Combating Fake News: An Investigation of Information Verification Behaviors on Social Networking Sites

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Abstract

The use of the term 'fake news' has recently become widespread; however, research on fake news is limited. This research intends to increase understanding of how users of social networking sites (SNSs) determine if they should confirm the validity of news content. Grounded in research on the epistemology of testimony, we develop and test a research model based on perceptions related to news authors, news sharers, and users to test verification behaviors of users. The findings indicate that social tie variety, perceived cognitive homogeneity, trust in network, fake news awareness, perceived media credibility and intention to share influence an individual's news verification behavior. We discuss the implications of our findings for SNS designers as well as users. We also integrate the theoretical perspectives of trust and testimony and demonstrate their value for explicating verification behaviors.

1. Introduction

Fake news, as the term is commonly understood in 2017, started gaining recognition in 2010 when Twitter bots were used to repost a fake news story concerning the replacement of Senator Ted Kennedy [1]. The fake news epidemic grew rampantly in 2014 with the promotion of a story suggesting the quarantine of an entire Texas town due to the concern of Ebola on US soil [1]. More recently, the role of fake news in society has gained increasing attention, and is now seen as impacting global politics. It has become so important, that both Facebook and Google are now trying to mitigate fake news on their platforms [1].

Fake news stories have recently caused disruptions to society and damaged individual lives. For example, a United States citizen was recently motivated to commit a shooting at a pizza parlor based on information obtained from a fake news story [1]. In another incident, a Facebook picture posted by a refugee in Germany was used in several fake news stories blaming refugees for terrorist attacks, despite the individual having no tie to the events [52]. Overall, the impact of fake news on our daily lives is becoming more noticeable.

Thus, it is important for society to understand how users view fake news and identify how to design social networking sites (SNSs) to minimize its negative consequences. To accomplish this goal, we argue that additional theoretical clarity on this issue is required. The vast majority of extant research on fake news focuses on satirical news outlets that mimic the look and feel of real news outlets [3]. The revised, popular definition of fake news, which includes the intent to manipulate, significantly alters the relevant theoretical perspectives and accentuates the importance of understanding behaviors related to fake news.

To address the gaps in our practical and theoretical understanding, we propose a research study grounded in the epistemology of testimony, in combination with extant research on the formation of trust. This research is driven by two research questions: how do perceptions of news authors and news sharers influence fake news verification behavior and how do user intentions change fake news verification behavior?

The rest of this paper proceeds as follows. First, we outline the relevant extant research on SNSs and fake news, as well as discuss the theoretical underpinnings of our work. Next, we develop a model that includes perceived network characteristics, general perceptions of the media and fake news, and individual intentions that impact verification behaviors. We then present our research method and outline our findings. Finally, we conclude with a discussion of the contributions, limitations, and future extensions of this research.

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2. Literature Review and Theoretical Underpinnings

2.1. Social Network Sites

The research on SNSs, such as Facebook, LinkedIn, and Twitter, is vast and investigates various impacts of SNSs on both individuals and organizations. At the organizational level, SNSs provide a platform to establish connections with customers, identify customer needs, and receive feedback [28, 36, 47].

For individuals, SNSs provide a platform where people can share information, exchange ideas about various topics, arrange civic and political activities, participate in social events, and disseminate news. Researchers have studied various characteristics of SNSs and their impacts, including strength of social ties [27], SNS addiction [50, 57], and the role of SNSs in news dissemination and civic and political participation [2, 37].

Today, SNSs have become a news source for millions of people [30], and are commonly used to raise public awareness about elections [60]. News organizations now actively employ SNSs to expand their reach [45], and research indicates that SNSs allow a more rapid spread of news through individual sharing of stories [10]. As a result, every individual can become a news source, which raises concerns about the validity of news sources and the spread of fake news. To date, there is relatively little research that investigates how SNS users verify the accuracy of information received through their network [64].

2.2. Fake News

Traditionally, research defined fake news as a television comedy genre in which a portion of the program is devoted to political satire [29]. Such programs draw millions of viewers by mimicking a traditional news cast, but adding humor [18, 30]. While critics argue that these programs confuse fact with humor, some researchers argue that they may be as informative as network news broadcasts, and may even attract an audience that is not interested in traditional news programs [18, 30].

However, the popular definition of fake news has recently undergone a transformation. The term fake news is now commonly applied to phony news stories maliciously spread by outlets that mimic legitimate news sources. There are three definitions of information necessary for understanding fake news: information, which is communication in a social context; misinformation, which is false information; and disinformation, which is information that is deliberately false [32]. Fake news, as it is now understood, is defined as false and misleading information [2], and therefore includes both misinformation and disinformation.

Fake news presents a challenge to society because exposure can affect the audience's perceptions [3, 30]. Fake news can affect trust [4, 56], shape people's perceptions of others [38, 46], and influence opinions of serious news and political debates [35]. People exposed primarily to fake news may perceive it as more realistic than legitimate news [3]. Research also shows that even if readers are told information is not true, a distinct cognitive process governs whether they choose to believe it [21].

Mitigating the impact of fake news is hampered by the fact that it is difficult to distinguish from legitimate news. Fake news that appears to originate from a traditional news source has a greater likelihood of impacting the observer [7]. This issue is compounded because both fake and legitimate news stories are shared through SNSs, further complicating the task of differentiating between the two [55]. Even millennials, who spend considerably more time online than other groups, are often incapable of determining the validity of online content [63].

SNSs not only speed up the dissemination of valid information, but may also be employed to disseminate false information with great efficiency. As a result, establishing a sound verification process for news and information is indispensable.

2.3. The Epistemology of Testimony

The concept of truth has been examined extensively in the fields of philosophy, psychology, and information systems. Due to the volume and complexity of extant theorizing on this notion, we offer a brief, and necessarily superficial, discussion of the relevant aspects of this concept.

Truth is, at least in part, the domain of epistemology, a branch of philosophy that examines knowledge and its acquisition. Of particular relevance is literature about the epistemology of testimony. This theory of knowledge is concerned with discerning the validity of information acquired through others [41]. Given our reliance on external sources of information, testimony is critical to the "formation of much that we normally regard as reasonable belief" [9:7].

In accordance with Shieber [51], we conceptualize testimony in the SNS context as the conveyance of information through written or audio/visual communication. Thus, testimony is the

act of disclosing information, while the epistemology of testimony is concerned with how recipients assess the veracity of that disclosure. For example, if an SNS member shares a news article or video, that member has engaged in an act of testimony. If a recipient of that article makes a judgement about its truth, that person has made an epistemic evaluation of the testimony. While we commonly think of "testimony" in the context of formal legal proceedings, communication among members of a social network can be viewed as one of many "social operations of the mind," and thus is a form of natural, rather than formal, testimony [13:38]. Such natural conveyances of information are pervasive in our everyday lives and are highly influential in the formation of our beliefs [51].

A fundamental precept of the epistemology of testimony is that the transmission of information through others dramatically alters the way in which information is converted into knowledge [41]. Rather than being able to directly assess the veracity of first hand empirical evidence, the recipient of testimony makes subjective judgements regarding the truth of information conveyed by the testifier. These assessments are necessary as the testifier may have underlying motives which influence the transmitted information and its conversion into knowledge [51]. Thus recipients strive for "appropriate, but not profligate, trust in the testimony of others" [51].

Based on the epistemology of testimony, Fallis [13] identifies four considerations when assessing the veracity of recorded information: authority, independent corroboration, plausibility and support, and presentation. Table 1 summarizes these considerations and indicates those most central to the present paper.

Table 1. Establishing the Truth of Testimony

Consideration	Addresses…	Included
Authority	The characteristics of the testifier (who testifies)	Yes
Independent Corroboration	The presence of others who offer similar testimony (how many testify)	Yes
Plausibility and Support	The nature of the information and logic offered in its support (what they testify)	No
Presentation	The characteristics of vehicle through which testimony is offered (how they testify)	No

While each of these considerations is likely to be involved in establishing the truth of information shared through SNSs, this research is primarily concerned with characteristics and behaviors of network members. As such, we focus on authority and independent corroboration, as they are both directly related to the characteristics of SNS members and their behaviors.

Authority is related to the characteristics of the individuals from whom the information is obtained [13]. Research suggests that authority may be interpreted as a signal of trustworthiness [51] and that information obtained from a trusted source is, itself, often trusted [13]. Assessing the authority of a testifier may take many forms. Historical accuracy is of significant importance when evaluating authority [13]. That is, has the information conveyed by a particular source been accurate in the past. Such consistency is a hallmark of trust. Credentials which signify specialized knowledge, another means of establishing authority, also commonly engender trust on the part of a testimony recipient [43]. Finally, interlocutors that are perceived as being free of bias, may be perceived as authorities and establish themselves as trustworthy testifiers [13]. That authority engenders trust is important in this context as trust serves as a form of justification for the testimony, allowing it to be accepted and incorporated as knowledge [39]. In the present study, authority may be assessed for two groups: news sharers (individuals within the network who share news) and news authors (the organizations responsible for creating news articles).

Independent corroboration represents an attempt by an individual to obtain alternate and unrelated sources of information to validate testimony [13]. Agreement by multiple sources is often considered a strong indicator of accuracy and is similar to the academic notion of triangulation [61]. Ideally, such corroborating evidence should be sought from sources that obtained the information independently in order to minimize the possibility that all sources are distributing inaccurate information derived from the same origin [13]. Fallis notes that this a significant issue in the context of the Internet given the ease with which the same information may be distributed via multiple websites [13]. In this study, news verification behavior is a measure of independent corroboration as it represents an attempt on the part of the news recipient to validate information using alternate sources.

Importantly, literature on the epistemology of testimony suggests that authority and independent corroboration are not independent [13]. Rather, the assessment of truth derived from a given technique influences the nature of assessments using other techniques. In other words, when faced with an unsatisfactory assessment, recipients commonly fall back to other means of evaluation. This notion, that

subjects form beliefs based on their direct assessments of the information source and on additional informational assessments, is a central tenet of most contemporary research on testimony [51]. For instance, if a recipient is unable to assess the authority of a testifier, or if the results of that assessment suggest fallacy, the recipient may seek others who offer similar testimony in order to develop more complete assessment of the credibility of the information. This phenomenon provides the foundation of our theoretical underpinnings.

3. Model Development

Drawing upon extant literature on the nature of information, the epistemology of testimony, and interpersonal trust, we develop a model (Figure 1) that examines factors that influence verification behaviors among recipients of news shared within social networks.
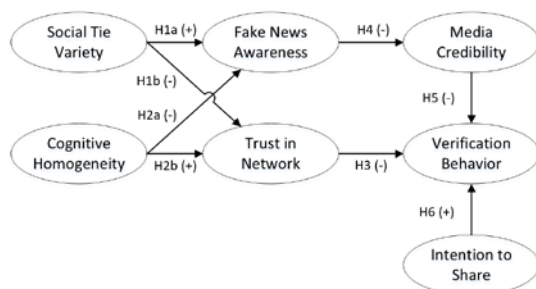
Figure 1. A model of news verification behavior

3.1. Perceptions of News Sharers

Research suggests that judgements regarding the veracity of information exchanged on SNSs depend, in large part, on the individuals from whom the information is received [64]. As such, the composition of the network is likely to play a significant role in the news verification behaviors of network members. In the present study, we assess SNS composition, i.e., the perceived characteristics of news sharers, using three constructs: social tie variety, perceived cognitive homogeneity, and trust in network.

Social tie variety is defined as "the diversity of offline groups and contexts represented in one's online social network" [20]. An individual's network may be composed of people introduced to that person over a long period of time and in a wide variety of social contexts. At the core, social tie variety is about how people met, and if they met through several different life periods, there is an increased likelihood for diversity. As that variety increases, the diversity

of backgrounds represented in the network increases [12], which also means a higher likelihood of exposure to fake news. The focal user may become aware that news offerings are fake when members of their network share news items that present facts about a given topic that are diametrically opposed to one another. Such disagreement illustrates a lack of "general acceptability" and serves as a cue to deception [34]. Thus, even if an individual does not clearly identify which news item is true and which is false, the presence of conflicting viewpoints indicates that at least one news item is likely untrue, thereby increasing the individual's awareness of fake news. Thus, over time, continued exposure to a diverse set of perspectives and opinions on a SNS increases one's fake news awareness. Therefore, we posit:

H1a: Social tie variety is positively related to fake news awareness.

As an individual's social tie variety increases, the person becomes exposed to a larger variety of ideas put forth by a more diverse network. Thus, social tie variety may be viewed as a measure of the correspondence between the social characteristics of the members of the SNS community. However, research suggests the development of interpersonal trust is hampered in situations where social similarity between the trustor and prospective trustee is lacking [31]. Trust is an integral, albeit complex, element which governs interactions within SNSs [23]. Consistent with the view that interpersonal trust consists of trusting beliefs and trusting intentions [42, 43], we define trust in SNS as the trusting beliefs held by an individual regarding the other members of their network. Dissimilarity between individuals negatively influences assessments of entitativity, the extent to which the parties perceive that they are part of a single group [8], and is associated with lower levels of trust [53]. Research suggests the relationship between collaboration as a member of a perceived group and increased levels of trust is deeply rooted in our neurobiology [14], and this relationship is well-supported in the extant literature from a wide variety of academic disciplines [33]. Thus, we posit:

H1b: Social tie variety is negatively related to trust in network.

Even in networks characterized by high levels of social tie variety (varied backgrounds of network members), there exists a possibility that the members of the group have strong, commonly-held beliefs. Perceived cognitive homogeneity is, "the extent to

which a person perceives members of his/her SNS network to share his or her views and beliefs" [20]. Instead of how people know each other (their social ties), this is a user's perception of the diversity of beliefs in their network. For example, a social tie to someone might be that they are a family member, however the perceived cognitive homogeneity might be very low. As a result, these are distinct measures of perceived diversity within a network. There is considerable evidence that some individuals construct social networks that exclude viewpoints with which they do not agree [2]. This behavior is related to homophily, our desire to engage with those that that we perceive as similar, a phenomenon widely studied in the SNS context [44]. However, because the underlying beliefs of SNS members are reflected in what they post [11], network segments characterized by a large degree of cognitive homogeneity reflect less topic diversity than segments which are more heterogeneous in nature [20]. In such contexts, individuals are less frequently exposed to alternative viewpoints and counterarguments related to their beliefs. Combined with confirmation bias, this is likely to decrease opportunities to identify false information and lower awareness of fake news. Thus, we hypothesize:

H2a: Perceived cognitive homogeneity is negatively related to fake news awareness.

As described previously, trust is highly related to perceptions of similarity between the trustor and trustee. While similarity may be judged on the basis of characteristics such as social background or even appearance [33], similarity of beliefs is particularly important. This is because unlike the more superficial approaches to discerning similarity, the identification of common belief structures requires knowledge-based familiarity, a particularly strong antecedent of trust [19]. Because SNSs are used to project a desired social identity that exemplifies the beliefs of the individual [14], posts serve as cues which allow network members to evaluate the degree of cognitive homogeneity that exists between themselves and other network members [20]. Individuals that perceive themselves as having similar opinions and thoughts as other network members are likely to connect more deeply than individuals that perceive themselves as different [48]. In the absence of cognitive homogeneity, the development of interpersonal trust between the focal user and other network members is expected to be inhibited. Thus, we offer the following hypothesis:

H2b: Perceived cognitive homogeneity is positively related to trust in network.

There is considerable empirical support for the contention that beliefs influence the actions taken by IS users in online environments. On SNSs, trust has been found to be an important governance mechanism which regulates the behavior of network members [23, 37]. Importantly, trust often serves as a mental shortcut, allowing interaction in complex situations without overwhelming the cognitive capacity of the trustor [24, 43]. In particular, in the presence of trust, an actor may forgo behaviors in which they might otherwise engage. For instance, McKnight and Chervany identify the relaxation of controls as a common trust-related behavior [42]. Hence, we posit that in the presence of a high level of trust, a news recipient may forgo validation, choosing instead to rely on those they find credible to assess validity. Thus, we offer the following hypothesis:

H3: Trust in network is negatively related to news verification behavior.

3.2 Perceptions of News Authors

As previously mentioned, in the context of news distributed through SNSs, the focal user may form impressions regarding news authors in addition to impressions about network sharers. Beliefs about news authors are also likely to influence verification behaviors. In this study, we assess these perceptions using the previously discussed construct, fake news awareness, as well as media credibility.

Credibility is crucial for any information source as its audience is generally highly interested in accuracy [13]. Consumers have numerous options for news coverage and the credibility of a given outlet may influence preferred source selection [5]. Media credibility is related to perceptions of believability, accuracy, trustworthiness, bias, and completeness [15], and is thus highly related to trusting beliefs identified in prior research such as competence, benevolence, and integrity [42]. As individuals become aware that news items from a particular source are likely false, at best they may perceive that source as incompetent. At worst, they may begin to question the benevolence and integrity of that source. Thus, in the words of Gunther, media credibility is "an audience response to media content" [26:147]. As such, we argue that individuals with higher levels of fake news awareness tend to be more skeptical about the credibility of the media, and thus hypothesize that:

H4: Fake news awareness is negatively related to media credibility.

Research shows that online users assess the credibility of web-based information, but both credibility assessments and verification behaviors vary by the type of information sought [15, 16]. News is generally perceived to be more credible than other types of online content [16]. It is clear, however, that news consumers recognize a wide variety of credibility issues with news sources ranging from incompetence to bias and deceptive practices [2]. Upon discovery of credibility issues, individuals commonly seek alternative sources in order to validate the accuracy of the information being conveyed [5, 13]. Thus the influx of fake news on SNSs not only heightens skepticism of news sources, but is also likely to encourage network members to be more vigilant in their efforts to assess the veracity of the news they consume via the SNS. As such, we offer the following hypothesis:

H5: Perceived media credibility is negatively related to news verification behavior.

3.3 User Intentions

Finally, in addition to assessments about both the original source of news content as well as about the members of the SNS through which that news propagated, a user's intentions related to the news item may also play a role in their verification behavior. SNS users often engage in identity management by carefully crafting a persona through their posts [62]. While posts are critical in the construction of the public identity, they may also tear down the public identity if they are construed as negative or misleading [59]. Thus, the curation of one's social identity may require significant effort to ensure that each post, whether original or shared, presents the desired public image [20]. However, users with no intention to share (commonly referred to as lurkers in internet parlance), do not engage in such identity management efforts as they do not post [22]. In the context of the present study, if an individual receives a news item but has no intention of sharing that post, they are less likely to actively verify that news item in order to protect their online persona. The converse is also true. Because the dissemination of fake news can significantly harm one's credibility within their network, those with a greater intention to share are more likely to engage in information verification behaviors. Thus, we posit:

H6: Intention to share is positively related to news verification behavior.

4. Methodology

To test our research model, we developed a survey composed of previously validated measures that were contextualized to the fake news context. News verification behavior was adopted from the information verification behavior construct in Flanagin and Metzger [15]. Media credibility was also adopted from Flanagin and Metzger [15]. Social tie variety and perceived cognitive homogeneity were adopted from Gerhart and Sidorova [20]. Fake news awareness was adopted from the security context [6] and several additional items were developed. Intention to share was adopted from Lee and Ma [37]. Finally, trust in network was adapted from Verhagen, Meents, and Tan [58].

The survey was conducted with students in the United States from three different universities. The universities varied by region, size, and demographics, which helps increase generalizability. The student population is composed of primarily millennials, who are an appropriate sample because they use SNSs more than any other age group [25].

Table 2: Demographics

Age		
19-24	330	64.2%
25-29	163	31.7%
30-34	14	2.7%
35+	7	1.4%
Gender		
Male	317	61.7%
Female	196	38.1%
Other	1	0.2%
Network Size		
0-149	87	16.9%
150-299	59	11.5%
300-449	72	14.0%
450-599	62	12.1%
600-749	65	12.6%
750-999	55	10.7%
1000-1499	81	15.8%
1500+	33	6.4%

Table 2 contains complete demographics. A total of 541 people participated in the survey. After cleaning the data to remove all incomplete responses, 514 usable responses remained. As expected, 95.9% of participants were aged 19-29 and the majority of participants were male (61.7%). Network size varied greatly, ranging from zero to several thousand connections, with most reporting less than 600 in their network.

5. Results

To test the complete model, we employed SmartPLS 2.0. A three-step analysis was completed to assess the measurement model, common method bias, and the structural model.

5.1 Measurement Model Assessment

To assess the measurement model, both reliability and validity need to be confirmed. Reliability is determined by a Cronbach's alpha score which should be greater than 0.70 [48]. All of the constructs have a Cronbach's alpha value of 0.76 or greater, indicating acceptable reliability. Convergent validity is determined by AVE values of 0.5 or greater [17]. The minimum AVE score is 0.52 indicating acceptable convergent validity. To determine discriminant validity, the square-root of AVE should be greater on the designated construct than other constructs [17]. As indicated in Table 3, all of the cited criteria are met.

Table 3: Measurement Model Summary

Var.	AVE	Cog	FNA	Ver	Int	MC	STV	TN
Cog	0.64	0.80						
FNA	0.65	-0.06	0.80					
Ver	0.52	0.11	0.25	0.74				
Int	0.81	0.28	-0.10	0.30	0.90			
MC	0.74	0.34	-0.20	0.04	0.41	0.86		
STV	0.68	0.16	0.20	0.15	0.14	0.13	0.82	
TN	0.78	0.32	0.04	0.16	0.16	0.35	0.28	0.89

Construct Abbreviation: Construct Name (Cronbach Alpha)

Cog: Perceived Cognitive Homogeneity (0.91), FNA: Fake News Awareness (0.92), Ver: News Verification Behavior (0.90), Int: Intention to Share (0.88), MC: Media Credibility (0.89), STV: Social Tie Variety (0.76), TN: Trust in Network (0.91)

Note. The diagonal elements are the square roots of the AVE.

5.2 Common Method Bias

Common method bias is an issue that can develop as an inadvertent result of research method and is a concern in survey research [49]. To test for common method bias, we conducted Harman's single factor test. Using the test, we must assess if the covariance among all variables is attributable to a single factor using an unrotated factor analysis [49]. The results of an unrotated factor analysis indicate seven factors are present, with the first factor accounting for 20.635% of the variance, which is

well under the threshold of 50%. Therefore, common method bias is likely not a concern in this study.

5.3 Structural Model Assessment

To assess the structural model, we evaluated the strength of relationships between variables and the predictive power of the model. The complete results are presented in Figure 2.

The structural model reveals support for all of the hypotheses presented. The relationship between perceived cognitive homogeneity and fake news awareness (H2a) is significant at the 0.05 level. The relationship between media credibility and news verification behavior (H5) is significant at the 0.01 level. All of the remaining hypotheses are significant at the 0.001 level. The relationship between social tie variety and trust in network (H1b) is hypothesized negative, however it is positive. Similarly, the relationship between trust in network and news verification behavior (H3) was hypothesized as negative and results in a positive relationship. The remaining hypotheses exhibit the expected direction of the relationship.

Social tie variety and perceived cognitive homogeneity explain 5.0% of the variance in fake news awareness and 15.4% of the variance in trust in network. Media credibility, trust in network, and intention to share explain 11.9% of the variance in news verification behavior.
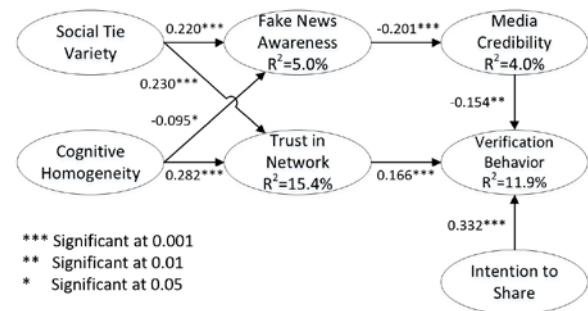
Figure 2. Structural Model Results

6. Discussion

The findings from the analysis of the structural model support the premise that perceptions of news sharers and news authors, along with the intentions of the focal user, influence news verification behavior. While all structural paths are significant, two paths exhibit coefficients with signs opposite of those hypothesized. First, consistent with the prevailing findings in the trust literature, we hypothesized that the relationship between social tie variety and trust in network was negative. However, we find the opposite

to be true in our model. This may be attributable to social interaction between network members. New perspectives in the trust literature have emerged that argue that social interaction in diverse environments, such as that experienced in the context of an SNS, may actually engender trust [31, 54]. Interaction allows the trustor to assess the competence, benevolence, integrity, and predictability of the trustee, prerequisites for trust formation [42]. In addition, social diversity may build confidence that the perspectives present in an online social network provide a broader and more complete perspective, resulting in the belief that the network, as a whole, may be trusted. Thus, social tie variety in environments such as a SNS may actually increase trust among network members.

Second, we hypothesized that as trust in network increased, news verification behaviors would decrease. This is logical if, as the trust literature suggests, users employ trust as a shortcut and relax controls in its presence. Here too, however, we see the opposite reflected in our results. We believe this result is best explained by relationship strength. High levels of trust suggest a deeper, more meaningful relationship between the focal user and the members of their network [42]. Research suggests that we attribute more importance to the perceptions of those with whom we are closely tied [40]. In the context of an SNS where posts are used to craft a favorable online persona [62], the focal user may be more concerned about the impressions held by trusted network members. That is, even if they receive a post from a trusted individual, they may choose to verify that post before sharing due to the trusting (and thus meaningful) relationships they hold with other members of their network. In the absence of trust (i.e. a network characterized by more superficial relationships), the focal user may have less concerns about the impressions held by other network members. However, a post-hoc analysis showed that trust in network does not moderate the relationship between intention to share and news verification behavior. Future research should further explore the nature of the relationship between these constructs.

This research makes several important contributions to both research and practice. For the academy, this study calls attention to the shifting definition of fake news, changing the focus from satirical commentary to willful malevolence. In so doing, we alter the dialog on the topic of fake news and encourage a reconsideration of SNS design and composition. In addition, our work integrates literature from both the epistemology of testimony and trust research areas, and demonstrates their combined applicability to the fake news phenomenon

within a SNS. To our knowledge, we are the first to employ the combination of these theoretical perspectives in the context of a SNS. We thereby introduce new theoretical tools with which to improve our understanding of SNS use. From a practical perspective, this research is timely and relevant to businesses engaged in news reporting as well as those that operate social networks. Beyond that, this study answers questions about how differences in networks impact the propagation of fake news within a SNS. Companies like Facebook and Google are actively engaged in efforts to mitigate the impact of fake news, thus highlighting the seriousness of the problem. This study, while exploratory, provides initial insights for both SNS developers and users which help combat the spread, and thereby the deleterious effects, of fake news.

Finally, this work is not without limitations and there are considerable opportunities for extensions and follow-on investigations. First, this study is based on a convenience sample of university students. While there is evidence to suggest that this sample is appropriate given the study context [25], a random sample drawn from the population at large would be useful to confirm our findings. Second, this study employs a cross-sectional survey method. However, we acknowledge that the relationships present in SNSs are dynamic and evolve over time [44]. As such, a longitudinal study would add significantly to our understanding of the dynamics which govern verification behaviors among SNS users. Finally, we have examined fake news without explicitly considering the nature of the news item and its relationship to the recipient. Research suggests that a meaningful connection with a message reduces the likelihood of rejection [26]. Given that much of the concern over fake news originates from political discourse [2], an examination of information verification that considered politically oriented news items in conjunction with the political affiliation of the recipient may be of considerable value to this research stream.

7. Conclusion

Fake news is endemic in modern SNSs. As a result, users of SNSs cannot decipher where information originates and whether it can be trusted. In this study, we draw upon the epistemology of testimony and extant theorizing on the development of trust to construct a research model that explores perceptions of both the network and the media, in conjunction with user intentions to better understand information verification behaviors. Empirical validation of our model finds that social tie variety

and cognitive homogeneity are important predictors of fake news awareness and trust in network. Additionally, fake news awareness is a significant predictor of perceptions of media credibility. Finally, this study finds that trust in network, media credibility, and user intention to share are antecedents of information verification behavior.

Fake news is a present and growing problem in society. This research is an important first step to expand our understanding, and offers new directions for future research.

6. References

[1] Akpan, M., "The Very Real Consequences of Fake News Stories and Why Your Brain Can't Ignore Them", *PBS NewsHour*, 2016.

[2] Allcott, H., and M. Gentzkow, "Social Media and Fake News in the 2016 Election", *Journal of Economic Perspectives 31*(2), 2017, pp. 211–236.

[3] Balmas, M., "When Fake News Becomes Real: Combined Exposure to Multiple News Sources and Political Attitudes of Inefficacy, Alienation, and Cynicism", *Communication Research 41*(3), 2014, pp. 430–454.

[4] Baumgartner, J., and J.S. Morris, "The Daily Show Effect: Candidate Evaluations, Efficacy, and American Youth", *American Politics Research 34*(3), 2006, pp. 341–367.

[5] Bucy, E.P., "Media Credibility Reconsidered: Synergy Effects between On-Air and Online News", *Journalism & Mass Communication Quarterly 80*(2), 2003, pp. 247–264.

[6] Bulgurcu, B., H. Cavusoglu, and I. Benbasat, "Information security policy compliance: an empirical study of rationality-based beliefs and information security awareness", *MIS Quarterly 34*(3), 2010, pp. 523–548.

[7] Busselle, R.W., and B.S. Greenberg, "The Nature of Television Realism Judgments: A Reevaluation of Their Conceptualization and Measurement", *Mass Communication & Society 3*(2&3), 2000, pp. 249–268.

[8] Campbell, D.T., "Common Fate, Similarity, and Other Indices of the Status of Aggregates of Persons as Social Entities", *Behavioral Science 3*(1), 1958, pp. 14–25.

[9] Coady, C.A.E., "The Domain of Testimony", In *Testimony: A Philosophical Study*. Oxford University Press, Oxford, 1992, 3–24.

[10] Diakopoulos, N., and M. Naaman, "Towards Quality Discourse in Online News Comments", *Proceedings of the ACM 2011 conference on Computer supported cooperative work*, (2011), 133–142.

[11] Druckman, J.N., "On the Limits of Framing Effects: Who Can Frame?", *The Journal of Politics 63*(4), 2001, pp. 1041–1066.

[12] Ellison, N.B., J. Vitak, R. Gray, and C. Lampe, "Cultivating social resources on social network sites: Facebook relationship maintenance behaviors and their role in social capital processes", *Journal of Computer-Mediated Communication 19*(4), 2014, pp. 855–870.

[13] Fallis, D., "On verifying the accuracy of information: philosophical perspectives", *Library Trends 52*(3), 2004, pp. 463–487.

[14] Fareri, D.S., L.J. Chang, and M.R. Delgado, "Computational Substrates of Social Value in Interpersonal Collaboration", *Journal of Neuroscience 35*(21), 2015, pp. 8170–8180.

[15] Flanagin, A.J., and M.J. Metzger, "Perceptions of Internet Information Credibility", *Journalism & Mass Communication Quarterly 77*(3), 2000, pp. 515–540.

[16] Flanagin, A.J., and M.J. Metzger, "The role of site features, user attributes, and information verification behaviors on the perceived credibility of web-based information", *New Media & Society 9*(2), 2007, pp. 319–342.

[17] Fornell, C., and D.F. Larcker, "Evaluating Structural Equation Models with Unobservable Variables and Measurement Error", *Journal of Marketing Research 18*(1), 1981, pp. 39–50.

[18] Fox, J.R., G. Koloen, and V. Sahin, "No Joke: A Comparison of Substance in The Daily Show with Jon Stewart and Broadcast Network Television Coverage of the 2004 Presidential Election Campaign", *Journal of Broadcasting & Electronic Media 51*(2), 2007, pp. 213–227.

[19] Gefen, D., E. Karahanna, and D.W. Straub, "Trust and TAM in Online Shopping: An Integrated Model", *MIS Quarterly 27*(1), 2003, pp. 51–90.

[20] Gerhart, N., and A. Sidorova, "The Effect of Network Characteristics on Online Identity Management Practices", *Journal of Computer Information Systems 57*(3), 2017, pp. 229–237.

[21] Gilbert, D.T., R.W. Tafarodi, and P.S. Malone, "You Can't Not Believe Everything You Read", *Journal of Personality and Social Psychology 65*(2), 1993, pp. 221–233.

[22] Gong, W., E.-P. Lim, and F. Zhu, "Characterizing Silent Users in Social Media Communities", *Proceedings of the Ninth International AAAI Conference on Web and Social Media*, (2015), 140–149.

[23] Grabner-Kräuter, S., and S. Bitter, "Trust in online social networks: A multifaceted perspective", *Forum for Social Economics 44*(1), 2015, pp. 48–68.

[24] Grabner-Kräuter, S., and E. a. Kaluscha, "Empirical research in on-line trust: a review and critical assessment", *International Journal of Human-Computer Studies 58*(6), 2003, pp. 783–812.

[25] Greenwood, S., A. Perrin, and M. Duggan, *Social Media Update 2016*, 2016.

[26] Gunther, A.C., "Biased press or biased public? Attitudes toward media coverage of social groups", *Public Opinion Quarterly 56*(2), 1992, pp. 147–167.

[27] Haythornthwaite, C., "Social Networks and Internet Connectivity Effects", *Information, Communication & Society 8*(2), 2005, pp. 125–147.

[28] He, X., and A. Negahban, "The Effects of Consumer Engagement Behavior on the Growth of Social Media Brand Community: Evidence from an SME", *International Journal of E-Business Research 13*(1), 2017, pp. 25–44.

[29] Holbert, R.L., "A Typology for the Study of Entertainment Television and Politics", *American Behavioral Scientist 49*(3), 2005, pp. 436–453.

[30] Holton, A.E., and S.C. Lewis, "Journalists, Social Media, and the Use of Humor on Twitter", *The Electronic Journal of Communication 21*(1 & 2), 2011.

[31] Jarvenpaa, S., and D. Leidner, "Communication and trust in global virtual teams", *Organization Science 10*(6), 1999, pp. 791–815.

[32] Karlova, N.A., and K.E. Fisher, "'Plz RT': A Social Diffusion Model of Misinformation and Disinformation for Understanding Human Information Behaviour", *Proceedings of the ISIC2012*, (2012), 1–17.

[33] Kramer, R.M., "Rethinking Trust", *Harvard Business Review 87*(6), 2009, pp. 68–77.

[34] Kumar, K.P.K., and G. Geethakumari, "Detecting misinformation in online social networks using cognitive psychology", *Human-centric Computing and Information Sciences 4*(1), 2014, pp. 14.

[35] Landreville, K.D., R.L. Holbert, and H.L. LaMarre, "The Influence of Late-Night TV Comedy Viewing on Political Talk: A Moderated-Mediation Model", *The International Journal of Press/Politics 15*(4), 2010, pp. 482–498.

[36] Larson, K., and R.T. Watson, "The Value of Social Media: Toward Measuring Social Meida Strategies", *ICIS 2011 Proceedings*, (2011), 1–18.

[37] Lee, C.S., and L. Ma, "News sharing in social media: The effect of gratifications and prior experience", *Computers in Human Behavior 28*(2), 2012, pp. 331–339.

[38] Lee, F.L.F., "The Impact of Online User-Generated Satire on Young People's Political Attitudes: Testing the Moderating Role of Knowledge and Discussion", *Telematics and Informatics 31*(3), 2014, pp. 397–409.

[39] Lehrer, K., "Testimony and Trustworthiness", In J. Lackey and E. Sosa, eds., *The Epistemology of Testimony*. Clarendon Press, Oxford, 2006, 145–159.

[40] Lin, R., and S. Utz, "The emotional responses of browsing Facebook: Happiness, envy, and the role of tie strength", *Computers in Human Behavior 52*, 2015, pp. 29–38.

[41] Lipton, P., "The Epistemology of Testimony", *Studies in History and Philosophy of Science Part A 29*(1), 1998, pp. 1–31.

[42] McKnight, D.H., and N.L. Chervany, "Trust and distrust definitions: One bite at a time", *Trust in Cyber-Societies 2246*, 2001, pp. 27–54.

[43] McKnight, D.H., and N.L. Chervany, "What trust means in e-commerce customer relationships: An interdisciplinary conceptual typology", *International Journal of Electronic Commerce 6*(2), 2002, pp. 35–59.

[44] Mcpherson, M., L. Smith-lovin, and J.M. Cook, "Birds of a Feather: Homophily in Social Networks", *Annual Review of Sociology 27*, 2001, pp. 415–444.

[45] Messner, M., M. Linke, and A. Eford, "Shoveling Tweets: An Analysis of the Microblogging Engagement of Traditional News Organizations", *International Symposium on Online Journalism*, (2012), 74–87.

[46] Moy, P., M.A. Xenos, and V.K. Hess, "Priming Effects of Late-Night Comedy", *International Journal of Public Opinion Research 18*(2), 2006, pp. 198–210.

[47] Nair, M., "Understanding and Measuring the Value of Social Media", *Journal of Corporate Accounting & Finance 22*(3), 2011, pp. 45–51.

[48] Nunnally, J.C., and I.H. Bernstein, *Pyschometric Theory*, McGraw-Hill, New York, 1994.

[49] Podsakoff, P.M., S.B. MacKenzie, J.-Y. Lee, and N.P. Podsakoff, "Common method biases in behavioral research: a critical review of the literature and recommended remedies.", *The Journal of applied psychology 88*(5), 2003, pp. 879–903.

[50] Salehan, M., and A. Negahban, "Social networking on smartphones: When mobile phones become addictive", *Computers in Human Behavior 29*(6), 2013, pp. 2632–2639.

[51] Shieber, J., *Testimony: A Philosophical Introduction*, Taylor & Francis, New York, New York, USA, 2015.

[52] Shubert, A., and N. Schmidt, "Syrian Refugee Takes Facebook to Court Over Fake News", *CNN*, 2017.

[53] Stewart, K.J., "Trust Transfer on the World Wide Web", *Organization Science 14*(1), 2003, pp. 5–17.

[54] Stolle, D., S. Soroka, and R. Johnston, "When does diversity erode trust? Neighborhood diversity, interpersonal trust and the mediating effect of social interactions", *Political Studies 56*(1), 2008, pp. 57–75.

[55] Thompson, C., "Fake News 101: The New Civics Course in US Schools?", *Associated Press*, 2017.

[56] Tsfati, Y., R. Tukachinsky, and Y. Peri, "Exposure to News, Political Comedy, and Entertainment Talk Shows: Concern About Security and Political Mistrust", *International Journal of Public Opinion Research 21*(4), 2009, pp. 399–423.

[57] Turel, O., "An Empirical Examination of the Vicious Cycle of Facebook Addiction", *The Journal of Computer Information Systems 55*(3), 2015, pp. 83–91.

[58] Verhagen, T., S. Meents, and Y.-H. Tan, "Perceived risk and trust associated with purchasing at electronic marketplaces", *European Journal of Information Systems 15*(6), 2006, pp. 542–555.

[59] Vitak, J., and J. Kim, "'You Can't Block People Offline': Examining How Facebook's Affordances Shape the Disclosure Process", *Proceedings of the 17th ACM conference on Computer supported cooperative work & social computing*, ACM (2014), 461–474.

[60] Wang, H., D. Can, A. Kazemzadeh, F. Bar, and S. Narayanan, "A System for Real-time Twitter Sentiment Analysis of 2012 U.S. Presidential Election Cycle", *Proceedings of the 50th Annual Meeting of the Association for Computational Linguistics*, (2012), 115–120.

[61] Wijnhoven, F., "The Hegelian Inquiring System and a Critical Triangulation Tool for the Internet Information Slave: A Design Science Study", *Journal of the American Society for Information Science and Technology2 63*(6), 2012, pp. 1168–1182.

[62] Wilson, R.E., S.D. Gosling, and L.T. Graham, "A Review of Facebook Research in the Social Sciences", *Perspectives on Psychological Science 7*(3), 2012, pp. 203–220.

[63] Wineburg, S., *Evaluating Information: The Cornerstone of Civic Online Reasoning*, 2016.

[64] Zubiaga, A., and H. Ji, "Tweet, but verify: epistemic study of information verification on Twitter", *Social Network Analysis and Mining 4*(1), 2014, pp. 1–12.