How do nonprofit organizations (NPOs) effectively engage with the public on social media? Examining the effects of interactivity and emotion on Twitter

Yafei Zhang

School of Journalism and Communication, Renmin University of China, Beijing, China

Chuqing Dong

AD+PR Department, College of Communication Arts and Sciences, Michigan State University, East Lansing, Michigan, USA, and

Yuan Cheng

Humphrey School of Public Affairs, University of Minnesota Twin Cities, Minneapolis, Minnesota, USA

Abstract

Purpose – This study seeks to understand the communication factors associated with effective social media for nonprofit organizations (NPOs). Specifically, the study investigated how interactive and emotional communication strategies influence public engagement in different ways, and how the effects differ by service-oriented and other types of NPOs.

Design/methodology/approach – Using computer-assisted textual and emotional analyses, the authors examined the functional interactivity, contingency interactivity and emotion elements of 301,559 tweets from the 100 largest US nonprofits. Negative binomial regression was applied to test the relationships among these elements and public engagement on Twitter (i.e. *likes* and *retweets*).

Findings – Findings revealed negative effects of functional interactivity on *likes*, negative effects of contingency interactivity on *likes* and *retweets* but a positive effect of functional interactivity on *retweets*. The findings also showed negative effects of emotion valence on *likes* and *retweets* but positive effects of emotion strength on *likes* and *retweets*. There were varying effects of interactivity and emotion on public engagement for service-oriented and other types of NPOs.

Originality/value – This study advances the nonprofit social media scholarship in several ways. First, this study suggests a clear yet largely ignored distinction in the effects of functional and contingency interactivity on public engagement. Second, this study is an early attempt to examine the role and impact of emotion elements in nonprofit social media success without downplaying the role of interactivity. Third, this study is one of the earliest attempts to include interaction effects for different types of NPOs. Last, this study contributes to the organizational social media use research by demonstrating the benefits of computer-assisted approaches in processing text data on social media. From a practical perspective, this study provides strategic guidelines for NPOs to design effective communication contents and improve their public engagement on social media.

Keywords Public engagement, Social media, Computational approach, Nonprofit communication

Paper type Research paper

The changing demographics and the turbulent economic environment have pushed nonprofit organizations (NPOs) to increase their social visibility and engage with the wider public to further pursue their organizational mission, increase trustworthiness, maintain long-term sustainability in the market and create greater social impact (Campbell *et al.*, 2014; Guo and Saxton, 2014; Lai and Fu, 2020; Lee, 2021; Saffer *et al.*, 2019; Tao *et al.*, 2021; Taylor, 2021).

Social media platforms (e.g. Facebook and Twitter) have become an increasingly prominent space for nonprofits to facilitate two-way communication with the public via interactive and dialogic features (Brubaker and Wilson, 2018; Cho et al., 2014; Chung et al., 2020; Wang and Yang, 2020). Recent statistics show that more than half of those who engaged with NPOs on social media ended up supporting the organizations in some way, and 18% of donors worldwide used Facebook fundraising tools to make donations (Nonprofit Source, 2018). Compared to for-profit organizations, nonprofits are more proactive in using social media because it significantly facilitates nonprofits' capacity and effectiveness in achieving their missions, soliciting donations and mobilizing public support for advocacy (Barns and Andonian, 2011; Smith, 2018). In addition, the real-time nature and the lower cost of public communications using social media are beneficial for nonprofits with constrained organizational resources (Lovejoy and Saxton, 2012; Knox and Gruar, 2007). Furthermore, social media has great potential to amplify the social impact of nonprofits by facilitating public engagement and building nonprofit-public relationships and social change (Saffer et al., 2019). Thus, the nonprofit sector has increasingly adopted social media as a communication channel (Campbell and Lambright, 2020; Chung et al., 2020; Xu and Saxton, 2019; Young, 2017; Wang and Yang, 2020).

NPOs, however, still face numerous challenges in implementing social media, including limited human resources, professional knowledge of social media management and flexibility in their organizational policy (Maxwell and Carboni, 2014). A recent Nonprofit Communications Trends report (Miller, 2020) indicated that although NPOs have invested considerable time on social media, they barely understand how to strategically use social media to achieve their goals. Thus, understanding how to maximize the value of social media and strategically and effectively engage with the public is a timely concern for both nonprofit scholars and practitioners.

Recent studies have identified Twitter as an effective platform for nonprofits to engage with the public, and thus, researchers have begun to explore NPOs' social media strategies (Chung et al., 2020; Taylor, 2021; Wang and Yang, 2020). Despite their valuable insights, these studies have limitations in either focusing on specific types of NPOs (Chung et al., 2020; Taylor, 2021) or relying on small datasets (Wang and Yang, 2020). As a result, these studies have not presented a comprehensive picture of the effectiveness of NPOs' strategic social media use. In addition, these studies have primarily focused on the interactive functions provided by Twitter without considering the role of emotions in the message content. It is important to address this missing piece of the puzzle because emotions are frequently incorporated into organizational social media messages and can significantly impact the public's attention and perceptions, as documented in previous social media literature (Stieglitz and Dang-Xuan, 2013). In the nonprofit management literature, emotions have been recognized as a key factor for mobilizing volunteers and donations for nonprofits (Paxton et al., 2020) and for fostering effective nonprofit leadership (Silard, 2018). However, emotions have rarely been studied from a nonprofit communication perspective in the social media context. Thus, this study argues that it is worthwhile to explore the understudied aspect of how emotions in NPOs' tweets affect public engagement on social media.

To fill the void, this study examined the communication strategies that the 100 largest NPOs (Forbes, 2019) employ to engage their stakeholders on Twitter. By analyzing 301,559 tweets using a computational approach, this study investigated the different roles of interactivity (i.e. functional and contingency) and emotion elements (i.e. valence and strength) in driving different levels of public engagement on Twitter. Theoretically, this paper contributes to the scant literature by identifying the critical role of emotions in triggering NPOs' public engagement on social media. In addition, compared to the predominant discussions on interactivity highlighting the technological features provided by social media platforms (e.g. URLs, hashtags, mentions) (e.g. Guo and Saxton, 2014; Ihm, 2019), our study

paid more attention to contingency interactivity (Sundar *et al.*, 2003) and emphasized the effectiveness of message-level interactions with the online public (e.g. a reply). We also identified how using interactivity and emotion strategies provide different benefits for service-oriented NPOs compared to other types of NPOs. From a practical perspective, considering that NPOs are interested in posting engaging content on social media (Miller, 2020), these findings provide much needed strategic guidelines for NPOs on effective engaging content to improve their relationship management on social media (Campbell and Lambright, 2020; Smith, 2018; Young, 2017).

Literature review
Public engagement on social media
Engagement is a multifaceted concept and has been defined in various ways (Dhanesh, 2017; Johnston and Taylor, 2018). For instance, Johnston (2018) defined public engagement as a dynamic process capturing psychological and behavioral connections and interactions between individuals and organizations. Public engagement is also conceptually captured by three dimensions: affective engagement, cognitive engagement and behavioral engagement (Dessart, 2017; Johnston and Taylor, 2018; Kim and Yang, 2017). Saxton and Waters' (2014) study also conceptualized public engagement as immediate and real-time behavioral responses measured by *likes*, comments and shares. Similar to Saxton and Waters (2014), most current studies have focused on the behavioral dimension when conceptualizing public engagement on social media (Chen, 2018). Behavioral measures of public engagement are explicit outcomes measuring how well nonprofits manage the relationship between the organization and the public on social media (Saxton and Waters, 2014). Based on these concepts, we draw from Men and Tsai's (2014) conceptualization of public engagement, which is defined as: "a behavioral construct with hierarchical activity levels, from passive message consumption to active two-way conversation, participation, and online recommendation" (p. 419). *Likes* and *retweets* are proxies of public engagement on Twitter (Watkins and Lewis, 2014; Dhanesh, 2017).

To further articulate the hierarchical levels of public engagement, Cho *et al.* (2014) and Ji *et al.* (2019) differentiated the number of *likes*, the number of shares and the number of comments as three levels of engagement from low to high. *Like* is a relatively easy way to express enjoyment and recognition, while *share* requires the public to become voluntary ambassadors to spread information about the organization (Cho *et al.*, 2014). In a similar vein, from a public attention perspective, Guo and Saxton (2018) suggested that the number of *likes* and the number of *retweets* represent two different levels of tangible feedback encouraging the public to give to NPOs. Retweeting is a reciprocal behavior of "giving and receiving attention," whereas liking functions as a bookmark that enables users to "keep useful tweets for future reference" (Guo and Saxton, 2018, p. 21). In addition, *retweets* indicate that "engaged audiences experience a desire to share the content with others online, offline or through both methods" (Hopp and Gallicano, 2016, p. 132). These studies have highlighted the differences in users' intentions when retweeting or liking organizations' tweets.

Previous research has suggested that retweeting is a higher level of engagement than liking and commenting (Goggins and Petakovic, 2014; Kaur *et al.*, 2019; Kim and Yang, 2017). The *like* button is the quickest way to show users' agreement and positive feedback toward organizations' social media content; however, it is a minimal and symbolic action (Kaur *et al.*, 2019; Sumner *et al.*, 2018). Pelletier and Horky (2015) indicated that social media users were eight times more likely to like a post than share it and comment on it. In contrast, when users decide to retweet a post, it will appear on their Twitter account (Huang and Yeo, 2018). Retweeting implies users' endorsement of the original content from organizations (Saffer *et al.*, 2019). Thus, individuals or organizations are more likely to retweet when messages are

congruent with their intended audience and with their identity (Huang and Yeo, 2018; Kim et al., 2014; Smith and Gallicano, 2015).

Based on the different cognitive efforts and attention levels, this study categorizes NPOs' public engagement on social media into two levels (Guo and Saxton, 2018; Ji et al., 2019). The first level of public engagement, also referred to as the lowest level of engagement, reflects limited cognitive effort and the lowest attention the public can give in responding to a message. The second level of public engagement, known as a higher level of engagement, requires greater information processing and attention from the public.

Strategies used to engage with the public on social media
The majority of previous research has focused on how organizations utilize social media to build relationships with the public and foster engagement. Social media provides an ideal platform for communication-based public engagement and has been implemented in various types of nonprofit activities including fundraising, information dissemination and advocacy (e.g. Auger, 2013; Campbell et al., 2014; Guo and Saxton, 2018; Lovejoy and Saxton, 2012; Waters et al., 2009). For example, Lovejoy and Saxton (2012) conducted a content analysis study to examine the top 100 NPOs' use of Twitter and identified three main stakeholder communication strategies:1) information sharing, which focuses on news and relevant activities about the organization; 2) community building, which aims to build rapport with stakeholders and create networks; and 3) advocating action, which encourages followers to donate, volunteer and participate in events.

This typology has been adopted to understand NPOs' engagement efforts on social media in many recent studies (Campbell and Lambright, 2020; Chung et al., 2020; Taylor, 2021). For example, Chung et al. (2020) analyzed an NPO's tweets, Women WhoCode and concluded that the public was more likely to engage with the NPO's information tweets than community and action tweets. Taylor (2021) also analyzed 626 tweets of a grassroots NPO from Twitter Chat and found that information sharing and community building accounted for the majority of the tweets. Campbell and Lambright (2020) compared NPOs' Facebook and Twitter use and suggested that NPOs mostly used Facebook for sharing information and Twitter for calling for action. These studies typically used content analysis and manual coding on small datasets to scrutinize the NPOs' information, community and action engagement in their social media content. While these studies provided insights on NPOs' public engagement efforts, they have been rarely examined the effects and effectiveness of the engagement.

Scholars have increasingly shifted their focus from describing public engagement on social media to investigating the effectiveness of public engagement using a quantifiable approach (e.g. Chung et al., 2020; Cho et al., 2014; Guo and Saxton, 2018; Ihm, 2019; Lam and Nie, 2020; Saffer et al., 2019; Wang and Yang, 2020). For example, Wang and Yang (2020) examined sample tweets of Fortune 500 and top 100 NPOs. They found that tweets providing informational usefulness were more likely to be liked and retweeted compared to those incorporating dialogic features. Lam and Nie (2020) examined 288 NPOs' Facebook posts in Hong Kong and showed that information-related posts were more likely to obtain *likes*, and action-related posts could generate more *shares* from the public. Chung et al. (2020) examined factors contributing to retweetability and found that URLs and emojis could effectively increase the number of *retweets*. Saffer et al. (2019) also employed the network approach and suggested that NPOs in a network where neighbors were well-connected were more likely to receive *retweets*.

Despite the contributions of these studies to NPOs' public engagement on social media, there are two research gaps in the extant literature. First, the literature did not distinguish functional interactivity from contingency interactivity. Thus, it is worthwhile to examine the varying effects of these two distinct concepts under the construct of interactivity (Sundar et al., 2003) on invoking public engagement on social media. Second, to the best of our

knowledge, no studies have examined the effectiveness of emotions in NPOs' social media messages. As a result, little is known about how the public responds to emotions as a communication tactic in NPOs' social media content. This study aims to address these two gaps. We propose the hypotheses and the research question in the following sections.

Interactivity on social media: functional and contingency
Interactivity on social media can be conceptualized from a functional interactivity view or a contingency view (Sundar *et al.*, 2003). Functional interactivity is defined as "an interface's capacity for conducting a dialogue or information exchange between users and the interface" (Sundar *et al.*, 2003, p. 33). From a functional view, interactivity resides in the technological affordances of the medium and highlights human-to-computer interactions (Ji *et al.*, 2019). That is, interactivity on social media is largely enabled by the technological features on the platform. For example, Li and Li (2014) suggested that functional interactivity is affected by the speed that content can be manipulated by the technological affordances of a social media platform. Previous studies have used hyperlinks (URLs) (Sundar *et al.*, 2010), mentions (Ji *et al.*, 2019) and hashtags (Ji *et al.*, 2019) to operationalize functional interactivity on social media. Hyperlinks are usually embedded in a message so the public can link to external pages if they are interested in knowing more details about certain aspects of the organization or relevant events (e.g. Matheson, 2004; Park *et al.*, 2016). Mentions (@) narrow the scope of stakeholder involvement to specific users and expand message visibility. By using a mention, dialogue can be initiated between the NPOs and the user, but the interactivity can also be viewed by the public who follow the nonprofit account (Lovejoy *et al.*, 2012). Hashtags allow messages to spread quickly among a group with shared interests. Incorporating hashtags provides "community cues" (Xu and Saxton, 2019, p. 44), indicating the organization's active presence in conversations on social media. Previous studies have found that the more functional features a website provides, the higher the interactivity levels (Sundar *et al.*, 2003). On social media, technological affordances such as URLs, mentions and hashtags enable more and wider connections with additional information and resources, stakeholders and communities. Thus, this study proposes the following hypothesis:

H1. Higher levels of functional interactivity are more likely to generate a) first-level (*likes*) (H1a) and b) second-level (*retweets*) (H1b) public engagement on Twitter.

Contingency interactivity focuses on message-level interactivity highlighting how messages flow between users through reactions and responsiveness (Li and Li, 2014). Following previous literature, this study defines contingency interactivity as the "subsequent messages [that] are contingent or dependent on previous messages" (Sundar *et al.*, 2003, p. 35). *Replies* and *retweets* are key indicators of message-level interactivity on Twitter, given that they enable NPOs to respond to previous tweets either from other organizations or individuals. The reply feature allows a user to directly respond to and address a previous tweet from another user (Li and Li, 2014). Retweet (RT) allows a user to repost tweets from another user while acknowledging that user (Lovejoy *et al.*, 2012). People can also add their thoughts when retweeting others' messages. Both can foster two-way communication and message flows between NPOs and the public, which, in turn, bring more people into the conversation. Thus, the following hypothesis is proposed:

H2. Higher levels of contingency interactivity are more likely to generate a) first-level (*likes*) (H2a) and b) second-level (*retweets*) (H2b) public engagement on Twitter.

Emotion elements on social media: valence and strength
Emotions play an important role in communication because they "influence what we notice, what we learn, what we remember, and ultimately the kinds of judgments and decisions we

make" (Forgas, 2006, p. 273). Theories of emotion have provided ample evidence to support the relationships between emotional content and individuals' cognitive processing and decision making (Rimé, 2009; Zhu and Thagard, 2002). Social sharing of emotion theory posits that the emotions in the environment that individuals are exposed to could prompt them to share their emotions with others either directly or indirectly (Rimé, 2009). Previous studies have also found evidence that emotional messages are more effective than non-emotional messages (Dillard and Nabi, 2006; Lang and Yegiyan, 2008). Emotions influence the visibility and shareability of messages on Twitter, contributing to increased public attention and feedback (Stieglitz and Dang-Xuan, 2013).

While emotional message strategies on social media have been researched in political communication (Bene, 2017; Stieglitz and Dang-Xuan, 2013) and marketing communication (Ashley and Tuten, 2015; Salehan and Kim, 2016), they are relatively less studied in the nonprofit context. It is especially important to examine nonprofit messages since they often include highly emotion-laden issues (Paxton *et al.*, 2020). Previous research has examined how emotions have been used in storytelling (e.g. Bublitz *et al.*, 2016; Waters and Jamal, 2011) and offline engagement (e.g. Paxton *et al.*, 2020). For example, earlier work from Waters and Jamal (2011) explored emotional words in a content analysis of 27 randomly selected NPOs' Twitter accounts and indicated that most tweets included words expressing excitement and happiness, followed by fear, hope, humor and sadness. Recent work by Paxton *et al.* (2020) examined the use of emotions in NPOs' mission statements and concluded that both negative and positive emotions impacted the amount of donations and number of volunteers. However, less is known about the use and effects of emotions in NPOs' social media communication.

This study focuses on two emotion elements: valence and strength. Emotion valence is categorized into positive and negative aspects (Ji *et al.*, 2019; Russell, 1983). Emotional messages could attract more attention and encourage higher levels of arousal, which ultimately affect reciprocal behaviors such as participation and sharing (Stieglitz and Dang-Xuan, 2013). These effects on online engagement are salient when negative emotions are expressed in messages. Negativity bias posits that individuals are more likely to focus on and react to negative emotions (Heiss *et al.*, 2019). Social media studies in political and marketing contexts have supported this notion. For example, negative emotions in politicians' Facebook posts increased the likelihood of eliciting public comments and shares (Bene, 2017). Heiss *et al.* (2019) also found that negative emotions in political actors' Facebook posts were positively associated with the number of *likes*. In a similar vein, Ji *et al.* (2019) found that corporate negative posts were likely to generate more shares on Facebook. Thus, we propose the following hypothesis:

H3. Compared to positive tweets, NPOs' negative tweets are more likely to generate 1) first-level *(likes)* (H3a) and 2) second-level *(retweets)* (H3b) public engagement on Twitter.

While many studies have focused on discrete emotions (e.g. Waters and Jamal, 2011; Paxton *et al.*, 2020), little attention has been paid to the strength of emotions. Strength of emotions means the "extremity or intensity of emotions" in organizational tweets (Ji *et al.*, 2019, p. 92). Rimé (2009) demonstrated that information sharing increased as emotions increased in strength because individuals' regulation of such emotions became more intense. Social media platforms reinforce emotional presence, which makes organizations' emotional content more visible and shareable (Bazarova *et al.*, 2015; Ji *et al.*, 2019). Therefore, we propose the following hypothesis:

H4. NPOs' tweets with higher levels of emotion strength are more likely to generate a) first-level *(likes)* (H4a) and b) second-level *(retweets)* (H4b) public engagement on Twitter.

NPO type
NPOs can be categorized into different types of organizations. For instance, O'Connor and
Shumate (2014) identified four types of NPOs, including fierce advocates for ideological
positions, direct public-serving organizations, foundations and membership. Among these
types of NPOs, human service NPOs are one of the largest categories in the United States (Sun
and Asencio, 2019). Human service NPOs provide a variety of services for individuals and
communities, such as services for disaster relief, physical and mental health, homeless,
elderly and children (Campbell and Lambright, 2020). Given the deep community roots,
human service NPOs play a significant role in community building with a variety of
stakeholders (Campbell and Lambright, 2020; Joassart-Marcelli and Wolch, 2003; Putnam,
2000). They are also likely to play significant roles in advocacy given their strong relationship
with government entities via government contracts or grants (Mosley, 2011). As one of few
studies focusing on human service NPOs' social media use, Campbell *et al.* (2014) concluded
that their main purpose in using social media was to market organizational events. However,
many human service NPOs do not have a clear plan for social media use. Young (2017)
surveyed 125 human service NPOs in a mid-Atlantic metropolitan and suggested that they
prioritized social media to promote events (96%), followed by engaging the community (92%)
and showing transparency (48.8%). In addition, 73% of human service NPOs indicated that
engaging the public was the primary reason to use social media (Young, 2017). Campbell and
Lambright (2020) focused on the hierarchical engagement perspective, indicating that human
service NPOs used Twitter mainly to call for action (51%), followed by disseminating
information (29%), and community building and maintenance (27%).

Despite these fruitful descriptive findings on service-oriented NPOs' social media use, little
is known about the effectiveness of service-oriented NPOs' social media use. In addition,
existing research has suggested that different types of NPOs vary in their use of social media
(Dong and Zhang, 2019; Nah and Saxton, 2013; Park *et al.*, 2016). Thus, this study proposes
the following research question to explore the varying effects of interactivity and emotion
elements on public engagement between service-oriented and other types of NPOs.

RQ. How do the effects of social media strategies (i.e. interactivity and emotion elements)
on a) first-level (*likes*) and b) second-level (*retweets*) public engagement on Twitter
differ between service-oriented and other types of NPOs?

Method
Data collection and sample
The data were retrieved from the official Twitter accounts of the largest 100 US NPOs
identified by Forbes (2019) Nonprofit Rank. Although social media has been increasingly
adopted by NPOs of all sizes, small and community-based NPOs lag behind in their social
media use and management due to their organizational and resource constraints (Hou and
Lampe, 2015). In addition, small NPOs may have more focused and local community-based
stakeholders rather than a wide, diverse audience on social media. Therefore, we focus on
large NPOs because they are relatively mature in their public relations planning and have a
stronger social media presence, which provides ample and richer content for our
investigation of various types of message factors and effects.

All of the NPOs in our study had active official Twitter accounts in 2017 and 2018. Using
the "retweet" R package through the Twitter API, we collected the most recent 3,200 tweets
sent by each of the 100 US NPOs starting on February 11, 2019. However, not all accounts
were equally active (*Mean* = 3,010.99, *Min* = 185, *Max* = 3,200, *SD* = 617.11). The final
sample consisted of 301,559 tweets. The retrieved tweets included the textual information of
the tweets, account information (e.g. friends count and follower count), the functional
interactivity features of the tweets (i.e. URLs, hashtags and mentions), contingency

interactivity features (whether a tweet was a reply, retweet or an original tweet), number of *retweets* and number of *likes* (once called "favorites" in Twitter) and photos. In addition, we obtained the total revenue of the 100 NPOs from the Forbes 2018 Nonprofit Rank website (Forbes, 2019).

Independent variables

Functional interactivity. Consistent with previous studies (Ji *et al.*, 2019; Tao *et al.*, 2021), URL links, hashtags and mentions were treated as indicators of functional interactivity and coded as three dummy variables. Specifically, the textual information was processed by the "*stringr*" R package, and relevant codes were applied to detect whether there was at least one hashtag (#) in each tweet. If at least one hashtag (#) was identified, it was coded as 1; otherwise, 0. In a similar way, if at least one mention (@) was identified by the codes, it was coded as 1; otherwise, 0. If at least one URL link (http(s)://) was identified, it was coded as 1; otherwise, 0. Functional interactivity was operationalized as a continuous variable ranging from non-interactive (0) to very interactive (3) to make the interpretation straightforward. Functional interactivity was coded as 0 when none of the following three types of indicators – URL links, hashtags and mentions – were detected. Functional interactivity was coded as 1 when only one type of indicator was found. Functional interactivity was coded as 2 when any combination of two types of indicators was presented. Functional interactivity was coded as 3 when all three types of indicators were detected. As the number increased, intense use of functional interactivity was demonstrated. Tweet examples are shown in Table 1.

Contingency interactivity. The study adopted the operationalization of contingency interactivity from Li and Li (2014) and Lovejoy *et al.* (2012). Contingency interactivity indicates whether a message was a reply (1 = yes, 0 = no) or retweet (1 = yes, 0 = no). Similarly, this study coded contingency interactivity into three levels from non-interactive (0) to very interactive (2) and treated it as a continuous variable to aid interpretation. Contingency interactivity was more evident as the number increased.

Emotion elements (valence and strength). To measure emotion valence and emotion strength in the tweets, the textual information was further analyzed by the computer-assisted content analysis software *SentiStrength* (Thelwall *et al.*, 2010). *SentiStrength* has been widely recognized as a state-of-art sentiment analysis tool to process short texts (Kroon and Van der Meer, 2021; Thelwall *et al.*, 2010; Vargo *et al.*, 2014). It has been rated among the best-automated sentiment analysis approaches in terms of human-level accuracy (Kroon and Van der Meer, 2021; Vargo *et al.*, 2014), especially for organizational messages (Kroon and Van der Meer, 2021). In calculating emotion scores in this study, the unit of analysis was each tweet. *SentiStrength* was employed to classify each tweet into a positive sentiment score from 1 to 5, and a negative sentiment score from -1 to -5. As a result, each tweet was assigned both positive and negative scores. Emotion valence and emotion strength were computed based on these two scores of each tweet. Valence was operationalized by using the absolute values of positive scores to subtract the absolute values of negative scores, which were estimated and assigned by *SentiStrength*. If the absolute values of positive scores were larger than the absolute values of negative scores, tweets were regarded as positive tweets; otherwise, negative. If the absolute values of positive scores were equal to the absolute values of negative scores, they were regarded as missing values. Strength was a continuous variable representing the overall sentiment, calculated as "strength = (positive score - negative score) -2" (Ji *et al.*, 2019, p. 95). Thus, the range of emotion strength was between 0 and 8, which was easier for interpretation as 0 represents the lowest degree of emotion strength.

NPO type. NPO type was operationalized as a dummy variable to indicate whether the NPO was service-oriented or not. We went through the mission statements of all the NPOs on their websites. If the NPOs provided direct human services to communities and people in

Key variable	Operationalization	Example 1	Example 2
Functional interactivity	URL + Mention + hashtag non-interactive (0) to very interactive (3)	-	-
	Functional interactivity = 0	We are grateful for all of our partners, supporters, field staff and volunteers who help us build hope for millions of people! (sent by *CarterCenter*) Carter Center	Because people organized and spoke out, tomorrow 8,118 people will be able to get care at Planned Parenthood health centers across America (sent by *PPFA*) Planned Parenthood Federation of America
	Functional interactivity = 1	It has been another record setting week for the PLSA as we paid out 1,108 parent and provider reimbursements. #edFL #edchoice (sent by *StepUp4Students*) Step Up for Students	Happy Holidays from your friends at Wounded Warrior Project. https://t.co/twZPtP7AcU (sent by *wwp*) Wounded Warrior Project
	Functional interactivity = 2	Today is the 26th anniversary of the Family and Medical Leave Act. Yet we still lack paid leave for all workers. Majorities of voters across party lines agree that it's time to take the next step: #PaidLeave for all working people. #FMLA26 @ACLU (sent by *ACLU*) American Civil Liberties Union and Foundation	Become a St. Jude Fan for Life during #NBAAllStarNYC, you could win an autographed jersey from your favorite team: http://t.co/jIYapab5Yg (sent by *Stjude*) St. Jude Children's Research Hospital
	Functional interactivity = 3	Learn more about @alexandani's new #CarryLight line, with 10% of proceeds to going to #JDRF using our link, here: https://t.co/rTExPKoen7 (sent by *JDRF*) JDRF International	Without early diagnosis and treatment, 1 in 3 children born with HIV will die by their second birthday. Unitaid is investing in better diagnostics to change that https://t.co/I7jCgrpY8c #AIDS 2018#pediatricHIV @CHAI_health @unicef_aids @EGPAF @AIDS_conference https://t.co/lDCsjBiopZ (sent by *PSImpact*) Population Services International

Table 1.
The operationalization and tweet examples for key variables

Table 1.

Key variable	Operationalization	Example 1	Example 2
Contingency interactivity	Reply + Retweet non-interactive (0) to very interactive (2)		
Contingency interactivity = 0		-	-
		THank you to all who supported #IDriveFor! Because of your efforts, @Chevrolet is contributing $400 k to help us fund innovative #breastcancer research; provide education guidance to help people reduce their risk; offer patient services to those who need it most. https://t.co/uFdSITY11s (sent by *AmericanCancer*)	Being a new parent comes with a lot of #financial responsibilities! You have to save for food, diapers, and education! Here's what new parents need to know about #college savings! https://t.co/GKj5qqKCPf (sent by *JA_USA*)
Contingency interactivity = 1		American Cancer Society @medpagetoday THank you for reporting on research released at #AAIC18 about the impact of hormone therapy on cognition. https://t.co/3efYGQ5HTc (sent by *alzassociation*)	Junior Achievement USA Casey to partner with @LutheranSvcs to help support their network in using Results-Based Leadership. https://t.co/gl8gdbZUhe (Sent by *LutheranSvcs*)
		Alzheimer's Association The invisible wounds to #women and #girls damage all of us https://t.co/fTEWu628p3 @phumzileumwomen @eu_echo @UN_Women (sent by *Americares*) Americares Foundation	Lutheran Services in America #SundaySong "Wonderful Day For The Race" (2018) by @MMBosstones "I'm talkin' 'bout the human one,Ä¶" Good luck today to #TeamAmericares in the @NYCMarathon, and @CTurlington and @RunTeamEMC in the #GoldenGateHalf! #NYCMarathon @Americares
Contingency interactivity = 2			@EveryMomCounts https://t.co/Nt8aGa3hxH (sent by *Americares*) Americares Foundation

(continued)

Key variable	Operationalization	Example 1	Example 2
Emotion valence	Using the absolute values of positive scores to subtract the absolute values of negative scores calculated by *SentiStrength*	-	-
Positive	absolute values of positive scores > absolute values of negative scores	Tonight, we are in El Paso celebrating the strength, resilience, and love of our border communities as we #MarchForTruth https://t.co/bjPayUvcZh (sent by *ACLU*) American Civil Liberties Union and Foundation	THank you to our @tfa_nashville and @tfamemphis corps members and alumni, whose leadership has landed Teach For America among the top performing teacher preparation programs in Tennessee for the eighth year in a row! Üi https://t.co/G3Aqr0Vtnm (sent by *TeachForAmerica*) Teach for America
Negative	absolute values of positive scores < absolute values of negative scores	The killing of iguanas in #Florida is unnecessary, inhumane and will ultimately be ineffective. Conflicts with iguanas can be mitigated, any killing that is done other than by properly-applied AVMA approved methods is unacceptable, - Nicole Paquette, HSUS https://t.co/jTDdqThAV8 (sent by *HumaneSociety*) Humane Society of the United States	Violence, economic collapse and crippling shortages now dominate life in Venezuela. This is the story of one Venezuelan family who felt they had no choice but to leave everything behind: https://t.co/hdDv01z2DC (Sent by *IRC*) International Rescue Committee
Emotion strength	"strength = (positive score – negative score) –2" (Ji *et al.*, 2019, p. 95)	-	-

(*continued*)

Table 1.

Table 1.

Key variable	Operationalization	Example 1	Example 2
Stronger emotions		Hope is being restored in #PuertoRico! See how we are helping churches and families #rebuild after devastating hurricanes last fall. https://t.co/iYfozkmIvq https://t.co/sAOtaAmD0T (sent by *SamaritansPurse*) Samaritan's Purse	"Family separations are extremely traumatizing, damaging to children, none are more affected than children with #disabilities, who rely on their loved ones for care, security, support‚Äù – @TheArcExec #FamiliesBelongTogether #KeepFamilesTogether #PwD (sent by *TheArcUS*) The Arc
Weaker emotions		Young Life friends are the best kind of friends! https://t.co/coEyVPAMoi (sent by *YoungLife*) Young Life	PATH helps to mobilize #Senegal in the fight against #malaria. #WorldMalariaDay https://t.co/7n2X5uCYcg https://t.co/7dCmY5jArN (sent by *PATHtweets*) PATH

Note(s): If absolute values of positive scores are equal to absolute values of negative scores, they are treated as missing values

need, such as food banks, homeless services, disaster relief, youth development and health care for women, children and elderly (O'Connor and Shumate, 2014) it was coded as 1, otherwise 0.

Dependent variables

Public engagement. Consistent with previous research (Guo and Saxton, 2018; Ji *et al.*, 2019), first-level public engagement was measured by the number of *likes. Likes* represent stakeholders' favorable views of tweets from an NPO. Second-level public engagement was measured by the number of *retweets. Retweets* represent stakeholders' acknowledgment and reposting activity of tweets from an NPO. They were measured by the total number of *likes* and *retweets.*

Control variables

The number of friends and followers were regarded as control variables because they were significant predictors of online influence (Anger and Kittl, 2011). The length of each tweet was controlled because it would influence individuals' processing of cognitive information, which may consequently affect public engagement. The inclusion of photos in tweets was controlled given their strong effect on public engagement (e.g. Ji *et al.*, 2019; Guo and Saxton, 2018). This study also controlled the total revenue representing the size of each NPO, given that social media usage may vary according to organizational capacity (Nah and Saxton, 2013).

Statistical analysis

This study primarily used negative binomial regressions to test the hypotheses. Specifically, H1–H4 were tested for main effects, and the RQ was answered by including the NPO type as the moderator.

In our sample, the dependent variables were measured by counting the number of occurrences (of *likes* and *retweets*). We first ran two Poisson models assuming that the mean and variance were equal in our sample. Then, the authors employed the *AER* R package and found that overdispersion existed for both the number of *likes* ($Z = 27.21$, $p < 0.001$) and *retweets* ($Z = 50.58$, $p < 0.001$). In addition, the observed variances of counts (of *likes* and *retweets*) were considerably larger than the means (see Table 2). Thus, the negative binomial regression models were necessary and suitable to adjust the over-dispersion problem for a large sample. Data analysis was performed in the *MASS* R package.

Results

Descriptive results

Most NPOs were service-oriented ($n = 206, 089, 68.34\%$). Regarding the use of interactivity features, URL accounted for 81.72% ($n = 246, 422$), followed by hashtag (#) (52.86%, $n = 159, 387$), mention (@) (50.44%, $n = 152, 098$), reply (14.84%, $n = 44, 752$) and retweet (23.09%, $n = 69, 648$). In terms of valence, there were 41.56% ($n = 125, 345$) positive tweets and 58.43% ($n = 176, 214$) negative tweets. The average emotion strength was 1.23 ($SD = 1.14$). The average number of *likes* was 79.92 ($SD = 2, 729.81$), and the average number of *retweets* was 69.43 ($SD = 2, 029.84$). Most messages sent by NPOs were service-oriented ($n = 206, 089, 68.34\%$) (Table 2).

Statistical results

H1 hypothesized that a higher level of functional interactivity can increase the likelihood of accumulating more 1) *likes* and 2) *retweets.* Our findings (Table 3) suggested that NPOs'

INTR

Table 2.
Descriptive statistics of key variables

	Dependent variables			Functional interactivity			Contingency interactivity		Emotion valence		Emotion strength
	Likes	Retweets					Reply to previous tweets	Retweet previous tweets	Positive valence	Negative valence	
NPO type	#Of tweets n (%)	Mean (SD)	Mean (SD)	URL link	Hashtag	Mention					Mean (SD)
Service-oriented	206,089 (68.34%)	45.92 (3,106.61)	47.74 (1,920.22)	167,553 (55.56%)	115,845 (38.42%)	104,299 (34.59%)	30,602 (10.15%)	47,802 (15.85%)	87,969 (29.17%)	118,120 (39.17%)	1.27 (1.15)
Others	95,470 (31.66%)	153.31 (1,642.19)	116.26 (2,247.64)	78,869 (26.15%)	43,542 (14.44%)	47,799 (15.85%)	14,150 (4.69%)	21,846 (7.24%)	37,376 (12.39%)	58,094 (19.26%)	1.14 (1.12)
Total	301,559 (100%)			246,422 (87.71%)	159,387 (52.86%)	152,098 (50.44%)	44,752 (14.84%)	69,648 (23.09%)	125,345 (41.56%)	176,214 (58.43%)	
Average		79.92 (2729.81)	69.43 (2029.84)								1.23 (1.14)

	Control variables				
	Number of friends Mean (SD)	Number of followers Mean (SD)	Photo n (%)	Tweet length Mean (SD)	Organization size Mean (SD)
Service-oriented	8,265.46 (23,490.82)	430,3053 (1,187,576)	75,563 (25.06%)	21.1 (10.14)	1,755.72 (3,194.79)
Others	7,288.19 (11,736.1)	751,9312 (1,259,584)	36,907 (12.24%)	22.99 (11.03)	639.98 (870.06)

Note(s): N = 301, 559; The organization size is measured by total revenue of the organization; the unit is a million

tweets with a higher level of functional interactivity negatively predicted log(*likes*)
($b = -0.07$, $exp(b) = 0.93$, robust SE = 0.002, $p < 0.001$) but positively predicted
log(*retweets*) ($b = 0.02$, $exp(b) = 1.03$, robust SE = 0.002, $p < 0.001$). This finding indicated that
as the functional interactivity level increased, the NPOs' tweets were less likely to be liked but
more likely to be retweeted by the public. Specifically, tweets with a higher level of functional
interactivity were associated with 7% fewer *likes* and 3% more *retweets*. Therefore, only H1b
was supported.

H2 hypothesized that a higher level of contingency interactivity would increase the
likelihood of accumulating more 1) *likes* and 2) *retweets*. Our findings suggested that the
NPOs' tweets with a higher level of contingency interactivity negatively predicted log(*likes*)
($b = -2.47$, $exp(b) = 0.08$, robust SE = 0.01, $p < 0.001$) and log(*retweets*) ($b = -0.02$,
$exp(b) = 0.98$, robust SE = 0.004, $p < 0.001$). This finding indicated that as the contingency
interactivity level increased, the NPOs' tweets were less likely to be liked and retweeted by
the public. Specifically, tweets with a higher level of contingency interactivity were
associated with 92% fewer *likes* ad 2% fewer *retweets*. Therefore, H2a and H2b were not
supported.

Regarding emotion valence, H3a and H3b predicted that negative tweets were likely to
generate more *likes* and *retweets*. The findings suggested that negative tweets were
negatively associated with log(*likes*) ($b = -0.04$, $exp(b) = 0.96$, robust SE = 0.003, $p < 0.001$)
but positively associated with log(*retweets*) ($b = 0.22$, $exp(b) = 1.25$, robust SE = 0.003,
$p < 0.001$). Specifically, negative tweets were associated with 5% fewer *likes* and 25% more
retweets. Thus, only H3b was supported.

H4 hypothesized that a higher level of emotion strength would predict a higher
probability of obtaining *likes* and *retweets*. The findings suggested that tweets showing
higher levels of emotion strength were positively associated with log(*likes*) ($b = 0.03$,
$exp(b) = 1.03$, robust SE = 0.001, $p < 0.001$) and log(*retweets*) ($b = 0.02$, $exp(b) = 1.02$, robust
SE = 0.001, $p < 0.001$).

The RQ explored how the NPO type moderates the effects of social media communication
strategies (i.e. interactivity and emotion) on public engagement. The findings (Table 4)

Independent variables	Log*(likes)*	Dependent variables Exponential regression coefficients	Log (*retweets*)	Exponential Regression coefficients
Functional interactivity	−0.07*** (0.002)	0.93	0.02*** (0.002)	1.03
Contingency interactivity	−2.47*** (0.01)	0.08	−0.02*** (0.004)	0.98
Emotion valence	−0.04*** (0.003)	0.96	0.22*** (0.003)	1.25
Emotion strength	0.03*** (0.001)	1.03	0.02*** (0.001)	1.02
Control variables				
Photo	0.25*** (0.003)		0.21 *** (0.004)	
Log (# of friends)	−0.005*** (0.001)		−0.01*** (0.001)	
Log (# of followers)	0.26*** (0.0007)		0.21*** (0.0008)	
Log (total revenue)	−0.04*** (0.001)		−0.002*** (0.002)	
Log (tweet length)	0.03*** (0.003)		0.26*** (0.004)	

Note(s): $N = 301,559$; Entries are coefficients with robust standard errors in parentheses; *$p < 0.05$,
**$p < 0.01$, ***$p < 0.001$

Table 3.
Main effects in
negative binomial
regression models
predicting log*(likes)*
and log*(retweets)* in
NPOs' tweets

showed that there was a significant two-way interaction effect between functional interactivity and NPO type on log(*likes*) ($b = 0.05$, robust SE $= 0.004$, $p < 0.001$) and log(*retweets*) ($b = 0.06$, robust SE $= 0.004$, $p < 0.001$). Compared to other types of NPOs, service-oriented NPOs were less likely to be liked ($b = 0.05$, $p < 0.001$) and more likely to be retweeted ($b = 0.07$, $p < 0.001$) if they included functional interactivity (Table 5 and Figure 1 [1]).

This study also found a significant two-way interaction effect between contingency interactivity and NPO type on log(*likes*) ($b = -0.39$, robust SE $= 0.02$, $p < 0.001$) and log(*retweets*) ($b = 0.12$, robust SE $= 0.007$, $p < 0.001$). Compared to other types of NPOs,

Independent variables	Log (*likes*)	Exponential regression coefficients	Log (*retweets*)	Exponential regression coefficients
		Dependent variables		
Functional interactivity	−0.09*** (0.003)	0.91	0.02*** (0.002)	1.03
Contingency interactivity	−2.27*** (0.02)	0.10	−0.02*** (0.004)	0.98
Emotion valence	−0.05*** (0.004)	0.95	0.22*** (0.003)	1.25
Emotion strength	0.05*** (0.001)	1.05	0.02*** (0.001)	1.02
Functional interactivity × NPO type	0.05*** (0.004)	1.05	0.06*** (0.004)	1.06
Contingency interactivity × NPO type	−0.39*** (0.02)	0.68	0.12*** (0.007)	1.13
Emotion valence × NPO type	0.16*** (0.006)	1.17	0.07*** (0.007)	1.07
Emotion strength × NPO type	−0.03*** (0.002)	0.97	−0.05*** (0.003)	0.95
Control variables				
Photo	0.25*** (0.003)		0.22 *** (0.004)	
Log (# of friends)	−0.006*** (0.001)		−0.01*** (0.001)	
Log (# of followers)	0.26*** (0.0007)		0.21*** (0.0008)	
Log (total revenue)	−0.04*** (0.001)		−0.001*** (0.002)	
Log (tweet length)	0.03*** (0.003)		0.25*** (0.004)	

Note(s): $N = 301, 559$; Entries are coefficients with robust standard errors in the parentheses; *$p < 0.05$, **$p < 0.01$, ***$p < 0.001$

Table 4.
Interaction effects in negative binomial regression models predicting log(*likes*) and log(*retweets*) in NPOs' tweets

	Simple slope effect			
Dependent variables	Service-oriented NPOs Slope of functional interactivity		Other types of NPOs Slope of functional interactivity	
Log(*likes*)	−0.04***		−0.09***	
Slope difference		0.05***		
Log(*retweets*)	0.06***		−0.01	
Slope difference		0.07***		

Note(s): *$p < 0.05$, **$p < 0.01$, ***$p < 0.001$

Table 5.
Two-way interaction effect between functional interactivity and NPO type on log(*likes*) and log(*retweets*)

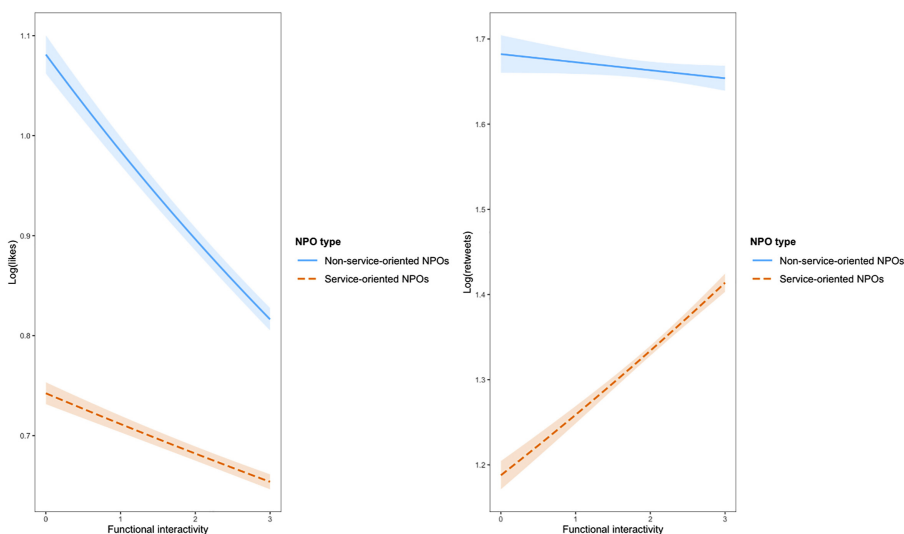**Figure 1.**
Two-way interaction
effect between
functional interactivity
and NPO type on
log*(likes)* and
log*(retweets)*

service-oriented NPOs were less likely to be liked ($b = -0.38$, $p < 0.001$) and more likely to be retweeted ($b = 0.12$, $p < 0.001$) if they included contingency interactivity (Table 6 and Figure 2).

In terms of the interaction effect between emotion valence and NPO type, the findings showed a significant two-way interaction effect between emotion valence and NPO type on log*(likes)* ($b = 0.16$, robust SE $= 0.006$, $p < 0.001$) and log*(retweets)* ($b = 0.07$, robust SE $= 0.007$, $p < 0.001$). Positive tweets were more likely to be liked in service-oriented NPOs ($M_{\text{diff}} = -0.11$, $p < 0.001$) while negative tweets were more likely to be liked in other types of NPOs ($M_{\text{diff}} = 0.05$, $p < 0.001$). Regarding log*(retweets)*, negative tweets led to more *retweets* for both service-oriented NPOs ($M_{\text{diff}} = 0.20$, $p < 0.001$) and other types of NPOs ($M_{\text{diff}} = 0.27$, $p < 0.001$) (Table 7 and Figure 3).

Regarding the interaction effect between emotion strength and NPO type, we found a significant two-way interaction effect between emotion strength and NPO type on log*(likes)* ($b = -0.03$, robust SE $= 0.002$, $p < 0.001$) and log*(retweets)* ($b = -0.05$, robust SE $= 0.003$, $p < 0.001$). Compared to other types of NPOs, service-oriented NPOs were less likely to be liked ($b = 0.03$, $p < 0.001$) and retweeted ($b = 0.04$, $p < 0.001$) if they used stronger emotions (Table 8 and Figure 4).

This finding indicated that as emotion strengthened, the NPOs' tweets were more likely to be liked and retweeted. Specifically, tweets with stronger emotions were associated with 3% more *likes* and 2% more *retweets*. Therefore, H4a and H4b were supported.

| | Simple slope effect | |
| | Service-oriented NPOs | Other types of NPOs |
Dependent variables	Slope of contingency interactivity	Slope of contingency interactivity
Log*(likes)*	−2.65***	−2.27***
Slope difference	−0.38***	
Log*(retweets)*	0.03***	−0.09***
Slope difference	0.12***	
Note(s): *$p < 0.05$, **$p < 0.01$, ***$p < 0.001$		

Table 6.
Two-way interaction
effect between
contingency
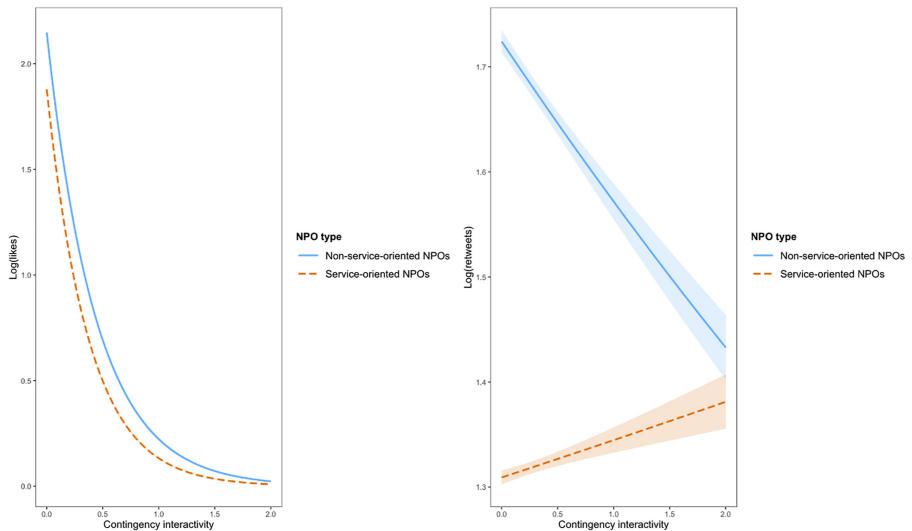interactivity and NPO
type on log*(likes)* and
log*(retweets)*

Figure 2.
Two-way interaction effect between contingency interactivity and NPO type on log(*likes*) and log(*retweets*)

	Simple effect			
	Service-oriented NPOs Estimated marginal means of emotion valence		Other types of NPOs Estimated marginal means of emotion valence	
Dependent variables	Negative	Positive	Negative	Positive
Log(*likes*)	−0.39***	−0.28***	−0.04***	−0.09***
Mean difference (log(*likes*))	−0.11***		0.05***	
Log(*retweets*)	0.39***	0.19***	0.38***	0.65***
Mean difference (log(*retweets*))	0.20***		0.27***	

Note(s): $N = 301, 559$; Entries are coefficients with robust standard errors in the parentheses; *$p < 0.05$, **$p < 0.01$, ***$p < 0.001$

Table 7.
Two-way interaction effect between emotion valence and NPO type on log(*likes*) and log(*retweets*)

Discussion

As social media usage continues to proliferate in the nonprofit sector, scholars have found that developing effective social media communication strategies has become imperative for NPOs (Guo and Saxton, 2018; Xu and Saxton, 2019; Saxton and Waters, 2014). This study used a computational approach to analyze 301,559 tweets from the largest 100 NPOs and revealed effective social media strategies that drive public engagement. We found that interactivity (functional and contingency) and emotion elements (valence and strength) in social media messages influence first and second levels of public engagement at varying degrees. In addition, these strategies influence public engagement in different ways for service-oriented NPOs and other types of NPOs.

Our findings indicated that functional interactivity is heavily employed by the NPOs in our sample. While most previous research has shown that interactivity is important for nonprofit social media use (Kim and Yang, 2017), our findings suggest that a careful distinction should be made between functional interactivity and contingency interactivity because they lead to different public engagement outcomes. Our findings from regression analyses revealed that using more functional interactivity on Twitter resulted in fewer *likes*.

	Simple slope effect		
	Service-oriented NPOs		Other types of NPOs
Dependent variables	Slope of emotion strength		Slope of emotion strength
Log(*likes*)	0.02***		0.05***
Slope difference		0.03***	
Log(*retweets*)	0.01***		0.05***
Slope difference		0.04***	
Note(s): *$p < 0.05$, **$p < 0.01$, ***$p < 0.001$			

This finding is consistent with Guo and Saxton's (2018) study suggesting that the excessive use of functional interactivity features (e.g. hashtags and mentions) in NPOs' social media messages may distract people from paying attention to the content itself. According to the limited capacity information-processing model (Lang, 2000), people have limited cognitive capacity to process information efficiently. When they simultaneously encounter multiple functional interactivity features on social media, such as URLs, hashtags and mentions, they may not be able to efficiently process these elements, resulting in less engagement at first. In contrast, a positive relationship between functional interactivity and the number of *retweets* was detected. In other words, the more functional features that NPOs adopt in tweets, the more likely their tweets will be diffused by the public. When NPOs employ URLs, mentions (@), and hashtags (#) in tweets, they aim to provide additional information, connect with specific users, and be involved in a particular topic (Lovejoy *et al.*, 2012). Using multiple functional features enabled by the social media platform in communications, NPOs can "seize on quickly arising events and opportunities" (Smith, 2018, p. 295), which in turn, widens organizations' content visibility and facilitates the message diffusion.

Regarding contingency interactivity, the negative effect on both levels of public engagement suggests that the public still prefers that NPOs create original social media content rather than replying to or retweeting others' previous messages. Replying to and
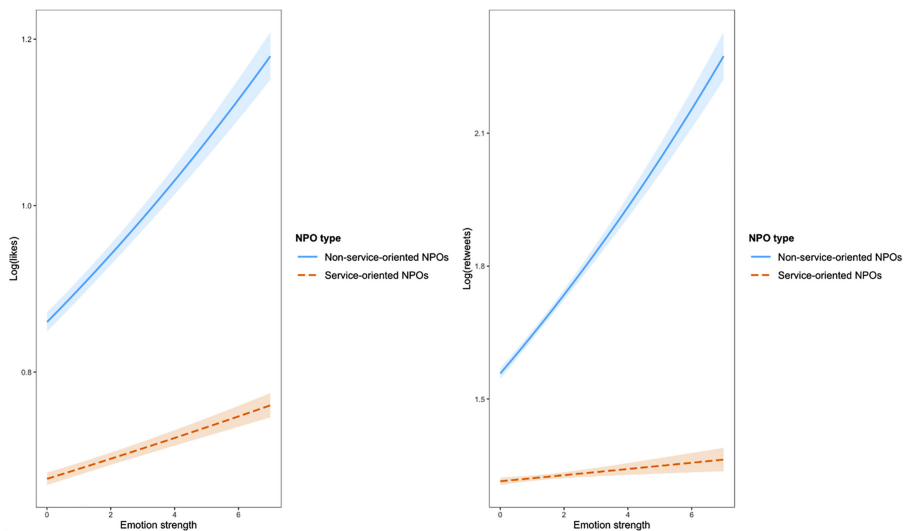
Figure 4.
Two-way interaction
effect between emotion
strength and NPO type
on log(*likes*) and
log(*retweets*)

retweeting previous tweets are less likely strategies to reach a wide range of stakeholders since they are meant to address messages from specific users (Li and Li, 2014) or acknowledge specific users (Lovejoy *et al.*, 2012). Therefore, contingency interactivity is confined to message-based interactions among a small group of stakeholders, which makes it difficult for the general public to find relevance and engage in the conversation.

This study also revealed interesting findings regarding the effects of emotional tweets. Regarding emotion valence, our findings suggest that negative tweets were more retweetable, which is consistent with negativity bias, suggesting that individuals are more likely to respond to negative rather than positive emotions (e.g. Rozin and Royzman, 2001; Vaish *et al.*, 2008). According to Rimé (2009), negative emotions lead to "temporary destabilization of the person, a generalized distressing condition that a person is highly motivated to reduce" (p. 64). Thus, negative emotions in NPOs' tweets could trigger individuals with more cognitive work and sharing behaviors to vent. In addition, NPOs may express negative emotions to highlight the need for helping their mission, which can trigger negative emotions, such as sadness, and drive the public to engage in deeper information processing and to take action (MacKuen *et al.*, 2010). Building on Chung *et al.*'s (2020) finding of a positive relationship between NPOs' use of emojis and retweetability, our study advances this line of inquiry by demonstrating the impact of negative emotions on retweetability.

However, we also found that negative tweets were less liked, as they generated 4% fewer *likes* on Twitter. This finding contradicts Heiss *et al.*'s (2019) finding on a positive relationship between negative emotions in social media content and the number of *likes*. The inconsistent finding can be explained by the difference between Facebook and Twitter. In Heiss *et al.*'s (2019) study, negative emotions were detected from political actors' Facebook accounts in Australia, and the negative emotions expressed in politicians' social media content were mostly targeted at their opponents (Xenos *et al.*, 2017). These tweets were more likely to be liked by the followers of that politician on Facebook. Unlike Facebook, which offers the capacity to build communities based on similar interests and creates strong ties among users (Eriksson and Olsson, 2016), Twitter is more open to the general public who may not have strong personal attachment and issue relevance with NPOs. Thus, it may be difficult for the general public to resonate with NPOs' negative emotions on Twitter, resulting in a lower

chance of liking their tweets. As for emotion strength, we found that tweets signaling strong emotions were more likely to be liked and retweeted, which is consistent with previous research on corporate communication on social media. However, it should be noted that the significant effect was marginal.

Our findings also suggest that interactivity and emotion strategies should be employed differently by service-oriented and other types of NPOs. Compared to other types of NPOs, both functional interactivity and contingency interactivity increase the likelihood of generating *retweet*s for service-oriented NPOs. For the general public, service-oriented NPOs have societal obligations and connect closely with communities (Hasenfeld, 2010). However, they are also criticized by the public for their bureaucratic management and inefficient use of resources (Hasenfeld, 2010). The functional and contingency interactive features on social media allow service-oriented NPOs to proactively alleviate the public's concerns and garner public support by spreading relevant information, promoting events and endorsing partners in a more transparent context. Thus, it is possible that service-oriented NPOs' use of functional and contingency interactivity features on social media increases communication transparency and boosts the public's trust, which in turn, promotes subsequent social sharing. In addition, since human service NPOs have close relationships with stakeholders and are deeply rooted in communities (Campbell and Lambright, 2020; Young, 2017), the public may be more willing to share content from human service NPOs and engage in the conversation. Our findings speak to Campbell and Lambright's (2020) study suggesting that human service NPOs mainly use Twitter to engage with people for action-related information.

The findings on the interaction between emotion and NPO type suggest that when NPOs are service-oriented, signaling negative emotions in tweets is likely to generate fewer *likes* but more *retweets*. For service-oriented NPOs, when they include negative emotions in their social media messages, they are most likely to emphasize social issues and disasters for the target public. Since *likes* symbolize positive feedback (Kaur *et al.*, 2019), the public may not feel it is appropriate to display positive reactions toward service-oriented NPOs' social media messages that highlight the severity of problems. In addition, *likes* are used to bookmark information for future reference while *retweets* aim to diffuse information and maximize the visibility of content (Guo and Saxton, 2018). Thus, the public may be more willing to promote the cause by retweeting and engaging in cause-related conversations. Service-oriented NPOs mainly address social issues that are close to people's life and wellness concerns, and such personal relevance is more likely to trigger negativity bias, leading to more *retweets* by the public.

Theoretical and practical implications
The findings of this study make several theoretical contributions. First, our study advances the literature on NPOs' public engagement by examining interactivity on social media from both functional and contingency perspectives. Specifically, this study suggests a clear, yet largely ignored, distinction between the effects of functional and contingency interactivity on public engagement. Our study also confirms previous empirical work indicating the limited effects of URLs, hashtags and mentions on engaging the public (Guo and Saxton, 2018). Our study adds to the literature by demonstrating the ineffectiveness of NPOs' reliance on replies or *retweets* to engage the general public.

Second, as suggested in this study, emotions are important for NPOs to engage with the public on social media. Emotions are fundamental to understanding the public's motivations and behaviors (Paxton *et al.*, 2020), but they were largely ignored in the nonprofit literature. Complementing Paxton *et al.*'s (2020) pioneer work on the positive relationship between emotions in NPOs' mission statements and offline donations, this study is one of the early efforts to examine the role and impact of emotional elements in nonprofits' social media

success. In addition to reinforcing the role of interactivity in eliciting public engagement on social media, our study adds new insights to Saxton and Waters' (2014) work on how emotion valence and emotion strength influence public engagement in the nonprofit communication context. More broadly, this study answers research calls for more social media strategies for NPOs (Guo and Saxton, 2018; Campbell and Lambright, 2020) by recognizing the effect of negative emotions on garnering a higher level of public engagement (*retweets*).

To the best of our knowledge, this study is one of the earliest attempts to include interaction effects for different types of NPOs. Specifically, this study enriches the literature on service-oriented NPOs' public engagement by adding additional factors (i.e. interactivity and emotions). Although many studies have explored human service NPOs' social media use, only two recent studies have focused on their public engagement effects (Campbell and Lambright, 2020; Lam and Nie, 2020). Campbell and Lambright (2020) also added organizational-level factors (e.g. organizational capacity and organizations' resource dependency). Our study moves beyond the engagement focus from organizational-level to message-level factors. In addition, unlike Lam and Nie's (2020) research relying on the typology of social media content (i.e. information, community and action) using a computational approach, our study demonstrates how interactivity and emotions integrated in social media messages can jointly influence service-oriented NPOs' public engagement on social media.

Methodologically, complementing previous studies using case studies or small datasets from social media (Chung *et al.*, 2020; Taylor, 2021; Wang and Yang, 2020), this study advances organizational social media research by employing computer-assisted approaches to process a large corpus of text data using relevant R packages (e.g. *stringr*). In addition, aligning with Ji *et al.* (2019), this study extends the use of *SentiStrength* to identify emotions in the nonprofit context on social media.

This study offers useful guidance for nonprofit practitioners to strategically use social media. First, NPOs should be aware that the use of URLs, hashtags and mentions work well to diffuse information to a larger audience. However, these functions may not garner *likes* for NPOs' posts based on the public's first impression. Thus, NPOs should be aware that some tweets could backfire if they are too ambitious about incorporating all functional interactivity features in their social media engagement. Given the negative effects of contingency interactivity on public engagement, we recommend that NPOs be cautious about using replying and retweeting functions when interacting with specific social media users because such interactions may only affect a small group of stakeholders and be less relevant to the general public, thereby failing to evoke wider public engagement with the general public.

Second, NPO practitioners should recognize the significant effects of negative emotions on garnering a higher level of public engagement (*retweet)* and should include negative emotional words when drafting social media messages. For example, when NPOs want to call for action or promote their events, managers should consider employing negative emotions in the social media content to facilitate information retransmission. In addition, we suggest that NPOs select strong emotional words if they decide to include emotions in their social media content. Beyond the instrumental goal of attracting more attention on social media, nonprofit managers should also recognize the potential risks and limitations of using this strategy as stronger and more negative emotions in messages often promote polarization (Kim and Kim, 2019). In other words, while using stronger and more negative emotions in social media messages may attract more attention, using these strategies may generate the unintended consequence of creating increased polarization. This is a delicate balance for nonprofit managers.

Our study also benefits those who work in human service areas. Since human service NPOs primarily use social media to advertise and promote events (Campbell *et al.*, 2014; Young, 2017), message diffusion is important. Our study indicates that service-oriented NPOs

should maximize the use of URLs, mentions and hashtags to increase their content visibility to facilitate message retransmission. In addition, service-oriented NPOs need to respond to and interact with specific stakeholders more proactively by replying to or retweeting their messages. Furthermore, service-oriented NPOs need to decide between including positive or negative emotions in their tweets since they generate conflicting effects on *likes* and *retweets*. However, the decision should align with their communication goals. If service-oriented NPOs want to generate more *likes*, they need to focus on positive tweets. In contrast, tweets expressing negative emotions should be prioritized if the communication goal is to generate more *retweets*.

Limitations and future research
The findings of this study should be interpreted with caution due to several limitations. First, this paper only focuses on large NPOs in the United States. Although we used this sample due to the availability of Twitter data, it limits the scope of the organizational size and geographic locations. In fact, 66.3% of NPOs are small with a budget of less than $1 million (Frailey, 2017). Future research will benefit from including medium- and small-size NPOs in the sample to provide a more comprehensive picture of effective social media for public engagement. Second, this study only uses tangible outcomes (number of *likes* and *retweets*) as outcome variables. We were unable to scrape the number of replies using Twitter API when we collected the data in 2019. Following Twitter's updated data collection policies, future research may consider adding the number of comments as an additional layer of public engagement on social media given that replies are direct communications with the public. Third, this study operationalized functional interactivity as a continuous variable, which focuses on the amount of interactive effort using social media functions to facilitate communication. However, this approach has limitations in assuming that the effect of a hashtag and the effect of a URL on invoking public engagement are the same without considering that different interactivity features could trigger varying perceptions of tweets. To better identify the effects of different functional interactivity indicators, we suggest that future research use experiments to explore the cause and effect from the public's perspective. Fourth, this study categorized NPOs as either service-oriented or other types of NPOs. It should be noted that the classification is not perfect since many NPOs do not have a clear boundary and are cross listed. Therefore, future research needs to establish a better classification system for NPO types.

Note

1. Values on the *Y*-axis in Figures 1-4 are based on the raw data

References

Anger, I. and Kittl, C. (2011), "Measuring influence on twitter", *Proceedings of the 11th International Conference on Knowledge Management and Knowledge Technologies*, New York, NY, ACM, pp. 1-4.

Ashley, C. and Tuten, T. (2015), "Creative strategies in social media marketing: an exploratory study of branded social content and consumer engagement", *Psychology and Marketing*, Vol. 32 No. 1, pp. 15-27.

Auger, G.A. (2013), "Fostering democracy through social media: evaluating diametrically opposed nonprofit advocacy organizations' use of Facebook, Twitter, and YouTube", *Public Relations Review*, Vol. 39 No. 4, pp. 369-376.

Barns, N.G. and Andonian, J. (2011), "The 2011 Fortune 500 and social media adoption: have America's largest companies reached a social media plateau", available at: http://www.umassd.edu/cmr/studiesandresearch/2011fortune500/ (accessed 18 September 2018).

Bazarova, N.N., Choi, Y.H., Schwanda Sosik, V., Cosley, D. and Whitlock, J. (2015), "Social sharing of emotions on Facebook: channel differences, satisfaction, and replies", *Proceedings of the 18th ACM Conference on Computer Supported Cooperative Work and Social Computing*, New York, NY, ACM, pp. 154-164.

Bene, M. (2017), "Go viral on the Facebook! Interactions between candidates and followers on Facebook during the Hungarian general election campaign of 2014", *Information, Communication and Society*, Vol. 20 No. 4, pp. 513-529.

Brubaker, P.J. and Wilson, C. (2018), "Let's give them something to talk about: global brands' use of visual content to drive engagement and build relationships", *Public Relations Review*, Vol. 44 No. 3, pp. 342-352.

Bublitz, M.G., Escalas, J.E. Peracchio, L.A., Furchheim, P., Grau, S.L., Hamby, A., Kay, M.J., Mulder, R. and Scott, A. (2016), "Transformative stories: a framework for crafting stories for social impact organizations", *Journal of Public Policy and Marketing*, Vol. 35 No. 2, pp. 237-248.

Campbell, D.A. and Lambright, K.T. (2020), "Terms of engagement: Facebook and Twitter use among nonprofit human service organizations", *Nonprofit Management and Leadership*, Vol. 30 No. 4, pp. 545-568.

Campbell, D.A., Lambright, K.T. and Wells, C.J. (2014), "Looking for friends, fans, and followers? Social media use in public and nonprofit human services", *Public Administration Review*, Vol. 74 No. 5, pp. 655-663.

Chen, Y.R. (2018). "Consumer engagement in social media in China", Johnston, K.A. and Taylor, M. (Eds), *The Handbook of Communication Engagement*, John Wiley and Sons, New Jersey, NJ, pp. 475-489.

Cho, M., Schweickart, T. and Haase, A. (2014), "Public engagement with nonprofit organizations on Facebook", *Public Relations Review*, Vol. 40 No. 3, pp. 565-567.

Chung, A., Woo, H. and Lee, K. (2020), "Understanding the information diffusion of tweets of a non-profit organization that targets female audiences: an examination of women who code's tweets", *Journal of Communication Management*, Vol. 25 No. 1, pp. 68-84.

Dessart, L. (2017), "Social media engagement: a model of antecedents and relational outcomes", *Journal of Marketing Management*, Vol. 33 Nos 5-6, pp. 375-399.

Dhanesh, G.S. (2017), "Putting engagement in its Proper place: state of the field, definition and model of engagement in public relations", *Public Relations Review*, Vol. 43 No. 5, pp. 925-933.

Dillard, J.P. and Nabi, R.L. (2006), "The persuasive influence of emotion in cancer prevention and detection messages", *Journal of Communication*, Vol. 56 No. 5, pp. 123-139.

Dong, C. and Zhang, Y. (2019), "NPOs' voice in CSR partnership: an exploratory study using topic modeling", *International Journal of Business Communication*, Vol. 00 No. 0, pp. 1-21.

Eriksson, M. and Olsson, E.K. (2016), "Facebook and Twitter in crisis communication: a comparative study of crisis communication professionals and citizens", *Journal of Contingencies and Crisis Management*, Vol. 24 No. 4, pp. 198-208.

Forbes (2019), "The 100 largest U.S. charities", available at: https://www.forbes.com/top-charities/list/#tab:rank (accessed 20 May 2019).

Forgas, J.P. (2006), "Affective influences on interpersonal behavior: towards understanding the role of affect in everyday interaction", in Forgas, J.P. (Ed.), *Affect in Social Thinking and Behavior*, Psychology Press, Philadelphia, PA, pp. 269-289.

Frailey, K. (2017), "What does the Nonprofit sector really look like?", available at: https://trust.guidestar.org/what-does-the-nonprofit-sector-really-look-like (accessed 15 August 2019).

Goggins, S. and Petakovic, E. (2014), "Connecting theory to social technology platforms: a framework for measuring influence in context", *American Behavioral Scientist*, Vol. 58 No. 10, pp. 1376-1392.

Guo, C. and Saxton, G.D. (2014), "Tweeting social change: how social media are changing nonprofit advocacy", *Nonprofit and Voluntary Sector Quarterly*, Vol. 43 No. 1, pp. 57-79.

Guo, C. and Saxton, G.D. (2018), "Speaking and being heard: how nonprofit advocacy organizations gain attention on social media", *Nonprofit and Voluntary Sector Quarterly*, Vol. 47 No. 1, pp. 5-26.

Hasenfeld, Y. (2010), "The attributes of human service organizations", *Human Services As Complex Organizations*, Vol. 2, pp. 9-32.

Heiss, R., Schmuck, D. and Matthes, J. (2019), "What drives interaction in political actors' Facebook posts? Profile and content predictors of user engagement and political actors' reactions", *Information, Communication and Society*, Vol. 22 No. 10, pp. 1497-1513.

Hopp, T. and Gallicano, T.D. (2016), "Development and test of a multidimensional scale of blog engagement", *Journal of Public Relations Research*, Vol. 28 Nos 3-4, pp. 127-145.

Hou, Y. and Lampe, C. (2015), "Social media effectiveness for public engagement: example of small nonprofits", *Proceedings of the 33rd Annual ACM Conference on Human Factors in Computing Systems*, New York, NY, ACM, pp. 3107-3116.

Huang, L.V. and Yeo, T.E.D. (2018), "Tweeting# Leaders: social media communication and retweetability of Fortune 1000 chief executive officers on Twitter", *Internet Research*, Vol. 28 No. 1, pp. 123-142.

Ihm, J. (2019), "Communicating without nonprofit organizations on nonprofits' social media: stakeholders' autonomous networks and three types of organizational ties", *New Media and Society*, Vol. 21 Nos 11-12, pp. 2648-2670.

Ji, Y.G., Chen, Z.F., Tao, W. and Li, Z.C. (2019), "Functional and emotional traits of corporate social media message strategies: behavioral insights from S&P 500 Facebook data", *Public Relations Review*, Vol. 45 No. 1, pp. 88-103.

Joassart-Marcelli, P. and Wolch, J.R. (2003), "The intrametropolitan geography of poverty and the nonprofit sector in Southern California", *Nonprofit and Voluntary Sector Quarterly*, Vol. 32 No. 1, pp. 70-96.

Johnston, K.A. (2018). "Toward a theory of social engagement", in Johnston, K.A. and Taylor, M. (Eds), *The Handbook of Communication Engagement*, John Wiley & Sons, New Jersey, NJ, pp. 19-32.

Johnston, K.A. and Taylor, M. (2018). "Engagement as communication: pathways, possibilities, and future directions", in Johnston, K.A. and Taylor, M. (Eds), *The Handbook of Communication Engagement*, John Wiley & Sons, New Jersey, NJ, pp. 1-16.

Kaur, W., Balakrishnan, V., Rana, O. and Sinniah, A. (2019), "Liking, sharing, commenting and reacting on Facebook: user behaviors' impact on sentiment intensity", *Telematics and Informatics*, Vol. 39, pp. 25-36.

Kim, Y. and Kim, Y. (2019), "Incivility on Facebook and political polarization: the mediating role of seeking further comments and negative emotion", *Computers in Human Behavior*, Vol. 99, pp. 219-227.

Kim, C. and Yang, S.U. (2017), "Like, comment, and share on Facebook: how each behavior differs from the other", *Public Relations Review*, Vol. 43 No. 2, pp. 441-449.

Kim, E., Sung, Y. and Kang, H. (2014), "Brand followers' retweeting behavior on Twitter: how brand relationships influence brand electronic word-of-mouth", *Computers in Human Behavior*, Vol. 37, pp. 18-25.

Knox, S. and Gruar, C. (2007), "The application of stakeholder theory to relationship marketing strategy development in a non-profit organization", *Journal of Business Ethics*, Vol. 75 No. 2, pp. 115-135.

Kroon, A.C. and Van der Meer, T.G. (2021), "Who takes the lead? Investigating the reciprocal relationship between organizational and news agendas", *Communication Research*, Vol. 48 No. 1, pp. 51-76.

Lai, C.H. and Fu, J.S. (2020), "Organizations' dialogic social media use and stakeholder engagement: stakeholder targeting and message framing", *International Journal of Communication*, Vol. 14 No. 26, pp. 2246-2271.

Lam, W.F. and Nie, L. (2020), "Online or offline? Nonprofits' choice and use of social media in Hong Kong", *VOLUNTAS: International Journal of Voluntary and Nonprofit Organizations*, Vol. 31 No. 1, pp. 111-128.

Lang, A. (2000), "The limited capacity model of mediated message processing", *Journal of Communication*, Vol. 50 No. 1, pp. 46-70.

Lang, A. and Yegiyan, N.S. (2008), "Understanding the interactive effects of emotional appeal and claim strength in health messages", *Journal of Broadcasting and Electronic Media*, Vol. 52 No. 3, pp. 432-447.

Lee, Y.J. (2021), "Liked on Facebook, liked for real?: nonprofits' online popularity and financial performance", *Nonprofit Management and Leadership*, Vol. 31 No. 3, pp. 609-621.

Li, Z. and Li, C. (2014), "Tweet or 're-tweet'? An experiment of message strategy and interactivity on Twitter", *Internet Research*, Vol. 24 No. 5, pp. 648-667.

Lovejoy, K. and Saxton, G.D. (2012), "Information, community, and action: how nonprofit organizations use social media", *Journal of Computer-Mediated Communication*, Vol. 17 No. 3, pp. 337-353.

Lovejoy, K., Waters, R.D. and Saxton, G.D. (2012), "Engaging stakeholders through Twitter: how nonprofit organizations are getting more out of 140 characters or less", *Public Relations Review*, Vol. 38 No. 2, pp. 313-318.

MacKuen, M., Wolak, J., Keele, L. and Marcus, G.E. (2010), "Civic engagements: resolute partisanship or reflective deliberation", *American Journal of Political Science*, Vol. 54 No. 2, pp. 440-458.

Matheson, D. (2004), "Weblogs and the epistemology of the news: some trends in online journalism", *New Media and Society*, Vol. 6 No. 4, pp. 443-468.

Maxwell, S.P. and Carboni, J.L. (2014), "Stakeholder communication in service implementation networks: expanding relationship management theory to the nonprofit sector through organizational network analysis", *International Journal of Nonprofit and Voluntary Sector Marketing*, Vol. 19 No. 4, pp. 301-313.

Men, L.R. and Tsai, W.H.S. (2014), "Perceptual, attitudinal, and behavioral outcomes of organization–public engagement on corporate social networking sites", *Journal of Public Relations Research*, Vol. 26 No. 5, pp. 417-435.

Miller, K. (2020), "2020 Nonprofit communications trend report", available at: https://npmgfreedownloads.s3.amazonaws.com/2020NonprofitCommunicationsTrendsReport.pdf (accessed 10 October 2020).

Mosley, J.E. (2011), "Institutionalization, privatization, and political opportunity: what tactical choices reveal about the policy advocacy of human service nonprofits", *Nonprofit and Voluntary Sector Quarterly*, Vol. 40 No. 3, pp. 435-457.

Nah, S. and Saxton, G.D. (2013), "Modeling the adoption and use of social media by nonprofit organizations", *New Media and Society*, Vol. 15 No. 2, pp. 294-313.

Nonprofit Source (2018), "The ultimate list of charitable giving statistics for 2018 looking for the latest charity giving stats and trends? We've got you covered", available at: https://nonprofitssource.com/online-giving-statistics/ (accessed 8 July 2019).

O'Connor, A. and Shumate, M. (2014), "Differences among NGOs in the business-NGO cooperative network", *Business and Society*, Vol. 53 No. 1, pp. 105-133.

Park, H., Reber, B.H. and Chon, M.G. (2016), "Tweeting as health communication: health organizations' use of Twitter for health promotion and public engagement", *Journal of Health Communication*, Vol. 21 No. 2, pp. 188-198.

Paxton, P., Velasco, K. and Ressler, R.W. (2020), "Does use of emotion increase donations and volunteers for nonprofits?", *American Sociological Review*, Vol. 85 No. 6, pp. 1051-1083.

Pelletier, M.J. and Horky, A.B. (2015), "Exploring the Facebook Like: a product and service perspective", *Journal of Research in Interactive Marketing*, Vol. 9 No. 4, pp. 337-354.

Putnam, R.D. (2000), *Bowling Alone: The Collapse and Revival of American Community*, Simon & Schuster, New York, NY.

Rimé, B. (2009), "Emotion elicits the social sharing of emotion: theory and empirical review", *Emotion Review*, Vol. 1 No. 1, pp. 60-85.

Rozin, P. and Royzman, E.B. (2001), "Negativity bias, negativity dominance, and contagion", *Personality and Social Psychology Review*, Vol. 5 No. 4, pp. 296-320.

Russell, J.A. (1983), "Pancultural aspects of the human conceptual organization of emotions", *Journal of Personality and Social Psychology*, Vol. 45 No. 6, pp. 1281-1288.

Saffer, A.J., Yang, A., Morehouse, J. and Qu, Y. (2019), "It takes a village: a social network approach to NGOs' international public engagement", *American Behavioral Scientist*, Vol. 63 No. 12, pp. 1708-1727.

Salehan, M. and Kim, D.J. (2016), "Predicting the performance of online consumer reviews: a sentiment mining approach to big data analytics", *Decision Support Systems*, Vol. 81, pp. 30-40.

Saxton, G.D. and Waters, R.D. (2014), "What do stakeholders like on Facebook? Examining public reactions to nonprofit organizations' informational, promotional, and community-building messages", *Journal of Public Relations Research*, Vol. 26 No. 3, pp. 280-299.

Silard, A. (2018), "Emotions for a cause: how the emotion expression of nonprofit leaders produces follower engagement and loyalty", *Nonprofit and Voluntary Sector Quarterly*, Vol. 47 No. 2, pp. 304-324.

Smith, J.N. (2018), "The social network?: nonprofit constituent engagement through social media", *Journal of Nonprofit and Public Sector Marketing*, Vol. 30 No. 3, pp. 294-316.

Smith, B.G. and Gallicano, T.D. (2015), "Terms of engagement: analyzing public engagement with organizations through social media", *Computers in Human Behavior*, Vol. 53, pp. 82-90.

Stieglitz, S. and Dang-Xuan, L. (2013), "Emotions and information diffusion in social media-Sentiment of microblogs and sharing behavior", *Journal of Management Information Systems*, Vol. 29 No. 4, pp. 217-248.

Sun, R. and Asencio, H.D. (2019), "Using social media to increase nonprofit organizational capacity", *International Journal of Public Administration*, Vol. 42 No. 5, pp. 392-404.

Sundar, S.S., Kalyanaraman, S. and Brown, J. (2003), "Explicating web site interactivity: impression formation effects in political campaign sites", *Communication Research*, Vol. 30 No. 1, pp. 30-59.

Sundar, S.S., Xu, Q. and Bellur, S. (2010), "Designing interactivity in media interfaces: a communications perspective", *Proceedings of the SIGCHI Conference on Human Factors in Computing Systems*, New York, NY, ACM, pp. 2247-2256.

Sumner, E.M., Ruge-Jones, L. and Alcorn, D. (2018), "A functional approach to the Facebook like button: an exploration of meaning, interpersonal functionality, and potential alternative response buttons", *New Media and Society*, Vol. 20 No. 4, pp. 1451-1469.

Tao, W., Li, Z.C., Chen, Z.F. and Ji, Y.G. (2021), "Public responses to nonprofit social media messages: the roles of message features and cause involvement", *Public Relations Review*, Vol. 47 No. 2, p. 102038, doi: 10.1016/j.pubrev.2021.102038.

Taylor, M.P. (2021), "All talk and No action? A comparative analysis of nonprofit twitter chats", *Journal of Nonprofit and Public Sector Marketing*, pp. 1-16, doi: 10.1080/10495142.2021.1953668.

Thelwall, M., Buckley, K., Paltoglou, G., Cai, D. and Kappas, A. (2010), "Sentiment strength detection in short informal text", *Journal of the American Society for Information Science and Technology*, Vol. 61 No. 12, pp. 2544-2558.

Vaish, A., Grossmann, T. and Woodward, A. (2008), "Not all emotions are created equal: the negativity bias in social-emotional development", *Psychological Bulletin*, Vol. 134 No. 3, pp. 383-403.

Vargo, C.J., Guo, L., McCombs, M. and Shaw, D.L. (2014), "Network issue agendas on Twitter during the 2012 US presidential election", *Journal of Communication*, Vol. 64 No. 2, pp. 296-316.

Wang, Y. and Yang, Y. (2020), "Dialogic communication on social media: how organizations use Twitter to build dialogic relationships with their publics", *Computers in Human Behavior*, Vol. 104, p. 106183, doi: 10.1016/j.chb.2019.106183.

Waters, R.D. and Jamal, J.Y. (2011), "Tweet, tweet, tweet: a content analysis of nonprofit organizations' Twitter updates", *Public Relations Review*, Vol. 37 No. 3, pp. 321-324.

Waters, R.D., Burnett, E., Lamm, A. and Lucas, J. (2009), "Engaging stakeholders through social networking: how nonprofit organizations are using Facebook", *Public Relations Review*, Vol. 35 No. 2, pp. 102-106.

Watkins, B. and Lewis, R. (2014), "Initiating dialogue on social media: an investigation of athletes' use of dialogic principles and structural features of Twitter", *Public Relations Review*, Vol. 40, pp. 853-855.

Xenos, M.A., Macafee, T. and Pole, A. (2017), "Understanding variations in user response to social media campaigns: a study of Facebook posts in the 2010 US elections", *New Media and Society*, Vol. 19 No. 6, pp. 826-842.

Xu, W. and Saxton, G.D. (2019), "Does stakeholder engagement pay off on social media? A social capital perspective", *Nonprofit and Voluntary Sector Quarterly*, Vol. 48 No. 1, pp. 28-49.

Young, J.A. (2017), "Facebook, Twitter, and blogs: the adoption and utilization of social media in nonprofit human service organizations", *Human Service Organizations: Management, Leadership and Governance*, Vol. 41 No. 1, pp. 44-57.

Zhu, J. and Thagard, P. (2002), "Emotion and action", *Philosophical Psychology*, Vol. 15 No. 1, pp. 19-36.

About the authors

Yafei Zhang is an assistant professor in the School of Journalism and Communication at Renmin University, China. She earned her Ph.D. in Mass Communication from the University of Iowa in 2017. Her research interests include digital communication and cross-cultural communication at organizational and societal levels.

Chuqing Dong is an assistant professor of Advertising + Public Relations at Michigan State University. Her research focuses on public relations, corporate social responsibility, strategic communication in the nonprofit/government sectors and digital media. Chuqing earned her MA in Public Policy and PhD in Mass Communication from University of Minnesota - Twin Cities. https://comartsci.msu.edu/our-people/chuqing-dong. Chuqing Dong is the corresponding author and can be contacted at: cdong@msu.edu

Yuan Cheng is currently an assistant professor in the Leadership and Management area and the Director of Graduate Studies for the Certificate in Nonprofit Management at the Humphrey School of Public Affairs. Dr. Cheng also serves as the managing editor for Public Administration Review (PAR). Cheng received his BS in Environmental Science from Zhejiang University in China and obtained his MA in Philanthropic Studies and PhD in Public Affairs from Indiana University. https://www.hhh.umn.edu/directory/yuan-cheng