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Optimizing the Presentation of Mental Health Information in Social Media: The Effects of Health Testimonials and Platform on Source Perceptions, Message Processing, and Health Outcomes

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ABSTRACT

Using social media for the purpose of disseminating mental health information is a critical area of scientific inquiry for health communication professionals. The purpose of this study was to investigate whether the presence of a first-person testimonial in educational mental health information placed in Facebook and Twitter messages influenced college students' ($N = 257$) source perceptions, information processing, cognitive elaboration, health information recall, beliefs, and behavioral intentions. Results show that exposure to social media messages that featured mental health information embedded with a testimonial predicted less source homophily and more critical thoughts about the social media source, less systematic message processing, and less cognitive elaboration. Health information recall was significantly impacted by both the social media platform and message content such that participants in the testimonial condition on Facebook were more likely to recall the health facts in those messages whereas participants who viewed the testimonial in Twitter were less likely to recall the facts in those tweets. Compared to those who read Facebook messages, participants who read Twitter messages reported higher levels of systematic message processing. These findings suggest that the integration of health testimonials into social media messages might inadvertently provoke psychological resistance to mental health information, thereby reducing the persuasive impact of those messages.

The investigation of how to optimize the presentation and dissemination of health information is essential to the study of health communication. Central to such inquiry is an examination of how message targeting and the method of message transmission influence health information processing and health outcomes (Hawkins, Kreuter, Resnicow, Fishbein, & Dijkstra, 2008). The ubiquity of online health information seeking is well established: 80% of Internet users report seeking health information in various online sources (Korda & Itani, 2013). Yet there remains a lack of empirical research about the influence of exposure to health messages that appear in social media. The pervasiveness of social media use, such that approximately 71% of U.S. adults use Facebook and another 23% use Twitter, facilitates tremendous opportunity for users and public health professional alike to communicate about a wide array of health topics (Pew Research Center, 2014).

Scholars have paid increasing attention to the topic of mental health information sharing as the recent emergence of partnerships between social media giant Facebook and suicide prevention advocacy groups, like the National Suicide Prevention Lifeline and Prevention Lifeline, offers social media users platforms on which to communicate about mental health (Dyak & Lukensmeyer, 2014). In light of evidence that college students are particularly vulnerable to mental health distress and suicide, some of these partnerships are focused exclusively on targeting mental health

information to college student populations (American College Health Association, 2006; Drum, Brownson, Burton Denmark, & Smith, 2009; Gallagher, 2006). An investigation of the benefits and limitations of using social media for the purpose of disseminating mental health information is a critical area of scientific inquiry for health communication professionals who seek to reduce the social stigma surrounding mental illness and prevent suicide in college student populations.

Of particular interest to the goals of the present study is an investigation of how to optimize the presentation of mental health information in social media platforms targeted to college students. Researchers have long recognized that the design of health messages is critical to engaging target audiences with important health information (Noar, Benac, & Harris, 2007). Message factors, like the presence of health testimonials, and source factors, like the degree of similarity between the source and the target audience, can influence effortful processing of the health information in those messages (Rimer & Kreuter, 2006). Research also suggests that message attention and processing can be influenced by users' perceptions about the medium through which health messages are delivered (Chaiken & Eagly, 1983). The purpose of this study is to investigate whether the presentation of a health testimonial in Facebook and Twitter messages that feature mental health information influences college students' message processing, source perceptions, and mental health beliefs and behavioral intentions.

The Presentation of Health Narratives

A burgeoning corpus of research suggests that the presence of narrative communication is paramount to the efficacy of health messages (Kreuter et al., 2007; Slater, 2002). Narrative communication, defined by the presentation of a sequence of connected events and characters or models, has myriad forms, including testimonials, entertainment-education, journalism, and so on (Kreuter et al., 2007). Unlike the presentation of nonnarrative health information (i.e., factual descriptions of prevalence rates, risk factors, symptoms, conditions, and treatments), health narratives have the capacity to capture and sustain audience attention by relaying health information in the context of a source's (i.e., character or model) personal health experiences (Braverman, 2008; Slater, 2002). Of course, the challenge of presenting mental health narratives in social media platforms like Facebook and Twitter is that the technological features of those platforms restrict the presentation of health narratives. Twitter's 140-character count limit and Facebook's status update design may inhibit users from sharing lengthy, detailed health stories, but both tweets and status updates can be designed to present users' accounts of their personal mental health experiences. Although the strategic use of social platforms to communicate about the topic of mental health may be a relatively novel endeavor for public health professionals, data suggest that Internet users routinely use social networking sites to post comments or queries about health-related topics and follow other people's health information experiences (Fox, 2011). While the technological affordances and uses of social media platforms might restrict users from presenting detailed health narratives, such platforms can and do facilitate the sharing of users' personal health testimonials in a way that promotes enhanced message processing. The purpose of this study is to explore the underlying psychological processes that influence how users respond to the presentation of testimonials embedded with mental health information in both Facebook and Twitter.

The Influence of Health Testimonials on Message Processing

Theoretically, social media messages that feature health testimonials should enhance the persuasive impact of those messages by promoting enhanced message processing. In addition to making the delivery of health information more interesting, the practice of integrating testimonials into health messages is motivated by the goal of creating engaging messages that enhance the relevance of a health topic (Braverman, 2008; Kreuter & Wray, 2003). The integration of testimonials into health information can increase the perception that a health topic is personally relevant in two ways. First, the sharing of personal health experiences can stimulate empathic perspective-taking whereby a message consumer identifies with the person sharing a health testimony (Cohen, 2000). This kind of identification experience can facilitate cognitive and emotional changes such that a person aligns his or her perspective with the person offering the testimonial. Second, health testimonials proffered by sources with whom one can identify increase perceived vulnerability to a health risk or condition

(e.g., depression) (Moyer-Gusé, 2008). It would be easy, for example, for a college student to imagine himself or herself experiencing a bout of depression in the wake of a common environmental stressor after reading about another student's experience of depression following a romantic breakup.

The perception that a message features a personally relevant health topic is an important predictor of message involvement (Quintero Johnson, Harrison, & Quick, 2013). The Elaboration Likelihood Model (ELM), a theoretical framework often applied in the context health persuasion, postulates that health messages are more likely to receive attention and in-depth processing when those messages feature cues to enhance the personal relevance of the message topic (i.e., mental health) (Petty & Cacioppo, 1986). This kind of systematic message processing is critical to the persuasive impact of health messages; evidence suggests that when audiences engage in systematic message processing, defined by careful attention to and consideration of message information, they are more likely to report message-consistent health beliefs, attitudes, and behaviors (Petty & Wegener, 1999).

The presentation of health testimonials can also influence information processing by enhancing message-consistent thoughts. The theoretical premise underlying the strategy of narrative persuasion is that the presentation of testimonials hampers important psychological mechanisms that foster persuasive resistance, including psychological reactance and counterarguing (Moyer-Gusé, 2008; Slater & Rouner, 2002). Because status updates and tweets that feature first-person testimonials should hamper social media users' negative affective responses to persuasive mental health information, social media users should be better able to attend to the mental health information itself. Theoretically, increased attention to the health information should increase cognitive elaboration about the message topic (defined by the number of thoughts about the topic of mental health). Evidence suggests that the presentation of health narratives, in different formats, does indeed promote the production of message-consistent thoughts (Escalas, 2007; Green & Brock, 2000; Niederdeppe, Kim, Lundell, Fazili, & Frazier, 2012). Not only does the production of thoughts about a health message topic have the potential to influence health beliefs, attitudes, and behaviors, research also suggests that health information recall should be enhanced by message features that enhance cognitive elaboration (Nabi, 1999; Petty & Cacioppo, 1979). In this study, we use an open-ended thought-listing task to explore social media users' cognitive elaboration of the topic of mental health and the resultant effects on mental health information recall, beliefs, and behavioral intentions.

The Influence of Health Testimonials on Source Homophily

Social media messages that feature health testimonials may also promote enhanced message processing through the mechanism of source identification. Scholars agree that an important dimension of identification is homophily—the degree to which audience members perceive that they are similar to a message source because of demographic, personality, or other characteristics (Moyer-Gusé, 2008). Social cognitive theory (SCT), which postulates that homophily

motivates attention to sources, is often invoked to describe how homophily influences the process of persuasion (Bandura, 2002). Scholars have long recognized that the process of vicarious learning—the fundamental components of SCT, which describes the capacity for humans to learn and adopt cognitive, attitudinal, and behavioral proclivities by watching others—is enhanced when audiences perceive that a message source is similar to themselves (Cohen, 2001; Rogers & Bhowmik, 1970). Exposure to a health message that features a homophilous source enhances perceived source credibility, health information processing, greater message recall, and health outcomes such as the adoption of health advice, and message-consistent health beliefs, attitudes, and behavioral intentions (Kreuter & McClure, 2004; Wang, Walther, Pingree, & Hawkins, 2008).

In this study, we explore the impact of targeting social media messages about the topic of mental health by creating tweets and Facebook status updates that feature the health testimonial of a homophilous source (i.e., a college student). At the crux of this study is our interest in how to optimize the presentation of mental health information in order to influence social media users' mental health knowledge, beliefs, and behavioral intentions. Extant research supports the premise that social media messages that feature testimonials from homophilous sources should influence users' perceptions about those messages and the message-processing mechanisms that are most critical to the process of health persuasion. In turn, we should expect to find that both perceptions about the source and enhanced message processing have a significant effect on mental health information recall, beliefs, and behavioral intentions. Therefore, we test the following hypotheses:

- H1: The presentation of a testimonial embedded with mental health information in social media messages will enhance users' perceptions of source homophily (a), systematic message processing (b), and cognitive elaboration about the topic of mental health (c).
- H2: The presentation of a testimonial embedded with mental health information in social media messages will enhance users' health information recall (a), mental health beliefs (b), and behavioral intentions (c).

In addition to exploring the effect of social media message design on the processing and persuasive impact of mental health information, we also explore the relationship between source homophily and systematic message processing. Regardless of the impact of message design strategies, evidence suggests that we should expect to find that source homophily enhances social media users' systematic processing of mental health information and that both source homophily and systematic message processing should have a direct effect on the health outcomes of interest. In line with this rationale, we test the following predictions:

- H3: Source homophily will enhance systematic message processing.
- H4: Source homophily and systematic message processing will enhance mental health information recall (a), mental health beliefs (b), and behavioral intentions (c).

The Influence of Social Media Platform

As social media platforms like Twitter and Facebook become popular vehicles for disseminating mental health information, it is important to consider how these platforms might influence users' perceptions about the presentation of health testimonials. Braverman (2008) observed that the persuasive impact of health testimonials is dependent, at least to some extent, on the modality through which those testimonials are delivered. Users' perceptions about the health information in social media are also likely to be influenced by their expectations about the social media platform through which such information is conveyed (Chaiken & Eagly, 1983; Sundar, 2008). For example, Sundar and Nass (2001) found that users' perceptions about online news message sources were impacted regardless of the message content in those messages. Other studies have demonstrated that users' perceptions about the sources of social media messages are influenced by factors such as the recency of communication and the number of a source's followers (Westerman, Spence, & Van Der Heide, 2014, 2012). Research also suggests users generally treat Facebook as a platform to maintain and enhance social networks through personalized messages, whereas Twitter is perceived as a vehicle to convey information to followers who may or may not be affiliated with one's social network (Marwick & Boyd, 2010; Nadkarni & Hofman, 2012). Expectations about the appropriate uses of both Facebook and Twitter might inadvertently invoke negative reactions that counteract the strategic incorporation of health testimonials. The sharing of health testimonials on Facebook might be perceived as a more appropriate use of the media platform, whereas the sharing of personal mental health experiences on Twitter might be perceived as a failure of the source to conform to informal rules about appropriate use of the medium. It is not clear how a source's disclosure of his or her personal experience with a stigmatized health topic—mental illness—might impact users' perceptions about the source (i.e., Facebooker or tweeter), subsequent message processing, and the resultant health outcomes. Therefore, we investigate the following research question:

- RQ1: Does the influence of health testimonials on users' source perceptions and message processing vary by social media platform?

Method

This study employed a 2 (mental health information design: testimonial versus no testimonial) \times 2 (social media platform: Twitter versus Facebook) factorial design to explore the processing and impact of mental health information in social media platforms.

Sample

Undergraduate students ($N = 257$) from a large northeastern public university were recruited to participate in a laboratory study. The age of participants ranged from 18 to 24 years

($M = 20.45$, $SD = 1.73$); 53% were female ($n = 157$) and 46% were male ($n = 120$). Of those who reported ethnic/racial identity, 50% identified as White ($n = 131$), 15% as Latino/Hispanic ($n = 41$), 14% as Black ($n = 38$), 10% as Asian ($n = 28$), 1% identified some other racial/ethnic category ($n = 3$), and 6% chose not to respond ($n = 17$). Approximately 77% of the participants ($n = 200$) reported that English is their native language, 20% said that English is not their native language ($n = 54$), and 1% chose not to respond ($n = 4$).

Procedure

Participants were directed to an on-campus laboratory where they were randomly assigned to a designated computer laptop that displayed a series of Facebook or Twitter messages. After reading the messages, the participants completed an online survey. Once finished with the survey, participants were provided with a fact sheet about local mental health resources and dismissed from the laboratory.

Stimulus

Participants read a series of tweets or status updates that featured either (a) mental health information with a testimonial (MHI + T) from one college student about his or her experience with mental distress or (b) mental health information only (MHIO) that contained facts about college students and mental health without a testimonial. Both the source of the messages (i.e., the tweeter or Facebook status updater, identified as a gender-neutral person named Corey Ashton) and the quality and quantity of health information about college students and mental health (e.g., nearly 20% of all college students experience mental illness, suicide is the second leading cause of death among college students, etc.) were standardized across message condition to prevent potential confounding effects of source and information bias. The profile picture of Corey was blurred to minimize the potential influence of source attractiveness on the participants' responses to the messages. In the MHI + T conditions, participants read about Corey's personal struggle with depression and his or her tweets/status updates featured factual information about college students and mental health. In MHIO condition, Corey's tweets/status updates featured factual information about college students and mental health without any description of his or her own experience with mental illness (see the [appendix](#) for sample messages).

Measures

Thought-Listing Procedure

Immediately after reading the tweets/status updates, participants were prompted to write "everything you remember thinking about while you were reading the messages." The data generated by the thought-listing task were tabulated and coded by two trained research assistants who established reliability using approximately 15% of the thought-listing sample ($n = 40$ surveys). Krippendorff's alpha (often considered the most accurate and conservative intercoder

coefficient) was used to calculate all intercoder reliability statistics (Neuendorf, 2002). Coders first categorized the thoughts into units of analysis, which were comprised of a single thought, generally indicated by the presence of a clause that contained a noun, an adjective, a verb, and punctuation ($\alpha = .92$). In order to create an index of cognitive elaboration, the sum of all the message-relevant thoughts ($M = 4.19$, $SD = 1.83$, range = 1–10) was computed by adding the total number of thoughts from eight categories, including *high cognitive elaboration thought*, which contained rich, vivid details and information indicative of effortful thinking about the message content ($\alpha = .84$); *self-referential thoughts*, defined by a person's thoughts related to his or her own personal experiences ($\alpha = .89$); *source credibility thoughts*, which contained mentions of or references to the credibility of the information proffered by the source (e.g., the tweeter/status updater) ($\alpha = 1.0$); *source critiques thoughts*, which contained mentions of criticisms or questions about the tweeter/status updater for disclosing personal information ($\alpha = .92$); *evaluation of the mental health status of the source thoughts*, which contained questions or comments about the mental health or well-being of the tweeter/status updater ($\alpha = .82$); *mental health-related thoughts*, which contained mentions of the topic of mental health or mental illness ($\alpha = .87$); *mental illness stigma thoughts*, which contained mentions of the social ramifications or difficulty of dealing with mental illness ($\alpha = 1.0$); *mental illness and college students thoughts*, which contained mentions about the prevalence of mental illness (or mental health concerns) in college student populations ($\alpha = .90$); and *health-related behavior thoughts*, which contained mentions of participants' desire to take action related to mental health ($\alpha = 1.0$).

Scaled Instruments

Immediately following the thought-listing procedure, participants completed the following measures, all of which used a 7-point Likert-type scale (where 1 = *strongly disagree* and 7 = *strongly agree*).

Source Homophily

Participants completed a three-item homophily scale, adapted from Andersen and De Mancillas (1978), to evaluate whether the tweeter/status updater was similar to themselves (e.g., "The person making the tweets/status updates is very similar to me") ($\alpha = .71$).

Systematic Message Processing

Participants completed a five-item systematic message processing scale, adapted from Kahlor, Dunwoody, Griffin, Neuwirth, and Giese (2003), to assess whether they were attending to and carefully considering the messages (e.g., "I found myself making connections between the information in the tweets/status updates and what I've read or heard about elsewhere").

Perceived Relevance of Health Topic

Participants completed a three-item scale, adapted from Quintero Johnson et al. (2013), to assess perceptions about the relevance of

the topic of mental health (e.g., “How personally relevant is mental health to you?”) ($\alpha = .80$).

Health Information Recall

Participants completed three health information recall items; two of those items were true/false question about information contained in all of the tweets/status updates (i.e., the percentage of college students who have a mental illness and the fact that mental illness is like a medical condition) and one item was an open-ended question (“what is the second leading cause of death for college students?”). Each participant was assigned a health information recall score, calculated by summing the total number of correct answers on the recall items ($M = 2.12$, $SD = .66$, range = 1–3).

Mental Health Beliefs

Participants completed two mental health belief items: “It is important for college students to take care of their mental health” and “I believe it is important to take care of my own mental health” ($\alpha = .80$).

Behavioral Intentions

Participants completed two items to assess their intentions to seek mental health information (“I plan to talk to someone about my mental health concerns” and “After reading these tweets/status updates, I plan to get more information about mental health”) ($\alpha = .61$).

Demographic Information

Participants completed a short demographic questionnaire about their gender, age, racial/ethnic identification, native language, and Twitter and Facebook use.

Manipulation Check

A four-item manipulation check, adapted from Lee and Oh (2011), was administered to assess whether the message manipulation was effective. Using a Likert-type scale ranging from 1 to 7, participants rated the tweets/status updates on four dimensions: not story-like/story-like; impersonal/personal; public/private; and non-intimate/intimate ($\alpha = .75$). An independent-sample *t*-test confirmed that participants in the MHI + T condition ($M = 4.46$, $SD = 1.05$) were more likely to perceive that the tweets/status updates contained “personal” instead of “public” health information than participants in the MHIO condition ($M = 4.01$, $SD = .09$), $t(231) = -2.86$, $p < .00$, $d = .44$.

Results

Analytic Procedure

To test the predicted relationships between the message factors and the main variables of interest, we conducted analysis of covariance to control for the direct and interactional effects of both the health information presentation manipulation (e.g., MHI + T versus MHIO) and social media platform (Twitter or Facebook), controlling for the influence of gender, racial/ethnic identification, native speaking language, Twitter/

Facebook use, and the perception that the topic of mental health has personal relevance.

The Influence of the Experimental Manipulations on Source Perceptions

The first analysis of covariance (ANCOVA) assessed the effect of the experimental manipulations on source homophily. There was no significant interaction between the health information and social media conditions, $F(1, 192) = .95$, $p = .05$, $\eta_p^2 = .01$, and no significant main effect for social media platform, $F(1, 192) = .68$, $p > .05$, $\eta_p^2 = .00$. However, there was a significant main effect for health information presentation, $F(1, 192) = 10.59$, $p < .00$, $\eta_p^2 = .05$. A contrast analysis of the differences among health information conditions, using a Bonferroni correction for familywise error ($M_{dif} = .54$, $p < .00$), revealed that participants in the MHI + T conditions reported significantly less source homophily ($M = 2.35$, $SE = .10$) than participants in the MHIO conditions ($M = 2.89$, $SD = .13$). Therefore, H1a was not supported.

To answer RQ1, we explored the influence of the message and media platform manipulations on perceptions about the information source. We created a composite score of participants' critical thoughts about the source using the three thought-listing categories including thoughts about the source credibility, the source's mental health status, and negative evaluations of the source ($M = .74$, $SD = .75$, range = 0–2). The ANCOVA revealed no significant interaction between health information and social media conditions on the frequency of participants' critical thoughts about the source, $F(1, 193) = 1.44$, $p > .05$, $\eta_p^2 = .01$, nor was there a significant main effect for the influence of the social media platform, $F(1, 193) = .85$, $p > .05$, $\eta_p^2 = .01$. However, there was a significant main effect for the influence of health information presentation, $F(1, 193) = 38.81$, $p < .00$, $\eta_p^2 = .17$. Using the Bonferroni correction for familywise error, the contrast test ($M_{dif} = .65$, $p < .00$) revealed that participants in the MHI + T condition ($M = .99$, $SE = .06$) generated significantly more critical thoughts about the source than those in the MHIO condition ($M = .33$, $SE = .08$).

The Influence of the Experimental Manipulations on Systematic Message Processing

The next ANCOVA, conducted to examine the influence of the main manipulations on systematic message processing, revealed no significant interaction between health information and social media conditions, $F(1, 193) = .00$, $p > .05$, $\eta_p^2 = .00$. There was a significant main effect for health information presentation, $F(1, 193) = 3.62$, $p < .05$, $\eta_p^2 = .02$. Using the Bonferroni correction for familywise error, the contrast test revealed a significant difference ($M_{dif} = .35$, $p < .05$): participants in the MHI + T conditions ($M = 3.93$, $SE = .11$) reported less systematic message processing than participants in the MHIO conditions ($M = 4.29$, $SE = .14$). Therefore, H1b was not supported. The results also revealed a significant main effect for social media platform, $F(1, 193) = 11.17$, $p < .00$, $\eta_p^2 = .05$; the Bonferroni contrast test ($M_{dif} = .64$, $p < .00$) revealed that participants in the Twitter condition reported more systematic message processing ($M = 4.34$, $SE = .12$) than participants in the Facebook condition ($M = 3.78$, $SE = .14$).

The Influence of the Experimental Manipulations on Cognitive Elaboration

To test the influence of the experimental manipulations on cognitive elaboration, we examined the influence of both the message content and the message platform on the frequency with which participants generated high cognitive elaboration thoughts, self-referential thoughts, and thoughts about the topic of mental health. An ANCOVA revealed no significant interaction between the health information and social media conditions on high cognitive elaboration thoughts, $F(1, 193) = 1.28, p > .05, \eta_p^2 = .00$, nor was there a main effect for the influence of media platform, $F(1, 193) = .46, p > .05, \eta_p^2 = .00$. However, there was a significant main effect for the influence of health information presentation, $F(1, 193) = 4.64, p < .05, \eta_p^2 = .02$. Using the Bonferroni correction for familywise error, the contrast test revealed a significant difference ($M_{diff} = .16, p < .05$): Participants in MHI + T conditions ($M = .37, SE = .04$) generated significantly fewer high cognitive elaboration thoughts than participants in the MHIO conditions ($M = .58, SE = .05$).

A similar pattern emerged for the frequency of self-referential thoughts; an ANCOVA revealed that there was no significant interaction between the health information and social media conditions on the frequency of self-referential thoughts, $F(1, 193) = .48, p > .05, \eta_p^2 = .00$, nor was there a significant main effect for media platform ($F(1, 193) = .77, p > .05, \eta_p^2 = .00$). However, there was a significant main effect for health information presentation, $F(1, 193) = 5.05, p < .00, \eta_p^2 = .02$. Using a Bonferroni correction for familywise error, the contrast test ($M_{diff} = .13, p < .05$) revealed that participants in the MHI + T conditions reported significantly fewer self-referential thoughts ($M = .14, SE = .03$) than participants in the MHIO conditions ($M = .27, SD = .04$).

To explore the influence of the main manipulations on cognitive elaboration about the topic of mental health, we created a composite score of the number of thoughts that each participant had in the four health-related thought-listing categories: mental health-related thoughts, mental illness stigma thoughts, college students and mental illness thoughts, and mental health-related behaviors thoughts. On average, participants reported 1.23 thoughts about the topic of mental health ($SD = .93$, range = 0–3). The ANCOVA revealed no interaction between the health information and social media conditions on cognitive elaboration about the topic of mental illness, $F(1, 193) = 1.18, p > .05, \eta_p^2 = .01$, nor was there a significant main effect for social media platform, $F(1, 193) = .32, p > .05, \eta_p^2 = .00$. There was a significant main effect for the influence of health information presentation, $F(1, 193) = 16.75, p < .00, \eta_p^2 = .08$. The Bonferroni contrast test revealed a significant difference ($M_{diff} = .56, p < .00$): Participants in the MHI + T conditions reported significantly fewer thoughts about the topic of mental illness ($M = 1.01, SE = .08$) than participants in the MHIO conditions ($M = 1.57, SD = .11$). Therefore, H1c was not supported.

The Influence of the Experimental Manipulations on Health Outcomes

Next, an ANCOVA was conducted to explore the influence of the manipulations on health outcomes. The results showed a significant interaction between the health information and social media conditions on recall of health information, $F(1, 193) = 12.24, p < .00, \eta_p^2 = .06$ (for the interaction effect see Figure 1). Because there was no significant main effect for health information presentation, $F(1, 193) = 1.33, p > .05, \eta_p^2 = .00$, H2a was not supported.

There was a significant main effect for social media platform, $F(1, 193) = 14.40, p < .00, \eta_p^2 = .07$, and the Bonferroni contrast test ($M_{diff} = .37, p < .00$) revealed that participants in the Twitter conditions had higher health information recall scores ($M = 2.25, SE = .06$) than participants in the Facebook conditions ($M = 1.87, SE = .07$). Another ANCOVA was conducted to explore the influence of the manipulations on mental health beliefs. The results revealed no significant interaction between health information and social media conditions on mental health beliefs, $F(1, 193) = 2.36, p > .05, \eta_p^2 = .01$, nor was there a significant main effect for the influence of health information presentation, $F(1, 193) = 1.37, p > .05, \eta_p^2 = .00$, or social media platform, $F(1, 193) = 1.18, p > .05, \eta_p^2 = .00$. Therefore, H2b was not supported.

The next ANCOVA was conducted to explore the influence of the manipulations on mental health behavioral intentions. The results revealed no significant interaction between health information and social media condition mental health behavioral intentions, $F(1, 193) = .42, p > .05, \eta_p^2 = .00$, nor was there a significant main effect for the influence of health information presentation, $F(1, 193) = .43, p > .05, \eta_p^2 = .00$, or social media platform, $F(1, 193) = .07, p > .05, \eta_p^2 = .00$. Therefore, H2c was not supported.

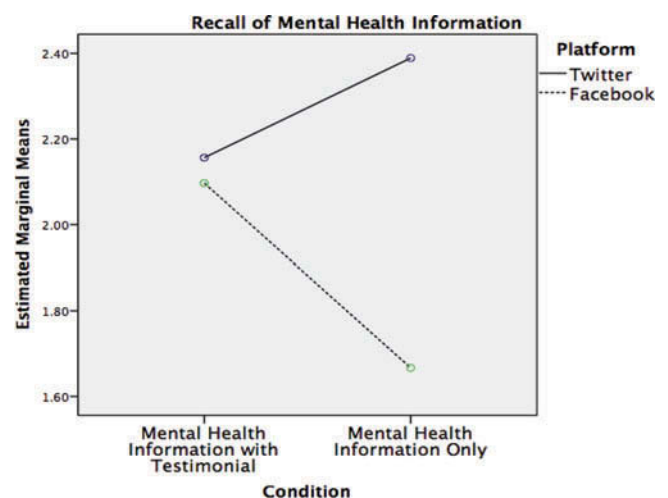


Figure 1. The interaction between health information presentation and social media platform on health information recall.

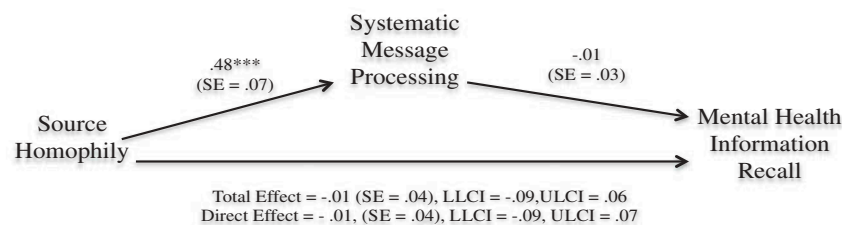
The Relationship and Influence of Source Homophily and Systematic Message Processing

To answer test the remaining hypotheses, we used the SPSS macro PROCESS (see Hayes, 2009; Preacher & Hayes, 2008) to test multiple mediation models by obtaining estimates of total and specific indirect effects of both source homophily and systematic message processing on mental health information recall, health beliefs, and behavioral intentions (controlling for the influence of gender, racial/ethnic identification, native speaking language, Twitter/Facebook use, the perception that the topic of mental health has personal relevance, and experimental condition). The models revealed that source homophily was a significant predictor of systematic message processing. Therefore, H3 was supported. Neither source homophily nor systematic message processing had a direct or indirect effect on mental health information recall (see Figure 2). Therefore, H4a was not supported. Although source homophily had neither a direct or indirect effect on participants' mental health beliefs, systematic message processing had a direct effect on health beliefs (see Figure 3). Therefore, H4b received partial support. Finally, both source homophily and systematic message processing had a direct and indirect effect on behavioral intentions (see Figure 4). It appears that message processing mediated the influence of source homophily on behavioral intentions. Therefore, H4c was supported.

Discussion

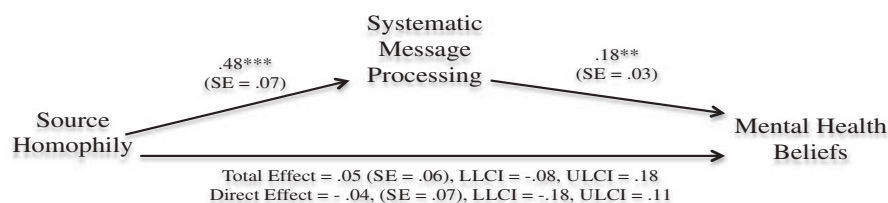
In light of growing trend of using social media to target college students with mental health information, the purpose of this study was to explore the influence of mental health testimonials, over and above mental health information, in Twitter and Facebook messages on perceptions about the social media sources and degree to which those messages induced systematic message processing, cognitive elaboration about the topic of mental health, and the resultant mental health information recall, beliefs, and behavioral intentions. The data presented here support long-standing theoretical assumptions about the relationships among source perceptions, message processing, and persuasive message effects. However, these data also suggest that the strategy of integrating a source's personal health experiences into social media messages provoked psychological resistance to mental health information, thereby reducing the persuasive impact of those messages.

Participants who viewed messages with health testimonials reported less source homophily and generated more critical thoughts about the social media source. At first glance, these findings appear to challenge conventional wisdom that the inclusion of personal health experiences should enhance source similarity and credibility. However, it is possible that both the stigmatized nature of the health topic and



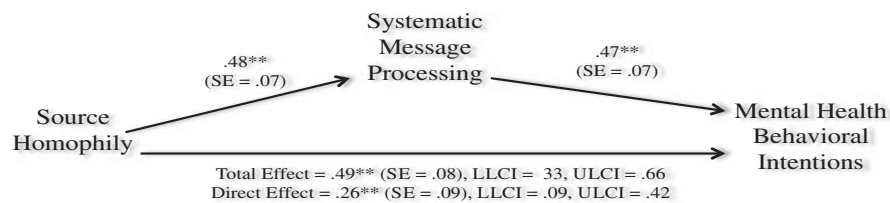
Notes. Based on 5000 bootstrap samples. LLCI = lower limit confidence interval of 95% and ULCI = upper limit confidence interval of 95% (bias corrected and accelerated).
* $p < .05$ and ** $p < .001$

Figure 2. The estimated mediation model (unstandardized β and SE) for mental health information recall.



Notes. Based on 5000 bootstrap samples. LLCI = lower limit confidence interval of 95% and ULCI = upper limit confidence interval of 95% (bias corrected and accelerated).
* $p < .05$ and ** $p < .001$

Figure 3. The estimated mediation model (unstandardized β and SE) for mental health beliefs.



Notes. Based on 5000 bootstrap samples. LLCI = lower limit confidence interval of 95% and ULCI = upper limit confidence interval of 95% (bias corrected and accelerated).
 $* p < .05$ and $** p < .001$

Figure 4. The estimated mediation model (unstandardized β and SE) for mental health behavioral intention.

participants' perceptions about the appropriate uses of the social media platforms like Twitter and Facebook to communicate about mental health worked together to produce a reactive psychological distancing effect. Exposure to messages that emphasized the source's personal experiences with mental health distress may have evoked psychological discomfort with the topic, and perhaps their own experiences of mental health distress, which then led to a kind of psychological distancing from the message source (i.e., the Facebooker/tweeter). Researchers have long recognized that cognitive dissonance, because it heightens psychological discomfort, can be an unintended response that negatively influences the process of health persuasion (Cho & Salmon, 2007).

It is also plausible that the college student status was a weak source of homophily and therefore hampered the effect of the message manipulation on participants' homophily judgments. However, researchers have long recognized that socio-demographic similarities—like those that arise from shared social status and organizational membership—are the foundation of homophilous relationships and interactions (McPherson, Smith-Lovin, & Cook, 2001). Perhaps other factors, like the message modality, weakened participants' attention to their shared similarity with the message source. It is reasonable that participants reported less source homophily simply because they did not know the source (i.e., Corey Ashton)—a product of the experimental design of the present study that might have raised participants' suspicions about the credibility and appropriateness of Corey's mental health information-sharing behavior with unknown social media users.

Here, it is important to note that by itself, source homophily was an important predictor of systematic message processing. Participants who perceived that the social media source (i.e., Tweeter, Facebooker) was similar to themselves were more likely to report effortful information processing. While this finding supports the importance of creating mental health messages that enhance viewers' perception that the social media source is similar to themselves, the findings in this study demonstrate the complexity of disentangling the relationship between users' responses to social media message content, health information processing, and the resultant message effects.

Both the design of the mental health information and the platform through which that information was delivered influenced systematic message processing. Participants who viewed Facebook and Twitter messages with health testimonials were less likely to report systematic message processing than those who viewed mental health information without a first-person testimonial. Interestingly, participants who viewed the Twitter messages were more likely to report systematic message processing than those who viewed Facebook messages. It is possible that the integration of testimonials into mental health information might inhibit the users from engaging in effortful message processing because the presence of this kind of personal information provokes a negative response to the message source (as evidenced in this study). If the audience's perceptions about a message source is the cornerstone upon which all subsequent message processing factors depend, as the ELM and other theories of health persuasion postulate, then the presence of a homophilous source that induced a reactive psychological distancing effect likely inhibited systematic message processing (Moyer-Gusé, 2008; Petty & Cacioppo, 1986).

The finding that participants in the Twitter message conditions reported higher levels of systematic message processing supports the notion that social media users interact with social media messaging in ways that reflect their perceptions about the function of those social media platforms (Marwick & Boyd, 2010; Nadkarni & Hofman, 2012). In the strategic design and dissemination of mental health information, health communication professionals must take into account how social media platforms might inadvertently affect users' processing of targeted health information.

In light of evidence that the presentation of health testimonials in both Twitter and Facebook predicted less systemic message processing, it is not surprising that this message design strategy was also associated with a reduction in participants' cognitive elaboration. Compared to participants in the MHIO conditions, participants in the MHI + T conditions were less likely to generate high cognitive elaboration, self-referential, and mental health topic-related thoughts. This finding reflects the long-standing theoretical assumption that message involvement is a necessary condition for influencing

audience's thoughts about a health topic (Cacioppo & Petty, 1979). One strength of the present study is our exploration of the impact of the experimental manipulations on the production of message-related thoughts. The use of an open-ended thought-listing procedure to explore participant's thoughts about the social media message he or she viewed enhances our confidence in the finding that cognitive elaboration was negatively impacted by the presentation of health testimonials.

The influence of the mental health presentation on participants' mental health information recall was significantly impacted by both social media platform and message content such that participants in the MHI + T condition on Facebook were more likely to recall the health facts in those messages whereas participants who viewed the MHI + T on Twitter were less likely to recall the facts than participants in the MHIO condition. These findings attest to the importance of considering how both message design and modality impact the effectiveness of health messages. Despite evidence that suggests that health information that features testimonials can be more persuasive and involving, these findings reveal the importance of considering how message modality interacts with message design. These data support the notion that because Twitter is often conceived of as an information-sharing platform, Twitter users might be distracted by the presentation of health information that features personal health information (i.e., narratives) (Marwick & Boyd, 2010; Nadkarni & Hofman, 2012). Facebook, on the other hand, is often perceived as a platform designed to allow users to share personal information. The strategic placement of mental health information that features health testimonials does not distract Facebook users from attending to the health information itself (as appears to be the case with Twitter messages).

Contrary to prediction, neither source homophily nor systematic message processing predicted health information recall. This finding contradicts the theoretical assumption that both the conditions that enhance message involvement and message involvement itself should influence the persuasive impact of health messages. However, these results echo findings in a recent study that revealed a negative association between audiences' systematic message processing of health narratives and health information recall (Quintero Johnson et al., 2013). The use of a post-message-exposure health recall measure limits our ability to ascertain whether the social media messages themselves or participants' preexisting mental health knowledge reduced the impact of message processing on mental health information recall.

Participants' mental beliefs and behavioral intentions were not influenced by health testimonials or social media platform. The cross-sectional, single-exposure design of this experiment may have limited the impact of the experimental conditions on these particular health outcomes. Ideally, public health efforts to present mental health information on social media platforms occur over an extended period of time to ensure that target audiences will have consistent and repeated exposure to messages. It is also possible that unlike health information recall, which appears to be impacted directly by message design and modality, mental health beliefs and

behavioral intentions are influenced directly by the ways in which social media users process health information (regardless of how that information is delivered). Although source homophily did not predict social media users' mental health beliefs, systematic message processing did. This finding suggests that by itself, source homophily may not be a requisite condition for influencing social media users' beliefs about the topic mental health. Instead, it may be more important to enhance message and exposure conditions that optimize effortful message processing.

The finding that both source homophily and systematic message processing predicted mental health-related behavioral intentions is consistent with theoretical predictions, albeit surprising in the context of the aforementioned results. It is possible that both source homophily and systematic message processing prompted participants to reflect on their own mental health needs, thereby stimulating the desire to engage in future mental health information seeking and discussing their mental health concerns with another person. Interestingly, the data also indicate that systematic message processing mediated the impact of source homophily on behavioral intentions. These findings suggest that the impact of source homophily is, to some degree, dependent on whether social media users actually attend to the health information in social media messaging. Public health efforts to educate college students about mental health are impacted by both message design and message processing factors. Put together, these findings reveal the importance of both social media users' perceptions about mental health information sources and their effortful processing of that information.

Limitations and Future Directions

These findings have practical implications for health communication professionals who use social media platforms to communicate about mental health: It is important to consider how conventional persuasive message strategies, like the presentation of personal health experiences, might inadvertently reduce message effectiveness. It is important to acknowledge that the cross-sectional nature of this study, coupled with the presentation of single health message topic to small sample of college student from one university, limits the generalizability of the findings presented here. Despite these limitations, these data illumine our understanding of the process of health persuasion in the context of social media messaging. Future studies should seek to explore how message design strategies in social media messaging, like the inclusion of health testimonials, impact social media users' perceptions and health information processing in other health contexts.

Researchers should also seek to enhance their methodological approach to the study of health information presentation in social media contexts by incorporating a more nuanced investigation of how users' perceptions about social media platforms influence health information processing and persuasive health outcomes. The experimental manipulations used in the present study—both the targeting of mental health information to a college student population and the presentation of those messages in media platforms that are increasingly popular among

college students—illustrate the complexity of communicating about the topic of mental health in ways that will effectively influence mental health knowledge, beliefs, and behavioral intentions. Ideally, the findings presented here will aid public health professionals in their efforts to communicate with college students and ameliorate the social stigma that continues to pervade the topic of mental illness.

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Appendix: Sample Messages

