Participants were told that the woman's messages on the screen were captured from an interview with her in an online chat room, and she may be a conversation partner later in the study.

Presentation of stimulus materials

Nicknames: The largest category of nicknames (45%) was related to the self in various ways (e.g., <stoned>, <baddady>) (Bechar-Israeli, 1995), and some nicks were based on a person's hobbies (e.g., <GuitarPickn>), and motives for chatting (e.g., <PhoneFun4u>) (Waskul and Douglass, 1997). Based on these results, the form of nickname was chosen as an adjective to show the person's personality. To show the female target's attitude toward strangers and her emotional condition, the nickname "Suspicious_Blue82" was chosen.

Avatars: To present a negative avatar, the most unattractive hairstyle, clothes, shoes, and accessories among various avatar items were chosen for this study. We used a distinctive words dictionary to illustrate different nonverbal expressions of an avatar and dichotomized these data into positive and negative. To avoid any doubts, an avatar's visual gestures and postures were described, inciting extremely negative expectancies.

Self-descriptions: After viewing the target's nickname or the same nickname plus an avatar, participants read a short introduction (e.g., name: Judy, age: twenty-one-years, gender: female, occupation: junior at the University of Florida, marital status: single). Next, participants observed the target's self-descriptions. Eleven characteristics were chosen to ensure a negative first impression. By a content analysis of “MSN” personals (e.g. hobbies, favorite types of music, consideration toward neighbors, thought about friends, idea about pets, ideal mate, college life, behavior at parties, plans after graduation, view of fate, and portrayal of the future), the items used in the manipulation were found to be representative of areas shared by chat room members. The content was presented in a question and answer format, and the target was described as inclined to avoid socializing with anonymous people at the party and even at the school.

To compare the effectiveness of different CMC situations, one stimulus was made in a text-only model, while another was constructed in a graphic-plus-text-model. In the graphic-based setting, the avatar's facial expressions and bodily movements were dramatically changed by the avatar's different messages. Examples of the screen snapshots of the target's messages for the text-only situation and graphic-plus-text situation are shown in Figure 1 and 2. The actual stimuli are available from the first author.

Attributional cues

Situational context: Trope and his colleagues (1991, Study1) showed that situational information exerts little influence on the interpretation of a negative behavior if the situational context was presented after the behavior. For this reason, the situational information was presented via computer before the participants read the descriptions of the target. In the experiment, 106 participants received the following situational explanation.

"A week ago, Judy was walking toward home alone after a meeting with classmates. In a dark side street, a stranger asked her for her phone number. She said no and walked away. He started following her. She asked him to stop following her as she walked home. In spite of her request, the stranger persisted, pulled out a gun, and he raped her."

Dispositional context: In contrast, a dispositional attributional set was created by the following information:

"A week ago, a new neighbor moved next door to Judy. When he saw her in her kitchen, he knocked at her door to ask her for a can opener, but she did not open the door, and she turned off all the lights in her house."

Cognitive busyness manipulation

To make sure the experimental cognitive busy manipulation worked, a test was performed. After viewing a screen with the target's basic information, participants in the busy condition were informed that the experimenter is interested in studying how well people could memorize information about the target while they perform different tasks. They were asked to read the descriptions carefully and later while viewing the video with the target's detailed information to recall an eight-digit number. After watching all messages about the target on the computer screen, only busy participants were asked to recall the number based on their memorization. They then wrote the number of digits that they could recalled in order and rated how distracted they were by the memorization task. This cognitive busy manipulation was successfully used by Gilbert and his colleagues' studies (1988, 1989), and in the Harris and Perkins' study (1995) to cause distraction effects in person perceptions.

Dependent measures

Initial expectations: After watching the first screen with the female target's nickname "Suspicious_Blue82" or the same nickname plus an avatar, participants were asked to indicate their initial expectations of the target on a 9-point rating scale.

Reactions to new people: The first questions were, "Based on your impression for her nickname, how do you think "Suspicious_Blue82" would react to new people in her daily life?" Participants responded to a 9-point scale from very unfriendly (1) to very friendly (9), from very rude (1) to very courteous (9), from very unkind (1) to very kind (9), from very insincere (1) to very sincere (9), from very uncaring (1) to very caring (9), and from very careless (1) to very careful (9), with the lower scores indicating more negative expectations.

Feelings about new relationship: The second six questions were "How do you think Suspicious_Blue82 would feel about starting a relationship with a new person?" Participants used a 9-point scale ranging from very unenthusiastic (1) to very enthusiastic (9), very insecure (1) to very secure (9), from very uncomfortable (1) to very comfortable (9), from very unsafe (1) to very safe (9), from very indifferent (1) to very excited (9), and from very pessimistic (1) to very optimistic (9), with lower scores indicating more negative thoughts.

Final expectations: After watching the video with the target's

introduction and descriptions, the participants gave their final evaluations of the female target on the same scales described above.

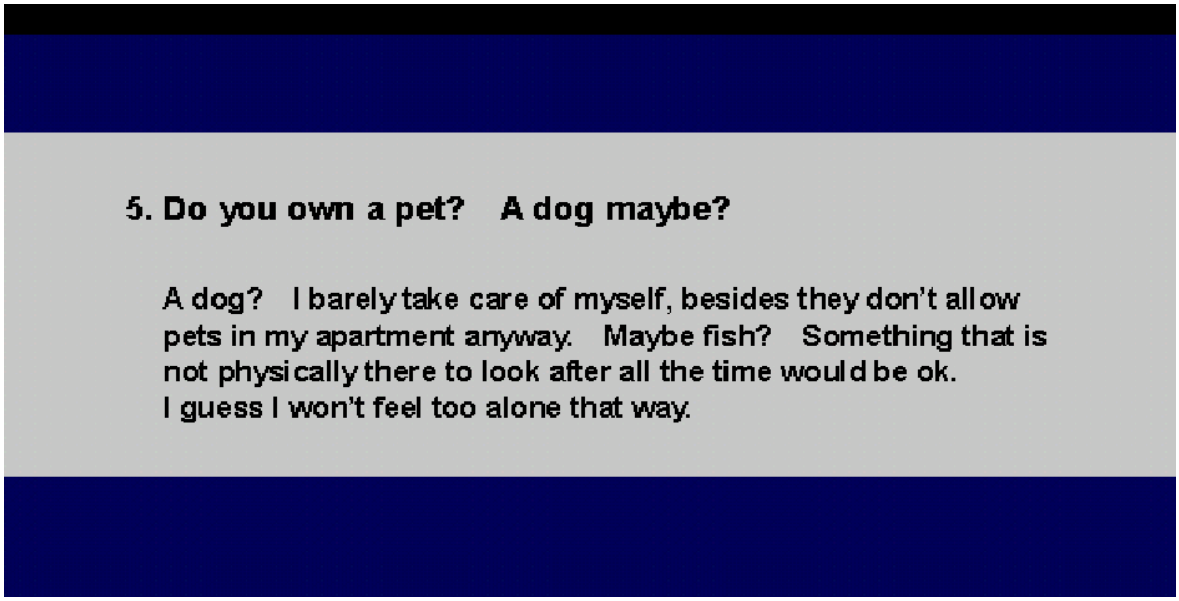

Figure 1. Screen snapshot of one of the target's messages for the text-only situation.

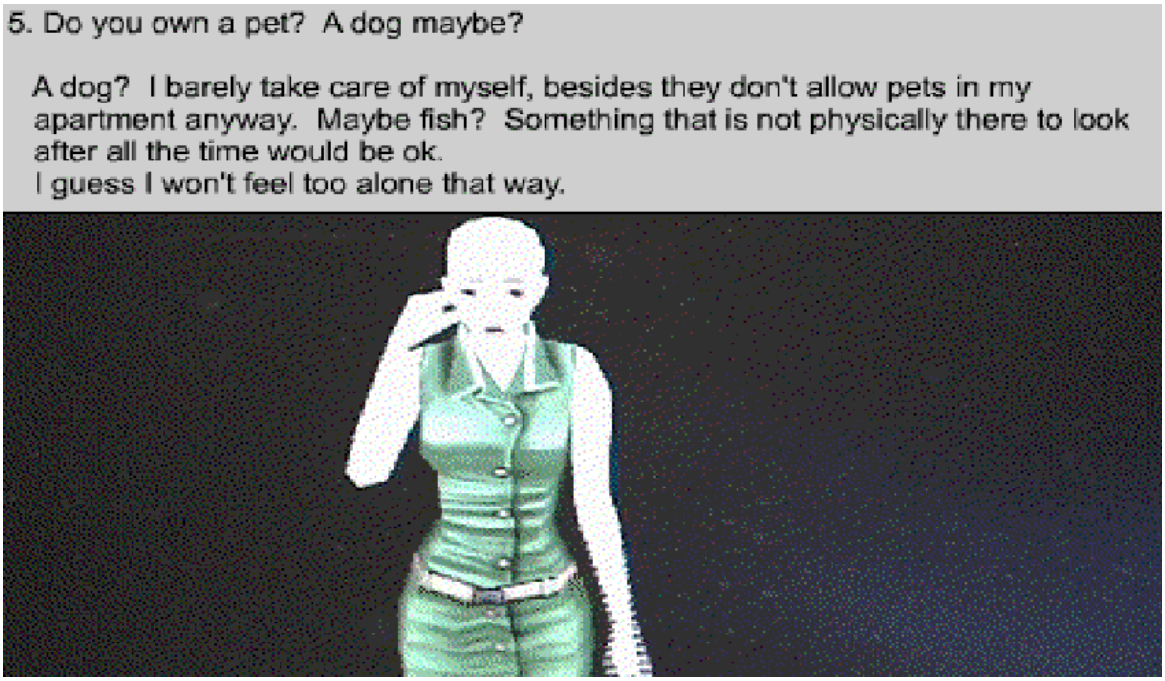

Figure 2. Screen snapshot of one of the target's messages for the graphic-plus-text situation.

Confidence in predicting: Terminal attributional confidences in expectations were assessed with a five-item subset of Clatterbuck's CL7 measure (Clatterbuck, 1979) that has shown an adequate reliability (coefficient alpha consistently exceeded .80). The five questions were: (1) How confident are you of your general ability to predict how Suspicious_Blue82 will behave in a similar situation in

the future?; (2) How confident are you of your general ability to predict the values she holds?; (3) How confident are you of your general ability to predict her attitudes?; (4) How confident are you of your general ability to predict her feelings or emotions?; and (5) How confident are you of how well you know her? Participants rated their confidence on a 9-point rating scale (e.g., 1 = not at all confident, 9 = extremely confident), with higher scores indicating higher confidence.

Willingness to converse: Initial negative expectations of the were evaluated with the question, "How likely would you be to initiate a conversation with Suspicious_Blue82?" Participants rated their willingness on a 9-point scale (e.g., 1= very unlikely, 9=very likely), with higher scores showing a greater likelihood to start a chatting session with the target.

Manipulation checks

Cognitive busyness: The effectiveness of the cognitive busyness manipulation was assessed by this question: "How distracting was it to have to memorize the eight-digit number?" Participants responded on a 9-point scale (e.g., 1 = not at all distracting, 9 = extremely distracting).

Attribution cues: To determine the effectiveness of this manipulation, all participants were asked to indicate, "How much Suspicious_Blue82's encounter with a stranger last week influenced her attitude toward strangers?" Participants gave their ratings on a 9-point scale (e.g., 1 = not at all influential, 9 = extremely influential), such that higher scores indicated a successful situational manipulation and lower scores a successful dispositional manipulation.

RESULTS

Cognitive busyness manipulation check

To test how well the manipulation worked to distract, a total of 103 cognitively busy subjects wrote the number based on their memorization. Among them, 70 % (N = 72) of the subjects were able to recall the 8-digit numbers accurately (M = 7.1, SD = 1.6).

Contrary to expectations, the distraction did not yield a simple main effect but rather a significant interaction effect for text vs. avatar by situational vs. dispositional condition existed, $F(1,102) = 11.32$, $p < .001$, $\eta^2_p = .103$, Power = .915. The cognitively busy participants in an avatar-plus-text condition said that they were more distracted when they had a situational (M = 4.7) rather than dispositional (M = 3.5) information about the female's negative personality. In contrast, in the text-only conditions dispositional cues were associated with greater distraction (M = 5.7) than was situational information (M = 3.5).

Attributional cues manipulation check

The main effect for situational influences by attributional cues was significant, $F(1,203) = 85.5$, $p < .001$, $\eta^2_p = .296$, Power = 1.0. Perceivers who read situational information about the target saw her as more influenced by her recent trauma (M = 7.4, SD = 2.2, N = 106) than those who read dispositional information (M = 4.5, SD = 2.3, *N* = 101). The two way interactions were not significant, but the three-way interaction was significant, $F(1,206) = 4.75$, $p < .03$, $\eta^2_p = .023$, Power = .583. Scheffe's post hoc pairwise analysis was conducted to test which conditions were significantly different (at $p < .05$) (see Table 1). A test for a linear trend replicated the main effect for attributional cues were significant in each case at $p < .001$. It should be noted that the greatest differences occurred for the Graphic – Busy – Situation cell (M = 8.3, SD = 1.5, N = 27) vs. the Graphic – Busy – Disposition cell (M = 4.0, SD = 2.2, N = 26) and the Text – Not Busy – Disposition cell (M = 4.2, SD = 2.3, N = 25), $F(7,199) = 14.0$, $p < .001$, $\eta^2_p = .329$, Power = 1.0. The common denominator for these differences is that the highest four all had a situation condition while the lowest four all had a dispositional condition and there were no consistent trends for the graphic-text condition not the busy-not busy condition for attributions about situational influences.

Confirmation and disconfirmation of negative expectations

The primary hypotheses in this study examined the differences in the mean scores on the perceptions of the female's reactions to a new relationship (*H1*) along with reactions to new people (*H2*), and willingness to converse (*H3*), among participants exposed to a situational vs. in a dispositional cue for the target's negative social behavior.

Attributions to female about starting a new relationship by attributional cues: H1: The main effect for attribution about the female's reactions to a new relationship by attributions (situation vs. disposition) was not significant, $F(1,203) = .001$, $p < .98$, $\eta^2_p = .000$, Power = .05. There was no significant difference in the "attributions to the female's reactions to a new relationship" for perceivers who were told the female's negative behaviors results from situational conditions (M = -.002, SD = 1.0, N = 106) versus those who were told the female's same behaviors were because of the female's dispositions (M = .002, SD = .9, N = 101). The cognitive busyness condition main effect was not significant, $F(1,203) = .32$, $p < .56$, $\eta^2_p = .002$, Power = .086. Lastly, there was no interaction effect for attributional cues by the cognitive busyness condition, $F(1,203) = .12$, $p < .73$, $\eta^2_p = .001$, Power = .064. As a consequence, Hypothesis 1 was not supported, and the participants' expectations about the female's reactions to new relationship did not vary by what information the participants received or by their cog-

Table 1. Scheffé tests for mean scores for situational influences by CMC, busyness, and situation vs. disposition (N = 207).

	Stranger encounter influenced the female's attitudes		
Between Groups	**M**	**SD**	**N**
Graphic-Busy-Situation	8.3 ^{e}	1.5	27
Graphic-Not busy-Situation	7.4 ^{d}	1.6	25
Text-Not busy-Situation	7.2^{d}	2.2	29
Text-Busy-Situation	6.6 ^{cd}	3.1	25
Graphic-Not busy-Disposition	5.1^{bc}	2.3	25
Text-Busy-Disposition	4.4^{b}	2.5	25
Text-Not busy-Disposition	4.2^{a}	2.3	25
Graphic-Busy-Disposition	4.0^{a}	2.2	26

Note: Numbers reported here represent mean score on nine-point scales.
^{abcde} Those means that do not share superscripts are significantly different from each other ($p < .05$). ^{f}Linear trend analysis significant at $p < .001$.

nitively business manipulation.

Reactions to new people factor by attributional cues: H2: The predicted main effect for the attributional manipulation was not quite significant, F(1,203) = 2.9, p < .09, η^2_p = .014, Power = .397. Perceivers who were told the female's reactions resulted from a situational context formed less negative expectations (M = .1, SD = .9, N = 106) than those who saw the target person's negative actions as coming from her innate character (M = -.1, SD = .9, N = 101). Cognitive busyness had no main effect, F(1,203) = .48, p < .49, η^2_p = .002, Power = .105, nor was the interaction of attributions by cognitive busyness significant, F(1,203) = .37, p < .54, η^2_p = .002, Power = .093.

Willingness to converse by attributional cues: H3: The overall hypothesis is supported as there is an attribution main effect for willingness to chat with the female, F(1,203) = 7.64, p < .006, η^2_p = .036, Power = .786. Perceivers in the situational condition were more likely to want to converse with the female (M = 2.9, SD = 1.9, N = 106) than those in the dispositional condition (M = 2.3, SD = 1.7, N = 101). There was no cognitive busyness main effect for willingness to talk with the female, F(1,203) = 1.30, p < .26, η^2_p = .006, Power = .206, nor an interaction effect for attribution by the cognitively business, F(1,203) = .044, p < .84, η^2_p = .000, Power = .055. As a consequence, Hypothesis 3 is fully supported, and the effects do not differ by how distracted the subject was.

Attributional confidence in predicting factor by CMC and by busy conditions: H4: The test for the main effect of CMC revealed no significant differences on the "attributional confidence in predicting," F(1,203) = .67, p < .42, η^2_p = .003, Power = .129.

The difference between participants who were involved in the avatar-based setting (M = .06, SD = 1.0, N = 103) and those who were involved in the text-based setting (M = -.06, SD = .9, N = 104) was not significant. The main effect of the cognitive business was examined, and no significant difference was found, F(1,203) = .63, p < .43, η^2_p = .003, Power = .124.

Consequently, two hypotheses regarding "knowledge confidence" by CMC settings (H4a) and by busyness (H4b) were not supported.

Overall, then, H3 was supported, H2 had a modest trend in the direction predicted, and H1 and H4 were not supported.

Post Hoc analyses

In addition to the four hypotheses, with respect to total 207 subject's behavioral tendency to use the Internet in their daily life, we explored the differences in the participants' Internet usage patterns on the dependent variable, "attributional confidence in predicting" factor. Interestingly, there was a near significant Internet use hours main effect, F(3,203) = 1.81, p< .147, η^2_p = .026, Power = .466. The participants who spent more than twenty hours in a week using the Internet scored higher on confidence (M = .18, SD = .9, N = 23) when compared to those who spent less than five hours in a week using the same medium (M = -.28, SD = 1.0, N = 44), but Scheffe's post hoc difference indicated that the means for each groups were not significantly different from each other.

Further, multivariate analyses of variance (MANOVA)

were conducted to measure the differences in various dependent variables for the three independent variables. Among various interaction effects, three interaction effects were statistically different.

Interaction effects on attributions about reactions to a new relationship: RQ1: The first research question asked how cognitively busy perceivers vs. cognitively non-busy perceivers form their impressions about a female by what information they read (disposition vs. situation) in different CMC conditions (text setting vs. avatar setting). There was a nearly significant three-way interaction for attributions about the female's reactions to a new relationship, $F(1,206) = 2.79$, $p < .08$, $\eta^2_p = .015$, *P*ower = .416. Scheffe's post hoc comparison test was performed to discriminate which conditions were significantly different ($p < .05$). A post hoc analysis showed that none of the means for the different groups were significantly different from each other.

Interaction effects on attributions about reactions to new people: RQ2: The second research question asked that participants in the two different busy conditions may form different impressions about a female's reactions to new people by attributional cues and CMC conditions. There was no significant three-way interaction for female's reactions to new people, $F(1,206) = 1.47$, $p < .23$, $\eta^2_p = .007$, Power = .227. But, a two-way interaction of reactions to new people by CMC busyness was signifycant, $F(1,206) = 4.19$, $p < .04$, $\eta^2_p = .021$, Power = .531. Scheffe's post hoc comparison test was performed to distinguish which conditions were significantly different ($p < .05$), and the means for the different groups were not significantly different from each other. Table 2 summarizes the various interaction effects for the three independent variables.

DISCUSSION

This present study examined whether perceivers with an initial negative expectation about a female target confirm their prior thoughts or disconfirm, and how different communicative conditions influence the perceivers' perceptual processes toward the target. Results revealed that perceivers responded differently only by the information they received, regardless of the level of cognitive distraction. When they read the female's situational explanation for her negative behaviors, they tended to form less negative impressions about her reactions to new people and they were more likely to initiate a conversation with her.

But they seemed not to use the situational contexts for understanding why the female reacted negatively to building a relationship with a new person even though they reported that the female's negative behaviors resulted from situational conditions. Perhaps participants in the situational condition, where the target person had experienced a recent rape, would see her as just as unlikely to form a new relationship as those in the disposition condition-but for different reasons. Those in the disposetional condition see her as just unfriendly and unusually suspicious whereas those in the situational condition see her as having good reasons for being highly cautious and suspicious. The three-way interaction of perceived situational influences by CMC (text-only vs. avatar-plus-text) × attribution (situation vs. disposition) × busyness (cognitive non-busy vs. cognitive busy) provides some support for this interpretation. . Scheffe's post hoc analysis showed that the greatest differences occurred for the Graphic – Busy – Situation cell vs. the Graphic – Busy – Disposition cell and the Text – Not Busy – Disposition cell. The Graphic – Busy – Situation cell responded that the situational context significantly affected the female's general attitudes toward new people more than the other two groups. Having to work harder in the situational and cognitive busy condition, these participants seemed to have reached a deeper level of appreciation of the impact of the trauma on the target person.

On this perspective, it should be noted that there was CMC main effect for the perceived situational influences.

The participants who received the avatar-based identity cues were more likely to say that the female's situation changed her attitudes toward strangers (M = 6.2, SD = 2.6, N = 103) than those who received the text-based cues (M = 5.7, SD = 2.8, N = 104), $F(1,206) = 2.79$, $p < .08$, $\eta^2_p = .015$, Power = .416. It might be possible that the participants could identify more correctly with the female when they watched the avatar's frown, facial expressions, and dynamic body movements while those who only received text messages could not get beyond these negative impressions to deeper appreciate of this person. The fact that she appeared unfriendly and egoistic to a neighbor and to her classmates was enough for these perceivers to convict her of having these traits.

Limitations and possibilities for future research

The nature of the sample used for this study limited the generalizability of the research findings. A small convenience sample of university students was used instead of a random sample. Due to that, the results should not be generalized beyond the sample of students.

In the present study, participants were not asked to indicate their gender. Given the nature of the situational manipulation (a female being raped by a stranger), this was probably a mistake as females probably react more strongly to this stimulus than would at least some males.

Table 2. Interaction effects of CMC, attribution, busyness on situational influences, perceived final expectations, willingness, attributional confidence (N = 207).

	Dependent Variables									
	Situational Influences		Reactions to a New Relationship		Reactions to New people		Willingness to Converse		Attributional Confidence	
Variable	F	P	F	P	F	P	F	P	F	P
CMC * Attribution					.001	1.0	1.3	.26	.13	.7
CMC * Busyness					4.2	.04	.24	.62	.001	1.0
Attribution* Busyness					.32	.57	.03	.86	.54	.5
CMC * Attribution* Busyness	4.8	.03	2.8	.08	1.5	.22	.001	1.0	.16	.7

[a]Computed using alpha = .05

Also no information about participants' experiences with sexual assault either as victims or perpetrators was collected. These issues are worthy of future investigation. In addition, these results need to be replicated in a variety of online chat-interaction situations, with attention to the differences among individual's technological experiences and life history of chat-room use.

This study focused on short-term psychological responses to the female, followed by the comparison of attributional confidence between the text-based and the avatar-plus-text based system. Future research may try to use various messages with a multimedia format (e.g., audio only, text only, audio + text, avatar + text, avatar + audio, photo + audio, photo + text, etc.) to clarify which communicative conditions lead higher attributional confidence.

Future research also needs to provide some tangible attributional cues to help perceivers evaluate the female's possible reactions to making new relationship. For this present study, the target's messages were constructed to induce forming negative expectations of the depressed female. The results revealed that overall the participants drew a negative image of the female. Instead of forming positive impressions, they regarded the female less negatively when they read the situational cues than when the remaining participants read the descriptive information. In future studies, we need to sample the domain of positive initial impressions of the communication target, rather than more or less negative impressions.

It should be considered that there is an individual difference in performing different works at the same time. Some people have better capacity to do different works than others do. For instance, some people may chat with others while they listen to music and do their homework simultaneously, whereas some people focus mainly on the conversation itself.

Bergen and his colleagues (2005) found that diverse CNN's news formats shown on a television gave viewers extra attentional works to remember and summarize the information they watched. Future research needs to construct different types of cognitive busyness conditions. As an example, it is reasonable to set up a participant to watch divergent subtitles of News (e.g., simple text messages, multicolored graphic messages, vocal messages format, etc) or to search for information about a certain topic while they interact with a person online.

Implications of the study

The major contribution of the present study is to bring together research ideas from social-cognitive psychology and communication research to gain a better understanding of factors influencing impression formation in online chat rooms. While the present study examined how perceivers form their impressions about a target in different CMC conditions, it showed the cognitive processes of two sorts-attributional sets and degree of cognitive work-load (business) could work together to shape initial impressions. We found that online chatters decided whether they would initiate a conversation with the person based on the information they received. Mitigating factors such as the knowledge that a female target person had recently suffered rape by a stranger made chatters more willing partially to discount the target's initial coldness and avoidance of interaction. Not only were some of their judgments of her were more forgiving, but they were also more ready to converse further with her. In contrast, those without mitigating information formed a more negative impression and were less willing to engage in further interaction.

The most interesting near-significant effect consisted of a three-way interaction in those participants who received the rape information viewed the target differently from everyone else, but only when they were in the text (non-avatar) condition. In that condition those who had an avatar saw her as ready for a new relationship whereas those with only text saw her as completely unready for a new relationship. One interpretation of this pattern is that with less information and less distractions, they could

dwell more on the implications of being raped. Further examination of social-cognitive and communication variables seem called for if we are to understand the development of relationships in online chat rooms.

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