Expressions of Social Presence in Agricultural Conversations on Twitter: Implications for Agricultural Communications

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Abstract

Computer-mediated environments such as social media create new social climates that impact communication interactions in un-mediated environments. As computer-mediated communication (CMC) stimulates more social communities, many communication behaviors will evolve and adapt to the unique social environment created by CMC. This study examined social variables during two different synchronous conversations on Twitter through a qualitative document analysis that coded messages into affective, interactive, and cohesive categories. Categories were determined by indicators within each message such as emoticons, direct responses, and the use of individuals' names. The researcher concluded that most social variables in the Twitter conversations fit into the interactive social presence category but that affective and cohesive responses supported personal connection and structure within the conversations. It was also found that the same category of responses could function differently in each conversation. However, both conversations in this study appeared to be successful. Therefore, agricultural communicators should feel comfortable using CMC that contains social presence dimensions to circulate agricultural information among populations across the globe. Additional research should be conducted to examine social presence among new topics, populations, and other forms of CMC.

Keywords

Twitter, social presence, agricultural communications, social media, computer-mediated communication

Introduction

Computer-mediated communication (CMC) supports the everyday activities of most Americans (Taylor, Jowi, Schreier, & Bertelsen, 2011). Spitzberg (2006) defined CMC as "any human symbolic text-based interaction conducted or facilitated through digitally-based technologies" (p. 630). CMC offers new forms of communication, such as posts and comments that can be archived, found in searches, and distributed to the masses (Chan, 2008). These activities have created a unique social environment that challenges traditional communication behaviors (Bartter et al., 2009). In the beginning, CMC held a very matter-of-fact or un-relational connotation. More recently, many

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people have begun using CMC as a means to initiate and develop relationships (Spitzberg, 2006). As innovations become more convenient and affordable, the importance of CMC is likely to increase (Spitzberg, 2006). Already, almost 78% of the population in North America is using the Internet (Internet World Stats, 2011), with more than 140 million active users on Twitter.com (Twitter, 2012).

The Internet has grown from an objective research tool of the information age to a powerful catalyst for societal change where people engage in networking through chatting, messaging, and blogging (Bartter et al., 2009). These types of new media have become a primary stage for sharing information, meeting new people, and learning (Bartter et al., 2009). Popular examples of new media include Facebook, YouTube, Flickr, blogs, Delicious, and Twitter (Bartter et al., 2009; Kaplan & Haenlein, 2010).

Twitter is described as a "real-time information network" that allows users to publish 140-character messages called tweets (Twitter, 2011, An information network, para. 1). Tweets are known as a form of micro-blogging (Jansen & Zhang, 2009; Zhao & Rosson, 2009). Depending on a user's preference, tweets can be accessed publicly or they can be private, meaning that tweets are viewable only to users who subscribe to another user's Twitter feed (Honeycutt & Herring, 2009; Twitter, 2011). Twitter also allows users to categorize tweets with a hashtag, which marks topics with a "#" symbol to link tweets about the same topic (Twitter, 2011). The use of hashtags makes it easy for users to engage with others who have similar interests (Miller, 2010). Twitter platforms such as TweetChat automatically add a designated hashtag to outgoing tweets and enable users to view only the tweets about one topic in a streaming format (Ferguson & Pettit, 2009).

Populations across agriculture have adopted the use of Twitter. For example, in 2009, third-party applications for CMC inspired a group of farmers to develop #AgChat (AgChat Foundation, 2011). #AgChat is a weekly, moderated conversation on Twitter for "people in the business of raising food, feed, fuel, and fiber" (AgChat Foundation, 2011, Why Agvocacy, para.1) with a mission to "empower farmers and ranchers to connect communities through social media platforms" (AgChat Foundation, 2011, Mission, para. 1). Similarly, #GardenChat is an online conversation where people interested in gardening come together and share stories about their personal growing experiences. These communities convene online using hashtags to locate other people tweeting about similar topics (Twubs, 2011). In the case of #AgChat, all participants follow and contribute to a stream of tweets marked with the #AgChat hashtag (AgChat Foundation, 2011). All participants of #GardenChat follow and contribute to a stream of tweets marked with the #GardenChat hashtag (Gardenchat, 2011).

A review of previous research in agricultural education and communications revealed no research that specifically examined social cues and levels of perceived social presence in computer-mediated communications, such as Twitter. Social presence theory has been used in the past to describe differences in face-to-face communication and CMC, but further research was needed to expose how these differences relate to levels of perceived social presence and communication interactions on a Twitter-based platform related to agriculture. Specifically, this study supported two priorities of the National Research Agenda (Doerfert, 2011): "Priority 2: New Technologies, Practices and Products Adoption Decisions" (p. 8) and "Priority 4: Meaningful, Engaged Learning in All Environments" (p. 9).

Theoretical Framework

This study was grounded in the theory of social presence. With the increasing use of computer-mediated communication and resulting communities such as #AgChat and #GardenChat, social

presence has taken on greater importance (Dunlap & Lowenthal, 2009). Founded on the psychological concepts of un-mediated environments, social presence was first defined by Short et al. (1976) as some level of salience (i.e., state of being there) between two people using a communication medium. According to Short et al. (1976), social presence is an important part of the process through which people develop knowledge and opinions about other people's characteristics and beliefs. Social presence often is described using the concepts of intimacy and immediacy, or the function of physical distance, eye contact, smiling, and "the perceptual availability of persons to one another," respectively (Argyle & Dean, 1965; Mehrabian & Diamond, 1971, p. 282).

Since the original theory was developed, social presence also has been defined as the level of awareness of another during communication and the resulting value of that awareness (Walther, 1992), and "the degree of feeling, perception and reaction of being connected to another intellectual entity on CMC" (Tu, 2002, p. 2). Biocca, Harms, and Burgoon (2003) described social presence as a "sense of being with another" who is symbolized in the form of "text, images, video, 3D avatars … computers and robots" (p. 1). Shen and Khalifa (2007) endorsed the concept of social presence that described a user's experience in three dimensions: awareness, affective social presence, and cognitive social presence.

Social context is interpreted by communicators through static and dynamic cues (Sproull & Keisler, 1986). Static cues are objects such as a large desk or personal belongings, while dynamic cues include nonverbal behavior such as nodding the head or frowning (Sproull & Keisler, 1986). A lack of these social cues during communication via computers can cause deindividuation, or a state in which users feel a loss of individuality (Spears & Lea, 1992; Taylor, 2011). Missing social cues in CMC can be replaced with response time; humorous or personalized message content; or paralanguage and emoticons, such as happy and sad faces (Anderson, Garrison, & Archer, 2001; Picciano, 2002; Richardson & Swan, 2003; Rourke et al., 2001; Taylor et al., 2011). In a study by Tu (2002), the most commonly used emoticon was ":-)," while paralanguage was commonly expressed through punctuation, abbreviations, font styles, and unique phrases. Participants indicated that emoticons and paralanguage made the conversation more comfortable (Tu, 2002). Kalman and Rafaeli (2010) also found that time-related, nonverbal, chronemic cues such as "pauses, time of day, and silence" (p. 55) affect online communication by meeting users' expectations about response time and encouraging or discouraging the amount of friendly content expressed in a message.

Daft and Lengel (1986) concluded that mediums without nonverbal cues result in concise, matter-of-fact communication that eliminates unnecessary interactions. For this reason, they emphasized that vague or expressive information should be transmitted through more personal mediums (Daft & Lengel, 1986). Similarly, additional research indicated that as communication moves along the continuum from face-to-face to computer-mediated interactions, it increasingly will be experienced as less personal and sentimental and more matter-of-fact (Walther, 1996). In a study conducted by Born and Miller (1999), respondents were concerned about the "effectiveness of student/professor interactions" in Web-based courses and cited this concern as a barrier to distance education (p. 37). In a later study by Nelson and Thompson (2005), "lack of personal contact" was identified as a potential barrier to online learning (p. 42). Moreover, studies on social presence suggested that researchers have not come to consensus about whether social presence is a function of communication mediums, techniques used by communicators, or a combination of mediums and techniques (Richardson & Swan, 2003).

Social presence allows online users to identify with others in a group and contributes to sharing of useful knowledge (Shen, 2010). By making introductions during the first few online learning

sessions, teachers can foster social presence to build trust and participation among group members (Johansen, Vallee, & Spangler, 1988). Gunawardena (1995) found that students felt more social presence when instructors interacted with "introductions and salutations." Tu (2002) found that participants felt more social presence when teachers supported a positive attitude about keyboarding skills and gave special attention to students who needed to further develop their skills. In addition, Murphrey and Dooley (2000) suggest that a "virtual presence" be provided for online learners (p. 49). Thus, it is important for online teachers and moderators to practice techniques that support social presence (Tu, 2002).

According to Kaplan and Haenlein (2010), business administrators have been investigating CMC to discover how social networks can be leveraged to benefit their businesses. However, a lack of nonverbal and paraverbal cues such as tone, pitch, and inflection in CMC can result in unorganized conversations, misperceptions, and confusion (Rhoades, 2011; Taylor et al., 2011). In addition, the lack of social cues in CMC resulted in a depersonalized or anonymous experience (Taylor, 2011).

Purpose

The purpose of this study was to gain a deeper understanding of social presence among users who participated in agriculture-related conversations in computer-mediated environments. Such insights into social presence can help guide agricultural communicators' online interactions with various stakeholders. The study was conducted in two parts. Part one focused on describing social variables through the examination of logged "tweets," and part two focused on perceived social presence and participant satisfaction among users during conversations in computer-mediated environments. The purpose of this paper, as part of the larger study, is to report findings from part one.

Methods

Mixed-methods that combined a qualitative content analysis of Twitter transcripts and online quantitative participant surveys were employed in the overall study. Part one of the study consisted of a qualitative content analysis in which individual messages were unitized into affective, interactive, and cohesive components of social presence based on the "Model and Template for Assessment of Social Presence" (Rourke et al., 2001). Demographic characteristics of respondents that were collected during part two of the study also are reported to provide context.

Based on the model created by Rourke et al. (2001), affective tweets were defined as tweets that contained expressions of emotion, humor, attraction openness, or self-disclosure, such as emoticons and indicating location. Interactive tweets were defined as tweets that referred to the presence of another person, such as quoting previous comments or asking general questions (Rourke et al., 2001). Cohesive tweets were defined as tweets that mentioned a specific individual either by their first name or Twitter username, or that used group pronouns such as "we," "us," or "all" (Rourke et al., 2001).

Seven weeks of #AgChat and #GardenChat Twitter conversation transcripts were examined. The weeks were selected based on alignment of conversation dates and the researchers' availability to monitor the conversations and follow-up tweets. Twitter messages and participants from #GardenChat and #AgChat conversations were selected for research based on two main criteria that supported the purpose of the study: (1) these online communities use computer-mediated communication to collaborate consistently throughout the year for a guided conversation on Twitter, and (2) these online communities support agricultural communications by helping those in the business and hobby of agriculture tell agriculture's story to the public from their perspectives (AgChat Foundation, 2011; Gardenchat, 2011).

Of the seven selected transcripts for each conversation, the three central weeks were examined for social presence. The two weeks at the beginning and end of the seven-week period were used for comparison of conversation characteristics, such as numbers of users and tweets posted, to establish that the weeks selected for qualitative examination represented typical conversations (see Table 1). Individual tweets from the three selected Twitter conversations were unitized based on the "Model and Template for Assessment of Social Presence" (Rourke et al., 2001). During unitization, only the messages without any indication of the senders were viewable. Each tweet was examined for affective, interactive, and cohesive components of social presence and assigned one or more categories, depending on two researchers' interpretation of the messages. Each researcher independently assigned categories to the tweets, and then the researchers agreed on the final unitization of the tweets to establish dependability.

Table 1
Tweets and Users of #AgChat and #GardenChat Conversations

Conversation Relevant to Survey	Tweets	Users	Tweets	Users
	#AgChat		#GardenChat	
Two weeks before	1,039	137	1,286	98
One week before	980	115	998	95
Week of survey	915	148	1,452	87
One week after	841	132	765	59
Two weeks after	1,130	117	1,162	70

The researchers independently assigned the same categories to 83% of the tweets from week three, 86% of the tweets from week four and 81% of the tweets from week five, prior to coming to consensus on the final categories to be assigned to the tweets.

Findings and Discussion

The population for #AgChat included 148 participants, 34 of whom reported demographic characteristics via an online questionnaire, resulting in a response rate of 22.97%. The population for #GardenChat included 87 participants, 15 of whom reported demographic characteristics via an online questionnaire, resulting in a response rate of 17.24%. Due to the viral nature of survey distribution, nonresponse error could not be addressed.

Of the 34 #AgChat survey respondents, 67.6% were female and 32.4% were male. Of the 15 #GardenChat survey respondents, 73.3% were female and 26.7% were male. Nearly half (44.1%) of #AgChat respondents were between 26 and 45 years of age. More than half (53.3%) of #GardenChat respondents were above 45 years of age. Most respondents were Caucasian.

Each conversation had one Latino respondent. and one #GardenChat respondent was African American. Overall, 18 states and two countries were represented by #AgChat respondents. Multiple

respondents indicated that they were located in California (*n* = 4), Indiana (*n* = 4), Iowa (*n* = 3), or Wisconsin (*n* = 3).

Other respondents were either the only one or one of two people from their specified states. Eleven states and one country were represented by #GardenChat respondents, who were either the only one or one of two people from their specified states.

Respondents rated themselves based on their Twitter experience. Of the #AgChat respondents, seven rated themselves as experts, 24 rated themselves as intermediate users, and three rated themselves as novice users. No #AgChat respondents rated themselves as having no Twitter experience. Respondents also indicated how many #AgChat discussions they had participated in using a range of zero to more than 10. The most frequent responses were more than 10 (*n* = 15), two (*n* = 5), one (*n* = 4), and four (*n* = 3). Of the #AgChat respondents, 23 reported the environment around them while participating in the conversation contained some background noise, such as people talking or television sounds; 10 reported that it was peaceful and quiet; and one reported that it was noisy and stressful. When asked if they had ever met in person any of the other #AgChat participants before the most recent discussion, 22 #AgChat respondents reported "Yes" and 12 reported "No."

Six #GardenChat respondents rated themselves as expert Twitter users, seven rated themselves as intermediate users, and two rated themselves as novice Twitter users. No #GardenChat respondents rated themselves as having no Twitter experience. Respondents also were asked to indicate how many #GardenChat discussions they had participated in using a range of zero to more than ten. The most frequent responses were more than 10 (*n* = 9) and six (*n* = 2). Of the #GardenChat participants, six reported the environment around them while participating in the conversation contained some background noise, such as people talking or television sounds; six reported that it was peaceful and quiet; two reported that it was noisy and stressful; and one reported that the environment was not like any of these options. When asked if they had ever met in person any of the other #GardenChat participants before the most recent discussion, six #GardenChat respondents reported "Yes" and nine reported "No."

Respondents' Interest in Agriculture

To align with the standard introduction included in #AgChat, respondents were asked to report their interests in agriculture. Of the #AgChat respondents, 38.2% reported that they were involved in marketing and communications, while 32.3% reported that they were involved in production. Other frequent interests of #AgChat participants included farming and sales/business. Twelve of the 34 #AgChat respondents indicated more than one interest in agriculture. Of the #GardenChat respondents, 46.7% reported that they were involved in marketing and communications, while 46.7% reported that they had a home garden. Other interests of #GardenChat participants included production, green living, sales/supplies, and public gardening. Eleven of the 15 #GardenChat respondents indicated more than one interest in agriculture.

Social Presence Dimensions: #AgChat

The first archived conversation for #AgChat included 1,308 total tweets; the second included 915 tweets; and the third included 1,130 tweets. In each conversation, interactive tweets were the most prominent, with more than 75% of tweets falling into that category (see Table 2).

Table 2
Categorization of #AgChat Tweets

	Affective	Interactive	Cohesive
Week before survey			
Tweets/category	432	1,017	467
Total tweets	1,308	1,308	1,308
% of total	33.03%	77.75%	35.70%
Week of survey			
Tweets/category	307	761	329
Total tweets	915	915	915
% of total	33.55%	83.17%	35.96%
Week after survey			
Tweets/category	217	1,006	311
Total tweets	1,130	1,130	1,130
% of total	19.20%	89.03%	27.52%

Though the #AgChat conversations officially started at 8 p.m. and ended at 10 p.m. Eastern, the conversations were archived and analyzed from 7:30 p.m. to 10:30 p.m. to view tweets from a full range of users, including those who may engage early, late, and throughout the official conversations.

It appeared that cohesive tweets, especially tweets from the moderator, in the #AgChat transcript played a prominent role in fostering a structured conversation. For example, 30 minutes before each #AgChat conversation began, the moderator of #AgChat sent a tweet announcing the start of conversation, such as "Hope folks are grabbing a snack & getting ready for #agchat cause we're T-minus 30 minutes -- please use twubs.com." This tweet was coded as cohesive due to the use of the group pronoun "we're" and affective due to the use of the word "hope" (Rourke et al., 2001). While this tweet and others like it are directed to the group as a whole, it does not interact with specific individuals or refer to previous comments. Thus, it was not coded as interactive.

Later in the conversations, the moderator sent another cohesive tweet announcing the format of the conversation that said, "Format for #agchat 1) Networking 8-8:15 pm ET 2) Moderated ?s 3) Executable idea 4) 9:55 Ask your own ?s, pitch your site or get ideas." Some participants retweeted this message, making the message interactive. However, the original message not only reinforced the structure of the conversation, but also helped foster a cohesive environment by addressing the group with guidelines that applied to everyone in the conversation.

Other cohesive tweets emphasized the format of the conversation and highlighted the importance of time. For example, the moderator noted a one-minute tardy in officially starting the conversation by sending a message that said, "Welcome all, a minute late in officially opening doors! #agchat" Participants also were kept on schedule with warnings from the moderator, such as "Couple more minutes and then we'll be going to another female in ag question. Great job Tweeps! #agchat," or "Q3 coming on up and we'll be moving on to new topic… #agchat." All of these tweets were coded as cohesive due to the use of greetings and group pronouns. One of these tweets was coded as interactive since the phrase "Great job" complimented others.

While cohesive tweets seemed to maintain structure of the conversations, it appeared that affective tweets may have helped participants become acquainted with each other. The moderator asked participants to provide meaningful introductions that included their locations and interests in agriculture. Though the moderator sent a cohesive tweet to request introductory information, such as "Guidelines for #agchat, 8-10pmET 1) intro w/ location & #ag interest 2) stay on topic 3) start," the responses were affective due to the disclosure of information. The moderator also sent a tweet directed to Twitter users who may have been watching the streaming conversation but not introducing themselves: "Intro time. Tell us who you are, even if you are lurking tonight. #agchat." Many tweets during the first 15 minutes of the conversations included users' names, states, and relationships to agriculture, all of which fell under self-disclosure, making them affective responses.

In addition to serving as introductory messages, affective tweets may have provided unrequested information. Affective tweets often included information that was irrelevant to the main topic of the conversations. During the time allowed for introductions, participants shared the requested information as well as their most recent activities, what they were doing while participating in #AgChat, and their food and beverage choices. One participant tweeted, "Will try not to get my keyboard greasy from the cheese curd goodness since I'm tweeting in from my new #Wisconsin home for #agchat tonight." Even after the time allotted for introductions, participants who joined the conversations late contributed similar information.

The most prominent category of tweets, interactive, occurred during the middle of the conversations, when participants had the opportunity to respond to specific questions. After introductions, the moderator asked between 12 and 14 questions that related to agriculture. Responses to these questions were at least coded as interactive due to the fact that participants were responding to a previous comment or question. These tweets often were recognized by a "Q" followed by the current question number. Though the moderator asked participants via a cohesive message to identify to which question they were responding, questions containing the "Q" were coded as interactive. For example, if a participant was responding to question one, they would include "Q1" in their response. Some participants responded to the questions by sending a message to the entire group, meaning that some responses were not directed at another user and did not retweet other users' messages. However, some participants seemed to engage in conversation with just one or two individuals instead of the group as a whole by using specific Twitter usernames in the beginning of their responses. This situation is illustrated by tweets such as "@TruffleMedia very cool that you had it 'up your sleeve' #Agchat." Tweets such as these were coded as cohesive for the use of an individual user's name. Some participants retweeted other participants' messages either with or without an additional comment. These kinds of tweets were coded as interactive due to the references to previous messages. Many participants replied to questions with messages that included emoticons, such as "Q12: Every now and then step outside your comfort zone ;-) #agchat." These tweets were coded as affective for the use of a text-based expression of emotion.

Before the last five minutes of the conversations, a tweet was sent announcing the time allotted for personal pitches. The tweet said, "You've done great and it's now PITCH time. Feel free to share your 'stuff,' ask a ? of your own, get feedback. #agchat." This announcement tweet was coded as interactive due to its complimentary nature. Tweets in response to this interactive message were more affective. Many participants expressed self-disclosure by sending links for personal blogs and websites, as well as personal recommendations and information. As the #AgChat conversations came to a close, many participants used affective and cohesive tweets to express appreciation for an enjoyable conversation. These tweets noted the end of the conversation through phrases such as "that's a wrap" and "very well done." Some latecomers expressed disappointment for missing the conversation with affective tweets that included statements such as "Sad I missed #AgChat ..."

Overall, the #AgChat conversations appeared to be very structured, as the moderator used many cohesive tweets to give instructions for format and introductory content, as well as indicators of time. Questions and responses in interactive tweets easily were identified by the use of "Q" followed by the question number before each question and before participants' responses. Participants generally seemed to be speaking to the #AgChat community as a whole through interactive and cohesive tweets, with exceptions of cohesive and interactive comments directed to individual users by a few individuals. The conversation was comparable to a situation in which a moderator asks a group of people one question at a time while each person responds to the entire group with his or her answer.

Social Presence Dimensions: #GardenChat

The first archived conversation for #GardenChat included 998 total tweets; the second included 1,452 tweets; and the third included 1,162 tweets. Of these, interactive tweets were the most prominent (see Table 3).

Though the #GardenChat conversations officially started at 9 p.m. and ended at 10 p.m. Eastern, the conversations were archived and analyzed from 8:30 p.m. to 10:30 p.m. to view tweets from a full range of users, including those who may engage early, late, and throughout the official conversation.

Tweets before the official #GardenChat conversation were interactive and may have functioned as a way to make online users aware of the upcoming conversation. While these interactive tweets in the #GardenChat transcript did not indicate a specific format, the tweets did indicate that the conversation would begin soon. Before the advertised start of #GardenChat at 9 p.m. Eastern, tweets indicated participants were preparing for the evening's conversation. These tweets included statements such as "Getting ready for #gardenchat tonight? ..." and "T minus 25< and counting!!" These tweets seemed to encourage potential participants and were coded as interactive and affective due to the question and the expression of emotion through punctuation.

As 9 p.m. Eastern approached, participants began to send messages with a more social function, such as greetings like "Hello! #gardenchat." Information such as names or locations was not requested by the moderator. However, some participants indicated their locations through tweets such as "#gardenchat hello from the drought land TX." These tweets were coded as affective due to the volunteered, personal information that expressed self-disclosure. Many participants did not include this type of information in their introductions. Therefore, many tweets in the first few minutes of the conversations were interactive or cohesive.

The moderator welcomed participants at the beginning of the conversations with a message that said, "Welcome to #gardenchat : 9-10 p.m. ET on Twitter ..." Some participants continued to send greeting-type messages as the conversations began. These types of messages were coded as cohesive due to the use of words that addressed the group as a united entity.

Table 3
Categorization of #GardenChat Tweets

	Affective	Interactive	Cohesive
Week before survey			
Tweets/category	368	659	457
Total tweets	998	998	998
% of total	36.87%	66.03%	45.79%
Week of survey			
Tweets/category	340	1,067	727
Total tweets	1,452	1,452	1,452
% of total	23.42%	73.48%	50.07%
Week after survey			
Tweets/category	258	844	688
Total tweets	1,162	1,162	1,162
% of total	22.20%	72.63%	59.21%

Participants used interactive tweets to gain information about the upcoming conversation. For example, some participants in multiple conversations sent messages that said, "@TheGardenChat Topic tonight? #gardenchat" and "Hi #gardenchat! What's the topic tonight? #gardenchat." These tweets were later addressed in the conversation through additional interactive tweets. Many participants' interactive tweets related to gardening or questions asked by the moderator, while many affective tweets related to participants' snacks, favorite dining venues, and other topics unrelated to gardening.

After participants were welcomed to the conversations, the greetings became fewer and fewer. Questions in interactive tweets were sent to the group by random participants as the questions were developed, rather than having been planned ahead of time and sent by the moderator. Participants were not asked to indicate to what question they were responding, so responses were not clearly associated with specific questions. In two of the three archived conversations, some tweets indicated that participants were watching a live streaming video of the moderator; "OMG! I'm on Ustream and I can see and hear ya'll! So much fun #gardenchat." Tweets like this one were coded as affective for the expression of emotion through punctuation and cohesive for the use of the group pronoun "ya'll." Tweets in the #GardenChat conversations imitated many small groups of people in a room, rather than one large group of people having a discussion. As 10 p.m. Eastern approached, no warn-

ing was given that the conversation was about to end. Many users noted the end of the conversation and complimented others with affective tweets, such as "This was fun to watch. Thanks. Have to go see if my garden is OK after the hard rain. Night. #gardenchat."

Overall, tweets in #GardenChat seemed to create several small conversations among several individuals more than one conversation among all participants. One category of tweets did not influence the conversation more than another category. A formal structure or attention to time was not apparent through a concentrated collection of tweets. Participants generally seemed to be speaking to other individuals, rather than the #GardenChat community as a whole.

Conclusions

For this study, the definition of social presence was operationalized as the level of salience between two people using a communication medium (Short et al., 1976). Social presence was created as a function of communication mediums and social variables found within #AgChat and #GardenChat messages. Based on the finding that most tweets in both conversations were interactive, it seemed that social presence on Twitter often is created through interactive responses, such as asking other people questions and referring to previous comments. This conclusion aligns with previous research that found reaching out to others contributes to social presence, helps users to identify with others in a group, and contributes to useful knowledge contribution (Shen, 2010).

Further, tweets indicated that it might be possible for interactive responses, as well as cohesive and affective responses, to function differently. For example, many interactive responses in the #AgChat conversations took place in a structured format during the time when the moderator asked questions and gave participants the opportunity to respond. Interactive responses in the #GardenChat conversations took place in a less structured environment where participants engaged with others through a combination of affective and interactive responses. Further, cohesive tweets in #AgChat helped maintain conversation structure by announcing important times and format for the upcoming conversation, while cohesive tweets in #GardenChat announced the upcoming conversation, encouraged others to participate, and acknowledged participants' contributions as a whole. Affective tweets in #AgChat contained more personal information such as locations and occupations, while affective tweets in #GardenChat focused on expressions of emotion. These conclusions align with previous research that found Twitter hosts a variety of users with different goals and interests (Java, Finin, Song, & Tseng, 2007) and that social presence can be separated into different dimensions (Rourke et al., 2001).

Overall, social dimensions in #AgChat and #GardenChat conversations involved messages that acknowledged and expressed appreciation for participants in the group. Participants did not appear to be concerned with developing and maintaining close relationships with other participants. Rather, most social dimensions supported a general relationship founded on commonalities of agriculture and gardening. Outside of these general topics in these one or two hour conversations, it did not seem that participants cared to associate closely with other participants. This conclusion supports previous research findings that Twitter users fall into different categories depending on their intentions and that if Twitter is irrelevant to users' intentions, they are less likely to use it (Dunlap & Lowenthal, 2009; Java et al., 2007). Also, the moderators of the #AgChat and #GardenChat conversations influenced the social dynamics of participants, which aligns with previous research that found online moderators should practice techniques in support of social presence (Tu, 2002).

Recommendations

Many studies about social presence have been conducted to explain the differences between CMC and face-to-face communication (Short et al., 1976). More research should be conducted to compare social presence dimensions in CMC and face-to-face environments. For example, a comparison of social presence dimensions that exist among a sample group engaging in conversation in a face-to-face environment with the social presence dimensions that exist among the same sample group engaging in conversation via CMC could be examined. To build on this study, further research should be conducted to investigate the best methods of supporting components of social presence. Future research also should be conducted to improve methods of measuring social presence, especially since some aspects of social presence have been deemed highly subjective and are thought to be measured best by self-reported tools (Biocca & Harms, 2002). Finally, further research should examine social presence dimensions among varying populations and sample groups that convene about topics outside of agriculture or about subtopics of agriculture, such as sustainability, production, or organics. Members of these groups should include individuals outside of #AgChat, #GardenChat, and Twitter to investigate social presence dimensions within other forms of computer-mediated communication.

Implications

Studies about social presence and CMC have been conducted to investigate the possible benefits that CMC can provide for businesses (Kaplan & Haenlein, 2010). However, some researchers have found that a lack of nonverbal and paraverbal cues, such as tone, pitch, and inflection, in CMC can result in unorganized conversations, misperceptions, and confusion (Rhoades, 2001; Taylor et al., 2011). Other researchers have found that lack of social cues in CMC resulted in a depersonalized or anonymous experience (Taylor, 2011). However, both conversations in this study, whether structured or unstructured, portrayed elements of social presence and appeared to be successful. Therefore, agricultural communicators should be confident that with certain social presence dimensions, Twitter conversations can be a successful way to communicate agricultural stories to others.

About the Authors

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