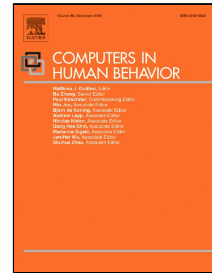# Accepted Manuscript

Pro-social Messages and Transcendence: A Content Analysis of Facebook Reactions to Mark Zuckerberg's Donation Pledge

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Pro-social Messages and Transcendence: A Content Analysis of Facebook Reactions to Mark Zuckerberg's Donation Pledge

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Abstract

This quantitative content analysis of over 4,000 Facebook posts explores the connections between transcendence-related character strengths and emotions expressed on social media in response to Mark Zuckerberg's pledge to give away 99% of his Facebook shares to charity. We found that (a) other-oriented hope was found in over half of the posts expressing hopeful thinking; (b) appreciation of moral beauty and excellence was the most prevalent moral emotion or character strength expressed in response to this prosocial act on Facebook; and (c) the presence of appreciation of moral beauty and excellence was positively correlated with the presence of hope, other-oriented hope, and spirituality. Implications of the study are discussed.

Keywords:

other-oriented hope; character strength; hope; appreciation of beauty and excellent; spirituality; prosocial Facebook posts

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Pro-social Messages and Transcendence: A Content Analysis of Facebook Reactions to Mark

Zuckerberg's Donation Pledge

1. Introduction

On December 1st, 2015, Mark Zuckerberg and his wife, Pricilla Chan, posted a message on

Facebook welcoming their daughter to the world. As a part of this message, Mark and Pricilla

announced that they would donate 99% of their Facebook shares (about $45 billion) during their

lifetime to create a better world for their daughter and the next generation. The letter, which was

written to their daughter, described how they planned to create a better world, and it was shared,

liked, and/or commented on by more than 2 million Facebook users. Additionally, many Facebook

users posted about the act of generosity on their own Facebook walls, commented on messages

about the event posted by both friends and media outlets, and responded to others' posts about the

donation.

This overwhelming response to Zuckerberg and Chan's donation pledge is an example of

the way that social networks like Facebook provide a unique opportunity for individuals to be

exposed to acts of kindness and generosity that may elicit self-transcendent emotions among users.

Social exchanges through Facebook posts and comments can be value-laden and charged with

emotions (i.e., Ferrara & Yang, 2015; Stieglitz & Dang-Xuan, 2013). These values and emotions

can influence attitudes, emotions, beliefs, and behaviors of other Facebook users regardless of

whether it is the content creator's intention and can affect the offline world in discernable ways

(i.e., Perloff, 2014; Laroche, Habibi, Richard, & Sankaranarayanan, 2012). Chen, Hsieh, Mahmud,

and Nichols (2014) identified and described categories of words that demonstrated user's value

orientations on Reddit (a social media platform) based on Schwartz's theory of Basic Human

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Values (Schwartz, 2006). The study supported the notion that words used on social media can be a potential predictor of people's values. Building on the research on emotional contagion (Hatfield, Cacioppo, & Rapson, 1993), Fowler and Christakis (2008) found that happiness can spread in social networks across a wide range of social ties and may have long-term effects. Various studies have also provided support for the speculation that emotions can spread via online interactions on social media (Coviello et al., 2014; De Choudhury, Counts, & Gamon, 2012; Harris & Paradice, 2007). Therefore, it is important to explore the kinds of messages users may create and be exposed to on social media platforms like Facebook. It is possible that positive message on social media about one's achievement or welfare can elicit negative emotions such as envy and depression in others (Tandoc, Ferrucci, & Duffy, 2015), especially for people who tend to engage in social comparison (de Vries, Möller, Wieringa, Eigenraam, & Hamelink, 2018). However, from an emotional contagion perspective, one's positive posts can also evoke positive emotions in others because others may imitate and take on the positive emotions expressed in the original posts (Ferrara & Yang, 2015; Hancock, Gee, Ciaccio, & Lin, 2008). Moreover, when positive messages are not self-promoting nor about one's self and the self's achievements and well-being, but rather, acts of social interests, they may be less likely to cause the processes of social comparison or elicit negative emotions. To date, no empirical study has unobtrusively examined social media users' expressions of various self-transcendent emotions in reactions to a prosocial act propagated on a social media platform. Therefore, this study aims to fill this gap.

Messages about prosocial acts demonstrate moral beauty and human goodness and often elicit self-transcendent emotions for the message receivers (Haidt, 2000). It remains unknown as to which self-transcendent emotions appear most frequently in response to messages about prosocial acts on social media. The present research aims to understand the types of self-transcendent

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emotions users may have expressed on social networking sites by closely examining the reactions to Zuckerberg and Chan's donation among Facebook users. Additionally, recent theorizing related to the content of hope proposed the concept of other-oriented hope, which is future-oriented thinking reflecting one's interest in others' welfare (Howell & Larsen, 2015). However, research on other-oriented hope is limited. One study examined value dimensions related to other-oriented hope (universalism and benevolence) and words used on the social media platform Reddit. This study revealed a positive linear relationship between words focused on others and larger groups (e.g., humans, first-person plural pronouns) and the self-transcendence value dimension manifested by two basic human values, universalism and benevolence (Chen, Hsieh, Mahmud, & Nichols, 2014). These results point to the need for additional empirical research on the ways other-oriented hope is expressed in everyday life.

In sum, the goal of this study is to provide a detailed examination of the responses to a well-known and widely discussed act of kindness announced on Facebook so that we may more fully understand the prevalence of various self-transcendent emotions expressed on social media, the relationships between these emotions, and the social media presence of the newly proposed psychological construct, other-oriented hope.

1.1. Social media, emotions, and prosociality

Social media sites have become a part of our daily lives, and these platforms act as a carrier of user-generated content containing cognitions, emotions, and behaviors. In fact, people share emotions with others more and more frequently on social media through their public presentation channels (as opposed to private message features on social media) for updates (i.e., tweets, status updates, posts on timelines, shared or live videos) and responses (Bazarova, Taft, Choi, & Cosley, 2013; Kivran-Swaine & Naaman, 2011). Emotions on social media are powerful and contagious

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(Coviello et al., 2014; De Choudhury et al., 2012; Ferrara & Yang, 2015; Harris & Paradice, 2007; Stieglitz & Dang-Xuan, 2013), and happiness can spread via social networks (Fowler & Christakis, 2008). Moreover, research has found that emotions expressed on Facebook public presentation channels such as status updates and posts on timelines are overwhelmingly positive (Sas, Dix, Hart, & Su, 2009), and Facebook users feel more intrinsically rewarded after sharing positive emotional content (Bazarova et al., 2013). Previous studies that examined emotions and moods expressed on social media have mainly analyzed only positive and/or negative affect (e.g., Bollen, Mao, & Pepe, 2011; Dupuis, Khadeer, & Huang, 2017; Harris & Paradice, 2007). As such, they may not capture the important nuances in emotions that have been expressed on social media. De Choudhury, Counts, and Gamon (2012) identified a diverse array of moods on Twitter under the guidance of the circumplex model of affect (Russell, 1980) that perceives affective experience as a bi-dimensional construct composed of both valence and activation. However, this particular study did not include self-transcendent positive emotions. Dale, Raney, Janicke, Sanders, and Oliver (2017) examined inspirational YouTube videos to identify potential elicitors of self-transcendent emotions and matched portrayals of these elicitors to viewers' real-time rating of inspiration. However, the main goal of the study was to identify elicitors of self-transcendent emotions in video content and to test the validity of these elicitors using an experimental methodology. Our study takes this examination of self-transcendent emotions one step further to include expressions of self-transcendent emotions presented by users on social media. We have unobtrusively examined social media users' expressions of various self-transcendent emotional reactions to a prosocial act announced on Facebook in an effort to more fully understand the ways that individuals might encounter self-transcendent emotions in their everyday lives.

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It is reasonable to expect Facebook users to experience various transcendence-related character strengths and emotions through social media use, given the existence of inspirational content such as inspirational quotes, touching videos, photos of natural beauty, powerful pictures depicting human connection, and friends' announcements of major life events. As suggested by previous studies, art, music, natural wonders, childbirth, panoramic views, and other things of beauty can elicit the self-transcendent emotion of awe (Keltner & Haidt, 2003; Shiota, Keltner, & Mossman, 2007), and acts of charity, generosity or any other virtue can elicit the self-transcendent emotion of elevation (Algoe & Haidt, 2009). Message content containing these common elicitors of transcendence-related emotions is not hard to find on Facebook. If the expressions of positive emotions circulate on social media sites, it is possible that they could positively influence users' emotional well-being, encourage prosocial behaviors, and benefit the virtual community as well as the offline, physical community. This upward spiral of positive emotion, prosociality, and well-being can be explained and supported by Fredrickson's (2001) broaden-and-build theory of positive emotions.

Mark Zuckerberg's Facebook announcement after the birth of his daughter serves as an exemplar of a prosocial act announced on a social network site. In light of the prosociality and social interest demonstrated by Mark Zuckerberg's donation announcement on Facebook and the unanswered questions in the literature of transcendence and social media, we pose the following research question:

RQ1: What is the most prevalent self-transcendent emotion shown in posts about this event?

1.2. Prosociality and transcendence-related character strengths

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Peterson and Seligman (2004) classified five character strengths under the virtue of *transcendence*, which is described as "the connection to something higher – the belief that there is meaning or purpose larger than ourselves" (Peterson & Seligman, 2004, p. 38). These character strengths are appreciation of beauty and excellence, gratitude, hope, humor[1], and spirituality. They are described as strengths that build connections to the universe and hence add meaning to humans' lives (Peterson & Seligman, 2004). Appreciation of beauty and excellence is associated with feelings of awe, elevation, wonder, and admiration (Haidt & Keltner, 2004); gratitude is represented by both the transcendent emotional experience of grace (Emmons, 2004) and the other-praising moral emotion of thankfulness (Haidt, 2003); hope is characterized by the emotional experience of longing for an outcome that is not very likely (Prestin, 2013); and spirituality, including religiousness, faith, and purpose, is defined from a cognitive perspective as "beliefs and practices that are grounded in the conviction that there is a transcendent (nonphysical) dimension of life" (Mattis, 2004, p. 600).

These transcendence-related character strengths and emotions can often be evoked by acts of moral beauty or kindness (Haidt, 2000). For instance, witnessing others' virtuous acts or a demonstration of human goodness can evoke feelings of elevation (Algoe & Haidt, 2009) and awe (Keltner & Haidt, 2003). Acts of kindness or generosity can bring rewards and reduce stress, which facilitates the emotional experience of gratitude (Emmons & McCullough, 2004). Additionally, Diessner, Rust, Solom, Frost, and Parsons (2006) found that describing acts of moral beauty increased trait hope, particularly agentic hope, which researchers have argued is an emotive component of hope (Snyder, Irving, and Anderson, 1991). It has also been found that, recalling an

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[1]As a result of the extremely subjective nature of humor, especially with regards to its ability to inspire self-transcendence, we have decided not to include this character strength in our analyses.

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act of moral beauty has been associated with increased spirituality (Van Cappellen, Saroglou, Iweins, Piovesana, & Fredrickson, 2013).

The positive associations between these strengths are expected, given that they are all classified under the virtue of transcendence by Peterson and Seligman (2014). Scholars have argued that many of the self-transcendent emotions are related to each other. For instance, awe is considered a prototypical emotion of religiousness (Keltner & Haidt, 2003), and appreciation of beauty and excellence is found to be associated with hope (Diessner et al., 2006). Moreover, each of the emotions classified under appreciation and beauty and excellence (elevation, admiration, and awe) has been found to be related to spirituality (Keltner & Haidt, 2003; Van Cappellen et al., 2013; Van Cappellen & Saroglou, 2012). However, the association between appreciation of beauty and excellence and spirituality has not been examined unobtrusively in a natural setting. In these empirical studies, elevation, admiration, and awe were induced either using an instructed recall method or video stimuli. Therefore, the question remains as to whether the relationship between appreciation of beauty and excellence and spirituality will hold in the real world, outside of experimental settings. As a result, we propose the following hypothesis:

H1: Instances of appreciation of beauty and excellence will be positively associated with the presence of spirituality in the Facebook comments on Mark Zuckerberg's post.

1.3. Hope, other-oriented hope, and prosociality

Hope is described as emotional experience of longing for an unlikely outcome and an emotional energy that drives individuals to maintain goal-seeking efforts while coping with stressors (Prestin, 2013). It is also defined as "a positive motivational state that is based on an interactively derived sense of successful (a) agency (goal-directed energy) and (b) pathways (planning to meet goals)" (Snyder, Irving, & Anderson, 1991, p. 287). Lazarus (1991, 2001)

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considers threatening situations as a necessary condition for hope to arise. In addition, the events that elicit hope should involve the perceived possibility of achieving a goal (Lazarus, 1991). Research suggests that acts of kindness or generosity can bring rewards and reduce the stress involved in an adverse situation (Emmons & McCullough, 2004). It follows that other's kindness or generosity in accordance with one's goal may serve as a stress reliever in the painstaking process of goal pursuit and increase the agent's perceived possibility of a favorable outcome. Therefore, the reduced stress and greater perceived possibility of goal achievement may subsequently lead to increased hope. At the same time, acts of kindness or generosity are common elicitors of elevation. This points to the possible connection between appreciation of beauty and excellence (i.e., elevation, awe) and hope. In fact, a study found that individuals demonstrated higher level of hope (the emotive agency component of hope) after they described behaviors of moral beauty, which are considered common elicitors of elevation (Diessner et al., 2006). Thus, we propose that:

H2: Instances of hope will be connected to the presence of appreciation of beauty and excellence.

Furthermore, in a study conducted by Prestin (2013), hope was predicted by an underdog's enduring struggle toward a personal goal portrayed in a video narrative and was associated with viewers' motivation to pursue their own goals. This draws our attention to the content of hope: if viewing an other's pursuit of a personal goal can elicit hope and inspire one's own goal pursuit, it is possible that witnessing an other's pursuit of a communal goal may evoke hopeful thoughts for the general others in a community and motivate one's pursuit of collective goals.

It is believed that individuals' hopes often concern the well-being of others (Howell & Larsen, 2015). This is captured by the concept of "other-oriented hope," which refers to a

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particular type of other-interest in which "we reveal our interest in the welfare of others by apportioning some of our future-oriented mental imaginings to others' welfare in addition to our own, more self-focused, hope" (Howell & Larsen, 2015, p. 15). Through examining empirical research in the field of hope studies, Howell and Larsen (2015) pointed out that many domains of hope studies support the existence and frequent occurrences of hoping for the others. For example, parents hope for their ill children to recover, formal and informal caregivers hope for their patients and close-others with health conditions to get better, and serious illnesses sufferers hope for their close-others and families to live well despite the difficulties caused by their serious illnesses. Although close others are the most common targets of other-oriented hope (e.g., Averill Catlin, & Chon, 1990; Bruininks & Malle, 2005), hope for the general others occurs as well. In a study conducted by Newton, Herr, Pollack, and McAdams (2014), middle-aged adults showed general-other-orientation (e.g., wanting to help underprivileged groups) when asked to describe their hope for the future. They also found a positive correlation between other-oriented hope and generativity, indicating that participants experienced a stronger desire to better the world for others to the extent that they held other-oriented hope. Snyder and Feldman (2000) argue that people who have higher levels of hope think about communal goals and dedicate proportionate pathways and agency thoughts about these goals. Additionally, research showed that people engage in hopeful thoughts toward communal goals 50% of the time, with the other 50% of the time dedicated to personal goals (Snyder & Feldman, 2000).

On a related note, Howell, Bailie, and Buro (2015) found that other-oriented hope was more likely to occur when participants were primed for the inclusion of others by the instructional statements for the tasks. This suggests that the presence of other-oriented hope may be enhanced by the inclusion of cues (words and/or meanings) related to the general "others" in the message of

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the stimulus event. Moreover, Chen et al. (2014) found a positive linear relationship between the words used on Reddit that focus on others and larger groups (e.g., humans, first-person plural pronouns) and the self-transcendence value dimension manifested by two basic human values, universalism and benevolence. These two values are closely related to the other-oriented hope concept (Howell & Larsen, 2015). Therefore, it is possible that wordings referring to larger groups or general others in a message about a hope-eliciting event (i.e., social interests or prosocial behaviors) may elicit other-oriented hope.

Taken together, hope elicitors may portray an adverse situation and the perceived possibility of goal achievement against unfavorable odds; it is possible that other-oriented hope might appear in these situations, especially when posts contain an orientation toward others. We propose that a combination of words indicating both hope and general others may represent hopeful thinking for the general others. Therefore, we pose the following research question:

RQ2(a): In Facebook users' written responses to a Facebook message announcing a

prosocial act, how is the presence of hope connected to the presence of general others?

RQ2(b): How frequently do posts contain both hope and an orientation toward general

others?

Additionally, many theoretical constructs point to humans' propensity to orient toward the interests of others as seen in social interest, communion, belongingness, prosociality, universalism, and benevolence values (Howell & Larsen, 2015). Social interest, for example, "involves a sense of social feeling toward all humankind, and the essence of social interest is the valuing of something outside the self without ulterior motives" (Leak & Leak, 2006, p. 208). This concept also accounts for the possibility that humans often engage in hopeful thinking for others (other-oriented hopeful thinking). Social interest and prosocial behavior go hand in hand (Crandall, 1980;

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Leak & Leak, 2006). Prosociality by definition involves an other-orientation. Prosocial behavior is described as acting in ways that benefit others (Keltner, Kogan, Piff, & Saturn, 2014). Thus, a relationship between other-oriented hope and prosociality seems plausible. Moreover, as discussed earlier, prosocial behaviors such as acts of moral beauty are common elicitors of emotions involving appreciation of beauty and excellence (i.e., elevation, awe), and they can relieve the stress that individuals feel in adverse situations where hopeful thinking is needed (Emmons & McCullough, 2004). Therefore, we propose that:

H3: The presence of appreciation of beauty and excellence will be positively associated with the co-presence of hope and an orientation toward general others[2].

We think Mark Zuckerberg's Facebook announcement after the birth of his daughter is a natural fit for our research inquiries because this post contains examples of social interests, other-orientation, generosity, and prosociality, which covers more than the necessary characteristics of a prosocial behavior stimulus material. Moreover, it is the most recent high-profile philanthropic event initiated by a well-known celebrity, and it drew attention and responses from a large number of Facebook users ($N > 2,000,000$). Lastly, all user responses happened naturally without any manipulation of the eliciting event or the user responses to this event, which allows us to explore naturally-created content in a way that has not yet been done by researchers. With that said, we conducted a quantitative content analysis of public responses to this high profile event on the Facebook.

2. Methods

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[2] The co-presence of hope and references to general others is an operationalization of other-oriented hope in this study. Additional details about this can be found in the method section.

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Our sample included posts and comments collected from Facebook.com using Crimson Hexagon, a social media analytics tool, with a list of search term combinations[3] such as "Mark Zuckerberg" and "gift" and "Zuckerberg" and "Chan" during the week of December 1, 2015 (12/1 to 12/8). A total of 6,174 unique posts[4] were coded for relevance by two coders. The authors coded a random selection of 10% of the sample (n = 618) to establish reliability (Krippendorff's alpha = .85) before they divided and independently coded the remaining 90% of the posts for relevance. Disagreements on relevance were discussed and resolved by authors when coding the 10%. A total of 4,084 posts were considered relevant and coded by a text analytics software, Linguistic Inquiry and Word Count (LIWC) 2015. Figure 1 shows a word cloud with 100 words generated by DiscoverText (another text analytics software) using the relevant posts. The authors then each independently coded a random selection of 10% of the final sample to check inter-coder reliability between the computer coding and human coders. Krippendorff's alphas for each of the coding categories are included below.

———Insert Figure 1 here———

The definition and descriptions of the transcendence-related character strengths detailed by Peterson and Seligman (2004) and Prestin (2013) were used as the coding scheme for this analysis. The coding dictionary was created with words collected during relevance coding and additional words associated with self-transcendent emotions based on previous content analyses of self-transcendent emotions (AUTHORS, 2016a; AUTHORS, 2016b). For example, the coding dictionary for hope included words and word stems (*n* = 69) such as bright, dream, foresee, goal, better, may we, tomorrow, we can, we will, overcome*, prospect*, and regain*. The coding

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[3] A full list of search terms used is provided as an appendix at the end of this paper.
[4] Spam/hoax posts asking people to share the post in order to receive part of the donation from Mark Zuckerberg were removed from the sample and are not included in this number.

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dictionary also contained 175 words and word stems associated with appreciation of beauty and excellence, 11 associated with gratitude, 24 associated with spirituality, and 23 associated with general others.

Eligible posts were coded for presence (1) or absence (0) for the following categories: appreciation of beauty and excellence (Krippendorff's α = .78), gratitude (Krippendorff's α = .97), hope (Krippendorff's α = .85), spirituality (Krippendorff's α = .98), general others (Krippendorff's α = .77) (which included words like "public" "community," "generation," "mankind," and "the poor") and close other(s) (Krippendorff's α = .93), (i.e. "family," "mother," "daughter").

The other-oriented hope variable was created as a combination of general others (i.e., words about others, larger groups) and hope. In other words, other-oriented hope was coded as present when both word(s) about general others and word(s) about hope were present in a particular post. This coding method captures the two main components of other-oriented hope, general others (the social component of social interest) and hope. For example, other-oriented hope was coded as presence for the following post because the words "hope," "you can," and "you will" were coded as the presence of "hope" and the word "people" and "public" were coded as the presence of "general others":

Congratulations on this initiative. I hope you will be sure to consider DISABILITY [SIC] as you frame your plans. DISABILITY is at at [SIC] the root of many of the ills you seek to heal - racial injustice, exclusion, poverty [SIC]. You can do a great deal to help promote understanding and help people with disabilities find meaningful work. Early

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diagnosis, for example. Job Skills training. Public Awareness. Please don't miss this important element in all that you do[5].

3. Results

The Phi coefficients of all measures are shown in Table 1. We conducted Phi coefficients to test correlations between these binary variables in order to examine H1 and H2. The relationship between appreciation of beauty and excellence and spirituality (H1) was supported in the right direction; however, the coefficient indicates a weak correlation, with $r_{\Phi} = .12$, $p < .001$. Similarly, appreciation of beauty and excellence was positively correlated with hope (H2), with $r_{\Phi} = .20$, $p < .001$. Therefore, support for hypotheses 1 and 2 was present and in the predicted direction, though both correlations were weak.

———Insert Table 1 here———

To explore which transcendence-related character strength or emotion was most frequently elicited by this prosocial Facebook post (RQ1), we compared the percentage of posts demonstrating a particular strength or emotion and found that appreciation of beauty and excellence was the most frequently shown character strength, as 36%[6] of all posts demonstrated this emotion. This strength is followed by hope (23%), spirituality (19%), and gratitude (13%). The percentages of posts that showed one of these character strengths are displayed in Table 2.

———Insert Table 2 here———

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[5] This post was copied directly from the Facebook post. All capitalization and wording is as it appeared on Facebook.

[6] One may expect a percentage higher than this. However, due to the fact that this prosocial event was introduced in an announcement that takes the form of a letter addressed to Mark's newborn, many comments or posts (about 44.9%) were either solely expressing congratulations or a combination of congratulations and expressions of transcendence. Even though writing blessings may have been an outcome of the experienced transcendence emotions, we chose to base our analysis on manifest data without making any conjectures.

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To answer RQ2a, in terms of how the presence of hope is connected to the presence of general others, another Phi coefficient test was conducted. We found a moderate positive relationship between hope and general others, with r_Φ = .39, p < .001. RQ2b asks about the percentage of posts that contained both references to general others and hope co-presence in all posts containing hopeful thinking. This was calculated by dividing the number of posts with other-oriented hope (n = 606) by the number of posts with hopeful expressions (n = 945). The results indicate that over half of the posts (64.13%) that expressed hopeful thinking were oriented to the general others, signifying the prevalence of other-oriented hope. On a related note, our H3 posited that other-oriented hope would also be positively associated with appreciation of beauty and excellence. A Phi coefficient test was conducted and indicated a weak positive association (r_Φ = .19, p < .001). Therefore, H3 received limited support.

4. Discussion

Social exchanges on social media can be value-laden and charged with emotions (Ferrara & Yang, 2015). These emotions can influence others' emotional states and affect the non-virtual world in tangible ways. Although positive social media messages may elicit negative emotions through mechanisms like upward social comparison (i.e., de Vries et al., 2018), they can also spread positive emotions from an emotional contagion perspective (Hatfield et al., 1993). In fact, evidence suggests that happiness can spread in social networks across social ties and may yield long-term effects (Fowler & Christakis, 2008). In particular, prosociality often elicits self-transcendent emotions that are above and beyond the self and the self's concerns and goals (Haidt & Keltner, 2004), and these emotions often direct our attention to matters that are greater than the self (Shiota, Thrash, Danvers, & Dombrowski, 2014). As such, self-transcendent emotions provide a rich area for exploring positive emotions and prosociality.

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In the present study, we conducted a systematic analysis of 4,084 Facebook posts written in response to Mark's donation announcement in order to explore the types of transcendence-related character strengths and emotions expressed in these posts. This is the first analysis of social media users' naturally occurring expressions of transcendence-related emotions and character strengths in response to a high-profile prosocial event revealed on social media. This analysis went beyond a traditional sentiment analysis approach (which mainly focuses on polar valenced affect), and the analysis of affects from the bi-dimensional affective experience perspective (Russell, 1980) to take a detailed and noninvasive look at transcendent-related positive emotions expressed by Facebook users. This is also the first empirical investigation of other-oriented hope in a natural setting on social media. Other-oriented hope was conceptualized as an other-interest in which we bring out our interest in others' well-being by dedicating some of our future-oriented mental processes to others' well-being instead of our own, self-directed hope (Howell & Larsen, 2015). The Zuckerberg announcement of a large-scale donation to social causes evoked massive social media responses and served as a perfect example of act of social interest that had great potential to elicit other-oriented hope. Social media sites serve as a platform for this positive emotional experience to spread through various mechanisms such as commenting, "sharing," and "liking" the positive message. In this analysis, we found that appreciation of beauty and excellence was the most frequently expressed self-transcendent emotion on Facebook in response to said charity event. This lends further support to the existing experimental findings that acts of human goodness and moral virtue can elicit self-transcendent other-praising emotions (elevation, admiration, and awe), as claimed by Algoe and Haidt (2009), and extends these findings to a social media context.

Additionally, the presence of appreciation of beauty and excellence (e.g. elevation, admiration) was weakly associated with the presences of both spirituality and hope. This points to

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the possible closeness and overlap of these three psychological constructs. It is possible that

expressions of one of these three character strengths may have served as elicitors of the other one

or two character strengths (or positive emotions). For example, the act of expressing an

appreciation of beauty and excellence on social media may have sparked one's spiritual side,

which led to expressions of those emotion and character strengths as well (e.g., "You are one of

God's masterpiece in terms of kindness and compassion!"). The network models of memory

propose that related concepts might activate each other when one of them is primed and cause

more spreading activation of related concepts (Roskos-Ewoldsen, Roskos-Ewoldsen, & Carpentier,

2009). This theoretical perspective can provide some explanation for the positive associations

between these emotions and character strengths. On the other hand, the weak associations between

these positive emotions and character strengths raise the question as to how often they are mixed

together as a single emotional response to prosocial events, with one or more emotions' textual

expressions being left out of the expressive user-created manifest content on social media. This

highlights the limitation of user-generated textual content in revealing all of the emotions a user

experiences.

Additionally, we found support for the occurrence of other-oriented hopeful thinking in

response to an act of moral virtue and social interest, which is consistent with the arguments

Howell and Larsen (2015) made regarding the existence of other-oriented hopeful thinking and the

need for further exploration the psychological concept, other-oriented hope. Also, this study

extended the finding of Howell et al. (2015) that suggested that task instructions cueing the

inclusion of others may increase other-oriented hope. Specifically, the finding of this study

provided evidence that other-oriented hopeful thinking was expressed on Facebook in the majority

of the (sampled) responses to an announcement regarding a donation pledge. This provides

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important implications for social media users and organizations in terms of inspiring other-oriented hopeful thinking and prosocial behaviors through prosocial messages on social media.

As expected, other-oriented hope was also weakly connected to appreciation of beauty and excellence. This finding, along with the other-oriented nature of other-oriented hope, points to the possible classification of other-oriented hope under the virtue of transcendence. This other-orientation is one of the characteristics that other-oriented hope shares with other character strengths manifesting transcendence.

The broaden-and-build theory of positive emotions (Fredrickson, 2001) holds that positive emotional experiences broaden individuals' momentary thought-action repertoires, which functions to encourage exploration of new things, and/or form social bonds, which in turn increase long-lasting personal resources. These resources can be used in the future to enhance coping and living. This theory proposes an upward spiral of positive emotion, prosociality, and emotional well-being. The associations between the focal emotions or strengths examined in this study (appreciation of beauty and excellence, hope, spirituality, and other-oriented hope) highlight the possibility that these emotions may reinforce each other in creating an upward spiral that may inspire prosociality and ultimately lead to the increased well-being of individuals and the communities in which they reside. Moreover, social media users are not only content creators but also content consumers. If being exposed to messages expressing transcendent-related positive emotions can make one create messages of the same nature, or cause one to "like" or share the exact messages, it may mean that these positive emotions can spread online via a wide range of both strong and weak social ties, benefiting even more individuals.

4.1. Limitations and future directions

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Although this study provides valuable findings regarding self-transcendent emotions expressed by Facebook users in response to a publicly announced prosocial act, the generalization of these findings to other context or media platforms should be approached with caution. As a result, it is worth noting a few characteristics specific to this study.

First, due to the inexistence of a validated measure of other-oriented hope, we operationalized it using the co-presence of expressions of hopefulness and words related to general others. This procedure still needs further validation as it may have included some instances where the references to general others were not related to hopeful thinking in a particular post. However, we attempted to limit some of the possible confounds by excluding these irrelevant expressions from the dictionary using an exclusion coding category designated for these possible instances (so they were not captured by the software as one of the focal emotions). For example, the phrase "no hope" was included in this exclusion category so that such expressions were not coded as "hope." Additionally, phrases such as "make it public" were also excluded by this category so that the word "public" was not coded as "general others." Moreover, a drawback associated with the natural setting of this study is that we could not control the number of elements included in the stimulus material that may have elicited these self-transcendent emotions analyzed herein. Future research could address this by adding some level of manipulation of the stimulus material.

Although exposure to positive news on social media may lead to positive effects, some research suggests that social media use can lead to feelings of envy and depression among users (Tandoc, et al., 2015). Although we did not analyze posts for jealousy or indicators of depression, it is possible that some users felt these emotions as a result of the donation announcement. For instance, a user may have been envious of the large sum of money Zuckerberg and Chan were able to donate or depressed about his or her inability to do the same. Because we have evidence that

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negative effects can also occur as the result of social media use, future research may want to explore the circumstances under which different kinds of effects occur so that we can better avoid negative outcomes in favor of positive effects on individual well-being.

Moreover, in surveys or controlled experimental studies, individuals are often provided with measurement items with descriptors for each emotion and asked to complete a full battery of questions. However, by conducting a content analysis, we can only analyze manifest content the way it appears naturally. This is a valuable way to measure these emotions unobtrusively and in a natural setting, but it is also possible that both the presence of and the associations between the positive emotions in the present study were under-estimated. For example, a user could have experienced spirituality, other-oriented hope, elevation, and gratitude; however, in the post or comment he or she may have only expressed one or two of these emotions and left out the expressions for the rest of them. Future studies could conduct both an experiment that includes measures for each possible emotion and a content analysis of participants' real-time social media posts to better examine the relationship between emotions that are privately experienced and those that are publicly expressed.

Lastly, previous research has found that the virtual world can be more affected by social desirability than the real world (Massara, Ancarani, Costabile, & Ricotta, 2012). This points to the possibility of social desirability bias in these positive responses to the message on social media. However, unless the positivity in the posts was interpreted as unauthentic, even positive posts created as a result of a social desirability bias could do more good than harm in terms of spreading positive emotions, making it vital that we understand the types of content present in these posts.

4.2. Conclusion

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Social media has great potential to serve as not only a channel for positive change, but also a venue to express and experience positivity. Emotions are contagious. Positive emotions may spread on social media just like they do in the physical world, albeit through different mechanisms such as status update, sharing, "liking," and commenting. Prosocial messages on social media sites may elicit self-transcendent positive emotions such as elevation, hope, spirituality, and awe, which can lead to users' written expressions of these emotions on social media. Reasonably, the most prevalent response on Facebook to the prosocial act examined in this study was the appreciation of beauty and excellence, followed by spirituality, other-oriented hope, and gratitude. This provides some implications for campaign and message designers in terms of which kind of positive responses to expect on social media when the message is about a generous act of social interest. Because each emotion is tied to a set of action tendencies, campaign designers can use this knowledge to develop targeted campaigns for prosocial goals. For example, feelings of elevation may lead one to emulate the person who showed moral beauty, to behave more virtuously, and to perform charitable acts (Algoe & Haidt, 2009). The action tendency most closely connected to gratitude is to thank or repay the benefactor (Smith, Tong, & Ellsworth, 2014; Watkins, Scheer, Ovnicek, & Kolts, 2006). The results regarding Facebook users' expressions of self-transcendent emotions in response to Zuckerberg's prosocial announcement allow us to better understand the kinds of emotions social media posts may inspire among individuals, bringing us one step closer to understanding the overall effects of exposure to these kinds of prosocial posts.

Additionally, social media content expressing positive emotions may serve as a starting point of an upward spiral of positivity that forms both vertically through elevated mood, performance of prosocial behaviors, improved psychological well-being, and the enhanced well-being of the community, and horizontally, formed through the spreading of positive self-

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transcendent emotions online and offline. The broaden-and-build theory of positive emotions (Fredrickson, 2001) provides theoretical support for the upward spiral of positivity that comes from positive emotions. The literature on prosocial behavior in the social media environment (i.e., Fatkin, 2015; Rodriguez-Vila & Bharadwaj, 2015) provides some support for the idea that social media content can spread positivity. Given these positive effects of positive emotions, exposure to prosocial social media content may be used as a prescription for individuals who would benefit from experiencing more self-transcendent positive emotions. The knowledge about relationships between prosocial social media content, positive emotions, prosocial acts, and improved psychological well-being can also be incorporated into a social media literacy endeavor that aims to increase the volume of meaningful user-generated content in an effort to enhance social media users' psychological well-being. The other-oriented hope expressed by social media users in response to a prosocial message demonstrated the self-transcendent nature of the affective and cognitive processes evoked by acts of other-interest. Expressions of other-oriented hope on social media have great potential to improve users' moods and encourage social connections, both of which contribute to improving social media users' psychological well-being.

Meanwhile, the positive emotions expressed on Facebook are somewhat related to each other, pointing out the possibility of the co-presence of these emotions in response to an act of prosociality. These interconnected emotions may also reinforce each other in expanding our mind and building resources that can help us to cope with difficult circumstances. As social beings, we engage in hopeful thinking for others and our larger social groups, especially when we are inspired by acts of social interests. However, future research is still needed to explore whether our other-oriented hopeful thinking would lead us to channel our resources and energy toward prosocial causes to achieve communal goals.

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Conflict of interest

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Figure 1. A 100-item word cloud generated with 4084 relevant posts in DiscoverText.

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Table 1

Summary of Phi Coefficients for Measures of Interest

	1	2	3	4	5	6
1. Appreciation	--					
2. Gratitude	.14**	--				
3. Hope	.20**	.15**	--			
4. Spirituality	.12**	.08**	.08**	--		
5. General Others	.22**	.20**	.39**	.07**	--	
6. Other-oriented Hope	.19**	.18**	.76**	.09**	.62**	--

Note. ** $p < .001$ (two-tailed), N = 4,084.

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Table 2

Percent of Posts Containing Each Coded Element

Appreciation of Beauty and Excellence	36%
Gratitude	13%
Hope	23%
Spirituality	19%
General Others	32%
Other-oriented Hope	15%
Self-oriented Hope	13%

Note. N = 4,084.

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Appendix I:

The full list of search terms used to gather the data included: (mark and zuckerberg) or (chan and zuckerberg) or (chan and zuckerberg and initiative) or (zuckerberg and gift) or (zuckerberg and letter) or (zuckerberg and charity) or (a and letter and to and max) or (zuckerberg and daughter) or (zuckerberg and announcement) or (99% and facebook) or ($45 and billion) or (facebook and shares) or (a and letter and to and our and daughter) or (zuckerberg and give) or (zuckerberg and gives) or (zuckerberg and inspires) or (zuckerberg and inspired) or (zuckerberg and hope) or (advancing and human and potential) or (zuckerberg and generosity) or (zuckerberg and society) or (zuckerberg and donated) or (zuckerberg and donates) or (zuckerberg and will and donate) or (mark and donates) or (mark and donated) or (mark and will and donate) or (congratulations and mark) or (thank and you and mark and zuckerberg) or (mark and "and" and chan) or (mark and philanthropy) or (mark and "and" and priscilla).

Highlights

- We analyzed 4084 Facebook posts in response to Mark Zuckerberg's donation pledge.

- Appreciation of beauty and excellence was the most expressed character strength.

- The presence of hope correlated with the presence of general-other-orientation.

- Other-oriented hope was expressed in more than half of the posts.

- Positive associations between several character strengths were found.