The Effects of User-to-User Online Interactivity on Political Emotion and Behavior

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Abstract

As the nature of the Internet rapidly changes to involve more user-to-user interaction, it becomes necessary to investigate the emotional and behavioral effects of interpersonal online communications. This study uses the theory of affective intelligence (Marcus, Neuman, & MacKuen, 2000), a model connecting levels of enthusiasm and anxiety with behavioral and information-seeking outcomes, as well as cognitive appraisal theory to insert emotion into a model of interactive media effects. The study posits that emotion is the link between the interactive experience and political behavior.

An experimental methodology, using a system of automated responses to participants' input in synchronous and asynchronous interactive settings, allows for the analysis of emotional and behavioral effects in a controlled environment. Hypotheses were proposed as to the general effects of interactive experiences, their emotional impact, and users' consequent behavioral inclinations. Results indicate that the nature of the online interactive experience plays an important role in determining emotional reactions, which were found to translate into intended political participation. As one of the first studies to examine the emotional effects of interactive user-to-user technologies, this study merges insights from emotion and computer-mediated communication research to pose new directions for further research on the topic.

Tables and Figures

As citizens move online in their search for information, desire to interact with others, and day-to-day routine, it becomes increasingly important to study the effects of such web-mediated interactions. Recent political campaigns have demonstrated an influx in new media campaign technologies. Innovative techniques include the use of social networking sites for group formation, the delivering of campaign news via text message, and new uses of websites for allowing a new dimension of political interaction and participation. The process of user-to-user online interactivity is particularly intriguing, for it allows for feedback from other users in what might be conceptualized as an online political space. While an emerging body of work deals with the characteristics and possible effects of web-based interactivity, several gaps remain in existing research. Most studies tend to focus on content, or user-to-system, interactivity, setting aside the social phenomenon of interpersonal, or user-to-user, interactivity. In addition, research on interpersonal interactivity tends to center around describing trends in message content, with only limited research detailing the effects of such interaction on the individual.

As users interact with other, relatively anonymous users within an online forum, the reinforcing or challenging tone of comments encountered may have a direct impact on emotions and subsequent political behavior. While some research has focused on the nature of political deliberation within such interactive groups (Price, Nir, & Cappella, 2006; Price & Cappella, 2002), the possible emotional impact of such online deliberation on the individual user has not been addressed. This study seeks to investigate the emotional effects of participation in a user-to-user political online forum, specifically focusing on the impact of the synchronicity of interaction and the tone of interactive discourse. Theoretical grounding in computer-mediated communication as well as in models of political emotion allows for the evaluation of general effects of online interpersonal interactivity in both synchronous and asynchronous conditions, as

well as effects of reinforcing and challenging feedback from other users on emotions and consequent behavior. Such research is crucial to an understanding of the emotional processes underlying online political deliberation, and proves useful for an analysis of what is increasingly a technology-based culture of political communication.

<div align="center">Prior Research on Interactivity and Online Political Discussion</div>

The Internet as Political Space

Barber, Mattson, and Peterson (1997) define seven integral characteristics of the Internet, in that it offers "inherent interactivity, potential for lateral and horizontal communication, point-to-point and non-hierarchical modes of communication, low costs to users (once a user is set up), rapidity… lack of national or other boundaries, and freedom from the intrusion and monitoring of government" (p. 8). An understanding of how the Internet has transformed communication processes is merely the first step in analyzing the effects of online political interaction; this new medium can be considered to have broader political significance. The existence of political spaces on the Internet has been the subject of much debate. The question of whether the impact of mediated political participation is localized to the online world or has the ability to translate into broader participation such as voting or involvement in a campaign is a crucial question to the analysis of this evolving form of participation.

The nature of online political deliberation has been studied in several respects by Price and colleagues (Price & Cappella, 2006; Price, Nir, & Cappella, 2002). In their study of the Electronic Dialogue Project, Price & Cappella (2006) connect Putnam's (2000) concept of social capital and civic engagement with online political deliberation. The Electronic Dialogue Project

was initiated during the 2000 presidential campaign, with samples of the population taking part

in web-mediated political discussions each month. It was one of the first projects to analyze the

role of synchronous (real-time) interactivity. Those who took part in these group discussions

demonstrated learning effects, as the interaction heightened social trust and political and

community participation. In addition, participating in the groups allowed users to draw on an

increased repertoire of arguments when discussing issues. Further research by Price, Nir, &

Cappella (2006) details the effects of argumentative climate on opinion and behavior, positing

that the climate and content of the discussion affect individuals' contributions to the group and

documenting several group dynamics that are apparent. Such research provides a starting point

for the study of what is often called "electronic democracy." It is necessary to understand the

processes underlying and effects resulting from online political deliberation, for interactive

online use is changing the way many citizens participate in politics.

Conceptualizing interactivity

In an investigation of what he terms the "interactivity paradox," Bucy (2004) reviews two

prominent conceptualizations of interactivity; his terminology forms the basis for this study.

User-to-system interactivity allows the user to interact with the medium itself through such

features as hyperlinks, polls, streaming media, and searches. This type of communication occurs

without contact with any other user (Stromer-Galley, 2000, p. 118), but concerns the ability of

participants in a forum to modify content of the interactive medium (Steur, 1995). By contrast,

user-to-user interactivity allows for people to interact via electronic media, "whether in the form

of e-mail (and its various permutations such as Instant Messenger), chat room discussions,

message boards, user forums, [or] internet telephony and videoconferencing" (Bucy, 2004, p.

56). These two types of interactivity may be combined by any given information source or site

(Bucy, 2004), though it is crucial to examine the differential effects of each. To date, much research has focused on user-to-system interactivity.

Stromer-Galley (2000) additionally draws on previous research to put forth a similarly conceived dichotomy of media (user-to-system) interaction versus human (user-to-user) interaction. Her distinction between the two modes of interaction lies in the source of feedback within the interaction. The analysis contrasts a medium-user interaction with Rafaeli's (1988) model of human interaction, in which feedback comes from other users as technology mediates the interpersonal exchange. Through content analysis, Stromer-Galley provides evidence for the prominence of user-to-system interaction and the lack of user-to-user interaction within candidates' 1996 and 1998 campaign websites. Hyperlinks, audio and video streaming, information downloads, and other media-interactive features were prominent on the websites, while very few candidate websites employed any type of human interaction such as discussion boards or chat rooms. Stromer-Galley posits that this lack of human interaction of candidate websites is due to such technologies being burdensome to implement, difficult to control, and involving a necessary loss of ambiguity.

The focus on the effects of user-to-system interactivity in contemporary scholarly literature (e.g., Bucy, 2004; Sundar & Kim, 2005; Tedesco, 2006) may reflect the vast degree to which user-to-system interactivity has permeated the online experience. Internet users have long been confronted with a hyperlinked environment, and are accustomed to downloading and streaming video or participating in polls to supplement their use of the text. Loss of control and ambiguity has long kept presidential candidates, for example, from providing ample opportunities for interpersonal interaction on their websites (Stromer-Galley, 2000). However, recent campaigns, particularly the 2008 presidential campaign, have increasingly made use of

user-to-user interactive features on their websites (for example, supporter blogs). In addition, the ability of interested users to comment and talk with other users on political blogs, user-generated video sites that contain numerous political channels (such as YouTube.com), and social networking sites has contributed to an increasingly interpersonal online experience. As the environment of the Internet changes, it becomes necessary to study the uses and effects of an increasingly *interpersonal* experience with more opportunities for user-to-user interaction.

User-to-user interactivity

This evolving use of the Internet generates new forms of interactive user-to-user participation that are not reflected in previous literature. Research that focuses only on user-to-system interactivity does not reflect the current state of the Internet, and must be expanded upon to provide a more accurate discussion of its interactive potential—particularly within campaigns that are increasingly conducted online.

The literature on computer-mediated communication (CMC) seeks to understand the processes by which users interact with each other via computer technology (primarily the Internet). Such research is often motivated by a process-oriented, feature-oriented, or perception-oriented approach to the interactivity (McMillan et al., 2008). Rafaeli (1988) provides an excellent definition of interactivity that allows for additional clarification of its interpersonal nature:

> Interactivity is a variable characteristic of communication settings. Formally stated, *interactivity* is an expression of the extent that in a given series of communication exchanges, any third (or later) transmission (or message) is related to the degree to which previous exchanges referred to even earlier transmissions. (p. 111)

Rafaeli and Sudweek's (1997) content analysis of message boards provides a similarly provocative analysis of computer-mediated communication, beginning "with the observation that group CMC is an experiment in social integration and democratic participation" (paragraph 4).

They propose that interactivity is a core component of the "glue" that holds online groups together, a hypothesis that is shared by Bucy (2004) in his evaluation of the "stickiness" of *content*-interactive sites. The processes of virtual listening and speaking are both crucial to user-to-user interactivity, which emphasizes the shared experience of users (Rafaeli & Sudweek, 1997).

However, not all interpersonal online interactions are identical, as Rafaeli & Sudweek explain. With 52.5% of messages in their content analysis referring to a single message above the user's in a thread, the authors define this majority of messages as *reactive* messages. In contrast, just under 10% were coded as *interactive* messages, relating several preceding messages to each other. Understanding the differences in content and process that exist *within* user-to-user interactivity can shed light on the various emotional and behavioral reactions that may be elicited.

Ng and Detenber (2005) elaborate upon another crucial dimension of user-to-user interactivity: level of synchronicity, defined as "the degree to which online interactions take place in real-time" (paragraph 3). Chat rooms provide opportunities for synchronous, or immediate, interactivity and feedback, while discussion boards allow for asynchronous (delayed) communication. Ng and Detenber's distinction between synchronous, asynchronous quick, and asynchronous slow interactions is one of the few nuanced investigations of levels of synchronicity in the computer-mediated communication literature, finding that users believed synchronous interaction to be more persuasive and more credible. This finding is significant, for it speaks to the possibility of effects on users stemming from more complex issues than the mere process of interaction itself. Speculating that users may have felt more involved in a synchronous conversation, or may simply have held lower initial expectations for synchronous

chat rooms, the authors provide a direction for future research. The various levels of synchronicity that are present in online interactivity distinguish it from face-to-face communication in which all feedback occurs in real time, and necessitates a careful study of the different types of interactivity that may occur within a single online experience.

The distinction between various levels of user-to-user interactivity also becomes apparent in considering motives that users report for participating in synchronous and asynchronous electronic forums. Understanding users' motives behind use of interactive technology allows one to better comprehend individuals' perceptions of the online, user-to-user experience. Kaye & Johnson (2006) report that while users of discussion boards and chat rooms cite similar motives for using the Internet (desire for information apart from traditional media sources, accuracy checks on mainstream media, contact with like-minded individuals), a desire for information dominates the motives of asynchronous users, while users of synchronous chat rooms tend to be motivated most by the desire for an interpersonal experience (2006). These distinctions in motive ordering further suggest the need to study various levels of interactivity.

Effects of computer-mediated interactivity

With these potential motivations of users in mind, an examination of evolving research on the impact and effects of interactivity brings to light several trends in the literature. The gratification of political involvement as described above raises questions about how users perceive their participation in an online forum. To this end, understanding the impact of such interactive experiences on political efficacy may lead to intriguing conclusions. While much of the prior research has focused only on content interactivity (Tedesco, 2006; Nisbet & Scheufele, 2004), insights from the work can be applied to user-to-user interactivity. Notably, one may argue that users perceive their online experience to be a form of political participation (Bucy &

Gregson, 2001), and thus tie their media use to others in the political world rather than merely interacting with the medium itself.

Research suggests that Internet use may be positively associated with political efficacy, both internal, "beliefs about one's own competence to understand, and to participate effectively in, politics," and external, "beliefs about the responsiveness of governmental authorities and institutions to citizen demands" (Niemi, Craig, & Matthei, 1991, p. 1407-1408). Tedesco (2006) measures the effects of using content interactive versus non-content interactive political websites on these two dimensions as well as on information efficacy, or the belief that high levels of information are important to the process of voting and that one is competent to help another citizen decide how to vote. Interactive use significantly increased all three types of efficacy, with implications for potential increased future participation (2006). While the study deals with content and not interpersonal interactivity, it sets an important precedent with its findings of statistically significant impacts on efficacy. Though cognitive demand of an increasingly content-interactive environment may have negative emotional impacts (Bucy, 2004)—decreasing one's perceptions of competence and ability—it is important to recognize the possible effects of interactive online use on political efficacy.

The democratizing potential of interactive Internet use, involving users' ability to engage in political deliberation online and translate their interactive online use into non-Internet participation, is a contentious point in the literature. While many scholars praise the benefits of Internet use for democratic prospects, social engagement, and political participation (e.g. Kenski & Stroud, 2006; Mossberger et al., 2008a and 2008b), others such as Bennett (2003) draw attention to problems that mitigate these benefits such as weak political ties in online networked groups, difficulty of control, and issues surrounding collective identity (Bennett, 2003).

Using chat rooms and other synchronous modes of communication also allows one to feel politically involved and become more enthusiastic about an upcoming election (Kaye & Johnston, 2006; see also Atkin et al, 2005, for further discussions of motivations for chat room use). The gratification of political involvement is especially crucial for a study of user-to-user interactivity effects; interactive media use could function for users as a type of media participation (Bucy & Gregson, 2001), which often involves active participation of the electorate and "may well be taking the place of direct, sporadic participation in politics" (p. 375). If users seek out interpersonal interactivity in order to feel more politically involved and enthusiastic, then it is valid to examine the effects of different *types* of computer-mediated interaction on political emotion and behavior.

Emotion: The Missing Link?

The above effects are intriguing, but seem to reflect an incomplete picture of the political processes underlying user-to-user online interactivity. If interactivity is defined with respect to the degree of response to previous posts within a thread, then the effects of reinforcing or challenging feedback undoubtedly have an impact on the user. Furthermore, if emotions are activated by the synchronous or asynchronous feedback that is central to user-to-user interactivity, then it is necessary to examine these emotions from a political perspective. This study seeks to incorporate emotion into a model of user-to-user interactivity effects, positing that the affective element of one's interactive experience is an important, but until now unelaborated, component of interpersonal online interactivity. Once the emotional processes underlying this

communication are determined, behavioral effects (such as impact on future participation or information seeking) may be more clearly illuminated.

Interactivity is a hybrid concept, as it "directs our focus to the intersection of the psychological and the sociological, the bridge between mass and interpersonal communication, the meeting of mediated and direct communication, and the paradox of written vs. spoken" (Rafaeli & Sudweeks, 1997, np). A consideration of the depth of research on emotion in interpersonal communication raises the question of why such emotional processes have not been applied to user-to-user interactivity over the Internet. Though face-to-face and online discussions are not comparable in every way, one can infer that online users' reactions may be similar to those elicited in a face-to-face communication. Price, Nir, & Cappella (2006) demonstrate that group dynamics traditionally studied in the face-to-face context can affect online deliberation; emotional reactions may exhibit the same parallel structure.

Though emotional processes have been affirmed as crucial to political judgment and decision-making, specific research on the activation of emotional processes within *computer-mediated* communication is severely lacking. Some research does exist on the emotional effects of user-to-system interactivity (including the use of hyperlinking and customization processes). Bucy (2004), for example, focuses on this content interactivity and describes what he terms the interactivity paradox: "Although interactive conditions were rated significantly more participatory, involving, and immediate than noninteractive conditions, interactive tasks also generated significantly more confusion, disorientation, and frustration than the reading task, albeit at fairly low levels" (p. 64-65). The cognitive demand elicited by high levels of content interactivity may therefore have negative emotional impacts on users attempting to navigate a crowded information environment. While interactivity may give websites their "stickiness," or

appeal, as Bucy describes, and positive performance-related and emotional outcomes may be related to use of interactive features (e.g. Rafaeli, 1988), there may be cognitive and emotional costs associated with such interactive use.

In contrast, the emotional effects of user-to-user interactivity on the individual have not been studied to any significant extent. Promising research by Joyce & Kraut (2006) provides evidence that the emotional tone of responses to a user's post influences future inclinations to return to a newsgroup. Although this research does not deal with emotional processes in the individual, it does recognize the significance of the response, as well as its emotion-eliciting nature. In order to investigate the role of emotional processing in interpersonal interactivity, it is next necessary to turn to a brief theoretical overview of political emotion—in particular, the theory of affective intelligence.

Emotion and political discourse

The study of affect and emotion, two terms that are often used interchangeably in the scholarly literature, has been influential in political thinking for centuries and is recently resurging in the literature as debates about rationality and emotion resurface. Neblo (2007) provides an excellent overview of traditional debates about emotionality, focusing on the philosophies of Plato, Aristotle, and Hume and describing the relevance of selected philosophical debates in contemporary thought and investigation in political communication. In recent years, the relationship between affect and cognition has been investigated by many researchers for diverse contexts and purposes. To illustrate, in the introduction to their edited volume, Neuman, Marcus, Crigler, and MacKuen (2007) count 23 models and conceptualizations of this relationship used in their book alone. However, the application of these models to a variety of political situations has only recently come to the forefront of research.

While the terms *affect*, *emotion*, and *feelings* are often used interchangeably in the

literature, it is important to distinguish among the concepts. In his work on emotion in campaign

ads, Brader (2005) provides definitions on which analysis of emotional reactions may be based:

> *Emotions* are specific sets of physiological and mental dispositions triggered by the brain
> in response to the perceived significance of a situation or object for an individual's
> goals… [whereas] *feelings* are the subjective awareness and experience of emotions… In
> addition, where emotions are discrete responses to specific stimuli, *moods* are diffuse
> positive or negative states that last for longer periods of time. Finally, *affect* is an
> umbrella term referring to an entire class of phenomena that is often taken to include not
> only emotions, feelings, and moods, but also pain, pleasure, and basic human drives.
> (Brader, 2005, p. 51; emphasis in original)

Spezio & Adolphs (2007) call for a multifaceted definition of emotional processing that

represents a fluid process of emotional activation, awareness, and use in political judgment and

decision-making. Measurement of emotional reactions by self-report allows only for

examination of subjective awareness of emotion; while measuring feelings may be the most

convenient way to operationalize emotional reactions, it is important to recognize the often

unconscious processes that underlie this conscious recognition of emotional state.

Russell (1980) expands on previous research to describe a circumplex model of emotion,

a conceptualization of affect highly relevant to the current study. Emotions—including

excitement, pleasure, contentment, depression, and distress— are spatially arranged in a circular

fashion around two perpendicular dimensions: "misery-pleasure" (often characterized as

valence) and "sleepiness-arousal" (Russell, 1980, p. 1164). Such a conceptualization of emotion

allows one to speculate about the various degrees and nuances of emotion that may be elicited in

a political situation—particularly within the complexity of online interactivity.

For a study of the effects of computer-mediated communication on emotion and

behavior—a subject that inherently ties affective response and the possibility of "rational"

political deliberation—perhaps the most relevant basis is the theory of affective intelligence, a

theory based upon a circumplex model and emphasizing a dual-process conception of political

emotion. Early work of Marcus & MacKuen (1993) details the progression from a simple

valence model of emotion to a more adequate circumplex model, in which "mood states

represent an amalgam of underlying feelings" (p. 680). The duality represented in the

circumplex model carries over to recognition of the brain's two limbic subsystems, in which one

system deals with enthusiasm and related emotions, while the other generates fear and anxiety.

Thus, two distinct systems influence the subtle changes that the average person notices as mood.

Affective Intelligence

Marcus, Neuman, and MacKuen (2000) define affective intelligence as "a theory about

how emotion and reason interact to produce a thoughtful and attentive citizenry" (p. 1). Their

connection between political emotion and political reasoning is a significant one, bridging a

long-standing debate about the relative importance of both rational and emotional thought in

political deliberation. The three main claims of the theory of affective intelligence—that

emotional evaluations are made before they become consciously apparent, that there are two

distinct processes of emotional judgment, and that these two processes lead to reliance on habit

and reasoned evaluation of alternatives in different contexts—are crucial to any analysis of

emotion's role in political judgment. While the research focuses on emotional reactions as a way

to manage and respond to a vast environment of information, it is possible to extend the logic to

computer-mediated-communication as users are provided with information from others, given a

chance to respond, and often confronted with sharply reinforcing or challenging reactions.

The authors describe two emotional systems that manage positive and negative input: the

disposition and surveillance systems. This dual conception is present not only in the psychology

of emotion, but also in the cognitive processing of stimuli; variations in enthusiasm, aversion,

and anxiety result, respectively, when a habit is "strategically salient" (p. 39) or an evaluation of

the normality of the environment occurs. The *disposition system*—located in the limbic region of

the brain— manages positive reinforcement, as users "sustain those habits about which we feel

enthusiastic and… abandon those that cause… despair" (p. 10). This "politics of habit" allows

for reliance on learned issues and past behavior as well as processes of mobilization and

demobilization. In contrast, the *surveillance system* deals with the introduction of novel

information or perceived threat to an existing belief—decreasing dependence on habit,

prompting anxiety, and focusing attention on the new stimulus. With the activation of this

system, contextual awareness and motivation for learning heighten as the brain attempts to make

cognitive sense of a novel or threatening situation.

The theory of affective intelligence applies to both "trait" and "state" conceptions of

emotion (Marcus, Neuman, & MacKuen, 2000). While the brief responses that one encounters

while visiting a chat room or discussion board may not have an effect on long-term inclinations

to further participation or attention to political issues, the brief burst of enthusiasm or anxiety

that results from reinforcing or challenging feedback may have significant short-term effects.

"Consistent with their predictions, enthusiasm is linked to involvement and anxiety is linked to

attentiveness and learning" (Brader, 2005, p. 61). If activated emotions of enthusiasm and

anxiety have different behavioral outcomes as one responds to his or her situation, then

measuring the emotional effects of computer-mediated communication, a possible component of

media participation (Bucy & Gregson, 2001), becomes an important task for researchers.

Emotion and Interactivity

In the case of computer-mediated communication, feedback users receive may reinforce

their line of thought, challenge their input, or remain neutral; as such, this online deliberation has

the potential to elicit emotional reactions from others. The separation of emotion into multiple processes is crucial to an understanding of the nuanced nature of emotional judgment (Marcus, Neuman, & MacKuen, 2000; see also Abelson, 1982, and Sullivan & Masters, 1988 for earlier conceptions of multi-channel conceptions of political emotion). In an extension of this influential body of research, the current study attempts to differentiate the implications of emotional reactions leading from both reinforcing and challenging feedback that users in a political discussion board or chat room may observe and receive. Here, the emotional processes are conscious, as users respond to an affirmation of or attack on their views; however, the logic behind the affective intelligence model is highly relevant. Since interaction with others is split into reinforcing and challenging feedback in this study (in an attempt to mirror types of responses users might encounter in an actual experience with CMC), it is appropriate to focus on a dual-system model of emotion to account for different emotional and behavioral outcomes.

The Role of Anger

Although in most respects the affective intelligence model is useful for an analysis of users' emotional reactions to online user-to-user interactivity, its dual process model does not account for one of the most common emotions that users may experience in an interactive environment while discussing an emotionally charged issue—that of anger. While the surveillance system of the affective intelligence model focuses on the role of anxiety as threat is introduced, anger must be treated as distinct from anxiety as a negative emotion; the cognitive appraisal model of emotion can be used to differentiate the two emotions and account for the role of anger in users' emotional reactions.

The appraisal model, as described by Lazarus (2001), is a cognitive-motivational-relational theory that considers the relationship between person and environment:

> The appraisal process involves a set of decision-making components, as it were, which create evaluative patterns that differentiate among each of the emotions; three primary appraisals, which concern the motivational stakes in an adaptational encounter; and three secondary appraisals, which have to do with the options for coping and expectations. The *primary appraisal* components are goal relevance, goal congruency or incongruency, and type of ego involvement. The *secondary appraisal* components are blame or credit, coping potential, and future expectations. (Lazarus, 1991, p. 39)

These two sets of appraisals evaluate and ascertain the well-being of the individual, and have the potential to yield an emotional reaction leading to an action tendency (Lazarus, 1991). Appraisal theory reflects a three-dimensional view of emotion, in which valence, arousal, and *potency* define the nature of the reaction (Scherer et al., 2006). The analysis of anger in particular benefits from a cognitive appraisal perspective; Lazarus devotes considerable time to discussing nuances of anger responses. Anger involves the appraisal of blame, leading from the attribution of control over the offending action and accountability when a threatening environment exists. In addition, "the preservation or enhancement of ego-identity" must be frustrated in order for an angry reaction to be elicited (Lazarus, 1991, p. 218)—an affront against the self. Such an affront leads to the action tendency of *attack* as a mode of coping (Lazarus, 1991).

These characteristics of anger, made clear by applying cognitive appraisal theory, warrant additional study of its impact on political action when evoked in an online interactive setting. Valentino et al. (2006) make a case for moving beyond a simple two-system model of emotion, in particular to differentiate between the impacts of various negative emotions. Anger and anxiety, in fact, have been shown to have different causes (Averill, 1982, as cited in Valentino et al., 2006) and have different effects on political behavior. Using the cognitive appraisal model to examine the processes underlying such emotions as fear and anxiety, Valentino et al. find that anger boosts participation above and beyond the effects of anxiety or enthusiasm. Furthermore, anger particularly boosts participation that is "costly" as opposed to "cheap"; for example,

donating money to a campaign versus wearing a campaign button; anxiety, in contrast, boosts

participation that is "less costly, especially information-seeking and opinion expression"

(Valentino et al., 2006, p. 25). These differential effects of anxiety and anger render it necessary

to examine both in a study of user-to-user online interactivity, particularly in situations where

users may receive feedback that challenges or attacks them or their views. Drawing insights

from the theory of affective intelligence and the cognitive appraisal model allows for a more

nuanced examination of the emotional and behavioral effects of online interactivity.

<div align="center">Hypotheses</div>

With the above theoretical basis, the following hypotheses are proposed as to the general

effects of interactive experiences, their emotional impact, and users' consequent behavioral

inclinations. Synchronous and asynchronous interactivity is hypothesized to elicit emotional

reactions from users. These emotions, in turn, may affect subsequent behavior in certain

situations.

General Effects of User-to-User Interactivity

1. Synchronous interactivity, allowing for immediate feedback, will have a greater impact on feelings of internal political efficacy than asynchronous feedback.

2. Those users experiencing synchronous feedback will express greater intentions of future online and offline participation.

3. Users will perceive synchronous interactivity to be more informative and credible than asynchronous interactivity.

4. The above effects will be stronger for those users receiving reinforcing feedback than for those receiving challenging feedback.

Emotional Impact of User-to-User Interactivity

5. Synchronous interactivity will elicit emotional reactions higher in arousal from participants than asynchronous interactivity.

6. The relationship between interactivity and emotional reactions will be moderated by tone of feedback.

    a. Participants who receive reinforcing feedback from their original post will display higher levels of enthusiasm than those who receive challenging feedback.

    b. Participants who receive challenging feedback from their original post will display higher levels of anxiety and anger than those who receive reinforcing feedback.

Behavioral Effects of Emotional User-to-User Interactivity

7. Experiencing increased enthusiasm will lead to increased willingness to participate, both through returning to the group and offline participation.

8. Experiencing increased anxiety will lead to increased willingness to seek out additional information on the topic.

9. Experiencing increased anger will lead to increased willingness to participate, especially through long-term, real-world modes of participation.

Methods

In order to examine the effects of user-to-user interactivity on political emotion and behavior, an experiment was conducted in order to systematically vary both level of synchronicity and tone of feedback received by users. This experimental design allows for analysis of the impact on emotions and political behavior of users of an online forum.

Participants

The sample consisted of 100 students from the University of Michigan Communication Studies participant pool, made up of underclassmen currently enrolled in Communication Studies 102, Media Processes and Effects. Distribution across the four conditions was relatively equal, with 49 participants in the asynchronous condition (25 with the challenging response, and 24 with the reinforcing response) and 51 in the chat room condition (28 with the challenging response, and 23 with the reinforcing response). College students, with high levels of Internet

and social networking use, are of interest for this study because they represent one of the age groups most likely to use new media campaign technologies. According to the Pew Internet and Public Life Project (2008), the percentage of Americans age 18-29 that uses the Internet to find campaign information, as well as broader political information, rose from 36% in spring 2004 to 50% in spring 2008. In addition, as of spring 2008, 58% of those ages 18-29 reported political engagement through using the Internet, receiving text messages, or sending and receiving emails (2008). Since college students are frequently exposed to an interactive online environment, and are often targeted with new media campaign technologies (such as social networking sites and text messaging), focusing on this population is a valid choice for the current study.

Procedures

While the current study aims to discuss the emotional and behavioral effects leading from political online interaction broadly, for purposes of the experiment the discussions were closely controlled and made to focus solely on one issue: participants' views on the easing of restrictions of embryonic stem cell research. The specific issue was chosen for several reasons. First, it was expected that the issue would be perceived as politically salient by the participants due to the recent prominence of Proposal 2, attempting to allow embryonic stem cell research in Michigan, on the November 2008 ballot. Though the election had already taken place at the time of the study and the issue was not framed as a Michigan issue, strong emotional reactions about the issue that have been the basis of support and opposition for Proposal 2 were expected to exist. The strong division between views of supporters and opponents of the issue is another important quality of the issue; there is little "gray area" between support and opposition of the proposal, as there is with many other prominent political issues such as abortion and affirmative action. Every effort was made to choose an issue on which participants would be able to clearly

articulate a view on either side of the issue, and minimize the frequency of "no preference" responses. Pretest survey questions measuring the salience of the issue and existing views on the issue attempted to clarify these assumptions.

At the beginning of the study, participants were assigned a computer terminal that had one of two versions of the study website pre-loaded into the web browser, located at http://www.stemcelldialogues.blogspot.com and http://www.stemcellresearchdialogues. blogspot.com. Both versions were identical in content and design, with the exception of type of interactive feature employed (chat room versus discussion board). Participants were asked to fill out a pretest questionnaire, containing questions on demographic characteristics, overall political new media use, and existing views regarding the easing of federal restrictions on embryonic stem cell research. They were assured that all responses were entirely confidential and that they were able to skip any questions that they did not feel comfortable answering.

Next, participants were directed to a website focusing on the political implications of the controversy on embryonic stem cell research in Michigan. This website was titled "Dialogues on the Politics of Embryonic Stem Cell Research," and featured balanced news coverage as well as either a chat room or a discussion board on the home page. To conceal the true purpose of the study, users were told in the informed consent document that they were to evaluate the usability of the site throughout their experience.

Participants were randomly assigned to one of four conditions: synchronous with reinforcing feedback, synchronous with challenging feedback, asynchronous with reinforcing feedback, and asynchronous with challenging feedback. For simplicity, experimental sessions alternated between participants using synchronous and asynchronous interactivity. All participants began by reading an article about the controversy written by Megha Satyanarayana

of the *Detroit Free Press*: "Heated Stem-Cell Battle Ends as Prop 2 Passes- Voters Approve

Fewer Limits on Using Embryos for Research." This article, written immediately following the

passage of Proposal 2 in Michigan, put forth arguments from both supporters and opponents of

the proposal and contained background information about the issue of embryonic stem cell

research. By giving all participants the chance to learn basic information about the issue, this

step in the methodology provided those with little prior knowledge of the controversy with a

reference point for the coming online conversations. Indeed, a few participants commented that

this article was the first that they had read about the controversy. Participants were explicitly

told not to visit any other websites during the online portion of the study, as well as to refrain

from using any other feature of the computer (e.g. games).

After finishing the article, participants were told to return to the main page of the

website and were given instructions regarding the use of the interactive feature (chat room for

synchronous sessions, discussion board for asynchronous sessions). Each participant was

instructed to enter the username posted on the computer and to record the session identification

number that was randomly generated. Participants in all conditions then viewed a pre-designed

script between two fictitious users, Reader54 and PoliticsCrazy, discussing their views without

significant challenge or conflict to avoid the influence of conversation climate on users'

responses. The timestamp on the conversations was altered to suggest that the communication

either was happening in real time (synchronous) or had happened in the past (asynchronous).

The participant was then prompted by PoliticsCrazy to respond by stating their views on the

topic, and consequently received an automated reply from a third user, Chatter389, that either

negatively challenged or positively reinforced their stated views. The synchronous condition

featured a series of responses designed to mimic a conversation taking place in real time, while

the single response of the asynchronous condition was delayed to invoke the nature of a

discussion board within the time constraints of the experience. Both conversations are described

in detail below.

Once all participants had finished interacting with the discussion board, they then were

asked to complete a posttest questionnaire that measured the dependent variables described

below. In addition, they were asked to evaluate the usability of the site (the stated purpose of the

study) and to answer a number of filler questions. To measure the tendency to seek out

information, participants were also be given the chance to request further information on the

topic through the questionnaire. Finally, participants were debriefed and thanked for their

participation.

Manipulation

The website visited by participants was created for the purpose of the study and was titled

"Dialogues on the Politics of Embryonic Stem Cell Research." This website was hosted by the

popular blog site Blogger. At the outset of the online portion of the study, participants were

asked to read the following welcome message on the home page of the website:

> Welcome to Dialogues on the Politics of Embryonic Stem Research, a nonpartisan
> website dedicated to contributing to the conversation about the divisive and controversial
> issues behind easing restrictions on using embryonic stem cells in research. We are
> committed to informing voters and giving you an opportunity to talk with others about
> your views.

A link below this welcome message directed participants to the aforementioned article about the

passage of Proposal 2 in the state of Michigan. The discussion board or chat room, dependent on

the experimental condition, was located on the home page below this link. Once a participant

logged into the feature with the provided username, he or she viewed pre-written scripts as that

suggested the current or prior presence of fictitious contributing comments to the website.

Content was identical across the two conditions, with the only difference being that the

conversation was static on the screen for the asynchronous condition and appeared sequentially

for the synchronous condition. Timestamps on the conversations reflected the temporal nature of

the conversation. These scripts were written as a reasoned deliberation between users, with the

aim of not suggesting an overly argumentative climate and not endorsing any particular view—

so as to not influence participants' inclinations to participate. The basic conversation was as

follows:

> **Reader54**: Does anyone have an opinion on this controversy?
> **PoliticsCrazy**: I think that easing restrictions on embryonic stem cell research is a great idea.
> **PoliticsCrazy**: The ability to use them to research cures is an amazing opportunity.
> **Reader54**: Okay, but I think the destruction of life is still involved. An embryo is a living thing, and when we kill that human by using the embryo for stem cell research, we are committing murder.
> **[Reader 54**: Hey, a new user. Welcome. **–synchronous condition only]**
> **PoliticsCrazy**: But isn't discovering cures for debilitating diseases pro-life also?
> **Reader54**: So far we haven't seen any cures emerge from embryonic stem cell research. Scientists are already conducting research with adult stem cells, and having some success.
> **PoliticsCrazy**: Think about the potential, though. Not to mention all the jobs it would create.
> **Reader54**: The research could spiral out of control and have disastrous consequences.
> **PoliticsCrazy**: Bans on cloning would stay intact, though. And there would be plenty of oversight-- universities' review boards, the National Institutes of Health....
> **PoliticsCrazy**: Any input from users out there?

The careful design of the site was an attempt to create the impression that users are

interacting on a legitimate political forum. A pilot test was undertaken to ensure that the

conversation was not biased toward either side of the controversy, as well as to measure the

valence of the reinforcing and challenging responses. Out of seven respondents, five defined the

conversation as "balanced in point of view"; one defined it as "biased toward pro-stem cell

research"; and one defined it as "biased toward anti-stem cell research." With these results in

mind, it is possible to conclude that the conversation is relatively balanced in point of view and did not significantly alter participants' perceptions of the conversation climate.

   Levels of synchronicity.   Two levels of synchronicity were studied through the experiment: asynchronous interactivity and synchronous interactivity. Asynchronous interactivity was operationalized as the post by a participant to a discussion board with delayed and indirect feedback from a fictitious user.   Participants received a single automated response to their input *three minutes after stating their views,* in order to embed a delay that is characteristic of asynchronous online communication. While this delay was relatively short compared to the hours or days that might separate posts in a real discussion board situation, this delay was the longest possible in terms of the time constraints of the experiment. Since no filler tasks were used, the delay was stark and, if artificial, at the very least emphasized. After this single response participants were not prevented from typing more comments, but were not acknowledged further by the fictitious user Chatter389.

   Synchronous interactivity was operationalized as the participation of a user in a chat room conversation, with three responses from the fictitious chatter to simulate a conversation taking place in real time. After participants added their views to the conversation in the chat room condition, they received a message asking them to elaborate upon their statements (framed as either reinforcing or challenging in nature, as described below). After further participant input, or after two minutes elapsed (to account for any participants who failed to elaborate), the participant received a message from Chatter389 either challenging or reinforcing the validity of their claims. Finally, immediately after this feedback a third automated response was sent, ending the conversation. All conversations and rules for delays and linked responses were written into the code of the website by a trained web programmer.

Tone of feedback. Tone of feedback was defined as either reinforcing or challenging

feedback from the fictitious user Chatter 389. The tone of response was set within the code of

the website to alternate with every other user, facilitating random assignment of this variable.

Within the discussion board, participants received one automated response back. The reinforcing

response stated: "Yes, that makes perfect sense. I really like your insight… I enjoyed reading

your response!" In contrast, the challenging response was: "Really, that doesn't make any sense

at all. It's terrible reasoning… I shouldn't waste my time here."

In the chat room condition, participants received a set of three responses to simulate an

ongoing conversation. These three responses were linked together in the website code to be

either all reinforcing in tone (labeled "a" below) or all challenging in tone (labeled "b"). After

the preset script finished appearing, the interactive portion of the conversation read:

> PoliticsCrazy: Any input from users out there?
> **(user input)**
> Chatter389: a I see. What else were you thinking? OR
>   b. I don't understand. Could you elaborate?
> **(more user input, or two minutes elapse)**
> Chatter389: a. Yes, that makes perfect sense. I really like your insight. OR
>   b. Really, that doesn't make any sense at all. It's terrible reasoning.
> Chatter389: a. I enjoyed talking with you! Goodbye! OR
>   b. I'm not going to waste my time here. Goodbye.

In general, responses were kept simple to maximize their relevance to any possible user input.

After receiving the last response, participants were permitted to continue typing, but received no

further feedback from Chatter389 to keep the design logistically feasible.

Measures

The hypotheses proposed may be summarized as follows: level of synchronicity will

affect both general reactions to the communication and emotional reactions; these relationships

will be moderated by the valence of the feedback received. More specifically, the emotional

reactions elicited by the interactive experience will then lead to certain behavioral outcomes, largely congruent with the expectations of the theory of affective intelligence and cognitive appraisal theory. Across the first set of hypotheses (those dealing with general effects), then, level of synchronicity is the independent variable, valence of feedback is the moderating variable, and efficacy, intention to participate, and perceived informative ability/credibility of the communication are dependent variables. This first analysis sets a framework for the second, emotional-behavioral model—in which level of synchronicity is the independent variable; emotional response, the mediating variable; and behavioral inclination, the dependent variable. Again, valence of feedback moderates this relationship.

Manipulation of level of synchronicity, as well as valence of response, was accomplished through the design of the two interactive features and the content of the automated responses, as described above. All dependent variables were measured through a posttest questionnaire administered after completion of the online task. In addition, demographic characteristics, levels of political new media use, and initial views on the issue were measured through a pretest questionnaire and are useful both as filler questions and in the analysis of hypotheses. Most responses were measured along a seven-point scale measuring level of agreement to a series of statements.

Mediating variable: Emotional responses. Participants were asked to answer a series of questions about their emotional responses during the experience, using a five-point scale ranging from "extremely" to "not at all": "How did you feel about the experience you just had on the website? Please tell me how much you felt each of the following emotions." Specifically, participants were asked to report how enthusiastic, hopeful, excited, stressed, worried, anxious,

afraid, irritated, angry, or outraged they felt because of the experience. These questions were among the first asked on the post-test questionnaire.

To measure the impact of level of synchronicity and tone of response on participants' emotional reactions, three scales were created to measure participants' scores on the enthusiasm items, the anxiety items, and the anger items. Each of the ten original items was recoded so that higher levels of emotion corresponded with higher numerical values, and so that the scales began at the theoretical minimum (a response of "not at all," therefore, received a code of 0). A factor analysis (principal component, direct Oblimin) was conducted using these items (see Table 1).

Table 1. Factor Analysis of Emotion Items[a]

	Component		
	Anger	Enthusiasm	Anxiety
How angry did you feel?	.954	-.004	.058
How irritated did you feel?	.892	-.003	-.045
How outraged did you feel?	.835	.023	-.044
How enthusiastic did you feel?	.014	.923	.104
How excited did you feel?	-.118	.794	-.081
How hopeful did you feel?	.120	.723	-.045
How worried did you feel?	-.007	.001	-.859
How afraid did you feel?	-.129	-.034	-.856
How anxious did you feel?	.123	.270	-.697
How stressed did you feel?	.276	-.046	-.649

Extraction Method: Principal Component Analysis.
Rotation Method: Oblimin with Kaiser Normalization.

a. Rotation converged in 8 iterations.

Note: Total variance accounted for: 72.42%

As shown in Table 1, the factor analysis uncovered a three-factor solution that largely reflected standard emotional scales used in previous research. The anger scale consisted of three items—how irritated, angry, and outraged the participant felt (alpha = .891). Enthusiasm was also measured by a three-item index, asking participants how enthusiastic, hopeful, or excited

they felt (alpha = .758). Finally, the anxiety scale was comprised of four items—how afraid, irritated, angry, and outraged participants reported feeling (alpha = .813). These scales were used throughout the analysis.

To measure level of emotional arousal, a new variable was created by summing the average of a participant's individual responses to positive emotions (namely, items on the enthusiasm scale) and the average of a participant's individual responses to negative emotions (items on the anxiety and anger scales). Since there were twice as many negative emotions on the battery of items, this process weighted positive and negative emotions equally in the final arousal scale.

In addition, participants were asked to list any other emotions that they experienced on the post-test questionnaire. While not allowing for comparison across participants, these results provide useful insight into other dimensions of participants' reactions to the experience. Perhaps the most useful purpose of this open-ended data was to assess the extent to which participants were susceptible to demand effects—the extent to which they thought the experience was artificial and that they were "talking" to a pre-set, automated conversation. While it was not feasible to directly assess the believability of the study design, this opportunity indirectly allowed those participants strongly annoyed or confused by the artificiality of the study design to state their complaints. However, only six of the 100 participants expressed any such concern in this section, suggesting that potential artificiality of the design may not be a serious concern.

Political efficacy. Level of internal political efficacy was measured with a series of questions to fully capture the concept, asking participants how well they believe they are able to understand the issue of embryonic stem cell research, how well they believe they are able to understand political issues and events in general, how competent to participate in politics they

view themselves, and to what extent they believe that they can contribute to political discourse on the topic. Responses to these questions were combined into an index for purposes of analysis. All questions were measured through a seven-point scale capturing the level of agreement with various statements, ranging from strongly disagree to strongly agree. Similarly, external political efficacy was measured with two statements taken from the 2004 American National Election Study (ANES): "public officials don't care much what people like me think" and "people like me don't have any say in what government does."

A scale for internal political efficacy was created combining the five items described above, with questions recoded so that higher scores denote higher political efficacy (alpha = .679). However, due to a flaw in the questionnaire design 13 participants skipped the first statement about internal efficacy ("I believe that I have a good understanding of the issues regarding regulating embryonic stem cell research"), resulting in an *N* of only 87 for this index. To compensate, an internal efficacy average was computed in order to include the results of all 100 respondents regardless of whether or not they had skipped the question, and both results are reported throughout the analysis below. For reference, reliability analyses for the four items answered by all 100 participants was very similar to the original index (alpha = .657).

Political participation. Since political participation is a broad concept with many possible conceptualizations, an index of five related questions was used to measure the variable, comprising both offline and online participation in a general index. These questions asked participants how likely they would be to attend a rally on the issue, contribute money to a fund related to the issue, email their representative about the issue, discuss the issue with their friends, or sign an online petition related to the issue, *assuming that the issue was presented on a future election ballot.* Since the scope of the experiment renders it impossible to gather data about

actual future participation, hypothetical measures may be the best possible approximation. The general participation index was highly reliable (alpha = .808). However, this participation index was again affected by a flaw in questionnaire design, in which 13 users only answered 4 of the questions, resulting in an *N* of 87. To compensate, a participation average was created, and the results of both analyses are reported below. For comparison, the reliability analysis for the four items for which *N* = 100 yielded similar results (alpha = .79).

A second, narrower index was created to measure intent to participate online in the future, relevant to this study of online interactivity (alpha = .78). The concept was measured through level of agreement with three statements about interaction with the website— "I would return to this website in the future," "I would participate in this online discussion forum in the future," and "I would seek out other similar forums online"—as well as two items from the general participation index, "I would send an email to my representative expressing my views on the issue" and "I would sign an internet petition related to this issue."

Information-seeking. An index of information-seeking (alpha = .716) was formed by combining participants' level of agreement with two statements: "I am likely to pay more attention to news coverage surrounding the issue in the future" and "I am likely to discuss the issue with my friends to try to learn more about it." Both statements were measured along a seven-point scale, ranging from strongly disagree to strongly agree.

Other variables measured. Participants in either of the interactive conditions were also asked to report how informative and credible they perceived the interactive communication to be with fairly straightforward questions (level of agreement with "the experience was informative," "the information that others gave was credible," and "the information others gave was well-thought out"). Finally, participants were given the opportunity to check a box on the

questionnaire to request further information from the website, as well as asked questions about

how likely they would be to seek out further information on the issue by paying more attention to

news coverage or learning about the issue through discussions with friends. A number of related

filler questions were included on the questionnaire, including questions about political new

media use and statements such as "my views on the issue changed as a result of the experience"

and "I am willing to consider other perspectives on the issue."

Control variables. A number of control variables were measured on the pre-test

questionnaire and included in the regression analyses for the third set of hypotheses. Prior

participation in online chats or discussions, political or otherwise, was measured by one question

asking if participants had ever engaged in either activity. Partisanship was measured with a

standard question from the ANES: "Generally speaking, do you usually think of yourself as:

Republican, Democrat, Independent, Other, or no preference?" These responses were recoded as

1 if the participant identified as Democrat, Republican, Independent, or Other, and 0 if no

preference was given to create the final partisanship variable. Strength of ideology was also

measured by a question from the ANES: "Where would you place yourself on the following

scale (or haven't you thought much about this)?" Responses ranged from extremely liberal to

extremely conservative on a seven-point scale, and included a response for "I haven't thought

much about this." The scale was "folded" to create a four-point with responses of moderate,

slightly ideological, ideological, and extremely ideological. In addition, participants were asked

to report their gender and whether or not they were registered voters in Michigan. Finally, the

extent to which participants followed the issue was defined on a scale of 1 to 6, denoting the

number of the following tasks the participant had completed: following the issue online, reading

newspaper articles about the issue, talking with friends about the issue, listening to news stories about the issue, voting on a proposal about the issue, and campaigning about the issue.

Analysis

Once information was collected and synthesized into a dataset, statistical tests were performed on the data to ascertain the existence and significance of the hypothesized relationships. Comparisons were made between participants in the asynchronous condition and the synchronous condition, as well as participants receiving reinforcing feedback versus those receiving challenging feedback. In addition, interactions between level of synchronicity and valence of feedback were examined for their complex emotional and behavioral effects. These statistical comparisons and significance tests allowed for careful examination of the data and the drawing of conclusions about emotional and behavioral effects of online interactivity.

A content analysis of the conversations that took place on the website, which were recorded and entered into an online database, was also undertaken to ascertain the nature of the conversations carried out. Variables analyzed included whether participants in the chat room condition entered responses before the main script finished appearing; whether participants in both conditions continued typing after the automated conversation was ended; and the number of words that participants typed in various areas of the chat or discussion. To gain a sense of how effective the automated model was in predicting a relatively natural flow of conversation, also coded were any noncompliance issues (for example, if participants did not type anything and simply sent blank comment fields); whether participants were interrupted by automated responses; and whether participants expressed annoyance that the fictitious users disappeared or were left with unanswered questions. Coding these aspects of the conversations provided a basis for the main analyses by generating an understanding of how participants interacted with the

fictitious users and whether or not there were any significant problems with the design of the technology that would compromise internal validity.

<div align="center">Results</div>

General Effects of User-to-User Interactivity

  The initial set of hypotheses, predicting general effects of user-to-user interactivity, was analyzed first to provide a basis for the more complex analyses to follow. Two-way analysis of variance was conducted to examine the study's results. Results for hypotheses 1-3, predicting main effects, are presented below, along with the corresponding interaction effects predicted in hypothesis 4.

  Hypothesis 1. Hypothesis 1 stated that synchronous interactivity, allowing for immediate feedback, will have a greater impact on feelings of internal political efficacy than asynchronous feedback. The main effect of condition (synchronous versus asynchronous) on the participant's score on the internal efficacy index was insignificant, $F(1, 84) = .009$, p = .925, as was the similar effect on average internal efficacy score, $F(1,97) = .728$, p = .396. In addition, the main effect of response (reinforcing versus challenging) on score on the internal efficacy index was insignificant, $F(1, 84) = 1.269$, p = .264, as was the effect on internal efficacy average, $F(97, 1) = 2.514$, p = .116. Thus, the hypothesis was not confirmed.

  The interaction predicted by Hypothesis 4, that the predicted effect would be stronger for those users receiving reinforcing feedback than for those receiving challenging feedback, was also insignificant; no significant results were found for either the internal efficacy index, $F(1, 83) = 1.719$, p = .193, or the internal efficacy average, $F(1, 96) = 2.375$, p = .127. However, these

interaction results were in the predicted direction; the lack of significance may result from the

small sample size. The internal efficacy average was slightly higher in the synchronous

condition (*M* = 4.70, *SD* = .20) than in the asynchronous condition (*M* = 4.55, *SD* = .20) if

reinforcing feedback was received. However, if challenging feedback was received, internal

efficacy was slightly *lower* in the synchronous condition (*M* = 4.10, *SD* = .18) than in the

asynchronous condition (*M* = 4.55, *SD* = .19). This relationship for internal efficacy average is

shown in Figure 1 below, with reinforcing feedback represented by the upward-sloping line; the

relationship is very similar for the internal efficacy index.

Figure 1. Interaction Effect Between Condition & Response on Internal Efficacy Average.
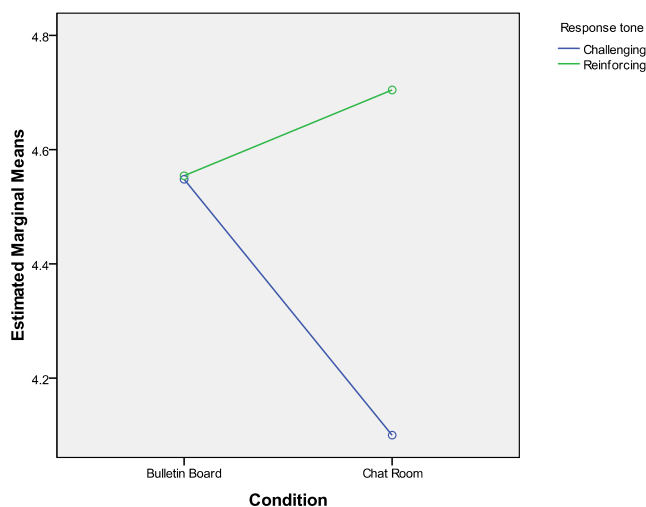
Hypothesis 2. Hypothesis 2 stated that those users experiencing synchronous feedback

would express greater intentions of future online and offline participation. The main hypothesis

was not confirmed; the main effect of condition on online participation intention was

insignificant, $F(1, 97) = 1.511$, p = .222, as was the main effect of condition on general

participation intention, $F(1, 84) = .288$, p = .593. Results were similar for the participation

average allowing for the analysis of all 100 participants. However, a main effect of response

tone on online participation approached significance, $F(1, 97) = 3.482$, p = .065. Scores on the

online participation index, measuring propensity to participate online in the future, were higher

for those participants receiving reinforcing feedback ($M = 16.16$, $SD = .78$) than for those

participants receiving challenging feedback ($M = 14.17$, $SD = .73$). While not predicted by the

initial hypothesis, this marginally significant result shown in Table 2 below reveals that

emotional tenor of comments received may be more important than the mechanics of the

interactive experience in predicting future political participation. The main effect of response on

general participation was insignificant, $F(1, 84) = 2.61$, p = .110; the participation average

produced similar results, $F(1, 97) = 1.87$, p = .174. However, the insignificant effect on general

participation intentions was in the same direction as the significant effect on online participation

intentions; participants who received the reinforcing feedback were more likely to participate.

Table 2. Summary of ANOVA: Online participation index.

Dependent Variable:Online participation index

Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	146.102ª	2	73.051	2.590	.080
Intercept	22900.809	1	22900.809	811.881	.000
condition	42.626	1	42.626	1.511	.222
response	98.224	1	98.224	3.482	.065
Error	2736.088	97	28.207		
Total	25653.000	100			
Corrected Total	2882.190	99			

a. R Squared = .051 (Adjusted R Squared = .031)

Hypothesis 4 predicted that the main effect of increased intentions of general and online

participation with increasing synchronicity would be stronger for those respondents receiving

reinforcing feedback. The interaction effect between condition and response tone on intentions

of online participation was insignificant, $F(1, 96) = .761$, p = .385. The hypothesis was not

confirmed. However, the interaction effect between condition and response on intentions of

general participation was significant for both the participation index, $F(1, 83) = 5.15$, p = .026,

and the participation average, $F(1, 96) = 6.65$, p = .011. For each result, participants who

received challenging feedback were more likely to express intentions to participate if they

interacted with others in the synchronous condition than the asynchronous condition, while the

effect for participants who received reinforcing feedback was reversed—they were more likely to

express intentions to participate if they interacted with others in the asynchronous condition than

the synchronous condition. The relationship for the interaction effect on participation average is

shown in Figure 2 and Table 3 below, with reinforcing feedback represented by the downward-

sloping line; the relationship for the interaction effect on participation index is very similar.

Figure 2. Interaction Effect Between Condition and Response on Average Score on Participation Index
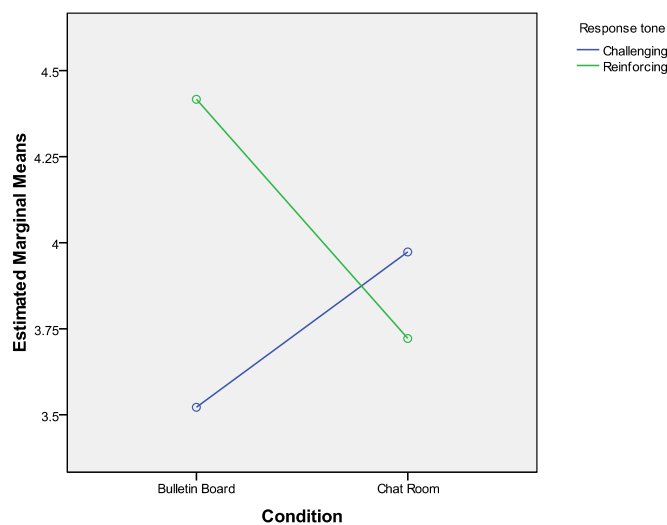
Table 3. Summary of ANOVA: General participation average.

Dependent Variable:Participate average

Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	10.852ᵃ	3	3.617	2.947	.037
Intercept	1519.404	1	1519.404	1237.748	.000
condition	.369	1	.369	.301	.585
response	2.572	1	2.572	2.095	.151
condition * response	8.166	1	8.166	6.653	.011
Error	117.845	96	1.228		
Total	1656.725	100			
Corrected Total	128.697	99			

a. R Squared = .084 (Adjusted R Squared = .056)

Hypothesis 3. Hypothesis 3 stated that users will perceive synchronous interactivity to be more informative and credible than asynchronous interactivity, and was not confirmed. The main effect of condition on how informative participants perceived the experience to be was insignificant, $F(1, 80) = 1.630$, p $= .205$ ($N = 83$). In addition, the main effect of condition on how credible participants perceived other users' information to be was insignificant, $F(1, 97) = .240$, p $= .646$. This difference was in the predicted direction. The interaction hypothesis (Hypothesis 4), stating that the predicted effects will be stronger for those users receiving reinforcing feedback than for those receiving challenging feedback, was also not confirmed. The interaction effect between condition and response on how informative the experience was perceived to be was insignificant, $F(1, 79) = .669$, p $= .416$ ($N = 83$), as was the interaction effect on the perceived credibility of other users' information, $F(1, 96) = .736$, p $= .393$.

Emotional Impact of User-to-User Interactivity

Hypothesis 5. Hypothesis 5 stated that synchronous interactivity will elicit emotional reactions higher in arousal from participants than asynchronous interactivity. Using this adjusted emotional arousal scale, the main effect of condition on emotional arousal was found to be insignificant, $F(1, 97) = 1.678$, p $= .198$. The main effect of response on emotional arousal approached marginal significance, $F(1, 97) = 2.66$, p $= .106$. Participants who received challenging feedback scored higher on the emotional arousal scale ($M = 1.63$, $SD = .16$), on average, than participants who received reinforcing feedback ($M = 1.261$, $SD = .17$). The interaction effect between condition and response on emotional arousal was insignificant, $F(1, 96) = .043$, p $= .835$. Thus, the hypothesis was not confirmed.

Hypothesis 6. Hypothesis 6 stated that the relationship between interactivity and emotional reactions will be moderated by tone of feedback. Hypothesis 6a specifically predicted

that participants receiving reinforcing feedback would display higher levels of enthusiasm than those who received challenging feedback. This hypothesis was not confirmed; the two-way ANOVA yielded an insignificant relationship, $F(1, 97) = 2.06$, p = .526. The effect was in the predicted direction, though; receiving reinforcing feedback led to a slightly higher score on the enthusiasm scale ($M = 2.73$, $SD = .34$) than receiving challenging feedback ($M = 2.45$, $SD = .31$). However, the main effect of *condition* on score on enthusiasm scale was significant, $F(1, 97) = 5.641$, p = .02, as shown in Table 4 below Participants in the asynchronous (bulletin board) condition scored higher on the enthusiasm scale ($M = 3.125$, $SD = .32$) than participants in the synchronous (chat room) condition ($M = 2.05$, $SD = .32$).

Table 4. Summary of ANOVA: Score on enthusiasm scale.

Dependent Variable:Score on enthusiasm scale

Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	31.384[a]	2	15.692	3.087	.050
Intercept	667.855	1	667.855	131.370	.000
condition	28.678	1	28.678	5.641	.020
response	2.061	1	2.061	.405	.526
Error	493.126	97	5.084		
Total	1185.000	100			
Corrected Total	524.510	99			

a. R Squared = .060 (Adjusted R Squared = .040)

Hypothesis 6b predicted that participants who received challenging feedback from their original post would display higher levels of anxiety and anger than those who received reinforcing feedback. Examining the main effects of response and condition on anxiety yielded similar results as the analysis of enthusiasm reactions. The main effect of response tone on score on anxiety scale, as predicted by the hypothesis, was insignificant, $F(1. 97) = 1.37$, p =.246. However, the main effect of *condition* on score on anxiety scale was marginally significant and in the opposite direction of the enthusiasm effect, $F(1, 97) = 3.326$, p =.071, as shown in Table 5

below Participants in the chat room (synchronous) condition reported higher levels of anxiety (*M* = 2.17, *SD* = .33) than those participants in the discussion board (asynchronous) condition (*M* = 1.30, *SD* = .34). Interaction effects on both enthusiasm and anxiety were insignificant.

Table 5. Summary of ANOVA: Score on anxiety scale.

Dependent Variable:Score on anxiety scale

Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	27.512[a]	2	13.756	2.432	.093
Intercept	299.708	1	299.708	52.980	.000
condition	18.814	1	18.814	3.326	.071
response	7.720	1	7.720	1.365	.246
Error	548.728	97	5.657		
Total	886.000	100			
Corrected Total	576.240	99			

a. R Squared = .048 (Adjusted R Squared = .028)

These results suggest an important conclusion, discussed below: the nature of the online interactive experience plays an important role in determining emotional reactions. Though response tone did not translate directly into emotional reactions, indirect effects were realized through the communication medium.

The second part of Hypothesis 6b, predicting the main effect of response tone on levels of anger reported, was supported by the data shown in Table 6 below. The main effect of response tone on condition was found to be highly significant, $F(1, 97) = 30.879$, p<.001. As predicted, participants receiving the challenging response expressed higher levels of anger (*M* = 3.73, *SD* = .34) than those receiving the reinforcing response (*M* = .995, *SD* = .36). The main effect of condition on response tone, as well as the interaction effect between condition and response on score on the anger scale, was insignificant. Anger, then, was the only emotion clearly predicted by the tone of the response received.

Table 6. Summary of ANOVA: Score on anger scale.

Dependent Variable:Score on anger scale

Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	188.801[a]	2	94.401	15.630	.000
Intercept	555.916	1	555.916	92.046	.000
condition	4.916	1	4.916	.814	.369
response	185.951	1	185.951	30.789	.000
Error	585.839	97	6.040		
Total	1370.000	100			
Corrected Total	774.640	99			

a. R Squared = .244 (Adjusted R Squared = .228)

Behavioral Effects of Emotional User-to-User Interactivity

Finally, the link between emotional reactions and behavioral inclinations was examined through regression analysis. Together with the last set of results, these hypotheses predict the mediating role of emotional reactions in explaining the effect of user-to-user interactive experiences on future intentions to participate.

All regressions were initially run with the following control variables included: prior participation in online chats or discussions, partisan leaning (coded as 1 if the participant identified with a party), strength of ideology (ranging from moderate to extreme), gender, registered voter status in the state of Michigan, and extent to which participants had followed the issue. Since only gender and extent to which the issue was followed were found to be significant in any of the analyses, the final regressions were run with only these two control variables included. For participation hypotheses, regressions were run using both the participation index and the participation average (as described above).

Hypothesis 7. Hypothesis 7 predicted that experiencing increased enthusiasm would lead to increased willingness to participate, both through online and offline participation. Regressions were run using an index of online participation and an index of general participation (online and

offline) as the dependent variables. As shown in Table 7 below, the hypothesis was confirmed.

The table reports standardized beta, the t-value, and the significance level for three components

of Hypothesis 7—the impact of emotion levels and control variables on the online participation

index, the general participation index, and the general participation average.

Table 7. Online and General Participation Regression.

	Online participation		Participation index		Participation average	
	β	t-value	β	t-value	β	t-value
Manipulation Variables						
Condition	-.027	-.270	.006	.060	.016	.171
Response	.144	1.348	.174	1.588	.090	.873
R^2 Change (%)	16.9%		25.4%		24.7%	
Control Variables						
Gender	-.060	-.651	-.229**	-2.426	-.236***	-2.662
Extent to which issue was followed	.251**	2.608	.365***	3.681	.375***	4.025
R^2 Change (%)	1.5%		2.7%		2.2%	
Emotion Variables						
Score on enthusiasm scale	.324***	2.907	.208*	1.800	.215**	1.990
Score on anxiety scale	-.035	-.309	.019	.163	.042	.385
Score on anger scale	.029	.246	.097	.801	.029	.257
R^2 Change (%)	6.9%		2.8%		3.0%	

$* \ p \leq 0.1, \ ** \ p \leq .05, \ *** \ p \leq .01$

It was found that experiencing increased enthusiasm did indeed predict intentions to participate

online ($\beta = .324$, $p = .005$), after taking into account relevant control variables. Among these

control variables, extent to which participants had followed the issue was also a significant

predictor of future online participation, somewhat intuitively ($\beta = .251$, $p = .001$). When the

same regression was run for general political participation, the results for the participation index

($N = 87$) and the participation average ($N = 100$) were very similar. The effect of enthusiasm

reactions was found to be a significant predictor of intended political participation ($\beta = .215$, p =

.05). In addition, both gender (β = -.236, p = .009) and extent to which participants followed the

issue (β = .375, p = .000) remained significant in the final analysis.

Hypothesis 8. Hypothesis 8 stated that experiencing increased anxiety would lead to

increased willingness to seek out additional information on the topic. This hypothesis, along

with Hypothesis 7, applied insights of the theory of affective intelligence to computer-mediated

communication, differentiating between use of the disposition and surveillance systems.

Table 8. Information-Seeking Regression.

	Final beta		Upon-entry beta	
	β	*t*-value	β	*t*-value
Manipulation Variables				
Condition	.054	.521	.	
Response	-.199*	-1.784		
R^2 Change (%)	6.0%			
Control Variables				
Gender	-.120	-1.256		
Extent to which issue was followed	.114	1.139		
R^2 Change (%)	3.9%			
Emotion Variables				
Score on enthusiasm scale	.365***	3.131	.360***	3.490
Score on anxiety scale	.089	.750	.175*	1.718
Score on anger scale	-.170	-1.389	-.014	- .118
R^2 Change (%)	8.7%			

$* \, p \leq 0.1, \, ** \, p \leq .05, \, *** \, p \leq .01$

As the table above shows, the initial regressions yielded a highly significant effect of enthusiasm

on information seeking (β = 3.131, p = .002). The impact of response tone (challenging versus

reinforcing) also approached significance, β = -1.784, p = .078. Despite the hypothesized

relationship, anxiety was not shown to be a significant predictor of information-seeking.

However, the impact of anxiety is marginally significant when it is entered into the regression

alone (upon-entry β = .175, p=.089), and significant when the regression is run with only anxiety

and anger included (β = .228, p=.049).   Since the effect of anxiety disappears when enthusiasm

is entered in the regression, it is possible that multicollinearity issues between the enthusiasm

and anxiety measures may be offsetting the actual impact of anxiety on information seeking;

participants may be likely to express heightened enthusiasm and anxiety at the same

time. Taking into account these significant effects of anxiety on information-seeking when

enthusiasm is not entered into the regression, it is possible to say that the hypothesis is partially,

and extremely cautiously, supported.

Hypothesis 9. Finally, Hypothesis 9 predicted that experiencing increased anger will lead

to increased willingness to participate, especially through long-term, real-world modes of

participation (requiring a relatively high degree of commitment). As shown in the analysis of

Hypothesis 7 above, anger was not shown to be a significant predictor of score on the online

participation index, general participation index, or general participation average. To analyze the

impact of anger on different *degrees* of political participation, a series of regressions was run

displaying the impact of emotional and control variables on each of the five items of the general

participation index (three offline and two online participation measures). The table below

displays the standardized beta for each regression run with the t-statistic in parentheses.

Table 9. Itemized Online and Offline Participation Regression.[1]

	Donation	Email	Rally	Petition	Discuss
Manipulation Variables					
Condition	.045	-.051	.032	.077	-.052
	(.397)	(-.498)	(.309)	(.758)	(-.551)
Response	.093	.141	.083	.086	-.030
	(.758)	(1.264)	(.755)	(.791)	(-.288)
R^2 Change (%)	8.7%	1.77%	1.75%	1.29%	2.53%
Control Variables					
Gender	-.287	-.158	-.192	-.135	-.094
	(-2.372)***	(-1.654)	(-2.033)**	(-1.446)	(-1.067)
Extent followed	.037	.341	.342	.261***	.404***
	(.333)	(3.399)***	(3.444)***	(2.647)	(4.368)
R^2 Change (%)	3.8%	0.1%	2.4%	3.5%	0.4%
Emotion Variables					
Score on enthusiasm scale	.168	.130	.076	.284***	.285***
	(1.307)	(.130)	(.657)	(2.485)	(2.654)
Score on anxiety scale	.100	.108	.117	-.136	-.067
	(.787)	(.913)	(1.000)	(-1.171)	(-.617)
Score on anger scale	.433	-.035	.021	.197	-.112
	(.666)	(-.282)	(.176)	(1.639)	(-.988)
R^2 Change (%)	1.9%	0%	0.4%	5.3%	5.3%

$* p \leq 0.1, ** p \leq .05, *** p \leq .01$

As the table shows, none of the regressions included anger reactions as a significant predictor of participation. The most significant result was the impact of anger on willingness to sign an internet petition (β = .197, p =.105). Enthusiasm, however, was a significant predictor of both signing an Internet petition (β = .284, p = .015) and discussing the issue with one's friends (β = .285, p = .009). With regard to anger, though, the hypothesis was not confirmed.

Discussion

The results discussed above present an intriguing picture of the emotional and behavioral effects of online user-to-user interactivity. While many hypotheses were not confirmed, the

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[1] The five individual items asked participants how likely they would be to attend a rally on the issue, contribute money to a fund related to the issue, email their representative about the issue, discuss the issue with their friends, or sign an online petition related to the issue, *assuming that the issue was presented on a future election ballot.*

significant results found—either in line with predictions or otherwise—present a progression of

emotional and behavioral effects. Level of synchronicity, and in one case tone of response, was

found to elicit emotional reactions; these emotional reactions led to predicted behavioral effects.

Enthusiasm was found to prompt intentions to participate online and offline, as well as intentions

to seek out further information. The behavioral effects of heightened anxiety were less evident,

but it is possible to cautiously conclude that the anxiety elicited may have had an impact on

intentions to seek out further information. These results build upon previous research on the

processes and effects of interactivity (user-to-user and user-to-system), inserting emotion into the

model of effects. Though only partially consistent with the tenets of the affective intelligence

model and cognitive appraisal theory, the results of this experiment suggest a role for emotion in

the study of how people interact online—as well as intriguing directions for future study.

The first set of hypotheses, dealing with general effects of user-to-user interactivity, did

not yield many significant results, but some interesting relationships were found that form a basis

for the more complex, emotional-behavioral model of effects. None of the predicted effects of

condition or response on internal efficacy was significant. However, an interesting interaction

effect was displayed, even though it fell short of significance (p = .127). Internal efficacy

increased as degree of synchronicity increased from asynchronous to synchronous if reinforcing

feedback was received. However, if challenging feedback was received, reported internal

efficacy levels *decreased* as the degree of synchronicity increased. This result suggests that the

emotional tenor of responses may impact how efficacious users of user-to-user interactive

features feel *in a chat room environment*.

While synchronous feedback was not found to elicit higher online and offline

participation as predicted, it was found that receiving a reinforcing response to one's comments

led to higher online participation. This significant result is consistent with the predictions of affective intelligence, and this basic effect of response tone on participation is further explored through the emotional and behavioral effects described below. The interaction effect of condition and response on general participation was also significant and was particularly interesting: Participants who received challenging feedback were more likely to express intentions to participate if they interacted with others in the synchronous condition than the asynchronous condition, while the effect for participants who received reinforcing feedback was reversed—they were more likely to express intentions to participate if they interacted with others in the asynchronous condition than the synchronous condition. This complex effect may be rooted in the additional emotions generated by level of synchronicity (heightened anxiety for users of synchronous interactivity and heightened enthusiasm for users of asynchronous interactivity). It is also possible that participants receiving challenging feedback viewed the opportunity to reply to the fictitious user's criticism in the chat room as a form of media participation, while this effect was not as pronounced for those receiving reinforcing feedback. In general, tone of feedback seemed to affect participation intentions more in the discussion board setting than the chat room setting.

     No effects of either condition or response tone on how informative or credible participants believed the communication to be were found. The questionnaire design flaw described above seriously weakened the measure of informational value, since several respondents did not answer the question. In addition, the lab setting and possible doubt of some participants about the realism of the study may have affected answers to these two questions.

     In looking at the emotional effects of user-to-user interactivity, the predicted main effects of response tone on enthusiasm, anger, and anxiety were not found, and the interaction effects

were insignificant. However, it was discovered that *level of synchronicity* exerted the strongest effect on participants' emotions. Surprisingly, receiving the reinforcing response did not lead participants to experience increased enthusiasm, nor did receiving the challenging response lead the participants to experience increased anxiety; instead, it was the nature of the interactive experience that prompted statistically significant effects on emotional reactions. Interacting with others in the asynchronous condition (discussion board) yielded higher enthusiasm, while interacting with others in the synchronous condition (chat room) yielded higher anxiety. Only anger reactions developed in line with the predicted hypotheses; participants receiving the challenging response experienced higher levels of anger than those who received the reinforcing response.

An important conclusion can be drawn from these results: The nature of the online interactive experience plays an important role in determining emotional reactions. Though response tone did not always translate directly into emotional reactions (the predicted effect was found only for anger), indirect emotional were realized through the communication medium. The user-to-user interactive experience itself defines the emotions reactions that are generated, supplementing or overtaking any effects from the tone of the response itself. The lack of statistically significant effects of response tone on emotion may follow from a weak manipulation of conversation tone or a lack of believability by the user, though pilot test results suggested that the challenging response could be characterized as primarily negative and the reinforcing response could be characterized as primarily positive. Instead, the significant effects found seem to suggest the importance of level of synchronicity in determining emotional reactions, and suggest an intriguing avenue for future study.

These emotional effects were, then, found to translate into intended participation. Higher enthusiasm was found to lead to a statistically significant increase in online and general participation, in line with the theory of affective intelligence, though the source of the enthusiasm was unique to this online communication. The enthusiasm generated by the experience, whether it originated from response tone or level of synchronicity, prompted intended participation and mobilization around the issue. Further research must examine whether these types of effects result from persuasion or reinforcement. Anxiety was found to impact information-seeking only when the effect of enthusiasm was not simultaneously examined. While this problem yields questions of multicollinearity between the enthusiasm and anxiety responses (with emotional arousal possibly leading to overlapping increases in both enthusiasm and anxiety), it is possible to cautiously conclude that anxiety may impact information seeking in this situation—a result that also would be in line with the theory of affective intelligence. More convincing, however, is the statistically significant impact of *enthusiasm* on intended information-seeking, suggesting that the enthusiasm generated by user-to-user interactivity has broad and far-reaching effects on users' behavioral inclinations.

Though increased levels of anger were found to result from receiving the challenging response, no significant effects of anger on intentions to participate were found. The manipulation of response tone may have been too weak to elicit significant anger among respondents, weakening the validity of the measure. It is likely that these non-effects resulted from the nature of anger reactions in the online environment. According to cognitive appraisal theory, anger involves the appraisal of blame in a threatening environment, and an attack must be considered as an affront against the self to elicit the emotion and the corresponding action potential (Lazarus, 1991). In the online environment simulated in this experiment, respondents

may have had little reason to believe that criticism received was an attack against the self, but rather an attack against comments posted. Thus, while anger was elicited from the challenging response, any possible behavioral change may have been mitigated by a number of factors—the controlled, relatively vague nature of the responses; the anonymity and distance between users generated by the online environment itself; or demand characteristics of the design. In addition, anger may have also been directed at various targets, making it difficult to observe direct behavioral effects; if participants' anger was directed at the other users in the chat room or the website itself, then this anger would be less likely to translate into political behavior than if the anger was based solely on reactions to stem cell research.

The conclusions described above are only valid in the context of the methodology employed. Designing a valid experimental methodology to accurately simulate online user-to-user interactivity was a significant challenge. The design of the stimulus and the interactive experience represents a tension between optimal internal external validity and optimal internal validity that, while significant, was resolved in the best possible manner. The methodology employed—participants "interacting" with fictitious users and receiving timed, automated responses to their feedback—was designed for optimal control and internal validity. All participants received the same responses, and both the degree of interactivity (how many responses were sent and received) and the strength of the emotional feedback were kept tightly controlled to allow for direct comparisons between groups. Employing this methodology kept spurious variables to a minimum by keeping as many factors as possible the same between the two groups.

The tradeoff between internal and external validity does somewhat hamper the design of the experiment, though. Feedback had to be designed to be as general, yet as relevant, as

possible, which may have led some users to suspect that they were not interacting with real users. The lab setting only exacerbated this concern, since demand effects may have played a role in the results found. Indeed, the highly controlled environment does make it somewhat difficult to generalize the conclusions reached to other situations of online user-to-user interactivity, where responses, degree of interaction, and emotions vary widely. This possible lack of external validity should be taken into consideration when interpreting the results of this study. However, the controlled methodology was employed to ensure that even if the results were not optimal for generalization, the precise nature of the true experimental setting would strengthen the internal validity of the conclusions—the confidence with which it can be concluded that effects on emotions and behavior were caused by the manipulations employed rather than any number of spurious variables. Furthermore, the nature of the experimental design restricted the range of interactivity that is normally found in a chat room or discussion board setting, standardizing the amount of time between responses. For example, the logistics of the experiment required that the delay in discussion board feedback be only three minutes, which is not only relatively short but does not capture the high variety in discussion forum activity that typically exists. These experimental limitations may explain any insignificant findings with respect to condition (level of synchronicity).

Some of these concerns about external validity can be allayed by examining the results of the content analysis of the conversations that was undertaken. It was found that only one participant was noncompliant with the conversation model (did not type anything to elicit the automated response). All other participants expressed their views so that the conversation could flow logically: the participant stated his or her views, the automated response asked for elaboration (in the chat room), the participant expanded on the previous comments, the

automated response provided challenge or reinforcement, and the automated response ended the conversation. Seventy-two percent of participants kept typing after the conversation was "ended" by the automated response, providing an average response of 17 words (M = 17.19, SD = 18.08). In addition, 25 respondents responded "early" in the conversation—stating their views or posting a response before the pre-determined script finished appearing and before user comments were explicitly asked for. Length of these responses averaged 10 words (M = 10.72, SD = 7.28). For all respondents, total words typed in the interactive feature ranged from a minimum of 13 to a maximum of 155 (M = 59.41, SD = 32.33). In addition, only 28% of all respondents asked a question of the fictitious chatters that was left unanswered, either during the conversation or after it had ended. These results form a picture of the way in which participants interacted with the fictitious users while providing some assurance that the conversations flowed in a realistic fashion and are a relatively sound means of simulating actual computer-mediated communication.

Still, further research must apply more innovative methodologies to determine any generalizable effects of online user-to-user interactivity, by allowing users to feel even more engaged with the conversation and increasing the realism of the experience. Employing designs that allow users to form the discussion boards or chat rooms themselves, while controlling for the varying levels of involvement and emotional response that may then exist, might alleviate some concerns about external validity. Demand effects, and in particular concerns about the realism of the design employed, remain a significant limitation of this study and one of the most significant challenges for future research.

Various other factors of this study may affect the conclusions reached—the small size and extremely homogeneity of the sample employed, for example. While the sample was the

only logistically feasible way to conduct this experiment, future studies should employ larger samples with greater diversity to ensure that effects are truly significant. In addition, the issue studied, while chosen for its relevance and emotionally divisive nature, was very specific to current political events and had already been voted upon on an election ballot. Thus, the measures of participation used—how likely participants would be to engage in various political acts assuming this issue was presented on a future election ballot—are not optimal for measuring actual behavioral measures. An estimation of future behavior (possibly based upon what had happened in the 2008 Michigan election) is not the same as actual behavior, and therefore the conclusions drawn must be interpreted cautiously. Furthermore, design problems with the questionnaire used caused some respondents to skip crucial questions. While statistical adjustments were made in the indices to account for these missed responses, a better design would have in hindsight yielded results of increased validity. Still, this study represents a first step toward evaluating a crucial component of online interactions—emotions and the behaviors that they prompt.

Future research must improve upon measures used to more accurately measure emotional and behavioral reactions, as well as develop innovative methodologies for studying user-to-user interactivity in an experimental setting. If automated responses are used, realism is crucial—both in the timing of messages received and their emotional tenor—to eliminate demand effects and increase validity of the design. Experiments must be conducted with various issues that allow for precise manipulation of the emotion and synchronicity variables.

The conclusion of the current study—that emotion does indeed play a role in predicting behavioral inclinations from online interactive experiences—contributes to an emerging field of research on computer-mediated interactivity. Understanding the full impact of the conversations

that users have with others online is a complex task that will only be neared with extensive future research. By studying the effects of level of synchronicity and emotional tone of interactive responses, these conclusions build upon literature on both interactivity and emotion to suggest an intriguing path for future research.

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Appendix 1: Pre-test Questionnaire

To begin the study, I would like to ask you some questions your political views and media use. All responses are confidential and cannot be traced to your name, U-M ID number, or any other identifying information. Circle the number of your answer.

Please provide the username you have been assigned: _____

1. With a new administration entering the White House and the recent passage of Proposal 2 in Michigan, much controversy surrounds the possible removing of legal barriers to embryonic stem cell research. To what extent have you followed recent news and controversy about easing restrictions on embryonic stem cell research, either in Michigan or at the federal level? Circle all that apply.
    1. I have followed this issue online.
    2. I have read newspaper articles about this issue.
    3. I have talked with friends about this issue.
    4. I have heard news stories about this issue.
    5. I have voted on a proposal about this issue.
    6. I have campaigned about this issue.

2. How well informed do you feel about this issue?
    1. Very well informed
    2. Well informed
    3. Somewhat informed
    4. Not informed at all

3. To what degree do you support or oppose easing federal restrictions on embryonic stem cell research?
    1. I strongly support easing the restrictions.
    2. I support easing the restrictions.
    3. I somewhat support easing the restrictions.
    4. I don't really have a position on the issue.
    5. I somewhat oppose easing the restrictions.
    6. I oppose easing the restrictions.
    7. I strongly oppose easing the restrictions.

4. Are you a resident of the state of Michigan?
    1. Yes
    2. No

5. Are you registered to vote in the state of Michigan?
    1. Yes
    2. No

6. On how many days in the past week did you use the Internet to seek out political information? _____

7. On how many days in the past week did you visit political news sites? _____

8. On how many days in the past week did you visit political blogs? _____

9. On how many days in the past week did you visit political pages or groups within social networking sites? _____

10. On how many days in the past week did you view political discussion boards or chats online? _____

11. On how many days in the past week did you use instant message clients (AIM, Pidgin, Meebo, etc.)? _____

12. On how many days in the past week did you discuss politics with your friends via instant message clients or social networking sites? _____

13. Have you ever contributed to a chat room, discussion board, or other interactive forum online?
      1. Yes
      2. No

14. Have you ever contributed to a *political* chat room, discussion board, or other forum online?
      1. Yes
      2. No

15. Generally speaking, do you usually think of yourself as a:
      1. Republican
      2. Democrat
      3. Independent
      4. Other- please specify
      5. No preference

16. Where would you place yourself on the following scale (or haven't you thought much about this)?
      1. Extremely liberal
      2. Liberal
      3. Slightly liberal
      4. Moderate
      5. Slightly conservative
      6. Conservative
      7. Extremely conservative

      8.   I haven't thought much about this.

17. What is your gender? _____

Appendix 2: Post-test Questionnaire

To complete the study, I would like to ask you some questions about your experience and about your beliefs and feelings about politics in general. All responses are confidential and cannot be traced to your name, U-M ID number, or any other identifying information.

What was the username you used on the website? (This username, your session number, and your responses on the website and on this questionnaire will not be linked in any way to your identity.)
_____

What was the session number you were assigned on the website? _____

Check here if you would like to receive further information from the website you visited. ☐
Check here if you would like to be notified of future chats or discussions at the website. ☐

How did you feel about the experience you just had on the website? Please tell me how much you felt each of the following emotions. Circle the number of your answer.

	Extremely	Very	Somewhat	A little	Not at all
How angry did you feel?	1	2	3	4	5
How excited did you feel?	1	2	3	4	5
How worried did you feel?	1	2	3	4	5
How enthusiastic did you feel?	1	2	3	4	5
How anxious did you feel?	1	2	3	4	5
How outraged did you feel?	1	2	3	4	5
How afraid did you feel?	1	2	3	4	5
How hopeful did you feel?	1	2	3	4	5
How irritated did you feel?	1	2	3	4	5
How stressed did you feel?	1	2	3	4	5

Did you experience any other emotions during the experience? If so, list them here:

1.

2.

3.

4.

Now I would like to ask you a few questions about your beliefs and feelings about politics. Please circle the number that describes how much you agree or disagree with the following:

I believe that I have a good understanding of the issues regarding regulating embryonic stem cell research.

1	2	3	4	5	6	7
Strongly disagree	Disagree	Slightly disagree	Neutral	Slightly agree	Agree	Strongly agree

Public officials don't care much what people like me think.

1	2	3	4	5	6	7

In general, I have a good understanding of politics and political events.

1	2	3	4	5	6	7

People like me don't have any say in what government does.

1	2	3	4	5	6	7

Sometimes politics is too complicated for people like me to understand.

1	2	3	4	5	6	7

I think that I can impact the political process.

1	2	3	4	5	6	7

I can make a contribution to political discourse about embryonic stem cell research.

1	2	3	4	5	6	7

Please circle the number that describes how much you agree or disagree with the following statements about your experience using the website and talking with others:

The website was informative.

1	2	3	4	5	6	7
Strongly disagree	Disagree	Slightly disagree	Neutral	Slightly agree	Agree	Strongly agree

The information that other users on the site gave seemed credible.

1	2	3	4	5	6	7

The information other users on the site gave was well-thought-out.

1	2	3	4	5	6	7
Strongly disagree	Disagree	Slightly disagree	Neutral	Slightly agree	Agree	Strongly agree

Other users on the site were rude.

1	2	3	4	5	6	7

Other users on the site were encouraging.

1	2	3	4	5	6	7

Other users on the site were nice to me.

1	2	3	4	5	6	7

Other users on the site were mean to me.

1	2	3	4	5	6	7

The site was easy to navigate.

1	2	3	4	5	6	7

I had problems with features on the website.

1	2	3	4	5	6	7

I found what others said to be useful to me.

1	2	3	4	5	6	7

I would return to this website in the future.

1	2	3	4	5	6	7

I would participate in this online discussion forum in the future.

1	2	3	4	5	6	7

I would seek out other similar forums online.

1	2	3	4	5	6	7

If an upcoming election contained a proposal regarding embryonic stem cell research:
I would contribute money to a fund related to the issue.

1	2	3	4	5	6	7
Strongly disagree	Disagree	Slightly disagree	Neutral	Slightly agree	Agree	Strongly agree

I would send an email to my representative expressing my views on the issue.

| 1 | 2 | 3 | 4 | 5 | 6 | 7 |

I would attend a political rally related to the issue.

| 1 | 2 | 3 | 4 | 5 | 6 | 7 |

I would sign an Internet petition related to this issue.

| 1 | 2 | 3 | 4 | 5 | 6 | 7 |

I would discuss the issue with my friends.

| 1 | 2 | 3 | 4 | 5 | 6 | 7 |

Finally, please circle the number that describes how much you agree or disagree with these statements about your views on easing restrictions on embryonic stem cell research:
I believe that federal restrictions on embryonic stem cell research should be loosened.

1	2	3	4	5	6	7
Strongly disagree	Disagree	Slightly disagree	Neutral	Slightly agree	Agree	Strongly agree

My views on the issue changed as a result of the experience.

| 1 | 2 | 3 | 4 | 5 | 6 | 7 |

I am willing to consider other perspectives on the issue.

| 1 | 2 | 3 | 4 | 5 | 6 | 7 |

I am likely to pay more attention to news coverage surrounding the issue in the future.

| 1 | 2 | 3 | 4 | 5 | 6 | 7 |

I am likely to discuss the issue with my friends to try to learn more about it.

| 1 | 2 | 3 | 4 | 5 | 6 | 7 |

Appendix 3: Website Content

Detroit Free Press: "Heated Stem-Cell Battle Ends as Prop 2 Passes- Voters Approve Fewer Limits on Using Embryos for Research"

Wednesday, November 5, 2008
Author: MEGHA SATYANARAYANA, FREE PRESS STAFF WRITER
The proposal to loosen restrictions on embryonic stem-cell research in Michigan passed early this morning as election results trickled in from across the state. The initiative was up 52%-48%, with 74% of precincts reporting, mirroring an exit poll conducted for the Free Press and other media outlets. The firm conducting the polling, Edison-Mitofsky, called the race shortly after midnight.

Proposal 2 would amend the state constitution to allow Michigan researchers to use embryos left over from fertility treatments to create embryonic stem-cell lines for disease research . It is currently prohibited to destroy an embryo for "nontherapeutic" purposes, and is illegal to donate an embryo to science.

Proponents, led by the bipartisan group Cure Michigan, contend that the embryos would likely be thrown away, and that because the recently discovered embryonic stem cell can form nearly every cell in the human body, it has untold potential for curing diseases.

"We're cautiously optimistic, but we're watching the returns," said Chris DeWitt, Cure Michigan spokesperson.

Opponents, led by Right to Life of Michigan and the Michigan Catholic Conference through a group called Michigan Citizens Against Unrestricted Science and Experimentation or MiCAUSE - object to the destruction of embryos on religious grounds and say the proposal as written would limit the state Legislature's ability to regulate the research . They also campaigned on the grounds that Michigan taxpayers would foot the bill for embryonic stem-cell research , a claim rejected by advocates, including Gov. Jennifer Granholm.

"We're obviously going to wait for the final results, but the trends don't look good," said Dave Doyle, MiCAUSE spokesman.

The campaigns for and against Proposal 2 were hard-fought and well-funded, with each side posting campaign-finance numbers in excess of $5 million. Proponents were well-backed by developer and philanthropist Alfred Taubman. Opponents were led in funding by the Michigan Catholic Conference.

At times, the battle over embryonic stem-cell research was heated, with both sides accusing the other of lying.

Opponents said early and often that research into adult stem cells and reprogrammed cells obviated the need for embryonic stem-cell research; proponents said it would be impossible to fully understand either adult stem cells or reprogrammed cells without understanding the embryonic stem cells from which they came.

Both presidential candidates said they would overturn the federal ban, which would increase federal funding.

Edina Allen of Brownstown Township, a Democrat, was undecided on the proposal last week, then voted for it. Her sister has multiple sclerosis.

"I was unsure because I didn't have the info. I've recently seen a few commercials, which led me to do a little more investigation," she said.

But John Addy, a registered Republican from Chesterfield Township, said he knew all along he would vote no.

The MiCAUSE campaign has focused on the ballot language - saying the state Legislature couldn't regulate a new science they say would lead to human cloning and animal-human chimeras.

The federal government oversees biomedical research , including aspects of human embryo research .

Institutions, such as the University of Michigan, have internal review or ethics boards that also set guidelines for such research .

The exit poll was done by Edison Media Research and Mitofsky International for a consortium of news organizations known as the National Election Pool. Interviews were done with 3,079 voters at 50 Michigan precincts Tuesday. An additional 504 Michigan absentee voters were interviewed in a pre-election telephone poll. The results have a margin of error of plus or minus 3 percentage points.

Contact MEGHA SATYANARAYANA at 313-223-4544 or megha@freepress.com.

Appendix 4: Conversations

<u>Synchronous:</u>
Reader54: Does anyone have an opinion on this controversy?
PoliticsCrazy: I think that easing restrictions on embryonic stem cell research is a great idea.
PoliticsCrazy: The ability to use them to research cures is an amazing opportunity.
Reader54: Okay, but I think the destruction of life is still involved. An embryo is a living thing, and when we kill that human by using the embryo for stem cell research, we are committing murder.
Reader54: Hey, a new user. Welcome.
PoliticsCrazy: But isn't discovering cures for debilitating diseases pro-life also?
Reader54: So far we haven't seen any cures emerge from embryonic stem cell research. Scientists are already conducting research with adult stem cells, and having some success.
PoliticsCrazy:: Think about the potential, though. Not to mention all the jobs it would create.
Reader54: The research could spiral out of control and have disastrous consequences.
PoliticsCrazy: Bans on cloning would stay intact, though. And there would be plenty of oversight-- universities' review boards, the National Institutes of Health....
PoliticsCrazy: Any input from users out there?
(user input)
Chatter389: a. I see. What else were you thinking? **OR**
            b. I don't understand. Could you elaborate?
(more user input, or 2 minutes elapse)
Chatter389: a. Yes, that makes perfect sense. I really like your insight. **OR**
            b. Really, that doesn't make any sense at all. It's terrible reasoning.
Chatter389: a. I enjoyed talking with you! Goodbye! **OR**
            b. I'm not going to waste my time here. Goodbye.
(Note: Responses were linked; participants received either three "a" or three "b" responses.)

<u>Asynchronous:</u>
Reader54: Does anyone have an opinion on this controversy?
PoliticsCrazy: I think that easing restrictions on embryonic stem cell research is a great idea.
PoliticsCrazy: The ability to use them to research cures is an amazing opportunity.
Reader54: Okay, but I think the destruction of life is still involved. An embryo is a living thing, and when we kill that human by using the embryo for stem cell research, we are committing murder.
Reader54: Hey, a new user. Welcome.
PoliticsCrazy: But isn't discovering cures for debilitating diseases pro-life also?
Reader54: So far we haven't seen any cures emerge from embryonic stem cell research. Scientists are already conducting research with adult stem cells, and having some success.
PoliticsCrazy:: Think about the potential, though. Not to mention all the jobs it would create.
Reader54: The research could spiral out of control and have disastrous consequences.
PoliticsCrazy: Bans on cloning would stay intact, though. And there would be plenty of oversight-- universities' review boards, the National Institutes of Health....
PoliticsCrazy: Any input from users out there?

(user input)
Chatter389: a. Yes, that makes perfect sense. I really like your insight… I enjoyed reading your response!

           b. Really, that doesn't make any sense at all. It's terrible reasoning… I shouldn't waste my time here.

Appendix 5: Informed Consent Form

PI: Colleen McClain   Faculty Advisor: Prof. Nojin Kwak
camcclai@umich.edu   kwak@umich.edu
                                                              240 University Towers
                                                              Ann Arbor, MI 48104
                                                              (734) 764-2587

I am conducting a study to investigate the effects of interactive features on political websites, in order to better understand how different types of online conversations affect users. In order to study this topic, I have designed a simple experiment that will take approximately half an hour to complete. Upon beginning the experiment, you will be asked to fill out a short questionnaire that includes questions about your media use and political views. You will then be directed to a nonpartisan website entitled "Dialogues on the Politics of Embryonic Stem Cell Research," where you will be asked to use and evaluate various features of the site and interact with other users by voicing your views on the subject. Finally, you will be asked to complete a second short questionnaire to help me understand your experience. You will be compensated for your participation with one hour of credit for the Communication Studies 102 Participant Pool Requirement.

I am not interested in monitoring individual responses, but rather in evaluating trends in the large group of participants. None of the information you provide, either on the questionnaire or during interaction with others on the website, will be tied to your name, student ID, or other identification, and results will only be reported in a collective sense.

There are no foreseeable risks to you from participating, since you will be using interactive features that you have likely used many times before and your responses will not be identifiable. However, if you feel uncomfortable at any point, you may withdraw without penalty. Participation in the study is entirely voluntary; if you choose to participate, please read the remainder of the form and sign below, confirming your understanding of this informed consent.

I hereby consent to participate in this experiment. I have been informed of the purposes and procedures involved, to the extent that they can be explained in advance. I understand that my participation is voluntary and that I am free to withdraw from participating at any time during the experiment without penalty. I understand that I may skip any questions in the questionnaires that I do not wish to answer. I also understand that my responses will be kept confidential and if I have any questions or comments regarding any aspect of the experiment, I should contact the Project Supervisor, Colleen McClain, or Professor Nojin Kwak, Faculty Advisor.

Print Name _____ Date _____ Signature _____

Appendix 6: Debriefing Form

PI: Colleen McClain   Faculty Advisor: Prof. Nojin Kwak
camcclai@umich.edu   kwak@umich.edu
                                                     240 University Towers
                                                     Ann Arbor, MI 48104
                                                     (734) 764-2587

The purpose of this form is to provide you with more information about the experiment in which you participated for credit. The experiment was designed to measure the emotional, attitudinal, and behavioral effects of different types of user-to-user online interactivity. I wanted to determine the effects of using chat rooms versus discussion boards, as well as receiving reinforcing or challenging feedback. The website you visited was created solely for the purposes of this study; while background information and news coverage posted was real, all conversations were written for the purposes of this study, featuring fictitious users. In addition, responses to your comments were generated by an automatic system, rather than an actual user conversing with you.

Most current research on interactivity, emotion, and behavior focuses on user-to-system interactivity, such as clicking on a hyperlink (e.g. Bucy, 2004). Previous studies found that user-to-user features were difficult to control and therefore seldom used on political websites (Stromer-Galley, 2000). However, as the nature of the Internet has changed to involve more user-to-user interaction and recent political campaigns have used interactive features extensively, it becomes necessary to investigate the emotional and behavioral effects of interpersonal online communications (see Ng & Detenber, 2005, for a discussion of the effects of user-to-user interactivity). This study uses the theory of affective intelligence (Marcus, Neuman, & MacKuen, 2000), a model connecting levels of enthusiasm and anxiety with behavioral and information-seeking outcomes, as well as cognitive appraisal theory to insert emotion into a model of interactive use effects.

Thank you for your participation in this study. Your time and responses will help me to understand how new media forms of political discussion impact individuals' emotions and behavior. If you have any questions about this area of research or this specific research project, please contact me, Colleen McClain, at camcclai@umich.edu. For further information:

Bucy, E. P. (2004). The interactivity paradox: Closer to the news but confused. In E. P. Bucy & J. E. Newhagen (Eds.), *Media access: Social and psychological dimensions of new technology use* (pp. 47-72). Mahwah, NJ: Erlbaum.

Marcus, G. E., Neuman, W. R., & MacKuen, M. (2000). *Affective intelligence and political judgment.* Chicago: The University of Chicago Press.

Ng, E. W. J. & Detenber, B. H. (2005). The impact of synchronicity and civility in online political discussions on perceptions and intentions to participate. *Journal of Computer-Mediated Communication, 10*(3).

Stromer-Galley, J. (2000). On-line interaction and why candidates avoid it. *Journal of Communication, 50*(4), 111-132.

Appendix 7. Additional SPSS Output

Table 10. Summary of ANOVA: Internal Efficacy Average.

Dependent Variable:Internal efficacy average

Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	3.184[a]	2	1.592	1.676	.192
Intercept	1991.132	1	1991.132	2096.247	.000
condition	.691	1	.691	.728	.396
response	2.388	1	2.388	2.514	.116
Error	92.136	97	.950		
Total	2084.480	100			
Corrected Total	95.320	99			

a. R Squared = .033 (Adjusted R Squared = .013)

Table 11. Summary of ANOVA: Internal efficacy average (with interaction).

Dependent Variable:Internal efficacy average

Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	5.408[a]	3	1.803	1.925	.131
Intercept	1993.316	1	1993.316	2128.296	.000
condition	.551	1	.551	.589	.445
response	2.317	1	2.317	2.474	.119
condition * response	2.224	1	2.224	2.375	.127
Error	89.912	96	.937		
Total	2084.480	100			
Corrected Total	95.320	99			

a. R Squared = .057 (Adjusted R Squared = .027)

Table 12. Summary of ANOVA: General Participation Average.

Dependent Variable:Participate average

Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	2.685[a]	2	1.343	1.034	.360
Intercept	1530.058	1	1530.058	1177.793	.000
condition	.194	1	.194	.150	.700
response	2.433	1	2.433	1.873	.174
Error	126.012	97	1.299		
Total	1656.725	100			
Corrected Total	128.697	99			

a. R Squared = .021 (Adjusted R Squared = .001)

Table 13: Summary of ANOVA: Perceived Informativeness of Website.

Dependent Variable:The website was informative.

Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	2.535[a]	2	1.267	.816	.446
Intercept	1681.053	1	1681.053	1082.907	.000
condition	2.530	1	2.530	1.630	.205
response	.008	1	.008	.005	.945
Error	124.188	80	1.552		
Total	1821.000	83			
Corrected Total	126.723	82			

a. R Squared = .020 (Adjusted R Squared = -.004)

Table 14. Summary of ANOVA: Perceived Informativeness of Website (with interaction).

Dependent Variable:The website was informative.

Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	3.578[a]	3	1.193	.765	.517
Intercept	1680.027	1	1680.027	1077.770	.000
condition	2.247	1	2.247	1.442	.233
response	.009	1	.009	.006	.938
condition * response	1.043	1	1.043	.669	.416
Error	123.145	79	1.559		
Total	1821.000	83			
Corrected Total	126.723	82			

a. R Squared = .028 (Adjusted R Squared = -.009)

Table 15. Summary of ANOVA: Perceived credibility of information.

Dependent Variable:The information that other users on the site gave seemed credible.

Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	.727[a]	2	.363	.217	.805
Intercept	1974.558	1	1974.558	1182.126	.000
condition	.400	1	.400	.240	.626
response	.354	1	.354	.212	.646
Error	162.023	97	1.670		
Total	2143.000	100			
Corrected Total	162.750	99			

a. R Squared = .004 (Adjusted R Squared = -.016)

Table 15. Summary of ANOVA: Perceived credibility of information (with interaction).

Dependent Variable:The information that other users on the site gave seemed credible.

Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	1.959[a]	3	.653	.390	.761
Intercept	1975.459	1	1975.459	1179.441	.000
condition	.486	1	.486	.290	.592
response	.334	1	.334	.200	.656
condition * response	1.232	1	1.232	.736	.393
Error	160.791	96	1.675		
Total	2143.000	100			
Corrected Total	162.750	99			

a. R Squared = .012 (Adjusted R Squared = -.019)

Table 16. Summary of ANOVA: Score on enthusiasm scale (with interaction).

Dependent Variable:Score on enthusiasm scale

Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	36.315[a]	3	12.105	2.380	.074
Intercept	662.555	1	662.555	130.287	.000
condition	29.988	1	29.988	5.897	.017
response	2.159	1	2.159	.425	.516
condition * response	4.931	1	4.931	.970	.327
Error	488.195	96	5.085		
Total	1185.000	100			
Corrected Total	524.510	99			

a. R Squared = .069 (Adjusted R Squared = .040)

Table 17. Summary of ANOVA: Score on anxiety scale (with interaction).

Dependent Variable:Score on anxiety scale

Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	27.887[a]	3	9.296	1.627	.188
Intercept	300.080	1	300.080	52.535	.000
condition	19.061	1	19.061	3.337	.071
response	7.770	1	7.770	1.360	.246
condition * response	.374	1	.374	.066	.799
Error	548.353	96	5.712		
Total	886.000	100			
Corrected Total	576.240	99			

a. R Squared = .048 (Adjusted R Squared = .019)

Table 18. Summary of ANOVA: Score on anger scale (with interaction).

Dependent Variable:Score on anger scale

Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	197.171[a]	3	65.724	10.926	.000
Intercept	560.297	1	560.297	93.145	.000
condition	4.177	1	4.177	.694	.407
response	187.122	1	187.122	31.108	.000
condition * response	8.369	1	8.369	1.391	.241
Error	577.469	96	6.015		
Total	1370.000	100			
Corrected Total	774.640	99			

a. R Squared = .255 (Adjusted R Squared = .231)

Table 19. Summary of ANOVA: Emotional arousal.

Dependent Variable:Emotional arousal

Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	5.474[a]	2	2.737	2.091	.129
Intercept	208.968	1	208.968	159.659	.000
condition	2.197	1	2.197	1.678	.198
response	3.484	1	3.484	2.662	.106
Error	126.958	97	1.309		
Total	344.619	100			
Corrected Total	132.431	99			

a. R Squared = .041 (Adjusted R Squared = .022)

Table 20. Summary of ANOVA: Emotional arousal (with interaction).

Dependent Variable:Emotional arousal

Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	5.531[a]	3	1.844	1.395	.249
Intercept	208.405	1	208.405	157.659	.000
condition	2.231	1	2.231	1.688	.197
response	3.469	1	3.469	2.624	.109
condition * response	.057	1	.057	.043	.835
Error	126.900	96	1.322		
Total	344.619	100			
Corrected Total	132.431	99			

a. R Squared = .042 (Adjusted R Squared = .012)

Table 21. Regression Analysis: Online participation index.[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	13.430	1.864		7.204	.000
	Condition	-1.129	1.007	-.105	-1.121	.265
	Response tone	1.556	1.015	.145	1.534	.128
	Extent to which participants followed the issue	1.219	.331	.348	3.681	.000
	Gender	-.384	1.287	-.028	-.299	.766
2	(Constant)	12.873	2.096		6.142	.000
	Condition	-1.256	1.047	-.117	-1.200	.233
	Response tone	2.026	1.179	.188	1.718	.089
	Extent to which participants followed the issue	1.166	.334	.333	3.489	.001
	Gender	-.444	1.293	-.032	-.343	.732
	Score on anger scale	.125	.234	.065	.535	.594
	Score on anxiety scale	.199	.244	.089	.818	.415
3	(Constant)	11.049	2.112		5.231	.000
	Condition	-.286	1.061	-.027	-.270	.788
	Response tone	1.546	1.147	.144	1.348	.181
	Extent to which participants followed the issue	.878	.337	.251	2.608	.011
	Gender	-.814	1.251	-.060	-.651	.517
	Score on anger scale	.056	.227	.029	.246	.806
	Score on anxiety scale	-.078	.253	-.035	-.309	.758
	Score on enthusiasm scale	.760	.262	.324	2.907	.005

a. Dependent Variable: Online participation index

Table 22. Regression Analysis: General participation average.[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	3.289	.375		8.769	.000
	Condition	-.054	.203	-.024	-.269	.789
	Response tone	.176	.204	.077	.863	.390
	Gender	-.610	.259	-.211	-2.358	.020
	Extent to which participants followed the issue	.331	.067	.448	4.976	.000
2	(Constant)	3.188	.419		7.602	.000
	Condition	-.099	.209	-.043	-.471	.639
	Response tone	.272	.236	.120	1.153	.252
	Gender	-.630	.259	-.218	-2.434	.017
	Extent to which participants followed the issue	.318	.067	.429	4.751	.000
	Score on anger scale	.022	.047	.053	.462	.645
	Score on anxiety scale	.059	.049	.125	1.207	.231
3	(Constant)	2.932	.432		6.782	.000
	Condition	.037	.217	.016	.171	.864
	Response tone	.205	.235	.090	.873	.385
	Gender	-.682	.256	-.236	-2.662	.009
	Extent to which participants followed the issue	.277	.069	.375	4.025	.000
	Score on anger scale	.012	.046	.029	.257	.798
	Score on anxiety scale	.020	.052	.042	.385	.701
	Score on enthusiasm scale	.107	.054	.215	1.990	.050

a. Dependent Variable: Participate average

Table 23. Regression Analysis: Information-Seeking Index.[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	9.028	.881		10.246	.000
	Condition	.026	.476	.005	.054	.957
	Response tone	-.538	.480	-.113	-1.122	.265
	Gender	-.446	.608	-.073	-.734	.465
	Extent to which participants followed the issue	.352	.156	.226	2.247	.027
2	(Constant)	9.448	.979		9.651	.000
	Condition	-.228	.489	-.048	-.466	.642
	Response tone	-.709	.551	-.148	-1.288	.201
	Gender	-.544	.604	-.089	-.900	.370
	Extent to which participants followed the issue	.322	.156	.207	2.063	.042
	Score on anger scale	-.111	.109	-.130	-1.016	.312
	Score on anxiety scale	.227	.114	.228	1.993	.049
3	(Constant)	8.537	.980		8.712	.000
	Condition	.257	.492	.054	.521	.604
	Response tone	-.949	.532	-.199	-1.784	.078
	Gender	-.729	.580	-.120	-1.256	.212
	Extent to which participants followed the issue	.178	.156	.114	1.139	.258
	Score on anger scale	-.146	.105	-.170	-1.389	.168
	Score on anxiety scale	.088	.117	.089	.750	.455
	Score on enthusiasm scale	.380	.121	.365	3.131	.002

a. Dependent Variable: Information seeking index