2012

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ARTICLE INFO

ABSTRACT

Social media have gained increased usage rapidly for a variety of reasons. News and information is one such reason. The current study examines how system-generated cues available in social media impact perceptions of a source's credibility. Participants were asked to view one of six mock Twitter.com pages that varied both the number of followers and the ratio between followers and follows on the page and report their perceived source credibility. Data indicate that curvilinear effects for number of followers exist, such that having too many or too few connections results in lower judgments of expertise and trustworthiness. Having a narrow gap between the number of followers and follows also led to increased judgments of competence. Implications of these findings are discussed, along with limitations of the current study and directions for future research.

1. Introduction

Technological changes have impacted the way in which we send and receive information. So-called social media have seen increased usage for the transmission of messages, and have seen an increase in usage as a news source (Pepitone, 2010). Social media use is also on the rise for sharing a variety of types of crisis and risk information. For instance, these media have been used to circulate up-to-the minute information about wildfires in Santa Barbara, CA (Now, 2009), to both protest and cover the protests after a disputed presidential election in Iran (Grossman, 2009), to share information and raise money after an earthquake in Haiti (Cashmore, 2010) and to spread information about cholera outbreaks in Haiti (Sutter, 2010).

A major question surrounding this phenomenon is how people make judgments about the credibility of the source of the information. This is an especially important question to answer as users of social media have become their own gatekeepers (Haas & Wearden, 2003). Users of social media may utilize specific components of a source's profile, which are unavailable in traditional media, in order to make such credibility judgments. One especially promising piece of information that can be used for this purpose is the ability to see cues about another's social network. Because people utilize such network information in making judgments in other

contexts (Burt, 2000), and this kind of information was not available in interpersonal settings on such a scale as it with social media, the current study examines how characteristics of these "public displays of connection" (Donath & boyd, 2004) on Twitter.com impact readers' judgments of source credibility about a perceived page owner.

1.1. Social media and source credibility

In general, media provide large sources of information for the public, and this is especially true for instances of risk. Risk generally creates uncertainty (Weick, 1995), which motivates people to seek information in order to deal with that uncertainty (Berlyne, 1960; Heath & Gay, 1997), and media provide much of that information (Heath et al., 1995; Murch, 1971). Moreover, the Internet has become a heavily used source of information for the reduction of risk-related uncertainty (Spence et al., 2006). Because social media allow users to gain access to pointed on-the-ground information about risk-related issues very quickly, social media such as micro-blogging (i.e., Twitter) seem especially adept at providing information to those seeking to reduce uncertainty. As Sutton, Palen, and Shklovski (2008) suggest, social media, which are gaining prominence as an information source in disaster and risk times, are one heavily used information source, despite questions that may exist about the veracity of the information shared through this channel.

Social media is a term used to describe a variety of channels that are built on the idea of collaborative creation and dissemination of

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content. They are centered on a fundamental principle of Web 2.0: They are all about harnessing collective intelligence (O'Reilly and Battelle, 2009). Social media provide a platform for users to create content, but also to discuss that content in a collaborative effort to create better content, and to come to a shared understanding of the content that is created. Examples of these platforms abound (e.g., Facebook, Youtube, Flickr, Wikipedia), but one that holds promise as a medium for news communication is Twitter (http://www.twitter.com). Twitter is a micro-blogging service that began in March of 2006 (twitter.com), where the restriction of users' posts to 140 characters each has led to the development of a sort of short-hand and speed in creating messages.

Overall, the use of social media as a news source is on the rise, and studies have pointed to increased use of social networking by the news industry. The Project for Excellence in Journalism (2009) reported that social networking is an important method for news distribution. For example, many news organizations have started using Twitter. They automatically feed Web headlines to their Twitter streams (Palser, 2009) whereas some "tweet" when breaking news happens. Other news organizations rely heavily on Twitterfeed, which automatically converts items from an RSS feed into Twitter updates (Armstrong & Gao, 2010). Although news information is readily available through social media such as Twitter, the credibility of that information may be questionable (Sutton, Palen, & Shklovski, 2008). Therefore, how judgments of source credibility are made is an important process to understand in learning about the usefulness of this information.

Perceived source credibility is defined as "judgments made by a perceiver…concerning the believability of a communicator" (O'Keefe, 2002, p. 181). A great deal of work has attempted to identify the distinct dimensions of perceived source credibility (see O'Keefe, 2002 for review). While there is still debate about the precise factor-structure of the construct, and that structure has been shown to vary from context to context (see Cronkhite & Liska, 1976), a common factor structure found includes three general dimensions of perceived source credibility (McCrosky & Teven, 1999; O'Keefe, 2002): expertise/competence (i.e., the degree to which a perceiver believes a source to know the truth), trustworthiness (i.e., the degree to which a perceiver believes a source will tell the truth as he or she knows it), and goodwill (i.e., the degree to which a perceiver believes a source has the perceiver's best interests at heart).

In traditional media, the information that is chosen for publication and presentation is done so through a process known as gatekeeping (Shoemaker & Vos, 2009). Simply put, gatekeeping is the process by which content creators decide what information should be given out, and how that information should be presented. In traditional news formats, such as newspapers or television news, there are usually numerous gatekeepers, including journalists, editors, and even advertisers and owners, potentially. Gatekeepers are assumed to be checking information for veracity, and thus became important in the process of ensuring the credibility of that information (Salcito, 2009).

Information provided in newer, online channels often suffers from a relative lack of professional gatekeepers to monitor content, and thus, lacks some of these traditional markers used to determine source credibility. Indeed, online, the gatekeeping function seems to shift from producers of content to consumers of content (Haas & Wearden, 2003; Metzger et al., 2003), leaving consumers responsible for making decisions about the perceived credibility of information they consume online. As Sundar (2008) stated "The digital media universe thus presents a dual challenge: (1) the overload of information, entertainment, and other offerings that constantly need organizing and (2) the lack of assurance of any uniformity in content quality, which necessitates a continual monitoring of credibility on the part of users" (p. 77).

Because credibility is a perception, and not something inherent within a channel or a source (Fogg & Tseng, 1999), many things can contribute to the perceived credibility of online materials (Metzger et al., 2003). To date, research has examined several other avenues with regard to online credibility, including site design features (e.g., Fogg et al., 2001), source attributions (e.g., Sundar & Nass, 2001), and the role of users' reliance on web-based information (e.g., Johnson & Kaye, 2002). However, what is relatively less well known is how people evaluate the information they consume through social media. Social Information Processing Theory (SIPT; Walther, 1992) provides a rationale for how people might use various cues to make such judgments. Furthermore, the MAIN model (Sundar, 2008), designed to explain credibility judgments in online settings, also provides a useful framework to consider.

1.2. Theoretical predictions of source credibility judgments online

Social Information Processing Theory (SIPT; Walther, 1992) suggests that people use whatever information a channel provides them with in order to make judgments about other people. Although it was originally designed to explain how people can accomplish their communication goals using even supposedly lean text-only channels, this theory also suggests how things will work with online channels that provide more information. One of the key assumptions of SIPT is that people have the same goals online as they do offline. One of those goals is forming impressions of others. SIPT suggests that in order to accomplish that goal, if a channel does not allow for the usual cues used, that people adapt their perceptions based upon information that the channel does afford.

As Hollan and Stornetta (1992) suggested, online channels can provide affordances to accomplishing one's goals by allowing for things that are not possible in face-to-face communication. The MAIN model (Sundar, 2008) is a model that discusses the technological affordances which allow for the heuristic processing of cues in an online setting to make judgments about the credibility of an online source. According to the model, some affordances can offer system-generated content, or metrics, that can be used as possible heuristics for these credibility judgments. These sorts of system-generated content may offer heuristic appeals through what the MAIN model refers to as agency cues. Agency cues are those cues that capitalize on heuristics that grant special weight to credibility cues that, for example, are computer- (rather than user-) generated.

Sundar (2008) calls one common heuristic that people use when examining online information the *machine heuristic*. The machine heuristic suggests that people assign greater credibility to information that is verified or chosen by a machine or computer. The rationale for this heuristic is that something that has no thoughts, feelings, political affiliations, etc., therefore *must* be free from bias (whether or not it is actually the case that an algorithm is, in actuality, free from bias). Therefore, we trust machines as a source of information more than we trust editors, producers, and similar human sources (Sundar & Nass, 2001).

Similarly, this heuristic may also inform the way that consumers of online information process system-generated cues. System-generated cues are pieces of information that are system or machine rendered (Tong, Van Der Heide, Langwell, & Walther, 2008). These cues are often generated and presented by the system based upon the previous behavior of that system's users. For example, the number of friends one has on Facebook is a system-generated cue that attests to a profile owner's social attractiveness. The user does not specifically count and report this statistic, instead the system draws upon the user's previous 'friending' behavior to generate and report the number of connections that the user has amassed in the system. System-generated cues have been shown to be important determinants of social judgments in previous research exploring impression formation on Facebook (Kleck, Reese,

Behnken, & Sundar, 2007; Tong et al., 2008; Utz, 2010) as these cues typically are perceived to be generated by an ostensibly unbiased source (i.e., a machine) and are taken by perceivers to be a reliable indicator of an underlying construct. These studies highlight the effectiveness of system-generated cues in affecting interpersonal judgments of a profile owner's personality. Taking Sundar's machine heuristic and the previously mentioned research on system-generated cues together one might conclude that, if the machine heuristic operates to inform how consumers of online information parse messages, one would expect the credibility of messages that are paired with system-generated cues to be parsed, at least in part, on the basis of the "testimonial" that a system-generated cue makes about the message, and may influence credibility judgments more strongly than the content of a message.

One piece of information social media afford is system-generated information about a source's social network. For example, individuals' and businesses' networks and structures can be used as sources of information about those people and companies (Burt, 2000). Past channels of communication would have made it difficult, if not impossible, to find information about an entity's social network. However, as Donath and boyd (2004) point out, social networking sites are set up such that users broadcast their social networks to other users, providing "public displays of connection" that are central characteristics of social networking sites, and were not previously available. Thus, looking at a source's social media site (such as a Twitter page) allows a user to get information about the source's network, and this information can be used to make judgments about the source, such as their credibility, popularity, and attractiveness. Specific to credibility inferences, Twitter provides at least two relevant pieces of information about a source's network: the number of followers a source has and the number of people the source follows.

1.2.1. Number of followers

Walther, Van Der Heide, Kim, Westerman, and Tong (2008) suggested that system-generated cues in an online environment may be utilized to form impressions of users. Tong et al. (2008) also examined how a system-generated cue—the number of friends one has on Facebook—impacts perceptions of a profile owner's popularity, extraversion, and social attractiveness. In general, they found a curvilinear pattern between the system-generated number of friends one had and social attractiveness. Those who had moderate numbers of friends were seen as more likeable compared to those with fewer or greater numbers of friends. This demonstrates the power of system-generated cues that show a person's social network in social media, and how users attend to them when making judgments.

However, this curvilinear pattern was found for Facebook, a site designed around maintaining a network of "friends". As Tong et al. (2008) noted, there were good reasons to suspect that becoming a "facebook whore" (c.f., Donath et al., 2004) and collecting too many "friends" was likely to be seen as problematic, and their findings suggested this was the case. Will the same pattern exist for developing a large number of "followers" on a Twitter page? Instead, will the number of followers a person has on a Twitter page will serve as a system-generated cue and as that number increases, so will a person's credibility on that Twitter page?

Twitter and Facebook employ somewhat different mechanics for aggregating social connections. A Facebook friend represents a bi-directional connection between two people (i.e., both individuals in the relationship must assent in order for one to be considered a friend). However, on Twitter one may choose to follow whoever one wishes—whether the person being followed is aware of it or not. And, although the person being followed may choose to remove a follower, she or he must do nothing (beyond generating timely and/or intrepid micro-blogging message content) to initiate a follower. Consequently, any impressions attributed to this system-generated cue may be most indicative of the credibility of the person who is being followed rather than any negative implications of simply being a "follower collector". We may assume that people are following a Twitterer because s/he sends messages that potential followers find pithy, informative, and/or credible. In this case, one would expect a linear pattern between number of followers and perceptions of source credibility, leading to the first hypothesis of the paper:

H1. As the number of followers a person has on a Twitter page increases, a perceiver's judgment about the source's credibility in terms of (a) trustworthiness (b), competence and (c) goodwill increases.

1.2.2. Followers vs. follows

Along with the number of followers that a Twitter user has amassed, the ratio between this number and how many others they follow has a potential impact on the credibility of a Twitter page owner. In some regards, this can be seen as information regarding how much connectivity one has (number of followers) and how much of an expert one is (number of follows). People who have high connectivity are often those who are able to bridge structural holes in a network (Burt, 2000) and are thus able to disseminate information across many people. Mavens are those who collect information (Gladwell, 2000) and are seen as experts in their subject matter (Feick & Price, 1987). These are distinct types of influential others, and make up two of the three important components of being an opinion leader or "super-diffuser" (Boster, Kotowski, Andrews, & Serota, 2011). However, only a small fraction of the population exhibits high levels of both these personality characteristics; thus, most people who are high in one or the other are not high in the second (Boster et al., 2011).

Of interest in the current research is how people respond to Twitter users who are offering information about both their connectedness and their inquisitiveness (i.e., how much of a maven a source is) simultaneously. To date there is little theoretical guidance as to how the ratio of followers to follows (potential cues for connectivity and inquisitiveness) will impact perceived credibility of a Twitter user. On one hand, it may be the case that individuals who the system shows to be extensive followers (regardless of their following) may be judged to be highly credible. Or, it is plausible that a balanced ratio of followers to followings is judged by perceivers to be most credible. Alternatively, it may be the case that an observer makes attributions about a target on the basis of a sort of 'wisdom-of-crowds' heuristic, such that when a profile owner has a large number of followers he or she must be a credible source in order to have amassed a large following. Thus, the research question of the paper asks:

RQ1: How does the ratio of followers to follows impact perceived credibility?

2. Method

2.1. Overview

In order to test the hypotheses and research question offered in the current study, a 3 × 2 between subjects experiment was designed. A mock Twitter page was created to represent a user whose page was devoted to the dissemination of information regarding H1N1 (swine flu). The number of followers (few, moderate, and many) was crossed with the ratio between followers and follows (narrow gap, wide gap). Participants viewed the Twitter page, and then responded to a measure of source credibility (McCroskey

& Teven, 1999) and several items regarding behavioral intentions associated with H1N1.

2.2. Participants

The 289 participants in this study came from introductory communication classes at two large universities; one in the Mid-Atlantic region, and one in the Midwest. Course credit was given for participation.

2.3. Materials

2.3.1. Stimuli

Participants were randomly assigned to view one of six mock Twitter pages (see Fig. 1 for a sample stimulus page). The pages were designed to appear as if the user was attempting to disseminate information and recent updates about H1N1. This was chosen as the crisis used for this mock page for three reasons. First, it was a relevant potential crisis at the time the data were collected. Second, it was a potential crisis that could affect the college audience, which made the content of the feed even more relevant for the sample utilized. Third, it was a potential crisis that did not have immediate dangers (such as an earthquake or wildfires would have), and thus, would not require immediate updates to appear real. The six pages represented a full cross of conditions with different numbers of followers (few, ≈70; moderate, ≈7000; many, ≈70000) and different ratios of follows to followers (narrow gap: the number of follows equals ≈90% of followers, wide gap: the number of follows equal ≈10% of followers). The labels "few", "moderate", and "many" are used here for convenience and clarity, however participants were never exposed to these labels and were left to make social judgments about the profile owner's credibility based only upon the number of followers the profile owner had and the number of people the profile owner followed. These numbers were chosen to appear realistic. A celebrity could not be used for the page as many participants would likely have seen this as fake. Thus, numbers of followers in the hundreds of thousands or millions by someone unknown was also likely to be seen as fake.

2.3.2. Instrumentation

After viewing the mock Twitter page, participants were asked to respond to a measure of source credibility (McCroskey & Teven, 1999). McCroskey and Teven's source credibility measure contains three separate constructs: competence, goodwill, and trustworthiness. Each is measured with six separate semantic differential type items, anchored with two antonyms (i.e., moral–immoral) and including a seven point response scale ranging from 1 to 7. After removal of one item (intelligent–unintelligent), the items measuring competence formed a unidimensional solution with acceptable reliability (α = .84), so the remaining five items were averaged to create a competence index. After removal of one item (cares about me–doesn't care about me) the items measuring goodwill formed a unidimensional solution with acceptable reliability (α = .76), so the remaining five items were averaged to create a goodwill index. All six items measuring trustworthiness formed a unidimensional solution (i.e., untrustworthy–trustworthy) with acceptable reliability (α = .84), so all six items were averaged to create a trustworthiness index.

2.4. Procedure

Participants were informed about the research opportunity in class. They were instructed to go to a website designed for the research study. Participants went to the website, and read the informed consent. After clicking on a button called "Begin Study", they were directed to a JavaScript program (Burton & Walther, 2001) that randomly assigned participants to view one of the six mock Twitter pages. After participants viewed the page, they were instructed to click on another link that sent them to the questionnaire. Once they completed the questionnaire, they clicked on another link that sent them to a separate page so they could enter their names. This ensured participant's names were kept separate from their responses in order to help maintain confidentiality.

3. Results

3.1. Hypothesis 1. Number of followers and source credibility

Hypothesis one predicted a linear relationship between number of followers and source credibility. Three one-way ANOVA's were conducted: one for each of the three credibility constructs. The number of followers had no significant relationship with competence, F = 1.57, p = .21, η^2 = .01; nor goodwill, F = 1.49, p = .23, η^2 = .01; nor trustworthiness, F = 2.88, p = .07, η^2 = .02. Thus, the data were not consistent with H1a, H1b, or H1c (See Table 1 for means and standard deviations). Although the data were not consistent with the predicted linear effect, a post hoc analysis revealed that there was a quadratic deviation from linearity for the effect of number of followers on a Twitter profile and the trustworthiness an observer ascribes to a profile owner, $F(1,281)$ = 5.51, p = .02, η^2 = .02. This deviation from linearity took an inverted u-shaped form. Although goodwill ($F[1,281]$ = 2.26, p = .13, η^2 < .01) and competence ($F[1,281]$ = 3.10, p = .08, η^2 = .01) descriptively trended in this direction as well, they did not clearly display this curvilinear effect.

3.2. Question 1. Relationship between ratio of followers and follows on source credibility

Research question one asked how the ratio of followers to follows presented on a Twitter profile impacted credibility judgments a perceiver made about a profile owner. In order to probe this research question the data were first analyzed using a multivariate analysis of variance (MANOVA) procedure, which looked at the overall effect of the gap between followers and follows (narrow vs. wide) on trustworthiness, competence, and goodwill together. The overall result of this test was marginally significant, Wilks' $lambda$ = 0.97, $F(3,265)$ = 2.54, p = .06. Given that the findings from the previous two hypotheses consistently identified only competence and trustworthiness as sensitive to the system-generated number-of-followers and number-of-follows cues, whereas goodwill was not, this result was not entirely unexpected. Consequently, the multivariate findings were probed further to determine which of the credibility constructs, if any, were sensitive to the gap between numbers of followers and follows.

One-way analyses of variance (ANOVAs) confirmed that the gap induction did not significantly affect judgments of goodwill, $F(1,279)$ = 0.50, p = .48, or trustworthiness $F(1,282)$ = 2.54, p = .11. However, the gap induction did significantly impact judgments of competence, $F(1,282)$ = 5.36, p = .02, η^2 = .02, such that Twitter profile owners with a narrow gap between the number of followers they had and the number of people they followed were perceived to be more competent than those with a wide gap indicating that they had many more followers than the number of people they followed (see Table 2 for descriptive statistics). Further, there was no significant interaction between the ratio of the gap and the number of follows, $F(2,273)$ = 1.25, p = .29. In other words, the number of follows made no statistically significant difference in terms of how the dynamics of the gap variable affected competence judgments. Competence judgments were greater when there was a narrow gap between the number of follows and the number of followers.
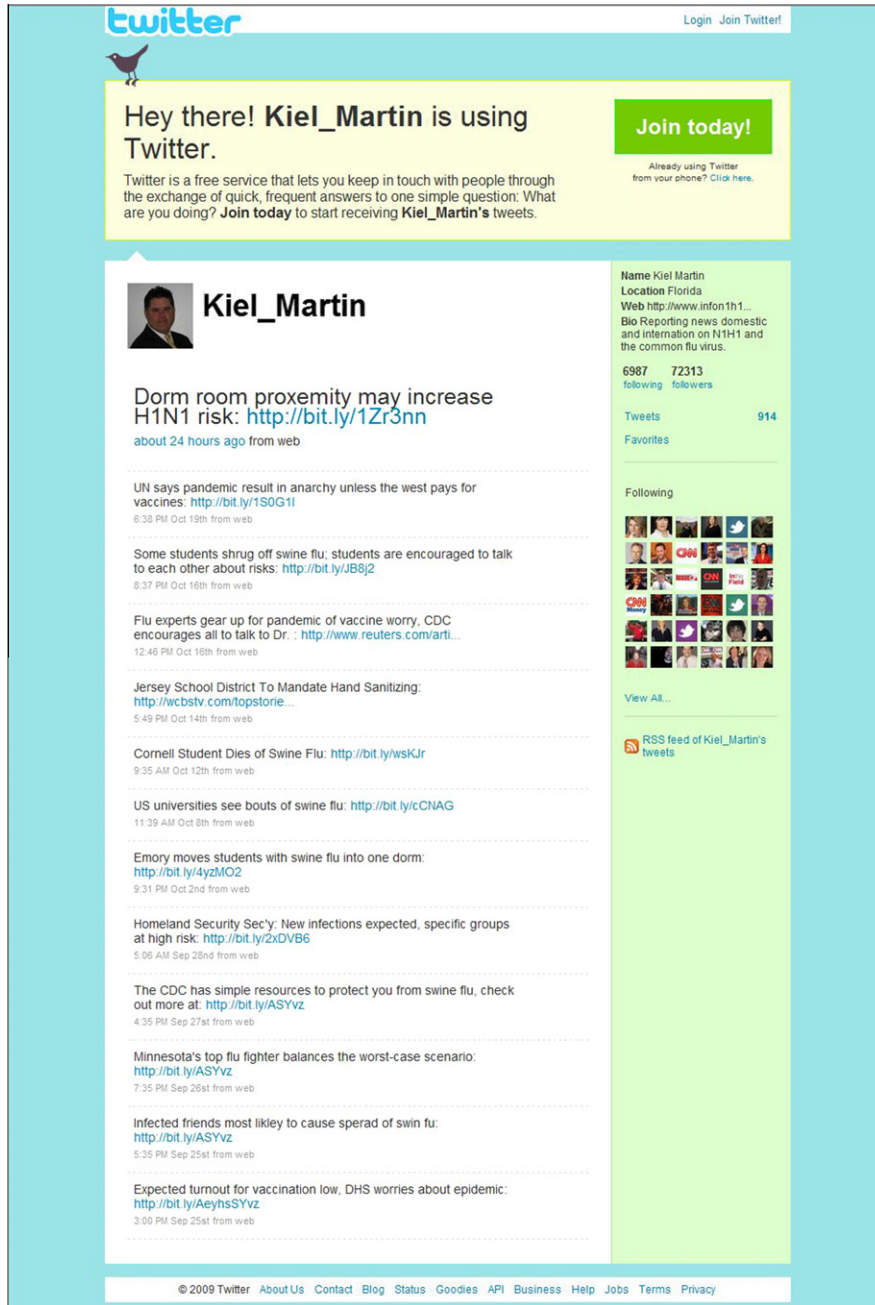
Fig. 1. Sample mock Twitter page used in study (moderate number of followers, wide gap between followers and follows).

Table 1
Means (and standard deviations) for credibility dependent variables by number of followers.

Number of followers	Credibility dimension		
	Trustworthiness	Competence	Goodwill
≈70 Followers	4.55 (1.01)	4.59 (1.06)	4.52 (1.01)
≈7000 Followers	4.84 (1.05)	4.85 (1.11)	4.64 (0.98)
≈70,000 Followers	4.53 (0.99)	4.62 (1.21)	4.39 (1.01)

Table 2
Means (and standard deviations) for credibility dependent variables by ratio of follows to followers.

Follower: followed ratio	Credibility dimension		
	Trustworthiness	Competence	Goodwill
Narrow gap	4.73 (1.01)	4.85 (1.10)	4.56 (1.04)
Wide gap	4.54 (1.03)	4.53 (1.15)	4.48 (0.96)

4. Discussion

The current study was designed to examine how information about a user's position in a social network displayed on a social media page affected judgments of their source credibility. Specifically, it examined the effects that the number of followers and the ratio between Twitter followers and follows had on ratings of competence, goodwill, and trustworthiness (McCroskey & Teven, 1999). To review, the data in the current study demonstrate that the number of followers a person has and the ratio between followers and follows impact judgments of that person's source credibility in a

number of ways: First, the degree to which an observer believes that a target knows the truth (competence) and the degree to which an observer believes that a target will tell them the truth as he or she knows it (trustworthiness) are curvilinearly related to the number of people following the Twitter profile owner. This is a curvilinear pattern such that too few or too many followers actually make a Twitter user seem less credible. Second, the ratio between the number of followers and the number of people one follows has an effect on the degree to which a perceiver judges a target to be competent in a specific subject matter. That is, if one has many followers, but does not follow many others, that person is regarded as less of an expert.

4.1. Number of followers and judgments of credibility

The data in the study were not consistent with the linear predictions for the impact of number of followers on judgments of competence and trustworthiness. Instead of a linear relationship, the data suggest a curvilinear pattern in the shape of an inverted "U". One possibility for these findings is that amassing followers on Twitter operates similarly to amassing friends in Facebook. Just as having too few or too many friends on Facebook leads to lower judgments (Tong et al., 2008), having too few followers on Twitter may make users think that the page owner has nothing worthwhile to say. However, having too many followers may cause people to think that the page owner is spending too much time amassing followers, rather than actually providing useful content, and may perceive Twitter users as "follower collectors" when they have too many followers, and this may decrease perceived credibility. Tong et al.'s (2008) finding that having too many Facebook friends impacts judgments of a target negatively was contingent upon the idea that the number of friends present on a person's profile was a sort of behavioral residue. That is, they surmised that the profile owner may be guilty of "friend whoring" and this behavior is what attributed to negative judgments of those with a great number of friends. Thus, one possibility is that people reason logically about publicly displayed connections.

One alternative to this interpretation would be that when the content of a message is held constant (as it was in the present work) people rely primarily on heuristic judgments of system-generated cues. This possibility is consistent with the findings of Metzger, Flanagin, and Medders (2010), who found that people often rely on heuristics when making credibility judgments online. This study's finding that the number of followers—who are amassed, presumably, through no real act of the Twitterer himself or herself—has a similar curvilinear effect on credibility, suggests an additional theoretical mechanism may be at work in some social networking environments. Specifically, in line with Sundar's (2008) MAIN model, there may be an "unbelieveability" heuristic that causes observers to be suspect of individuals who have amassed large numbers of social connections. It is interesting to note that one might interpret this study's findings as inconsistent with Sundar's bandwagon heuristic, which predicts that as something becomes popular (e.g., a news story) as evidenced by other users' preferences, individual preferences for that story also increase, was not supported. Instead, when users judged the source as having a non-normative number of followers, they may have relied on a heuristic that suggests that expectancy violations for information presented about the connectedness of a source results in more negative judgments about a source. Just as the popular fairy-tale protagonist Goldilocks only displayed a preference for what fell between two extremes, users of social media may rely on a "Goldilocks" heuristic in which both too many and too few social connections attenuate judgments overall. Having too few followers may still operate as a cue that suggests that the page owner has nothing of value to add, but having too many followers may suggest to people that the page is no longer special. This

possibility seems to be one more way in which people rely on social cues to make credibility judgments of online information (Metzger et al., 2010). These possibilities deserve future research.

4.2. Ratio of followers to follows and judgments of source credibility

The data also suggest that having a narrow gap between the number of followers and the number of people followed led to increased judgments of competence. Although having many followers while only following a few others might sound like a definition of expertise, the data suggest otherwise. It is possible that users of social media hold an expectation that they will be just that: social, and thus, they expect a certain level of reciprocity within the relationships they have. If this is the case, then there may be a social cue that is impacting expertise ratings, such that a narrow gap is more consistent with increased reciprocity.

Taken together, these findings suggest that although social media can exhibit some characteristics of traditional mass media, such as potential reach, other traditional mass media characteristics, including amassing consumers of content (like that measured by Nielsen ratings), may not operate in a completely similar manner. As Thompson (2010) suggests, when Twitter communities become too large, they cease to operate as a community. In essence, these social media become unsocial, as users and followers cannot possibly interact with each other. Although this lack of interaction is a hallmark of traditional mass media, it is possible that when people use and make judgments about others using Twitter, they expect to have the possibility of social interaction. Thompson also suggests that when someone amasses an incredibly large amount of followers (like celebrities often do) there is no pretense about Twitter operating as a community. The current paper did not examine numbers of followers that ran into the millions, in order to maintain realism. It was thought that an extreme number such as that would be seen as unlikely for an unknown entity and the current study was designed to leave out any possible celebrity effects. However, future research should examine these suggestions.

4.3. Judgments of goodwill

Another interesting set of findings in the current study involves judgments of goodwill. Although effects were found for competence and trustworthiness, no effects were found for the number of followers or the ratio between these two on judgments of a source's goodwill. These pieces of social network information were not associated with changes in perceptions that a Twitter user has a page viewer's best interests at heart. Goodwill may be based more upon the content of a Twitter user's posts rather than how many people that user is following or followed by. Heuristic cues such as these network positions might be effective in creating a perception that a person knows what they are talking about and they are honest (following an appropriate number of people must mean the user knows their information, and if a reasonable number of people follow that user, that probably are honest). However, making judgments about whether a Twitter user (or anyone, for that matter) has the heavily interpersonal judgment of "MY" best interests at heart might require more attention to what the messages actually say, in order to make that kind of more interpersonal determination. As the current study is not designed to test this notion, future research would be necessary to examine this possibility.

4.4. Implications for theory and future research

These findings suggest further and increased usefulness of SIPT (Walther, 1992). In one sense, this is surprising given that one of the central tenets of SIPT is that relational communication and

impression formation require multiple interactions over an extended interaction—a feature the 140-character message limit in a venue like Twitter would seem to actively slow. This study is one in a line of several studies that illustrates that, even in a relatively restricted time period, there are certain types of social information that users can parse and use to make social judgments (e.g., Van Der Heide, D'Angelo, & Schumaker, in press; Walther et al., 2009).

Future research would do well to extend SIPT to account for the reliable impressions that form in even a very limited exposure to a target. As social judges parse social networking profiles, they seem to attend to and utilize the most condensed social cues, which consequently allow them to efficiently form social impressions. As newer channels increase the information that is available, including sometimes providing things unavailable in face-to-face interactions (such as the social network position information examined in the current study), it should still follow that we use the information that is available, and the current data are consistent with that notion. In some cases, it would seem that there may be cues which exist, and are prevalent in social network sites, that are far more efficient than any vocalic, kinesic, or other nonverbal cue available to the face-to-face communicator. Thus, SIPT would seem to remain a useful framework and theory for understanding and explaining human communication, keeping in mind that technology can provide affordances as well as limitations to accomplishing one's goals (Hollan & Stornetta, 1992). Further, future scholarship should be directed toward understanding how social information is transmitted very quickly and through information sources unavailable to a face-to-face communicator.

The current study has a few limitations. First, it did not fully cross the number of followers and the number of follows. Future studies should be designed to more fully cross these potential indicators of connectivity and maven-ness (i.e., provide mock Twitter pages showing a ratio of 200% follows compared to the number of followers). This would allow for a fuller picture of the interaction between these two variables and would also allow for examination of effects for the number of people followed on credibility independent of the number of followers.

Another limitation in the current study is the small effect sizes found. This is not too surprising, as there are many other things that impact source credibility. However, these findings are still important for two reasons. First, small changes in the mock twitter pages led to patterns of source credibility that are also consistent with past research on social media cues and judgments (Tong et al., 2008), suggesting the possibility of an "unbelievability" and a "Goldilocks" heuristic, mentioned above, that future research can examine. Second, the cues about network size isare information that people did not have easy access to, if any access at all, prior to social media. The fact that this is a relatively new piece of information suggests other things for future research. First, as people become more accustomed to looking for and relying on this piece of network information, it may become an even more important piece of information in making credibility judgments. This can be tested in future research by including experience using social media such as Twitter, especially for news-related purposes, as a variable of importance.

Although the current study focused on pieces of network information that were difficult/impossible to utilize prior to social media, and did so for that reason (their relative newness), it only examined pieces of count information as an initial step. However, there are other aspects of network information that also may have an impact upon judgments of source credibility, and deserve future research attention. One of these future avenues is examination of who makes up a person's social network. For example, it is possible that certain people carry more weight than others, and when those people are seen as following or being followed by someone, this impacts credibility differently. For example, if someone looks at another person's twitter, and notices that an well-known expert is following that account, it may increase judgments of source credibility about the owner. The current study was designed to examine if "how many?" impacted judgments of credibility. Future research can examine if "who?" also impacts judgments of credibility in social media, and if so, how it impacts credibility.

Another direction for future research centers on the type of crisis used in the current study. H1N1 was selected for the mock Twitter pages for reasons previously mentioned. However, there are crises which require more immediate attention, such as the Haitian earthquake, and as Levinson (2009) pointed out, one of Twitter's hallmarks is the immediacy of messages. For example, new hashtags were created for the relief efforts in Haiti to speed up the potential to offer aid, including things like rescuing people (Lardinois, 2010). The speed and immediacy of posts that are a hallmark of Twitter (Levinson, 2009) are likely major reasons this channel is growing in use for crisis situations. This suggests that immediacy of updates is an important variable for future research to examine. It may be that immediacy of updates is more important when the danger associated with the crisis examined is of a more immediate nature. In fact, if constant updates are not necessary, it is possible that immediacy is counterproductive for credibility judgments. Future research can examine this possibility.

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