2-2018

Tweeting #Leaders: Social media communication and retweetability of fortune 1000 chief executive officers on Twitter

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To appear in *Internet Research*

Tweeting #Leaders: Social Media Communication and Retweetability of Fortune 1000

Chief Executive Officers on Twitter

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Abstract

Purpose - To better understand executive communication on social media, this paper examines the pattern of messages posted by chief executive officers (CEOs) on Twitter and their retweetability (rate of reposting by other users).

Design/methodology/approach - The study data comprises 1068 original tweets randomly selected from all Fortune 1000 CEOs tweets in 2014. The impact of the contextual factors (industry background, activeness, and Twitter age) and content factors (content types, supplementary information, and linguistic features) on retweetability was examined through regression analyses.

Findings - CEOs tweet to share information and insights, to promote their companies or products, to update work or life status, and to interact with the public. Original insights, promotional messages, and seasonal greetings were most likely to be retweeted. CEOs' backgrounds, usage of hashtags, and certainty of language were also positively associated with retweetability.

Practical implications - CEOs may enhance their online social influence through demonstrating leadership by sharing insights about their organization or industry and posting topical messages (e.g., season's greetings). Furthermore, CEOs could use hashtags strategically to initiate or participate in discussions and promote their personal visibility.

Originality/value - This study is one of the first to evaluate how leaders of the largest companies in the US communicate on Twitter. It contributes to a theoretical understanding of the factors underlying online influence—the influence of the status of the online communicator versus the message content on information forwarding.

Keywords Social media, Executive communication, Information forwarding, Corporate leaders, Micro-blogging, Twitter

Paper type Research paper

1. Introduction

The social media presence of a chief executive officer (CEO) adds value to their organization's corporate reputation by potentially providing an influential voice online. Having the CEO of an organization engage with the public on social media humanizes efforts in communicating organizational values and building rapport with news media and the public (BRANDfog, 2014; Weber Shandwick, 2013). Yet, most CEOs are laggards in adopting social media communication. A report from CEO.com and DOMO (2014) found that 68% of Fortune 500 CEOs had no public presence in any major social network sites (SNSs) such as Facebook, Twitter, LinkedIn, Google+, and Instagram. The same report further noted that many of those CEOs with public social media accounts were not actively engaging with the public. A recent survey of social media use among senior executives found that many respondents were suspicious of the credibility and value of social media (Porter *et al.*, 2015). This skepticism might explain the paltry number of CEOs with social media presence.

That most CEOs remain apprehensive about social media communication highlights a need for greater guidance that is informed by empirical evidence. Extant literature on this topic is largely limited to descriptive statistics of CEOs' social media presence (e.g., Weber Shandwick, 2013), case studies on how CEOs involve social media in the decision-making process (e.g., Jameson, 2014), and surveys of senior executives' attitudes toward social media communication (e.g., Porter *et al.*, 2015). Little research has examined how CEOs can demonstrate their role in social media communication beyond what their organizations are doing through institutional accounts. Although CEOs may be influential figures offline, their social influence might not necessarily extend to social media settings (Freberg *et al.*, 2011). There is, therefore, a need to examine how CEOs have been communicating on social media and the influence of such communication.

This study is one of the first to examine how CEOs of the largest companies in the US (Fortune 1000) communicate on social media and the extent to which their messages are shared by the public. It examines messages (tweets) posted by CEOs on Twitter and their retweetability (rate of reposting by other users). Informed by the heuristic–systematic information processing model (HSM, Chaiken, 1980), this study contributes to a theoretical understanding of the factors underlying online influence by assessing the influence of the status of the online communicator vis-à-vis the message content on information forwarding. Twitter was chosen for examination as it stands together with LinkedIn as the most frequently used social media platforms among CEOs (CEO.com and DOMO, 2014, 2016). Studying executive Twitter communication would enable this study to examine the mainstream public's responses to CEOs' social media messages—as opposed to LinkedIn, which serves professional online communities.

2. Literature Review

2.1 Social media and executive communication

Prior research has examined the patterns of executive communication on social media and users' perceptions of such communication. For example, Porter *et al.* (2015) found that top executives from Fortune 500 and Inc. 500 companies adopted one-way communication with followers using relatively formal language than general users on Twitter. Alghawi *et al.* (2014) proposed four image-building strategies of Chinese CEOs on Weibo (a popular microblogging platform in China): socializing with followers, presenting expert information, posting textbook-like messages, and keeping a diary-like daybook. Their survey data suggests that Chinese followers preferred an "expert" image to a "friend" image. Tsai and Men (2016) posited that CEOs' assertive and responsive communication styles on social media could help to build positive organization-public relationships.

Although the above studies provide useful knowledge regarding executive communication and its impact, they are mostly based on studying participants' self-reported attitudinal responses to given communication patterns. There has been limited research that investigates executives' social media communication using evidence based on evaluation of their actual messages and public behavioral responses on social media. As Saxton and Waters (2014) argue, without measuring actual public responses on social media, any evaluation of efforts in social media communication is entirely implicit. This study, therefore, investigates top executives' messages on social media and users' responses to their messages.

2.2 CEOs as online leaders

As with the social media accounts of organizations, CEOs can use their self-named social media accounts to facilitate organizational and industry information dissemination and answer questions from the public. However, simply assuming the role of organizational spokesperson on social media would not enable a CEO to add significant value to the organization's communication efforts. To achieve the greatest impact, CEOs should aim at becoming social media influencers who can shape, alter, and change social media audience's attitudes and perceptions (Freberg *et al.*, 2011). Put differently, CEOs should demonstrate online leadership, which entails a set of communication strategies specific to social media.

Online leadership emerges from those who gain social influence through conversations and interactions with others in online communities (Huffaker, 2010). Extant literature conceptualizes online social influence as the ability to drive actions of others online, such as disseminating information, contributing content, and making purchasing decisions (Cassell *et al.*, 2006; Dholakia *et al.*, 2004; Huffaker, 2010). In this sense, online leaders exert social influence on others by encouraging communication and social interactions in online communities (Huffaker, 2010).

Online leadership is different from corporate leadership which stems from a person's formal position in the executive structure. While the social media accounts of CEOs ought to attract attention by virtue of their status as corporate leaders, this does not mean that a CEO's social influence offline is automatically transformed into online impact. To effectively gain social influence on social media, a CEO must assume the attributes of an online leader, that is to exert social influence on the online community. However, there has been little research on how online influence may be wielded by CEOs. To address this research gap, this study examines CEOs' use of Twitter, one of the most popular microblogging platforms. Specifically, this study focuses on CEOs' tweets and their online social influence as measured by public responses to those tweets in the form of the number of retweets.

2.3 Retweeting as a measure of online social influence on Twitter

Twitter is a microblogging platform which enables users to broadcast messages within 140 characters to other users who have elected to follow their account. Like many other social networking platforms, Twitter facilitates connections and information sharing among people who are physically distributed (Kaplan and Haenlein, 2011). Users with large numbers of followers on Twitter are more likely to receive responses (retweets, comments, likes, etc.) to their messages (Suh *et al.*, 2010).

A growing body of research on the implications of Twitter for business practices has examined organizational use of the platform and its impact on consumer perceptions and behaviors. Social media public relations (PR) research, in particular, illustrates how organizational use of Twitter contributes to relationship and consumer community building and dialogues between organizations and publics (e.g., López *et al.*, 2017; Lovejoy and Saxton, 2012; Okazaki *et al.,* 2015; Rybalko and Seltzer, 2010; Zhang and Luo, 2017). Twitter enables conversations among users (Park *et al.*, 2016; Waters and Jamal, 2011); an organization can reply to consumers' messages on Twitter and mention certain users to

include them in a conversation. Meanwhile, marketing research demonstrates that microblogging can contribute to the adoption of services and products. Zhou *et al.* (2017) found that informative and persuasive tweets positively affected brand equity and consumer purchase intention. Rui *et al.* (2013) found that positive word-of-mouth (WOM) on Twitter, especially those that express watching intention, facilitates movie sales. Conversely, Hennig-Thurau *et al.* (2015) identified a negativity bias of WOM suggesting that negative tweets have a negative impact on consumers' choice of movies.

On Twitter, eWOM is usually diffused through users' retweeting behaviors, that is by sharing someone's tweet with other Twitter users (Kim *et al.* 2014). A message's retweetability represents message virality, meaning that "engaged audiences experience a desire to share the content with others online, offline, or through both methods" (Hopp and Gallicano, 2016, p. 132). Existing studies (Cassell *et al*., 2006; Cha *et al*., 2010; Huffaker, 2010; Kim *et al*., 2014) indicate that greater retweetability of messages signifies social influence because these messages drive, at a minimum, public responses on social media.

A competent social media communicator should be equipped with the skills of crafting influential messages on social media that will be shared by others. Scholars argue that retweeting represents a higher level of engagement than liking and commenting (Goggins and Petakovic, 2014; Kim *et al.*, 2016). Retweeting a message to one's own followers is a user activity that follows from reading and posting (Anger and Kittl, 2011). Users are cognitively engaged when deciding to repost some messages from other users. As retweets are displayed on one's own Twitter page, retweeting entails identity concerns or impression management in deciding whether the particular message shared is congruent with one's intended audience and self-identity (Kim *et al.*, 2014; Smith and Gallicano, 2015*).*

Following from the above review, the number of retweets is used as a measure of online social influence in this study. In the next section, we outline the theoretical framework for

this study and discuss the contextual and content factors that may contribute to message retweetability.

2.4 Factors that contribute to retweetability

This study employs the HSM to evaluate the factors that contribute to retweetability of CEOs' messages on Twitter. According to the HSM, receivers process persuasion messages using two distinctive modes: heuristic information processing, which entails assessment of contextual features (e.g., sender), and systematic information processing, which entails assessment of message features (Chaiken, 1980). Applying the HSM model in online settings, prior research demonstrates that, to process and decide to share online information, receivers not only draw on message features such as content topics but also contextual features such as senders' online activeness and expertise (e.g., Chen and Fu, 2015; Luo *et al.*, 2013; Stieglitz and Dang-Xuan, 2012; L. Zhang *et al.*, 2014; Zhang and Peng, 2015). The HSM model thus provides an appropriate theoretical framework for this study to account for the different ways by which users may process CEOs' tweets.

From an information processing perspective, a follower may be attracted by a CEO's message on Twitter merely because the message is from a top executive or may be more focused on the content or topic of the tweet. In the latter scenario, a follower who is uninterested in the topic is less likely to engage with the tweet by sharing or commenting. To account for the different processing modes, this study evaluates the impact of contextual factors (activeness, Twitter age, and industry background) and message characteristics (content types, use of supplementary information, and linguistic features) on retweetability.

2.4.1 Contextual factors related to retweetability. The present study considers CEO-specific and Twitter-specific contextual factors as heuristic cues to source characteristics (Chaiken, 1980) that may influence retweetability. Among CEO-specific factors, CEOs' industry background is likely to play an important role in determining their online social

influence. In terms of expertise information sharing, for example, people tend to have higher expectations of companies that involve high-risk business or promote high-risk products (Gürhan-Canli and Batra, 2004; X. Zhang *et al.*, 2014). It stands to reason that CEOs' message retweetability may be influenced by people's expectations of the CEOs in relation to their industry background. As prior research lacks examination of the impact of industry on CEOs' influence on social media, a research question is proposed:

RQ1: How does Fortune 1000 CEOs' industry background influence their messages' retweetability?

As for Twitter-specific factors, this study considers the impact of activeness on Twitter and account age. Typically measured by post frequency, activeness is often used to identify influencers in social networks (Sun and Ng, 2013). SNS usage intensity is predictive of online social capital (Ellison *et al.*, 2007), which means that those who spend more time on SNS are likely to have higher levels of social influence. Prior research suggests that the emergence of online leadership is positively associated with the frequency of communication initiation (Huffaker, 2010; Misiolek and Heckman, 2005). When people perceive the high quantity of communication of a person in online groups, they are more likely to judge this person as possessing leadership traits. Thus, it may be argued that CEOs' activeness contributes to users' heuristic processing on Twitter. Similarly, Twitter age is another plausible heuristic cue. Leadership emergence research indicates that people tend to perceive higher trust with someone who stays active in an online community (Huffaker, 2010)— messages from the person receive more attention from others.

Two hypotheses related to Twitter-specific factors are thus proposed:

Hypothesis 1: The higher the activity level of Fortune 1000 CEOs on Twitter, the more retweets their messages will receive.

Hypothesis 2: The greater the Fortune 1000 CEOs' Twitter age, the more retweets their messages will receive.

2.4.2 Content factors related to retweetability. Several studies (e.g., Chen, 2016; de Almeida *et al.*, 2016; L. Zhang *et al.*, 2014) indicate that content features (systematic cues) play a greater role in retweetability than contextual factors (i.e., heuristic cues). Although people may assume someone's social influence from his or her background, they are unlikely to engage with every single message posted by the person in the same manner. Rather, most people would process specific content posted by the person which highlights the importance of online communicative actions (as measured by message characteristics). Three message characteristics that are likely relevant to retweetability are investigated in this study: (a) types of content, (b) usage of supplementary information, and (c) linguistic features.

2.4.2.1 Types of content. Tweets of different topics diffuse in Twitter networks differently. For example, politically controversial topics could continue to spread for comparatively longer periods (Romero *et al.*, 2011). Moreover, social influence is topic-sensitive. In one study, the hashtag (e.g., #topic; which represents a message's topic or subject) diversity of each Twitter user was found to be negatively related to the number of total retweets (Weng and Menczer, 2015). Meanwhile, other studies found that CEOs that construct an expert image and demonstrate thought leadership, consistently tweeting insights on the industry and the company, are viewed more favorably by the public (Alghawi *et al.*, 2014; Tsai and Men, 2016). These findings indicate that content type is likely to be a significant predictor of social influence and retweetability.

Prior research has demonstrated the relationship between social media message types and their effectiveness in helping to achieve marketing and PR goals (e.g., Choi *et al.*, 2017; del Mar Gálvez-Rodríguez *et al.*, Jhih-Syuan and Pena, 2011; Zhang *et al.*, 2014). Some studies adopted Lovejoy and Saxton's (2012) information-action-community framework (e.g., Park

et al., 2016; Saxton and Ghosh, 2016). Others utilize the multiple goals perspective of communication to study various types of messages delivered by organizations. For example, Interaction Process Analysis (IPA; Bales, 1950) which divides communication into task-orientated and socioemotional-orientated styles was used to examine how organizations engage customers on SNSs (Jhih-Syuan and Pena, 2011; X. Zhang *et al.*, 2014). Such pre-existing content categorizations, however, should not be directly applied to the analysis of CEOs' tweets as CEOs' social media messages are distinctive from those posted by organizations (Jameson, 2014; Alghawi *et al.*, 2014). Given the lack of prior categorization of CEOs' Twitter messages, two research questions (RQs) are warranted:

RQ2: What types of content do Fortune 1000 CEOs post on Twitter?

RQ3: What types of content posted by Fortune 1000 CEOs are more likely to be retweeted?

2.4.2.2 Usage of supplementary information. Using supplementary information in tweets such as adding hashtags and URLs has been linked to retweetability (Saxton *et al.*, 2015; Suh *et al.*, 2010; Liu *et al.*, 2012). Adding hashtags in tweets contributes to message promotion on Twitter because they embed the subjects within the tweets which promote their visibility when those subjects are searched by users (Page, 2012; Saxton *et al.*, 2015). Adding URLs in tweets could also significantly contribute to retweetability (Suh *et al.*, 2010). A plausible explanation is that adding URLs allows the poster to include additional information in a tweet—which is limited in 140 characters—especially when communicating highly technical issues (Stephens and Barrett, 2016). It might also serve to provide useful information, which contributes to dialogic communication with the public (Kent and Taylor, 1998). Given the benefits of using hashtags and adding URLs, it is expected that CEOs who use such supplementary information when microblogging could engage the public more effectively:

Hypothesis 3: Fortune 1000 CEOs' tweets that include supplementary information (hashtags and URLs) receive more retweets.

2.4.2.3 Linguistic styles. The third attribute investigated in this study is linguistic features, which are likely to be significantly related to online social influence and message retweetability. Tsai and Men (2016) argue that CEOs on social media should adopt a mix of communication styles. Specifically, CEOs should be assertive when answering questions and providing advice as well as responsively demonstrating empathy and willingness to listen to public concerns. In their study, it was found that these communication styles were positively associated with social media users' perception of parasocial interaction with CEOs. Following from this finding, the present study examines three linguistic styles: social processes, certainty, and affect.

Social media facilitate interpersonal, two-way communication. Recognizing the interpersonal benefits of using social media, marketing and PR scholars suggest that "social" communication styles should be used to establish positive relationships with customers and the public to achieve promotional and engagement goals (e.g., Berger, 2014; Cho *et al.*, 2014; X. Zhang *et al.*, 2014). For organizational leaders like CEOs, in face-to-face settings, they are expected to use socioemotional-oriented communication with subordinates to improve leader-member relationships and promote a positive, comforting organizational environment and group coherence (Bales, 1950; Abu Bakar *et al.*, 2010; Sheer, 2014). It is also likely to be the case online, especially when facing external stakeholders. CEOs who adopt social linguistic styles should gain more attention from the public because people would feel more personally connected with CEOs (Tsai and Men, 2016).

Affective messages or emotional messages, either positive or negative, are more likely to gain attention and be shared (Berger, 2013; Heath and Heath, 2007). Accumulating research evidence suggests that affective content can draw more attention in online communities. For

instance, the affect level of political tweets was positively related to the rate of retweets (Stieglitz and Dang-Xuan, 2012) and online leaders used more affective language in discussion groups (Huffaker, 2010). Thus, we would expect CEOs' tweets that are more affective will receive more public attention and more likely to be shared.

Certainty entails the clarity and power of language. Clear and powerful messages are more persuasive and will help leaders to spread ideas (Huffaker, 2010). The use of powerful language is linked to perceptions of greater credibility and persuasion effectiveness (Alvídrez and Franco-Rodríguez, 2016; Holtgraves and Lasky, 1999). Huffaker (2010) found that online leaders adopted more assertive linguistic styles and argued that "powerful language seems a successful persuasive device" (p. 612) for leaders to spread ideas. For corporate leaders who expect to become social influencers, adopting high certainty language styles should help them gain social influence on social media. The following hypothesis regarding linguistic styles and retweetability is thus proposed:

Hypothesis 4: The higher the Fortune 1000 CEOs' tweets in social, affective, and certainty levels, the more retweets they will receive.

3. Methods

3.1 Data collection

The inclusion criteria for data collection were Twitter accounts of chief executives of Fortune 1000 companies as listed in 2013 and 2014. Authenticity of the accounts was verified by checking the profile descriptions, contents of tweets, and whether the account was mentioned by other users. The tweets were collected using NCapture, a web browser extension of the NViVo 10 software package. Tweets that contain only retweets were excluded given that they are not authored by the CEOs. The data captured included URLs to webpages, websites, pictures, or videos. There were a total of 53 Fortune 1000 CEOs' accounts on Twitter but only 37 (69.81%) were active in 2014 with 5634 tweets posted. On average, each CEO

account had 166192 followers and followed 335 users. The average Twitter age was 4.28

years (SD = 1.62). In terms of industries, the CEOs were from art, entertainment and

recreation (n = 5, 13.51%), finance and insurance (n = 7, 18.92%), information (n = 10,

27.03%), retail trade (n = 2, 5.41%), utilities (n = 5, 13.51%), and others including

manufacturing, mining, packaging, and transportation (n = 8, 21.62%).

3.2 Selection of tweets for analysis

Given the large disparity in the number of tweets posted among CEOs, analyzing the entire

dataset of 5634 tweets would over-represent the tweets of the most actively posting CEOs

and the tweets posted during the most active period of posting (e.g., around a single event).

As such, the tweets of the CEOs were selected using systematic random sampling. Each

CEO's tweets were chronologically ordered (from 1 January 2014 to 31 December 2014) and

every 5th tweet was selected. Tweets from Randall L. Stephenson, Reed Hastings, and

Warren Buffett were excluded as these CEOs only posted one tweet in 2014. The resultant

sample comprised 1068 tweets posted by 34 CEOs. Based on this sample, the types of

content and use of supplementary information were manually coded while the linguistic

features were detected using a software. The impact of these message characteristics on

retweetability was then examined through a series of regression analyses. See Table 1 for

details of each of the 37 CEOs' followers, users they were following, total number of tweets,

and number of selected tweets. Table 2 provides the descriptive statistics of all the tweets and

the systematically selected tweets used in the analyses.

[Table 1 about here]

[Table 2 about here]

3.3 Coding content types

The coding scheme was developed through a combination of deductively obtaining categories

from extant literature and inductively developing new categories that emerge from a close

reading of the data. As mentioned earlier, pre-existing social media content categorizations are of limited use to this study as they either focus on topics indicated in tweets from general users (e.g., L. Zhang *et al.*, 2014) or tweets from organizations (e.g., Li and Li, 2014; Lovejoy and Saxton, 2012). Nevertheless, pre-existing categorization provides heuristic devices for coding scheme development. Therefore, a hybrid approach is necessary.

An initial coding scheme was adapted from the information-action-community framework (Lovejoy and Saxton, 2012) and informed by research on CEO social media strategies (Jameson, 2014; Alghawi *et al.*, 2014). The final coding scheme comprised four categories which represent the different communication goals of the CEOs' tweets: to share, to promote, to update, and to interact (see Table 3 for exemplars of each category and their frequencies). Using the above coding scheme, the first author and a trained research assistant conducted the content analysis. To establish reliability, the two coders independently coded 50 (4.68% of the eventually coded tweets) randomly selected tweets. Discrepancies between coders were resolved by discussion. The inter-coder reliability was satisfactory ($\kappa = .86$).

[Table 3 about here]

3.3.1 To share. CEOs use Twitter to share information and insights, mostly about their companies, the industry, and current affairs. Beyond mere information, CEOs also post original content that expresses what they think about certain issues. These insights include reflecting on the meaning of leadership, commenting on current affairs, and expressing concerns about social issues.

3.3.2 To promote. This category entails promotional messages that CEOs post to Twitter, such as introducing a product or calling for participation in corporate events. It also includes branding messages that promote companies by highlighting achievements and industry recognitions. This category mirrors the mobilization and call-for-action purposes of messages from non-profit organizations identified in previous studies (Lovejoy and Saxton, 2012;

Saxton and Waters, 2014). In addition to calling for participation or action, messages in this category also include the deliberation of the company's vision and mission, which implicitly help to promote the organization.

It should be noted that the primary communication goal of the tweets takes precedence in the coding scheme. This meant that even if a promotional message contains information, it would not be coded as "to share" information if the primary intention is "to promote". Promotional messages typically contain words that promote actions (cf. Lovejoy and Saxton, 2012). For instance, while a tweet, "#DellWorld 2014 is coming and you are invited http://t.co/6qpLTLe4Aw!", includes company-related information, the primary communication goal of this tweet is to promote an organizational and community event. There were also tweets that help to promote the CEOs' companies. These tweets occasionally touched on the companies' mission or vision statements and can be clearly differentiated from tweets that convey company-related information. For instance, "#DidUKnow Nearly 1 out of 7 people in the world are either an international or internal migrant. @WesternUnion helps people connect" is considered a promotional message but not "#AutoNation total retail new vehicle unit sales for the 1st quarter up 4%, highest since 2007" which provided a sales update of the company.

3.3.3 To update. One of the canonical message categories of tweets from personal Twitter accounts is status update which addresses the question of "what is happening?" (Naaman *et al.*, 2010). This communication goal pertains to the relational nature of social media that motives users to post self-related information. For CEOs, this category of messages appeared in the form of writing about what is happening in their daily professional and personal lives. Notably, this type of messages is more personable and, thereby, distinct from those posted by organizations that pertain to corporate activities, which is more informational. It should be noted that tweets that serve the purpose of updating status is

different from tweets that share information or insights. The former pertains to CEOs'

everyday professional or personal activities whereas the latter is about sharing information or

insights of organizations, industries, and so on. For instance, "#AutoNation total retail new

vehicle unit sales for the 1st quarter up 4%, highest since 2007" is coded as sharing

information whereas "On @CNBC with @HobbsieNY talking about @expediainc's earnings

shortly. See you soon @SquawkCNBC fans! #expe" is coded as updating work/professional

life status.

   3.3.4 To interact. Tweets in this category indicate dialogic communication or such

intent between CEOs and Twitter users. Organizational leaders often publicly recognize the

excellent performance of employees and deliver thank you messages or "pep talks" to their

team in the tweets. Outside the work domain, CEOs demonstrate their engagement in social

activities such as expressing greetings during festivals, participating online events such as

ice-bucket challenges, and replying messages to specific Twitter users.

3.4 Detecting linguistic features

The tweets were exported as individual text files from NViVo and imported to Linguistic

Inquiry and Word Count 2007 (LIWC; Pennebaker *et al.*, 2007), an automatic linguistic

feature detection software, for processing. LIWC counts the number of words within a given

text according to a well-developed and externally validated dictionary (see Tausczik and

Pennebaker, 2010) that includes words categorized into 81 language categories. The results

of the analysis indicate percentages of certain words appearing in the text that represent a

given category. For example, "affective processes" encompasses the proportion of words

such as "happy", "cried", and "abandon" (Tausczik and Pennebaker, 2010, p. 40) in a given

text.

   Affect, certainty, and social processes were selected for regression analyses. The tweets

in this study were preprocessed to account for the unique communication styles of

microblogging. Linguistic noise (Derczynski *et al.*, 2013) in tweets exists when people use abbreviated words to convey more information (e.g., "c u tmr" means "see you tomorrow", "b/c" means "because"). As the pre-defined dictionary of LIWC does not contain abbreviated words of the microblog-genre, the preprocessing included normalization of abbreviated words (e.g., "w/" to "with", "ppl" to "people", "wk" to "week") and separation of hashtags that combine multiple words (e.g., "#Youthunemployment" to "# youth unemployment").

To further validate the LIWC results, 30 randomly selected tweets from each of the three focal categories (i.e., social, affect, and certainty) were manually coded. A coder was trained using the explanations from LIWC's definitions of the three categories and rated the tweets' social, affect, and certainty levels on a 5-point Likert scale (l-very low to 5-very high). Bivariate correlation analyses results revealed that the rater's scores had significantly positive relationships with the three categories: $r_{social} = .78$, $p < .01$; $r_{certain} = .73$, $p < .01$; $r_{affect} = .80$, $p < .01$, which indicates good validity of LIWC results. Table 4 illustrates LIWC output from analysis of the sample of CEOs' tweets in this study.

[Table 4 about here]

3.5 Evaluating retweetability

To understand the impact of contextual and content factors on retweetability, a series of negative binomial regressions (owing to the highly skewed data) were conducted. This method is favored over Poisson regression analysis because the dependent variable (i.e., number of retweets) is overly dispersed ($M = 73.92$, Variance $= 202657.49$). The control variable was the number of followers. The independent variables included contextual and content factors. Contextual factors were CEO backgrounds (art, entertainment and recreation $n = 99$, finance and insurance $n = 300$, information $n = 107$, retail trade $n = 91$, utilities $n = 132$, others $n = 339$), Twitter age, and activeness (as measured by number of tweets posted

per month). Content factors included content types, supplementary information use, and linguistic styles.

In each step of the regression, a set of independent variables were entered into the model: the number of followers as a control variable (step 1), contextual factors (step 2), and content factors (step 3). Incidence rate ratios (IRRs) or exponentiated coefficients of the independent variables were examined. IRR indicates the change in a dependent variable for each unit change in an independent variable. For instance, an IRR of 1.098 means that one-unit change in a variable is related to 9.8% increase in the number of retweets. For an independent categorical variable, an IRR indicates the difference compared to the referent group that is related to changes in a dependent variable. Note that some variables in the models pertain to the user (e.g., industry background, activeness, Twitter age, the number of followers) while others pertain to individual tweets (e.g., linguistic styles). Variables pertaining to users vis-à-vis individual tweets were entered in different steps to evaluate their contributions to message retweetability.

4. Results

Table 5 presents results of correlation analyses of the study variables. Table 6 presents results of regression analyses. The number of followers (control variable) had a statistically significant but minimal impact on retweetability, B = 0.000006, IRR=1.000006, $p < .001$.

[Table 5 about here]

[Table 6 about here]

4.1 Contextual factors

On RQ1, the regression analyses reveal that the background of CEOs had a greater impact than other variables. Tweets of CEOs from the information industry were more likely to be retweeted, followed by those from art, entertainment or recreation industries. Activeness had a significant negative relationship with retweetability, however the effect size was small, B= -

0.03, $p < .01$, IRR=0.97. Hypothesis 1 was, therefore, not supported. Twitter age had a significant positive relationship with retweetability, thereby supporting hypothesis 2.

4.2 Content factors

On RQ2, the results indicate that more than half of the tweets were informational. Unlike organizational accounts, promotion and mobilization messages comprised only 5.34% of the CEOs' tweets. Nearly one third of the tweets were status updates related to CEOs' professional and personal lives. Interaction with employees and stakeholders comprised 15.45% of the tweets. On RQ3, the results indicate that messages containing season's greetings, insights about the organization, and promotions of the organization received significantly greater numbers of retweets than mere organizational information sharing (i.e., the referent group). As compared to the referent group (i.e., to share information about CEOs' organizations), updating status of personal life, recognizing employee excellence, and replying to messages on Twitter were negatively related to retweetability.

On the use of supplementary information, 400 (37.45%) of the 1068 tweets analyzed contained hashtags while 751 (70.32%) had URLs (including URLs of pictures or videos). The regression analyses indicate that using hashtags and adding URLs had significant impact on retweetability, thereby supporting hypothesis 3. The final set of content factors pertains to linguistic features, as measured by levels of social processes, affect, and certainty in the tweets. The most salient linguistic features were affect and social processes. Certainty language was less common. The regression analyses show that only certainty has a statistically significant impact on retweetability, which partially supports hypothesis 4. Each unit increase in certainty led to a mere 8% increase in the number of retweets.

5. Discussion

As one of the first studies to investigate top executives' social media messages and their effectiveness, this study provides a significant contribution to our understanding of social

influence and leadership on social media. Heeding the call to investigate CEOs' online messages (Alghawi *et al.*, 2014; Tsai and Men, 2016) and initial public responses online (Saxton and Waters, 2014), this study provides a systematic analysis of Fortune 1000 CEOs' messages on Twitter, proposing and demonstrating a framework guided by HSM (Chaiken, 1980) that incorporates contextual factors and content characteristics. Taken together, the results indicate that CEOs' industry background and content types carry more weight than supplementary information use and linguistic features in influencing message retweetability.

5.1 Implications for research

This study contributes to a better understanding of executive communication on social media. Our findings suggest that CEOs do not necessarily have to mimic organizational practices of social media communication. As spokespersons, CEOs can expand their organizations' communication efforts through distinct types of social media messages. Some guidelines meant for organizations might not be equally effective for personalities. For example, providing useful information is deemed as a way of initiating dialogic communication with stakeholders (Kent and Taylor, 1998). This role, however, might be better left to the organization's social media accounts which are already doing so. To better understand how organizational leaders can provide distinctive contributions to the social media communication of their organizations, future research should compare public responses to messages from different kinds of accounts related to the organizations (e.g., accounts of CEOs, marketing professionals, employees, and the organizations) to identify communication strategies and skills best suited to manage these respective accounts.

Although the CEOs' background was found to have a significant impact on retweetability, CEOs' communication styles are also important given that CEOs would not receive sustained public attention merely because of their capacity as corporate leaders if they do not actively interact online. Online leadership research suggests that people who engage in

interactions in online communities are more likely to be perceived as leaders (e.g., Cassell *et al.*, 2006; Huffaker, 2010; Misiolek and Heckman, 2005). Our study extends this line of research by examining a group of individuals who already possessed a certain level of social influence before they join online social networks. Our findings suggest that, even with preexisting influence, CEOs must adopt appropriate message strategies if they wish to gain influence on social media.

This study further contributes to microblogging research in at least three ways. First, this study proposed and illustrated a content categorization of organizational leaders' tweets, that extends our understanding of executive communication on social media, which has received comparatively little scholarly attention. Notably, this study is one of the first to examine top executives' tweets based on their communication goals. While prior research (Lovejoy and Saxton, 2012; Rybalko and Seltzer, 2010) has identified the communication goals of Twitter messages from organizations, the communication patterns of top executives' actual messages on Twitter have not been examined until now.

Second, this study contributes to our understanding of online information diffusion in the context of executive communication on Twitter. Our findings suggest that CEOs' industry background, as a contextual cue, is a significant predictor of message retweetability. Tweets of CEOs from art, entertainment or recreation, information, and retail trade industries were more likely to generate retweets than those from industries such as mining, transportation, and manufacturing. The former industries are ostensibly more interesting to the general public than the latter ones and therefore receive greater attention online. Companies from industries such as mining have more niche audiences and stakeholders, which call for more specialist content that have little general appeal. Previous research suggests that people may hold different expectations on types of information communicated by organizations that belong to different industries (Gürhan-Canli and Batra, 2004; X. Zhang *et al.*, 2014). Our

findings extend those studies by showing that the type of organization is also an important factor in considering the message strategies for CEOs who wish to gain online social influence.

Third, this study extends our knowledge of the impact of linguistic styles on social influence on Twitter. Previous research suggests that the perception of leadership is associated with psycho-linguistic features of messages such as affect, certainty, and social processes (e.g., Cassell *et al.*, 2006; Huffaker, 2010; Slatcher *et al.*, 2007; Stieglitz and Dang-Xuan, 2012). In this study, however, it was found that CEOs' affect and social linguistic features did not significantly influence retweetability. This finding might be explained by the character limit on microblogging platforms which meant that the linguistic style tends to be more standardized. It is also possible that the findings from studying general Twitter users may not be applicable to how leaders use such platforms. Future research should examine how users' identities influence their communication strategies and effectiveness. For instance, political leaders on Twitters have a more limited communication goal of mobilizing resources or motivating followers (Stieglitz and Dang-Xuan, 2012). Their affective and social linguistic styles might be more influential when compared with CEOs whose communication goals are more diverse.

5.2 Practical insights into top executive communication on social media

The findings in this study have practical implications for CEOs and communication professionals. As supported by our findings, Twitter posts from CEOs serve various communication goals. People are interested in retweeting original content from CEOs, especially their professional insights and social messages that address general interests. Promotional tweets from CEOs —particularly messages that promote the companies' vision or mission statements were also more likely to be retweeted. Thus, CEOs who exhibit thought leadership and act as spokespersons for organizations are likely to be favored by the

public on social media. CEOs should draw on their expertise to share insights and work with

their communication team to distribute and promote information about the organizations.

Like ordinary users on Twitter, CEOs do post status updates about their life moments.

Status updates help to distinguish the type of messages posted by CEOs from those by

depersonalized organizational accounts. Although one might expect the public to pay

attention to CEOs' social activities, this study found that such information (especially status

updates on personal life) was not likely to be retweeted. This finding supports the notion that

highly social CEOs ought to be "spontaneous yet not too informal" (Weber Shandwick, 2013,

p. 22). CEOs should not behave like ordinary individuals on social media in recording their

daily activities to interact with the public as such content do not necessarily interest most of

their followers. This finding should encourage senior executives who have privacy concerns

with the sharing of personal information to go on social media given that they can

comfortably share their business insights to gain online social influence without having to

reveal details of their personal life.

Besides considering the type of content in their messages, CEOs should also capitalize

on existing social media tools to enhance their communication with the public. Our findings

indicate that including hashtags in tweets significantly increases retweetability. Through

strategic use of hashtags, CEOs can initiate or participate in discussions on certain topics and

promote their visibility. They can invoke frequently used hashtags (e.g., #employment) or

create new hashtags that correspond to their organizations' programs (e.g., #inspiredbypets

and #DellPeak14).

5.3 Limitations and directions for future research

This study has several limitations that could be addressed in future studies. Fortune 1000

CEOs were chosen as the subject for this study as they represent the top senior executives of

the largest companies in the US. Nevertheless, these CEOs may not be representative of most

US organizations. Furthermore, they may not represent the best practices of CEO in social media communication. Future studies should expand the scope of organizations and examine whether the findings in this study can be generalized to other platforms—including internal SNS—and applied to other indicators of initial public responses such as likes and comments. As retweets can be bought or automated, the number of retweets may not fully represent genuine responses from Twitter users. Also, it is not certain if the tweets analyzed in this study were written by the CEOs themselves—some of them may work with their communication or PR teams to craft the messages. To address these issues, future research could investigate the impact of content and contextual factors of CEOs' messages using experiments to further validate the findings. In addition, this study faced a common limitation of research using LIWC in that the analysis of text sentiment does not fully account for more nuanced meanings (Chung and Pennebaker, 2008; Kim *et al.*, 2016). Future studies could employ qualitative content analysis to better understand the sentiment of the tweets.

Despite these limitations, the findings demonstrate the meaningful impact of social media content characteristics. Future studies could examine the diversity of hashtags and its relationship with retweetability. Further research on how message strategies are related to perceptual and relational outcomes of public engagement is also warranted. A combination of content analysis and survey studies could provide useful insights regarding the longitudinal impact of message strategies. In addition, a discourse analysis of conversations between CEOs and the public on social media may illuminate the community building process that would better inform CEO message strategies on social media. Finally, retweeted messages were outside the scope of this study given the focus on how CEOs craft original content. Yet, retweeted content may be part of wider message strategies to share, to promote, to update, and to interact with the publics. Future work could examine retweeting behaviors of CEOs to evaluate its role in CEOs' online communication strategies.

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No. 4, pp. 819–838.

Table 1. Account information of Fortune 1000 CEOs on Twitter ($N = 37$).

CEO and Twitter name	No. of followers	No. following	No. of tweets in 2014 (% of all tweets)	No. of tweets sampled (% of the CEO's tweets)
Carlos M. Cardoso (@CarlosMCardoso)	984	579	567 (1.06%)	106 (18.69%)
John A. Catsimatidis (@JCats2013)	4048	2052	546 (9.69%)	102 (18.68%)
Jack Salzwedel (@AmFamJack)	4865	201	537 (9.53%)	98 (18.25%)
Jeff Joerres (@ManpowerGroupJJ)	8032	1192	524 (9.30%)	94 (17.94%)
Patrick K. Decker (@PatrickKDecker)	512	189	351 (6.23%)	71 (20.23%)
David Lenhardt (@dklenhardt)	2669	237	334 (5.93%)	57 (17.07%)
Michael Dell (@MichaelDell)	864300	1383	286 (5.08%)	49 (17.13%)
Walt Bettinger (@WaltBettinger)	1318	159	262 (4.65%)	48 (18.32%)
Mike Jackson (@CEOMikeJackson)	12017	824	249 (4.42%)	54 (21.69%)
Hikmet Ersek (@WesternUnionCEO)	5500	108	202 (3.59%)	49 (24.26%)
Rupert Murdoch (@rupertmurdoch)	540884	90	200 (3.55%)	44 (22.00%)
Omar Ishrak (@MedtronicCEO)	8220	142	169 (3.00%)	37 (21.89%)
Dennis Hatchell (@ChiefRoo)	472	5	168 (2.98%)	34 (20.24%)
Michael Rapino (@rapino99)	17943	314	168 (2.98%)	27 (16.07%)
Alex Molinaroli (@amolinaroli)	10669	193	146 (2.59%)	33 (22.60%)
Elon Musk (@elonmusk)	1573076	40	134 (2.38%)	25 (18.66%)
Satya Nadella (@satyanadella)	335923	38	114 (2.02%)	26 (22.81%)
Thomas Klein (@tomkleintk)	1285	199	80 (1.42%)	16 (20.00%)
Tim Cook (@tim_cook)	871621	38	83 (1.47%)	13 (15.66%)
David Barger (@DavidJBarger)	6906	503	70 (1.24%)	9 (12.86%)
Jeff Immelt (@JeffImmelt)	25960	62	59 (1.05%)	9 (15.25%)
Dara Khosrowshahi (@dkhos)	14344	373	57 (1.01%)	11 (19.30%)
Dean Scarborough (@chester1955)	551	225	46 (0.82%)	8 (17.39%)
Carl Bass (@carlbass)	8845	134	40 (0.71%)	6 (15.00%)
Darren Huston (@Darren_Huston)	1936	596	35 (0.62%)	6 (17.14%)
Shaygan Kheradpir (@ShayganK)	2611	84	35 (0.62%)	4 (11.43%)
Marissa Mayer (@marissamayer)	862607	334	32 (0.57%)	6 (18.75%)
Bruce Broussard (@BruceDBroussard)	1786	35	31 (0.55%)	6 (19.35%)
Brian Krzanich (@bkrunner)	3632	7	30 (0.53%)	5 (16.67%)
Mark T. Bertolini (@mtbert)	8536	421	30 (0.53%)	5 (16.67%)
Cindy B. Taylor (@cindybtaylor)	87	108	17 (0.30%)	2 (11.76%)
Naren Gursahaney (@NarenGursahaney)	337	108	14 (0.25%)	4 (28.57%)
John Donahoe (@Donahoe_John)	13167	733	8 (0.14%)	2 (25.00%)
Greg Brown (@gregbrownmoto)	2415	28	7 (0.12%)	2 (28.57%)
Randall L. Stephenson (@RandallLStephen)	39	NA	1 (0.02%)	0 (0%)
Reed Hastings (@reedhastings)	5065	20	1 (0.02%)	0 (0%)
Warren Buffett (@WarrenBuffett)	925939	NA	1 (0.02%)	0 (0%)

Note. Fortune 1000 status as listed in 2013 and 2014. Twitter account information retrieved in February 2015.

Table 2. Descriptive statistics of all the tweets and sampled tweets.

	All the tweets ($N = 5634$)				Sampled tweets ($N = 1068$)			
	Minimum	Maximum	Mean	SD	Minimum	Maximum	Mean	SD
1. Number of retweets	0	28645	89	720.37	0	7954	73.92	450.18
2. Number of followers	39	1573076	129518.8	328868.19	87	1573076	126826.78	323235.54
3. Twitter age	1	7	4.28	1.62	1	7	4.24	1.61
4. Activeness	0.08	47.25	27.86	15.36	0.58	47.25	27.61	15.19
5. Social processes	0.00	50.00	6.97	7.73	0.00	42.86	5.90	6.75
6. Affect	0.00	66.67	7.15	7.63	0.00	40.00	5.58	6.50
7. Certainty	0.00	50.00	1.00	2.97	0.00	50.00	1.00	2.95

Table 3. Tweet content codes, explanations, exemplars, and frequencies.

Communication goal	Exemplars	*n*	%
To share		540	50.56%
Information (Company)	#AutoNation total retail new vehicle unit sales for the 1st quarter up 4%, highest since 2007.	131	12.27%
Information (Business)	#US weekly #joblessclaims drop 36k to 280k. Continuing claims at lowest level since May 2007 http://t.co/qLF9a3WwZs	167	15.64%
Information (Others)	7 Things I Wish I Had Known at 25. http://t.co/ws1MWPz4m1 #yam Good Article!	56	5.24%
Insights (Company)	Was asked yesterday...what does AmFam look for when promoting people. Simple. Smarts, work ethic, integrity. Courage. Curious. #leadership	28	2.62%
Insights (Business)	American R&D Investments and the Political Divide! This political poker comes at a very high price—jobs, especially. http://t.co/Ttfu5GIrtX	63	5.90%
Insights (Others)	ISIS can only be beaten by policy of elimination and even then with difficulty. This is historic war of barbarism v, civilization.	95	8.90%
To promote		57	5.34%
Company	#DidUKnow Nearly 1 out of 7 people in the world are either an international or internal migrant. @WesternUnion helps people connect.	22	2.06%
Products/Events	#DellWorld 2014 is coming and you are invited http://t.co/6qpLTLe4Aw!	35	3.28%
To update		305	28.56%
Work/Professional life status	On @CNBC with @HobbsieNY talking about @expediainc's earnings shortly. See you soon @SquawkCNBC fans! #expe http://t.co/iY7BVCAeeN	229	21.44%
Personal life status	Enjoying dinner at @legalseafoods- bib and all! Boston landmark. http://t.co/33W0u1bW3G	76	7.12%
To interact		166	15.54%
Recognition	Congrats 2 WU employees, Agents and business partners in #Myanmar. @WesternUnion just celebrated our 1st anniversary http://t.co/wUgm6N7n01	109	10.21%
Greetings/Wishes	Happy 4th of July everyone ...https:/t.co/KxKxKdq9iq	23	2.15%
Online response solicitation	Retweet if you love Saturdays at @PetSmart!	19	1.78%
Replying to messages	@wesleyslobo just need to c if I can make it work given flights to Europe that week let me c. Would love 2 make it happen this time or next	15	1.40%
	Total:	1068	100%

Note. The texts in exemplars are not normalized.

Table 4. Examples of LIWC output.

Tweets	LIWC category and score
	Social Processes
Happy Mothers Day to everyone!!	40.00
Great video showing how Raymundo brought added efficiency to the manufacturing process @johnsoncontrols	0
	Affect
A very sad day as my beautiful sweet friend Lucky passed away. We will all miss her dearly. Goodbye sweet sweet girl.	39.13
Grass roots innovation in action - the start-up culture in @Microsoft #Garage	0
	Certainty
You will either drive by, or drive through, your Christmas. I say go through every moment, every gift, every conversation, and every memory!	17.39
Rejection...often a catalyst for success. Failure...often an ingredient. #BonoLetter	0

Table 5. Bivariate correlations of study variables.

	1	2	3	4	5	6	7
1. Number of retweets	-	.42**	.05	-.18**	.04	-.01	.09**
2. Number of followers		-	.26**	-.31**	.01	.03	.07*
3. Twitter age			-	.03	.01	.10**	-.01
4. Activeness				-	-.12**	-.10**	-.08**
5. Social processes					-	.11**	.20**
6. Affect						-	.15**
7. Certainty							-

Notes: * $p <.05$, ** $p <.01$ (two-tailed)

Table 6. Negative binomial regression with number of retweets as dependent variable ($N = 1068$)

Steps and Variables Entered	B (SE)	Z	Exp (B)
Step 1. Control Variable			
Intercept	1.99***(0.04)	51.58	7.35
Number of followers	0.000006*** (0.0000002)	35.92	1.000006
χ^2	3289.84***		
Log Likelihood	-4025.83		
AIC	8055.65		
Step 2. Contextual Factors			
Intercept	0.73*** (0.18)	4.13	2.07
Background of CEOs[a,b]			
Art, entertainment or recreation	2.24*** (0.13)	16.82	9.40
Finance or insurance	0.53*** (0.11)	4.98	1.70
Information	2.60*** (0.13)	19.38	13.51
Retail Trade	1.59*** (0.15)	10.71	4.90
Utility	0.45** (0.14)	3.21	1.57
Twitter Age	0.20*** (0.03)	7.14	1.22
Activeness	-0.03*** (0.003)	-9.56	0.97
χ^2	4722.29***		
Log Likelihood	-3309.6		
AIC	6637.2		
Step 3. Content Factors			
Intercept	.55** (.23)	2.43	1.74
Content Types[a,c]			
To share			
Information (Business)	-0.13 (0.14)	-0.94	0.87
Information (Others)	-0.11 (0.21)	-0.52	0.90
Insights (Company)	1.35*** (0.24)	5.67	3.87
Insights (Business)	-0.20 (0.18)	-1.09	0.82
Insights (Others)	-0.03 (0.17)	-0.15	0.97
To promote			
Company	0.76** (0.25)	3.01	2.13
Products/Events	-0.46 (0.22)	-2.09	0.63
To update			
Work/Professional life status	-0.09 (0.13)	-0.66	0.92
Personal life status	-1.01*** (0.19)	-5.36	0.37
To interact			
Recognition	-0.34* (0.16)	-2.16	0.71
Greetings/Wishes	1.17*** (0.26)	4.42	3.21
Online response solicitation	0.42 (0.27)	1.53	1.52
Replying to messages	-1.10* (0.44)	-2.50	0.33
Supplementary Information[a]			
Use hashtags (#)	0.52*** (0.08)	6.35	1.68
Use URLs	0.26** (0.09)	2.84	1.30
Linguistic Features			
Social processes	0.01 (0.01)	1.46	1.01

Affect	-0.001 (0.01)	-0.18	0.998863
Certainty	0.08*** (0.01)	5.25	1.08
χ^2	5048.50***		
Log Likelihood	-3146.49		
AIC	6346.99		

a. Dummy variables, yes=1, no=0;

b. Other industries (Manufacturing, Mining, Package & Labeling, and Transportation) was omitted as a reference group;

c. Information (Company) was omitted as a reference group.

AIC: Akaike's Information Criterion

*p <.05, **p <.01, ***p <.001