Framing Facebook: An Analysis of the Massachusetts Down Syndrome Congress

Briana Trifiro, Rachael Dier, Dan Lei, Siyu Liu, Paola Rivera, Akanksa Upadhyay, Ruonan Wang, Feiyang Xu, Haoyue Yuan and Zhimin Zhang

Boston University

Framing Facebook: An analysis of the Massachusetts Down Syndrome Congress

Presently, there is ample literature focused on the prevalence and effectiveness of frames within the media sphere (Goffman, 1972; Iyengar, 1991; Semetko & Valkenburg, 2000). While the majority of this work focuses heavily on frames used within news media (Iyengar, 1991; Semetko & Valkenburg, 2000), there is a lack of scholarship regarding the use of framing in social media content. To this end, the present analysis seeks to address this gap within the literature and offers a useful case study to analyze the impact of framing on social media engagement.

The Massachusetts Down Syndrome Congress (MDSC) is a nonprofit organization whose mission is "to ensure that individuals with Down syndrome in Massachusetts are valued, included, and given the opportunities to pursue fulfilling lives" (Massachusetts Down Syndrome Congress (MDSC), n.d.). Despite their widespread offline success, the organization receives limited online engagement. The authors of the present study posit the following overarching research question: *to what extent does the use of frames in Facebook content generated by Down syndrome nonprofits impact user engagement*? By analyzing the content published by the MDSC as well as other Down syndrome organizations across the country, we aim to deduce what types of Facebook content receive the highest user engagement.

Overview on Nonprofit Social Media Research

Existing literature has illustrated that members of the special needs community often require support and encouragement beyond their immediate family (Heiman & Berger, 2007). Heiman and Berger (2007) found that parents of children with Aspergers required additional social support, including action from educational institutes and volunteer-based organizations.

Beyond offline support, online communities are equally paramount. Ammari, Morris, and Schoenebeck (2014) found that parents of children with autism spectrum disorder (ASD) and Down syndrome were likely to seek support via social media; parents were most likely to use Facebook in an effort to find support groups and share their experiences.

The proliferation of social media has fostered greater awareness of nonprofit organizations, as well as improved interaction between organizations and their audiences (Kim, Chun, Kwak & Nam, 2014). The existing literature focuses largely on the use of social media platforms by ASD advocacy groups. Research from Saha and Agarwal (2016) indicates that social media sites provide an open and quickly accessible platform to distribute, collect, and exchange information for families affected by ASD. Molin, Sorbring, and Löfgren-Mårtenson (2014) suggest parents believe that social media platforms, such as Facebook, are effective in generating greater awareness of disabilities and provide a sense of community. Research also indicates that Facebook groups can help parents whose children are diagnosed with ASD access critical information (Roffeei, Abdullah & Basar, 2015).

While the MDSC does great work in their community, a significant consideration is their lack of social media engagement. They achieve notably less engagement than that garnered by national organizations, such as Save Down Syndrome (SDS) (Save Down Syndrome, Inc., n.d.) and the National Down Syndrome Society (NDSS) (National Down Syndrome Society, n.d.). Considering these challenges, the present study seeks to address how nonprofit organizations can utilize different framing strategies in order to enhance user engagement.

Framing Theory

Framing theory is one of the most widely recognized theories used within the communication discipline. Originally developed by Goffman (1972), this theory describes the media's use of frames to present information, which in turn influences the audience's evaluation. According to the framework, audiences use their own beliefs and culture to form a filter to contextualize information. Often coupled with the theoretical frameworks of agenda-setting and priming theories, framing is used within the communication discipline to analyze the effects of different frames in news production (Scheufele & Tewksbury, 2007). Further, framing has been found to have a significant impact on information processing decisions (Smith & Petty, 1996). In his seminal work, Iyengar (1991) identified two main typologies of frames: thematic and episodic. Thematic frames place the issue within a broader context, and focus on general trends or discussions (Iyengar, 1991). In contrast, episodic frames provide specific examples, case studies, or event-oriented reports that focus on individual trends or discussions (Iyengar, 1991).

Thematic and Episodic Framing

The concept of thematic framing was originally constructed to create a theoretical framework under which television news coverage on political issues could be analyzed (Iyengar, 1991). When reporting news stories, those under the thematic framing tend to present a collective or general picture, instead of focusing on concrete or individual cases. For instance, coverage of presidential debates, welfare expenditures, and overarching sociopolitical wrongdoings would be categorized as utilizing the thematic frame. The second tenant of Iyengar's framing typology, episodic framing, presents information through an individualistic lens and focuses on one person or specific event (Iyengar 1991, 1996). In general, the literature indicates that the use of episodic

framing is more common than that of thematic framing (Adatto, 1994; Cappella & Jamieson, 1997). Although current research is primarily focused on framing within politics, as posited by McCombs (2004), the core framework is transferable to other topics, including nonprofit organizations.

Existing literature also illustrates how content utilizing episodic frames can affect audiences differently than those that utilize thematic frames (Gross, 2008; Miller, 2019). As demonstrated by Gross (2008), episodic frames have been shown to be more emotionally engaging in experimental research. The use of episodic frames successfully elicited feelings of sympathy and pity among respondents, demonstrating that the use of framing can have significant cognitive and affective impacts on audiences (Gross, 2008). In summary, not only are episodic frames more commonly used (Adatto, 1994; Cappella & Jamieson, 1997), they are able to elicit stronger – and more compelling – emotional responses from audiences (Gross, 2008; Miller, 2019). To this end, we propose the following hypothesis:

> **H1a:** Facebook posts that utilize episodic frames will have greater user engagement (i.e. likes, comments and shares) than Facebook posts that do not use episodic frames.
> **H1b**: Facebook posts that utilize thematic frames will have less user engagement (i.e. likes, comments and shares) than Facebook posts that do not use thematic frames.

Further, Hale (2007) found that media coverage about nonprofits is often framed episodically, whereas discourse regarding healthcare is often presented through thematic narratives (Higgins, Naylor, Berry, O'Connor & McLean, 2006). Kang (2013) found that, in the coverage of ASD in U.S. television news, use of personal responsibility frames (episodic) outnumbered the use of social (thematic) frames. Although the use of different frames in media coverage has been studied extensively (Gross, 2008; Higgins et al., 2006; Iyengar, 1991; Kang,

2013; Miller, 2019), there has been very little empirical research dedicated to understanding nonprofit organizations' use of framing strategies in social media content.

Semetko and Valkenburg (2000) Frames

Building off the existing research (Entman, 1991; Neuman, Just, & Crigler 1992), Semetko and Valkenburg (2000) analyzed European political print and televised news stories and identified five prevalent news frames: attribution of conflict, human interest, economic consequences, morality, and responsibility. Conflict frames emphasize general conflict, such as instances of disagreement and reproach, between individuals, groups, or institutions, which is a common method to attract audiences' attention. Conflict frames are widely used in presidential election campaign news (Patterson, 1993). Human interest frames focus on individuals and usually contain a human face or emotion in the presentation of issues to invoke the audience's sympathy. This includes instances of humanitarian work, rescue operations following natural disasters or individual biographies (Wasike, 2013). Economic consequence frames discuss the potential or actual economic consequences on individuals or groups of events**.** Morality frames utilize moral prescriptions to cover an event or issue, such as political scandals and fraudulent activity (Wasike, 2013). Finally, responsibility frames attribute responsibilities of causing or solving an event or issue to a certain individual.

This well-established typology of framing theory has been employed in much of the existing literature to examine how certain issues are framed in different media outlets (An & Gower, 2009; Dimitrova, Kaid, Williams & Trammell, 2005; Hamdy & Gomaa, 2012; Schuck & de Vreese, 2006; Wasike, 2013). An and Gower (2009) followed Semetko and Valkenburg's (2000)'s framework and analyzed crisis news coverage and crisis news frames throughout 2006.

Of the five frames, the responsibility frame was utilized the most often. Considering the existing literature, the present study seeks to understand which of the Semetko and Valkenburg (2000) frames are utilised most often in Facebook content generated by Down syndrome nonprofit organizations. To this end, the following research question is proposed:

> **RQ1:** To what extent does Semetko and Valkenburg's (2000) framing typology coincide with Iyengar's (1991) framing typology?

Through a content analysis of pediatric Autism news content, Muhamed and Yang (2017) found that out of all the Semetko and Valkenburg frames (2000), human interest was utilized most frequently by news channels. To this end, the following hypothesis is proposed:

> **H2:** Of the posts that utilize the Semetko and Valkenburg's (2000) frames, the human interest frame will be utilized most frequently in the Facebook posts issued by Down syndrome nonprofit organizations.

Framing and Social Media

Framing theory is primarily used to analyze news content, specifically involving polarizing subjects (Hamdy & Gomaa, 2012; Kwon, Chadha & Pellizzaro, 2017; Siapera, Boudourides, Lenis & Suiter, 2018). However, there is limited research on the utilization of specific frames on social media used by nonprofit organizations. Through a content analysis of Facebook and Twitter posts from 41 nonprofit and 8 media organizations issued during the Haitian earthquake, Muralidharan, Rasmussen, Patterson and Shin (2011) found that episodic frames episodic were more frequently than thematic, regardless of organization type or social media platform.

As previously discussed, episodic framing is the most commonly used of the two framing strategies offered by Iyengar (1991) (see Adatto, 1994; Cappella & Jamieson, 1997). In order to understand the best possible implementation of these frames to generate optimum user

engagement, the present study presents a quantitative analysis of multiple different Down syndrome nonprofit organizations and their use of framing on Facebook. To this end, the following research questions are posed:

> **RQ2:** Which interaction between episodic and thematic frames and the Semetko & Valkenburg (2000) frames result in the greatest user engagement (i.e. likes, comments and shares)?
>
> **RQ3a:** What is the impact of the framing typologies (episodic/thematic and Semetko and Valkenburg's frames) on the tonality of user comments on the Facebook posts issued by Down syndrome nonprofit organizations?
> **RQ3b:** What is the impact of framing typologies (episodic/thematic and Semetko and Valkenburg's frames) on the tonality of user impressions on the Facebook posts issued by Down syndrome nonprofit organizations?

Content Analyses Within the Existing Literature

Content analyses are widely utilized within the existing research, specifically to understand social media (Bail, 2016). One interesting vein of the existing research is the use of this methodology to assess the success of nonprofit organizations' Facebook use. Through a content analysis of 275 nonprofit organizations' Facebook pages, Waters, Burnett, Lamm, and Lucas (2009) concluded that nonprofits have not yet taken advantage of the vast majority of the Facebook applications available to them. Waters et al. (2009) found that nonprofits rarely develop content for Facebook posts beyond including external links to news stories, photographs, and discussion board posts, and argued that these organizations should begin to understand how to use social networking sites as their audience numbers start to expand. Similarly, Hannah and Lam (2017) found that entertainment and educational posts generated the most engagement in Facebook content. Additionally, posts that expressed the author's emotion received more engagement than those that were more informational or linked to outside information.

The present study seeks to illustrate which framing techniques are utilized by Down syndrome nonprofit organizations and their impact on user engagement. To compare the MDSC's strategies with those of its national and local organizations, the following research questions are posed:

> **RQ4:** Is there a difference in user engagement (i.e. likes, comments and shares) between posts issued by national Down syndrome organizations and by local organizations?
>
> **RQ5a-b:** Which frames are most frequently utilized by a) national and b) local organizations that provide resources for the Down syndrome community?
>
> **RQ6a-b:** Which frames, when incorporated into social media content, generate the most user engagement for a) national and b) local organizations that provide resources for the Down syndrome community?
>
> **RQ7:** How does the MDSC's use of frames compare to that of general Down syndrome organizations' incorporation of frames in terms of frequency?

Methods

Sampling

1,200 Facebook posts were sampled from 240 Down syndrome nonprofit organizations across the United States. Only organizations categorized as "nonprofit organizations" on Facebook and those who had been active for at least the past year were included. Posts were sampled between March 11th, 2019 and March 11th, 2020 using Crimson Hexagon. This ensured that we included recent, diverse and comprehensive content that spanned a year's worth of events and activities. Further, March is a critical month for the Down syndrome community, as it hosts World Down Syndrome Day ("World Down Syndrome Day," n.d.). All posts within the specified time range were downloaded and five random posts were selected from each organization using a random number generator to avoid selection bias. When coding for the level of the organization, the coding team identified two organizations as 'web-based organizations.'

These organizations catered to a wide audience without a fixed brick and mortar location. However, as only two organizations within the sample fit this criteria, data from these organizations are not included in our analysis. Thus, our final sample included 1,190 posts from 46 organizations.

Coding Procedure

Two graduate student coders completed four rounds of inter-coder reliability (ICR) with Facebook posts issued by nonprofits that serve the ASD community. The inclusion of the ASD community makes procedural sense as both ASD and Down syndrome are genetic disorders ("National Human Genome Research Institute," n.d.). Further, research from Warner, Moss, Smith and Howlin (2014) indicates that 40 percent of individuals with Down syndrome also meet the criteria for ASD, illustrating potential for an intersection of research. Finally, members of both communities are known to use social media groups as they perceive there to be less judgement online, and can access both geographic-based and case-based communities (Ammari et al., 2014). The coders established an average ICR of 0.88, and average percent agreement of 95.08%. Of note, a few variables fell below our average ICR score of 0.88. Thus, we accepted a baseline ICR score of 0.62 for select variables. No variables fell below an 81% agreement between the coders. A full list of Krippendorf Alphas are outlined in Table 1 (Appendix A).

Tonality. As part of the coding process, the coders operationalized user engagement through the tonality of user comments using a five-point Likert scale and the tonality of user impressions by number of occurrences of each impression per post. Facebook impressions include 'like,' 'love,' 'haha,' 'wow,' 'angry,' and 'sad.' Coders recorded the number of occurrences of each impression for each post. During the data cleaning process, the impressions

were grouped as positive ('love,' 'haha,' and 'wow'), negative ('angry,' and 'sad'), and neutral ('like'); coders then summed each occurance type. If a post received a majority of any one kind of impression, its tonality was coded as such. If a post had equal occurrences of two or more categories, it was coded as a mixed tonality. If the post had no comments, the tonality of impressions for that post was coded as 'inapplicable.'

Transforming User Engagement Score

As we are interested in the impact of various framing typologies on user engagement, the present study operationalizes user engagement as an aggregate total of the impressions, comments and shares garnered by an individual post, as supported by work from Rus & Cameron (2016). However, during data-cleaning, the data indicated a severe right skew within the user engagement variable. To remedy this, we transformed the variable so it was normally distributed by employing a two-step approach outlined by Templeton (2011). First, the variable of user engagement was transformed into a percentile rank. Next, we applied an inverse-normal transformation; the finalized data collected to operationalize user engagement follows a normal distribution (Templeton, 2011). Any future reference to the 'user engagement score' variable represents the transformed data. There are two primary considerations for this method. Firstly, the variable in question cannot be of ordinal type. Secondly, researchers should be vigilant about any mode values that can potentially skew the variable's distribution.

Results

A descriptive overview of the data is presented in Table 2 (Appendix B). Posts issued in November had the highest user engagement score (M = 83.08, SD = 222.71) while posts issued in January had the lowest (M = -31.43, SD = 247.07). It is also worth noting that posts without

information about events (n = 604, M = 84.45, SD = 283.69) had greater user engagement scores than posts with information about events (n= 584, M = 18.95, SD = 227.97). Of the posts that featured events, posts with mentions of World Down Syndrome Day (M = 79.82, SD = 242.64) and the Buddy Walk or the Smile Mile (M = 67.59, SD =185.91) had higher user engagement scores.

H1: H1a predicted that Facebook posts that utilized episodic frames would have a higher user engagement score than Facebook posts that do not; whereas Facebook posts that utilize thematic frames will have a lower user engagement score than posts that do not (**H1b**). A one-tailed independent samples t-test was conducted to compare the means between posts that utilized episodic frames (M =55.68, SD = 256.11, 95% CI [40.46, 70.90]) and posts that did not use episodic frames (M = 13.35, SD = 294.11, 95% CI [-44.01, 70.71]) was not significant t(114.52) =1.40, p = .072, Hedge's g = 0.14. **H1a** was not supported. A one-tailed independent samples t-test was conducted to compare the means between posts that utilized thematic frames (M =24.55, SD =293.35, 95% CI [-32.11, 81.20]) and posts that did not use thematic frames (M =54.69, SD = 256.26, 95% CI [39.45, 69.94]), was not significant t(117.24) =-1.01, p = .079, Hedge's g = 0.10. **H1b** was not supported.

RQ1: The first research question sought to analyze the extent to which the Semetko and Valkenburg's (2000) framing typology coincided with the Iyengar's (1991) framing typology. A full breakdown of how the frames coincide with one another can be seen in Table 3 (Appendix C). Of the posts that used the Iyengar (1991) frames, the sample primarily reflected characteristics of episodic frames (n = 503).

H2: The second hypothesis predicted that of the posts that utilize the Semetko and Valkenburg's (2000) frames, the human interest frame would be utilized most frequently in the Facebook posts issued by Down syndrome nonprofit organizations. **H2** was supported; of the 1190 posts, 351 posts (29.5%) utilized the human interest frame (Appendix C).

Framing and Tonality of User Feedback

RQ3 looked to explore the impact of both framing typologies on the tonality of user feedback, operationalized through comments and impressions. Posts that included characteristics from both episodic and thematic frames and posts that did not include characteristics from either frames were eliminated from our analysis, as both these groups had a limited sample and were skewing the analyses. **RQ3a** sought to address the impact of the framing typologies on the tonality of user *comments*. A 4 (Iyengar (1991): episodic, thematic, episodic and thematic, neither) x 5 (Tonality of comments: positive, negative, netural, mixed, or inapplicable) chi-square test indicated that the relationship between the Iyengar (1991) frames and tonality of *comments* is not related, $\chi 2(12, N = 1190) = 9.26, p = .681$.

A 13 x 5 (Tonality of comments: positive, negative, netural, mixed, or inapplicable) chi-square test indicated a statistically significant relationship between the use of the Semetko and Valkenburg (2000) frames and tonality of comments $\chi 2(48, N = 1190) = 393.24, p < .001$. A breakdown of the 13 frame combinations is listed in Table 4 (Appendix D). Of the sample considered, the majority of posts did not have comments ($n = 747$, 62.77%). Of the posts with comments, the largest portion of user comments were positive ($n = 333$, 75.17%).

RQ3b addressed the impact framing typology on the tonality of *impressions*. For the Semetko and Valkenburg (2000) typology, a significant 13 x 5 (Tonality of impressions:

positive, negative, netural, mixed, or inapplicable). A breakdown of the 13 frame combinations is listed in Table 4 (Appendix D). The chi-square test indicated that the relationship between the Semetko and Valkenburg (2000) frames and tonality of user impressions is associated, $\chi 2(48, N = 1190) = 188.12$, $p < .001$. Of the sample considered, the majority of impressions were neutral (n = 983, 82.61%), which was operationalized through Facebook's 'like' feature. The second largest portion of user impressions were positive (n = 57, 4.79%), operationalized by the 'love,' 'haha,' and 'wow' impressions.

A chi-square test of the Iyengar's (1991) framing typology's impact on tonality of user impressions yielded a significant four (Iyengar (1991) frame: episodic, thematic, episodic and thematic, neither) x five (Tonality of impressions: positive, negative, neutral, mixed, or inapplicable) analysis, indicating that there is not a significant relationship between use of the Iyengar (1991) frames and tonality of user impressions, $\chi 2(12, N = 1190) = 15.63$, $p = .209$. Of the posts considered, the majority of impressions had a positive tonality ($n = 340$, 28.3%).

Framing and User Engagement

RQ2 asked which interaction between the Iyengar (1991) frames and the Semetko and Valkenburg (2000) frames would result in the highest user engagement score. A two-way, 4 (Iyengar (1991): episodic, thematic, episodic + thematic, neither) x 10 (Semetko and Valkenburg (2000): no frame, conflict, human interest, economic consequence, morality, human interests + economic consequence, human interest + responsibility, economic consequence + responsibility, human interests + economic consequence + responsibility, 'other') between-subjects ANOVA. Posts were coded as 'other' if the content included dimensions beyond those outlined by the Semetko and Valkenburg (2000) typology. The ANOVA found that there were no significant

main effects for the Iyengar (1991) frames, $F(3, 1169) = 1.19$, $p = .313$, and significant main effect for the Semetko and Valkenburg (2000) frames, $F(12, 1169) = 3.55$, $p < .001$, on user engagement score. The interaction effect between the Iyengar (1991) frames and Semetko and Valkenburg (2000) was significant, $F(4, 1169) = 3.41$, $p = .009$.

To analyze the interaction effect between the two framing typologies, we created a new variable that accounted for each occurring overlap. We then ran a one-way, between-subjects, ANOVA with 20 conditions. The conditions are detailed in Table 5 (Appendix E). The results were significant, $F(15, 1169) = 15.48$, $p < .001$, $\eta 2 = 0.15$. We then ran a post hoc Tukey's HSD; to eliminate skewness, we disregarded occurances of the following frame combinations, as they only occurred once: conflict + economic consequence, conflict + responsibility, economic consequence + responsibility and morality. The episodic + human interest + responsibility combination ($M = 239.13$, $SD = 216.03$, 95% CI [163.09, 315.18]) was associated with a significantly higher user engagement score than the episodic + economic consequence combination ($M = -32.60$, $SD = 247.49$, 95% CI [-84.91, 19.71], $p < .001$), episodic + 'other' ($M = -43.22$, $SD = 226.15$, 95% CI [-63.02, -23.42], $p < .001$), and thematic + 'other' ($M = 19.07$, $SD = 306.14$, 95% CI [-46.79, 84.94], $p = .001$) frames. Posts that used the episodic + human interest frame combination ($M = 186.00$, $SD = 252.44$, 95% CI [159.05, 212.96]) were associated with higher user engagement score than combination of episodic + economic consequence ($M = -32.60$, $SD = 247.49$, 95% CI [-84.91, 19.71], $p = .000$), episodic + 'other' ($M = -43.22$, $SD = 226.15$, 95% CI [-63.02, -23.42], $p < .001$) and thematic + 'other' ($M = 19.07$, $SD = 306.14$, 95% CI [-46.79, 84.94], $p < .001$). Comprehensive results are available in Table 5 (Appendix E).

Organizational Level

RQ4 sought to address whether there was a difference in user engagement between posts issued by national and local organizations. A two-tailed independent samples t-test was conducted to compare the mean user engagement score between posts issued by national Down syndrome organizations (M = 289.07, SD = 329.31, 95% CI [201.24, 376.91]) and posts issued by local organizations (M = 37.34, SD = 245.89, 95% CI [22.67, 52.00]), was significant, $t(55.99) = 5.54$, $p < .001$, confirming that posts issued by national Down syndrome nonprofit organizations had significantly higher user engagement scores than posts issued by local organizations.

National Organizations' Use of Framing. RQ5a asked which frame from each typology (Iyengar (1991) frames or Semetko and Valkenburg (2000) frames) was most frequently utilized by *national* Down syndrome organizations. Of the framing typologies, content produced by national Down syndrome organizations primarily utilized the episodic frame (n = 51, 92.7%) and human interest frame (n = 19, 34.5%).

RQ6a asked which frames, when incorporated into social media content produced by *national* Down syndrome organizations, were associated with a *higher user engagement score.* In advance of running the analyses, we eliminated frames with less than two occurrences to limit skewness, which were the economic consequence frame and the human interest + economic consequence frame combination. The updated sample (n = 52) reflected only three frames from the Semetko and Valkenburg (2000) typology: human interest, responsibility and 'other' frames. The sample used to conduct this analysis only included posts that featured characteristics from the episodic-only or thematic-only conditions of the Iyengar (1991) frames.

A one-way between-subjects ANOVA with three conditions (Semetko and Valkenburg (2000) frames: human interest, responsibility, and other) was conducted to analyze the differences in user engagement score. The results of the ANOVA were significant $F(2,49) = 12.96$, $p < .001$, $\eta 2 = 0.35$. The post hoc Tukey HSD test indicated that the posts that utilized the characteristics of the human interest frame ($M = 547.59$, $SD = 232.31$, 95% CI [427.60, 667.58]) had significantly higher user engagement scores than the posts with characteristics of the responsibility frame ($M = 234.82$, $SD = 244.17$, 95% CI [81.33, 388.31], $p = .010$) and the 'other' frame ($M = 126.66$, $SD = 298.76$, 95% CI [-26.83, 280.15], $p < .001$).

A two-tailed independent samples t-test was conducted to compare the mean user engagement score of posts that utilized episodic frame ($M = 313.12$, $SD = 311.34$, 95% CI [226.82, 399.42]) and posts that utilized thematic frame ($M = -11.52$, $SD = 449.97$, 95% CI [-266.01, 242.97]), and were not significant, $t(3.23) = 1.42$, $p = .126$.

Local Organizations' Use of Framing. RQ5b sought to identify which frame from each framing typology (Iyengar (1991) frames or Semetko and Valkenburg (2000) frames) were most frequently utilized by *local* Down syndrome organizations ($n = 1080$). The data shows that the episodic frame ($n = 990$, 91.7%) and the human interest frame ($n = 316$, 29.3%) were most frequently utilized by these organizations.

RQ6b sought to address which frames were associated with the highest *user engagement score* for *local* organizations. To meet the assumptions of an ANOVA, frames with less than two occurrences were eliminated from our analysis. This included removing posts that included the following combinations of the Semetko and Valkenburg (2000) frames: conflict + economic consequence, conflict + responsibility, economic consequence + responsibility, and morality.

With the updated sample (n = 1077), a one-way between-subjects ANOVA with 10 conditions (Semetko and Valkenburg (2000) frame: none, conflict, human interest, economic consequences, responsibility, human interest + economic consequence, human interest + responsibility, economic consequence + responsibility, human interest + economic consequence + responsibility, and 'other') was conducted. The results were significant $F(9, 1067) = 24.31$, $p < .001$, $\eta^2 = 0.17$, suggesting there is a relationship between use of Semetko and Valkenburg (2000) frames and user engagement score.

Post hoc comparisons using the Tukey HSD test found that posts that include characteristics of human interest frame (M = 161.58, SD = 239.65, 95% CI[135.16, 188.00]) had significantly higher user engagement scores than posts that include characteristics of economic consequences frame (M = -44.91, SD = 212.12, CI [-92.09, 2.67], $p < .001$) and the 'other' frame (M = -47.17, SD = 226.10, 95% CI [-66.25, -28.08], $p < .001$). Additionally, a Tukey HSD post hoc test found that posts that include characteristics of the responsibility frame (M = 74.08, SD = 175.16, 95% CI [36.62, 111.53]) had significantly higher user engagement scores than posts with characteristics of the economic consequences frame (M = -44.91, SD = 212.12, 95% CI [-92.09, 2.67], $p = .029$) and of the 'other' frame (M = -47.17, SD = 226.10, 95% CI [-66.25, -28.08], $p <.001$).

Finally, the post hoc test also found that posts that include characteristics of characteristics of the human interest + responsibility frames (M = 239.13, SD = 216.03, 95% CI [163.09, 315.18]) had a higher user engagement score than posts with characteristics of economic consequences frame (M = -44.91, SD = 212.12, 95% CI [-92.09, 2.67] , $p < .001$), the

responsibility frame (M = 74.08, SD = 175.16, 95% CI [36.62, 111.53], p = .018) and the 'other' frame (M = -47.17, SD = 226.10, 95% CI [-66.25, -28.08], p <.001).

To assess the relationship between the use of the Iyengar (1991) framing typology and user engagement, a one-way between-subjects ANOVA with 4 conditions (Iyengar (1991) frames: episodic, thematic, episodic and thematic, neither) was run. The results were significant, $F(3, 1076) = 2.63$, p = .049, η^2 = 0.01. The post hoc Tukey HSD test was not significant. However, a post hoc LSD test found that posts with episodic-only characteristics (M = 41.51, SD = 244.69, 95% CI [26.27, 56.75]) had a higher user engagement score than posts with thematic-only characteristics (M = -21.37, SD = 256.63, 95% CI [-37.33, -5.41], p = .026). The post hoc test also showed that posts with characteristics of both episodic and thematic frames (M = 216.12, SD = 138.94, 95% CI [-11.54, 443.78]) had a higher user engagement score than posts with thematic-only characteristics (M = -21.37, SD = 256.63, 95% CI [-37.33, -5.41], p = .036).

Overview of the MDSC

Our sample included five posts issued by MDSC. Of this sub-sample, content published during the month of July had the highest user engagement score (M = 518.14). Majority of this sample did not mention events (n = 3), but content that mentioned community-building events had the highest user engagement score (M = 425.28). When considering how the MDSC's use of frames compares to that of general Down syndrome organizations' use of frames in terms of frequency of use (**RQ8**), we found that they utilized episodic frames (General: n = 1084, 91.1%; MDSC: n = 5, 100%) as well as human interest frames (General: n = 351, 29.5%; MDSC: n = 3, 60%) most frequently.

Discussion

The purpose of the present study is to analyze Facebook content issued by Down syndrome non-profits across the U.S. under the lens of framing theory in an attempt to identify what kinds of content receive the most user engagement. We found that social media content that incorporates dimensions of Iyengar's (1991) episodic frame and Semetko and Valkenburg's (2000) human interest frame received the highest user engagement score. These findings echo a large majority of the existing research that asserts that human interest (Muhamed & Yang, 2017) and episodic frames tend to be the most widely used (Cappella & Jamieson, 1997). However, our findings expand upon the existing literature by demonstrating a clear relationship between user engagement and the use of these framing strategies.

We also assessed the relationship between the two framing typologies and the tonality of comments and impressions. Our results show that use of the Iyengar (1991) frames have a significant relationship with tonality of impressions. However, there does not appear to be a significant relationship with tonality of comments and the presence of Iyengar (1991) frames. Further, use of the Semetko and Valkenburg (2000) frames have a significant relationship with tonality of impressions and comments. Additionally, content issued by national nonprofit organizations received a higher user engagement score than content issued by local nonprofits, demonstrating the reach of national organizations in comparison to that of local ones. Our results also showed that posts that included a combination of the episodic and human interest were associated with higher user engagement scores than the other combinations we analyzed, demonstrating the effectiveness of utilizing these frames in social media content.

The most notable consideration is that while establishing ICR, our coding team rapidly noted that there was a need for an 'other' code to account for posts that included content well

beyond the Semetko and Valkenburg (2000) frames. Our final Down syndrome sample included a significant portion of such posts (n = 594). This is notable as it stresses the importance of the creation of a social media-specific framing typology to allow for valid analyses of content across industry and application. Further, while content analyses offer great insight of certain media texts, we would be remiss to neglect to mention that we cannot infer causality between the use of frames and user engagement. Further, we are unable to determine the rationale regarding why audiences engage with certain content. We would encourage future research to seek to address these concerns.

Considering the aforementioned limitations, there are various opportunities for future research within this line of work. Notably, the present study only analyzes text posts. However, Facebook is rapidly becoming a heavy image-based platform. Thus, we recommend that future research analyzes the impact of image use on user engagement. It could also be interesting to analyse the impact of hashtags on user engagement. Saxton, Niyirora, Guo and Waters (2015) argue that hashtag usage leads to increased levels of user engagement for advocacy organizations. Future research may benefit from further inquiry regarding the impact of hashtag use on social media content.

In summary, our findings demonstrate significant implications regarding the role of framing strategies in social media content and offer valuable insight to nonprofit organizations seeking to enhance user engagement on their posts. Our results lend considerable support to existing empirical work on the role of framing in content creation, and demonstrate great potential for future scholars to develop social media specific framing typologies.

References

Adatto, K. (1994). *Picture perfect: The art and artifice of public image making*. New York: Basic Books.

Ammari, T., Schoenebeck, S. Y., & Morris, M. R. (2014). Accessing social support and overcoming judgment on social media among parents of children with special needs. In *Eighth International AAAI Conference on Weblogs and Social Media.*

An, S. K. & Gower, K. K. (2009). How do the news media frame crises? A content analysis of crisis news coverage. *Public Relations Review, 35*(2), 107–112. https://doi.org/10.1016/j.pubrev.2009.01.010

Bail, C. A. (2016). Emotional feedback and the viral spread of social media messages about autism spectrum disorders. *American Journal of Public Health, 106*(7), 1173–1180. http://dx.doi.org/10.2105/AJPH.2016.303181

Cappella, J. N., & Jamieson, K. H. (1997). *Spiral of cynicism: The press and the public good.* Oxford, UK: Oxford University Press.

Dimitrova, D. V., Kaid, L. L., Williams, A. P., & Trammell, K. D. (2005). War on the Web: The immediate news framing of Gulf War II. *Harvard International Journal of Press/Politics, 10*(1), 22–44. https://doi.org/10.1177/1081180X05275595

Entman, R. M. (1991). Framing U.S. coverage of International news: Contrasts in narratives of the KAL and Iran Air incidents. *Journal of Communication, 41*(4), 6–27. http://dx.doi.org/10.1111/j.1460-2466.1991.tb02328.x

Goffman, E. (1974). *Frame analysis: An essay on the organization of experience.* Harvard University Press.

Gross, K. (2008). Framing persuasive appeals: Episodic and thematic framing, emotional response, and policy opinion. *Political Psychology, 29*(2), 169-192. http://dx.doi.org/10.1111/j.1467-9221.2008.00622.x

Hamdy, N., & Gomaa, E. H. (2012). Framing the Egyptian uprising in Arabic language newspapers and social media. *Journal of Communication, 62*(2), 195–211. https://doi.org/10.1111/j.1460-2466.2012.01637.x

Hannah, M., & Lam, C. (2017). Drawing from available means: Assessing the rhetorical dimensions of Facebook practice. *International Journal of Business Communication, 54*(3), 235-257. http://dx.doi.org/10.1177/2329488415572788

Hale, M. (2007). Superficial friends: A content analysis of nonprofit and philanthropy coverage in nine major newspapers. *Nonprofit and Voluntary Sector Quarterly, 36*(3), 465-486. http://dx.doi.org/10.1177/0899764006296849

Heiman, T., & Berger, O. (2008). Parents of children with Asperger syndrome or with learning disabilities: Family environment and social support. *Research in Developmental Disabilities, 29*(4), 289-300. http://dx.doi.org/10.1016/j.ridd.2007.05.005

Higgins, J. W., Naylor, P. J., Berry, T., O'Connor, B., & McLean, D. (2006). The health buck stops where? Thematic framing of health discourse to understand the context for CVD prevention. *Journal of Health Communication, 11*(3), 343-358. http://dx.doi.org/10.1080/10810730600614110

Iyengar, S. (1991). *Is anyone responsible?* Chicago: University of Chicago Press.

Iyengar, S. (1996). Framing responsibility for political issues. *Annals of the American Academy of Political and Social Science, 546*, 59-70.

Kim, D., Chun, H., Kwak, Y., & Nam, Y. (2014). The employment of dialogic principles in website, Facebook, and Twitter platforms of environmental nonprofit organizations. *Social Science Computer Review, 32*(5), 590–605. http://dx.doi.org/10.1177/0894439314525752

Kang, S. (2013). Coverage of autism spectrum disorder in the US television news: an analysis of framing. *Disability & Society, 28*(2), 245-259. http://dx.doi.org/10.1080/09687599.2012.705056

Kwon, K., Chadha, M., & Pellizzaro, K. (2017). Proximity and terrorism news in social media: A construal-level theoretical approach to networked framing of terrorism in Twitter. *Mass Communication and Society, 20*(6), 869-894. http://dx.doi.org/10.1080/15205436.2017.1369545

Massachusetts Down Syndrome Congress About the MDSC. (n.d.). About the MDSC [webpage]. Retrieved from https://mdsc.org/aboutus/AbouttheMDSC.cfm

McCombs, M. (2004). Media salience and the process of framing: Coverage of the Columbine school shootings. *Journal of Mass Communication Quarterly, 81*(1), 22-35. https://doi.org/10.1177/107769900408100103

Miller, A. (2019). Trends in american newspaper coverage of autism. *Semantic Scholar.* Retrieved from https://www.semanticscholar.org/paper/Trends-in-American-Newspaper-Coverage-of-autism-Miller/e6168fd7b65f1a384ac621e1d3ce2d6468ffc535

Molin, M., Sorbring, E. & Löfgren-Mårtenson, L. (2014). Teachers' and parents' views on the

Internet and social media usage by pupils with intellectual disabilities. *Journal of Intellectual Disabilities, 19*(1), 22–33.doi:https://doi.org/10.1177/1744629514563558

Muhamad, J. W., & Yang, F. (2017). Framing Autism: A Content Analysis of Five Major News Frames in U.S.-Based Newspapers. *Journal of Health Communication*, *22*(3), 190–197. doi: 10.1080/10810730.2016.1256453

Muralidharan, S., Rasmussen, L., Patterson, D. & Shin, J. H. (2011). Hope for Haiti: An analysis of Facebook and Twitter usage during the earthquake relief efforts. *Public Relations Review, 37*(2), 175-177. doi:http://dx.doi.org/10.1016/j.pubrev.2011.01.010

National Down Syndrome Society. (n.d.). Home [Facebook page]. Facebook.com. Retrieved from https://www.facebook.com/NDSS1979/

National Down Syndrome Society. (2020). What is Down Syndrome? [webpage]. Retrieved from https://www.ndss.org/about-down-syndrome/down-syndrome/

Neuman, W. R., Just, M. R., & Crigler, A. A. (1992). *Common knowledge. News and the construction of political meaning.* Chicago: The University of Chicago Press.

Patterson, T. (1993). *Out of order.* New York: Knopf

Roffeei, S. H. M., Abdullah, N., & Basar, S. K. R. (2015). Seeking social support on Facebook for children with autism Spectrum Disorders (ASD). *International Journal of Medical Informatics, 84*(5), 375–385. doi:http://dx.doi.org/10.1016/j.ijmedinf.2015.01.015

Rus, H. M., & Cameron, L. D. (2016). Health communication in social media: message features predicting user engagement on diabetes-related Facebook pages. *Annals of Behavioral Medicine, 50*(5), 678-689. doi:http://dx.doi.org/10.1007/s12160-016-9793-9

Saxton, Gregory & Niyirora, Jerome & Guo, Chao & Waters, Richard. (2015).

#AdvocatingForChange: The Strategic Use of Hashtags in Social Media Advocacy. Advances in Social Work. 16. 154-169. 10.18060/17952.

Saha, A., & Agarwal, N. (2015). Demonstrating social support from autism bloggers community on Twitter. *Proceedings of the 2015 IEEE/ACM International Conference on Advances in Social Networks Analysis and Mining 2015 - ASONAM 15.* doi:http://dx.doi.org/10.1145/2808797.2809364

Save Down Syndrome, Inc.. (n.d.). Home [Facebook page]. Facebook.com. Retrieved from https://www.facebook.com/savedownsyndrome/

Scheufele, D. A., & Tewksbury, D. (2007). Framing, agenda setting, and priming: The evolution of three media effects models. *Journal of Communication, 57*(1), 9-20.

Schuck, A. R. T., & de Vreese, C. H. (2006). Between risk and opportunity: News framing and its effects on public support for EU enlargement. *European Journal of Communication, 21*(1), 5–32. doi:http://doi.org/10.1177/0267323106060987

Semetko, H. A., & Valkenburg, P. M. V. (2000). Framing European politics: A content analysis of press and television news. *Journal of Communication, 50(*2), 93–109. doi:http://doi.org/10.1111/j.1460-2466.2000.tb02843.x

Siapera, E., Boudourides, M., Lenis, S., & Suiter, J. (2018). Refugees and network publics on Twitter: Networked raming, affect, and capture. *Social Media + Society, 4*(1), 1 – 21. doi:http://dx.doi.org/10.1177/2056305118764437

Smith, S., & Petty, R. (1996). Message framing and persuasion: A message processing analysis. *Personality and Social Psychology Bulletin*. 22. 257-268. doi:10.1177/0146167296223004.

Templeton, G. F. (2011). A Two-Step Approach for Transforming Continuous Variables to Normal: Implications and Recommendations for IS Research. *Communications of the Association for Information Systems*, 28, pp-pp. doi:https://doi.org/10.17705/1CAIS.02804

Wasike, B. (2013). Framing news in 140 characters: How social media editors frame the news and interact with audiences via Twitter. *Global Media Journal, Canadian Edition, 6,* 5–23.

Warner, G., Moss, J., Smith, P., & Howlin, P. (2014). Autism Characteristics and Behavioural Disturbances in~ 500 Children with Down's Syndrome in England and Wales. *Autism Research, 7*(4), 433-441. doi:http://dx.doi.org/10.1002/aur.1371

Waters, R. D., Burnett, E., Lamm, A., & Lucas, J. (2009). Engaging stakeholders through social networking: How nonprofit organizations are using Facebook. *Public Relations Review, 35*(2), 102–106. doi:http://dx.doi.org/10.1016/j.pubrev.2009.01.006

What is World Down Syndrome Day? (2020). World Down Syndrome Day. [webpage]. Retrieved from https://www.worlddownsyndromeday2.org/about-wdsd

Appendix A

Table 1

Krippendorff's Alphas

Variable	Intercoder Reliability (α)
Organization level	0.874
Post characteristics	
Month of publication	0.87
Mention of event	0.981
Presence of framing typologies	
Episodic frame	0.626
Thematic frame	0.655
Conflict frame	1
Human interest frame	0.688
Economic consequence frame	0.958
Morality frame	1
Responsibility frame	0.626

Appendix B

Table 2

Descriptive Overview

Organization Level	N (%)
National	54 (4.54%)
Local	1080 (90.76%)
Total	1190

User engagement	M (SD)
Impressions	38.72 (220.84)
Comments	2.13 (7.61)
Shares	9.43 (63.89)

Appendix C

Table 3

Framing Typology

Iyengar Frames (1991)	Semetko and Valkenburg's (2000)Frames	Frequency of Use
Episodic frames only (n=1083)	Other	501 (46.3%)
	Human Interest	337 (31.2%)
	Morality	94 (8.7%)
	Economic Consequence	86 (7.9%)
	Human Interest and Responsibility	31 (2.9%)
	Economic Consequence and Responsibility	11 (1.0%)
	Human Interest and Economic Consequence	9 (0.8%)
	Conflict	6 (0.6%)
	Human Interest, Economic Consequence and Responsibility	3 (0.3%)
	Conflict and Economic Consequence	1 (0.1%)
	Conflict and Responsibility	1 (0.1%)
	Economic Consequence, Responsibility and Morality	1 (0.1%)
Thematic frames only (n=98)	Other	83 (84.7%)
	Human Interest	11 (11.2%)
	Morality	3 (3.1%)
Both episodic and thematic frames (n=5)	Other	3 (60%)
	Human Interest	2 (40%)
No Iyengar frame used (n=3)	Other	3 (100%)

Appendix D

Table 4

Semetko and Valkenburg Frames (2002) and Tonalities

Tonality		Semetko and Valkenburg Frames (2002)	
1	Postive	1	No Frame
2	Negative	2	Conflict
3	Neutral	3	Human Interest
4	Mixed	4	Economic Consequence
5	Inapplicable	5	Morality
		6	Conflict + Economic Consequence
		7	Conflict + Responsibility
		8	Human Interest + Economic Consequence
		9	Human Interest + Responsibility
		10	Economic Consequence + Responsibility
		11	Human Interest + Economic Consequence + Responsibility
		12	Economic Consequence + Responsibility + Morality
		13	Other

Appendix E

Table 5

Descriptive Statistics

Frames Interaction	Mean	Std. Deviation	N
1.0 (Episodic & No frame)	140.03	267.83	2
1.1 (Episodic & Conflict)	170.86	274.11	6
1.10 (Episodic & Human interest)	123.63	263.10	9
1.11 (Episodic & Human interest + responsibility)	239.13	216.03	31
1.13 (Episodic & Economic consequence + responsibility)	164.94	185.53	11
1.2 (Episodic & Human interest)	186.00	252.44	337
1.22 (Episodic & Human interest + economic consequence + responsibility)	129.78	44.16	3
1.25 (Episodic & Economic consequence + responsibility + morality)	-198.17	.	1
1.3 (Episodic & Economic consequence)	-32.60	247.49	86
1.32 (Episodic & Other)	-43.22	226.15	501
1.5 (Episodic & Morality)	97.02	186.64	94
1.7 (Episodic & Conflict + economic consequence)	-0.66	.	1
1.8 (Episodic & Conflict + responsibility)	314.32	.	1
2.0 (Thematic & No frame)	269.85	.	1
2.2 (Themaric & Human interest)	5.27	251.59	11
2.32 (Themaric & Other)	19.07	306.14	83
2.5 (Themaric & Morality)	-154.43	133.96	3
3.2 (Both episodic and thematic & Human interest)	344.34	29.93	2
3.32 (Both episodic and thematic & Other)	130.64	103.73	3
4.32 (Neither episodic and thematic & Other)	-33.15	260.47	3
Total	52.08	259.69	1189

Table 5a. Means and standard deviations for frames interaction

	1.0	1.1	1.10	1.11	1.13	1.2	1.22	1.3	1.32	1.5	2.2	2.32	2.5	3.2	3.32	4.32
1.0	1	-30.84	16.40	-99.10	-24.91	-45.97	10.25	172.63	183.25	43.01	134.76	120.96	294.46	-204.31	9.38	173.18
1.1		1	47.23	-68.27	5.92	-15.14	41.08	203.46	214.08	73.84	165.59	151.79	325.29	-173.47	40.22	204.01
1.10			1	-115.50	-41.31	-62.37	-6.15	156.23	166.85	26.61	118.36	104.56	278.06	-220.71	-7.02	156.78
1.11				1	74.19	53.13	109.35	271.74*	282.35*	142.11	233.86	220.06*	393.56	-105.20	108.49	272.28
1.13					1	-21.06	35.16	197.54	208.16	67.92	159.67	145.87	319.37	-179.40	34.30	198.09
1.2						1	56.22	218.60*	229.22*	88.98	180.73	166.93*	340.43	-158.33	55.36	219.15
1.22							1	162.38	173.00	32.76	124.51	110.71	284.21	-214.56	-0.86	162.93
1.3								1	10.62	-129.62*	-37.87	-51.67	121.83	-376.94	-163.24	0.55
1.32									1	-140.24*	-48.49	-62.29	111.21	-387.56	-173.86	-10.07
1.5										1	91.75	77.95	251.45	-247.32	-33.62	130.17
2.2											1	-13.80	159.70	-339.07	-125.37	38.42
2.32												1	173.50	-325.26	-111.57	52.22
2.5													1	-498.77	-285.07	-121.28
3.2														1	213.69	377.49
3.32															1	163.79
4.32																1

Table 5b. Posthoc comparisons using Tukey's HSD. Mean differences shown. * shows the mean difference is significant at the 0.05 level