Community Poll: Externalizing Public Sentiments in Social Media in a Local Community Context

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Abstract

Social media platforms such as Twitter and Facebook are commonly used to disseminate up-to-date news information, but they also contain a lot of noise and irrelevant content. The contents of social media platforms are typically filtered by followship or friendship oriented relationships, and is almost always driven by trending news topics at the national scale, making it difficult for users to gather useful information that is most pertinent to a local community context. Research has utilized content analysis techniques to gain insights on the sentiment expressed about political topics on social media sites. However, there has been little attempt to understand how users would perceive this information if opinions and sentiments about news topics were externalized and made aware to them. We designed Community Poll, a smartphone application that aggregates local news feeds with relevant tweets about the local news topics. A Public Attitude Meter is calculated based on the sentiment score of the tweets for each of the local news topic presented in the system. We conducted a 2-week deployment with 16 users about their perception of the system. The users reported that Community Poll helps them digest locally relevant news topics, and quickly gather public opinions associated with the topics. They reported that being aware of public sentiment encouraged them to more actively participate in discussions on social media. Curiosity about a score-based representation is an important element that drove them to consume local news topics that they wouldn't otherwise be exposed to. Interestingly, although being aware of public sentiment served to reaffirm people's positions on the local topics, users expressed concerns about how sentiment awareness might bias *other people's* judgments regarding news topics.

Introduction

The emergence of social media has provided a new channel for any individuals, groups, and organizations to create, broadcast, and exchange information such as general news information, announcements, personal opinions, and random thoughts. Accordingly, much research has investigated the influences and potential consequences of such affordances of social media in different contexts, including presidential elections (Larsson and Moe, 2012), crisis emergencies (Shih et al., 2014; Vieweg et al., 2011), education (Forte et al., 2012), public health (Paul and Dredez, 2011), and organizations (Zhao & Rosson, 2009).

In the community context, local news media outlets are often seen as windows to a community's shared identity; engaging local citizens in active discussions of local issues is crucial in establishing a strong sense of community vitality (Putnam, 2000). Local news media in small towns are starting to leverage social media capabilities such as blogs and microblogs to create a more interactive environment for local citizens (Chung & Nah, 2009). A number of online news websites have already leveraged social media by allowing people to add comments using their online credentials (e.g., Facebook, Twitter, etc.), which reduces the "flaming" effect and increases content credibility.

However, there exist major challenges for facilitating discussions about local news in the online space. Unlike national news sites, very few users partake in commenting on local news articles, and this is true even for more prominent local topics. Currently, a forum-style discussion space is typically located at the bottom of an online news article. This is fine for news sites with a national audience because there is enough traffic to make it worthwhile for people to debate and digest other people's comments. This is not true for a local news site, where having more sparse local topics to cover and a smaller population size almost always result in the failure to achieve a sense of critical mass for carrying out meaningful conversations (Markus, 1987). Instead, limited discussions about local issues take place in scattered special-interest online forums and word-of-mouth (i.e., talking with friends or family members or

attending public meetings). This results in uneven information distribution, making it very difficult for people to gauge public opinions on local issues.

To address this challenge, we propose a novel approach to aggregate and assess public opinions about local news topics. First, we extract relevant microblog contents based on the actual content rather than predefined #hashtags, and anchor them to formal local news articles. Second, we employ a content analysis technique to extract overall public sentiments about the local topics. We have designed and implemented a civic application called Community Poll (CP). CP presents aggregated formal local news and social media content as well as displaying a general public attitude toward the local news topics.

In this paper, we specifically strive to investigate the following the following research question.

> **RQ:** *How do people perceive and use CP for local news consumption?*

This paper is the first report of the implementation of the sentiment analysis algorithm to support local news consumption and conveying sentiment to users in a simple-to-grasp metric. Our goal for the deployment study is exploratory rather than confirmatory, and we want to understand the experiential outcomes of the system usage from the users' perspective. We aim to use the display of the sentiment score as a sense making resource for users, and also as an artifact to evoke human reflection, without presuming to fully or accurately assess what people feel.

Related Work

There are a number of elements that constitute and sustain local communities. For example, communities have their own unique history, daily news, events, activities, issues, concerns, and plans that are created, shared, disseminated, and maintained by local entities.

As technologies have more penetrated in and become an indispensable part of people's daily life, many local communities have started to construct and maintain technology infrastructure and utilize web- and mobile-technologies to achieve positive community outcomes, including increasing access to local information, promoting civic engagement, and creating avenues for collaboration and communication (Merkel et al., 2004) by making effort on effectively leveraging technology in the context of local communities (Gurstein, 2003).

Social media have provided new channels to create, share, and disseminate information to diverse entities including people, groups, organizations, and governments. Although social media transcend a distance when connecting people, a great portion of social media users are linked with ones who are often geographically close (Scellato et al., 2010), which in part influence social media use at a local level. At a community level, local news media outlets post news updates, local groups announce and advertise upcoming events, and people share personal experiences, reviews, photos, or videos on social media (Bollen, Pepe, and Mao, 2009). Chung and Nah (2009) reported that uses of interactive features afforded by social media result in heighted user satisfaction toward community news sites.

There have been a number of studies that aim to increase interactions with local events in local communities. For example, *Discussion in Space (DIS)* is a feedback platform designed to utilize large public screens and personal mobile devices to advertise community relevant questions and issues as well as encouraging local people to respond to them via SMS and Twitter (Schroeter, 2012). Geolocated Embedded Memory System (*GEMS)* is a mobile application that integrates an element of location-based storytelling and gamification (Procyk and Neustaedter, 2014). It allows local residents to reflect on their personal stories and experiences occurred in their local area, creating and sharing local community's historical values among local people. *Lost State College* is another application that leverages official historical and user-generated contents to create more dynamic and interactive local historical landmarks (Han et al., 2014b). *Viewpoint* is a simple yet effective polling tool to increase civic awareness of and participation in local issues of different stakeholders by allowing local citizens to vote (Taylor et al., 2012).

Han, Shih, and Carroll (2014a) described the Local News Chatter platform, the first smartphone application that provided an algorithm to filter and associate local tweets that are relevant to local news topics. The aggregated news and tweets are then presented in a tag cloud. They envisioned that the users of the app could consume the relevant tweets as a source of informal news that could complement the official news sources in a local community. In an interface evaluation lab study, they suggested that such a platform could have the potential of encouraging local news consumption, and a deployment study could unpack the nuances in actual usage.

An important emerging method for investigating social media interactions is characterizing "sentiment" toward targeted events based on content analysis in large data sets (Pennebaker et al., 2001). Characterizing sentiment in this way can provides a simple and empirically-based indicator of public attitudes. Content analysis of public sentiments has been applied to national elections (Semaan et al., 2014; Tumansjan et al., 2010), political debates (Diakopoulos and Shamma, 2010; Maruyama et al., 2014), major incidents (Thelwall et al., 2011), and other contexts.

Our work contributes to and extends this line of investigation, focusing on news and events related to local communities, and exploring the experiences, utilities and attitudinal effects of presenting end users with sentiment scores as a resource for their own sense making. This workCP extends the Local News Chatter platform (Han et al., 2014a) by applying sentiment analysis to tweets and visualizing it to the users. It further explores how people perceive public sentiments expressed in the tweets associated with the local news topics in users' natural environment.

Community Poll Application

Community Poll (CP) has been designed to aggregate formal local news articles and tweets from Twitter. CP collects RSS news article feeds from five local news sites in State College, PA, a small college town in the Northeastern US (note that each website provides a RSS link that only contains local news articles) and stores them in a database on our server on an hourly basis. After a natural language pre-processing (such as stop word removal), word tags are extracted from news titles and descriptions, and their TF-IDF (Term Frequency-Inverse Document Frequency) scores are calculated, a standard metric to measure the "importance" of a tag (Jones, 1972).

Then the selected tags along with a geo-coordinate and a radius (we used 3 miles because this covers the town's local area) are sent to a Twitter search API. Presented results (i.e., user name tweet message, timestamp, etc.) from Twitter are all stored in our local database. Lastly, our server conducts a sentiment analysis of the newly added tweets using the content analysis method described in Pennebaker, et al. (2001), which categorizes textual content into 82 language dimensions. For the purpose of this study, we used a simplified algorithm that classifies

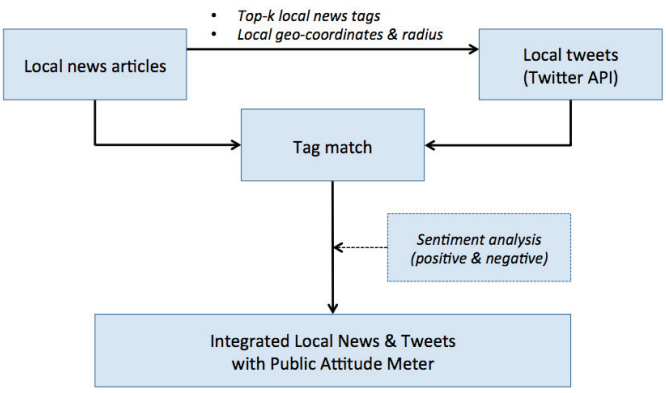

Figure 1. Overall flow of Community Poll. CP integrates local formal news and user generated tweets and presents them along with a Public Attitude Meter.

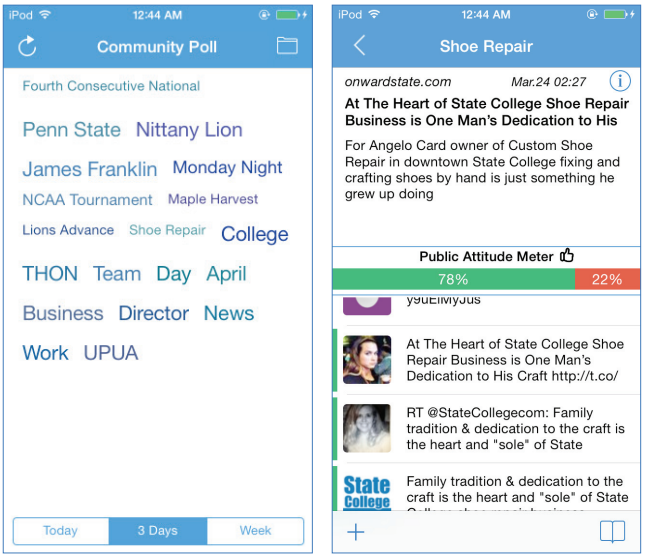

Figure 2. Screenshots of the Community Poll application. A tag cloud displayed depending on the time window (left) and corresponding local news articles, tweets, and a result of Public Attitude Meter based on the sentiment analysis (right).

word groups into either positive or negative. A sentiment score is assigned to each tweet based on the percentage of positive or negative word groups are identified in the tweet. The sentiment scores are computed based on tweet content, but not the news content. Retweet URLs are omitted from the sentiment score calculation. The overall public attitude toward a single local topic is the average of the sentiment scores of all tweets associated to that topic. Figure 1 depicts the overall flow of CP.

Because the data from local news media and tweets are already connected by the word "tags," we are able to present the information together in an integrated fashion. Figure 2 shows the screenshots of CP. A set of tags is presented in a tag cloud (Figure 2, left). The size of each tag indicates its popularity where the larger tag means that there are more local news articles that cover the news topic related to the tag. Conversely, smaller tags indicate more distinctive local news topics that could potentially be more informative, because it is likely that the users would be less aware of them. Users can also access a different set of tags depending on three timeframes, namely daily, three days, and a week.

When one of the tags is clicked, CP displays corresponding local news articles and tweets in one view (Figure 2, right). If there are multiple formal local news articles associated with the tag, users can swipe the screen horizontally and read them. There is also a list of associated tweets to the selected tag, and users can swipe the screen vertically to read them. Between these two resources, there is a "Public Attitude Meter" that displays

the average sentiment scores in a bar graph. If the meter score is positive, a thumbs-up icon will be displayed next to the text, whereas a thumbs-down icon will be shown if the meter score is negative. Moreover, each individual tweet also has a positive or a negative attitude indicator in which a positive tweet shows a green bar whereas a negative tweet shows a red bar next to the user profile image. In their individual Twitter timeline outside of the CP platform, when users tweet, CP appends the tweets to include a link to the original news article so that the tweet would not appear out of context.

In summary, our design approach shows a unique way to represent and deliver local community information. CP only utilizes news content that is relevant to a local community and strives to combine local news articles and tweets based on the tags to present richer and more dynamic local community information to local residents. An important aspect is that we associate the relevant tweets to local news article by the actual content of the tweet rather than relying on predefined #hashtags. This allows us to present all tweets relevant to a topic that are often undiscovered because they were posted under different self-selected hashtags by the Twitter users. A Public Attitude Meter is also a new way to transform less visible, scattered tweets and individual voices into a quick overview of public opinion toward the local topics. Moreover, another salient aspect of CP is that CP leverages existing content because both local news articles and tweets are already posted. This would be very helpful in real world tool adoption, especially for social interactive application, because CP is not just another novel news tool with no content and no real users. For users, this also provides them with a starting point and prompts them to further interact with local news and tweets.

From the user study, we specifically strive to understand how people use CP in the wild and how they perceive and experience with a Public Attitude Meter in the context of local communities.

User Study

To better understand how people would perceive and use CP as a civic application and investigate how Public Attitude Meter influence or change participants' news consumption and their belief or opinions, we designed and conducted a user study with 16 local residents in a small college town in the Northeastern US with approximately 42,000 local residents, and a total of 150,000 including the immediate surrounding area. We recruited them via the university research website and word of mouth. Participants were first asked to complete the online pre-survey which asked about how often and from which channel they access local news information. After the survey, participants installed the CP application on either their iPhone or Android and were asked to use it for two weeks.

There was no specific requirement regarding application usage, but we encouraged them to consider using CP as part of their news consumption practice everyday during the study. We also encouraged them to add their own tweets through CP. After two weeks, we asked them to complete the online post-survey questions for sharing their experiences with and feedback on CP. Both pre- and post-surveys employed 7-point Likert scale questions (where 1 = *Strongly disagree* and 7 = *Strongly agree*) and open-ended questions.

Results

Participants

Participants consisted of 8 male and 8 female, where 10 of them were in their 20s, 5 of them were in their 30s, and one of them was in his 40s. In terms of their length of residence, 5 of them have lived in this community less than two years, 8 of them have lived between three and four years and 3 of them have lived more than five years.

Sources	**Mean (SD)**
Social networking sites	6.1 (1.6)
Word-of-mouth	6.0 (1.2)
Local websites	4.6 (1.5)
Local news TV or radio	3.6 (1.7)
Local newspapers	3.0 (1.6)

Table 1. Frequency of accessing local news information from different sources (1 = Never use and 7 = *Several times a day*).

The pre-survey results indicated that study participants were generally interested in reading and accessing local news information. As shown in Table 1, online social media channels and word-of-mouth are the primary source of accessing local news information, much more so than newspapers or news websites, which shows the growing popularity of social media as a news platform. This shows that the study participants should be familiar with the information presented in the Community Poll interface.

Interacting with local news in a new way

All participants successfully completed the study and mentioned that they used the application everyday as a way of reading and accessing local news information. Some of them in particular liked the idea of a tag cloud interface because they were able to quickly check the main topics in local areas and read the related information about them.

We asked them how CP changed their awareness of the local community. Overall, participants were generally positive about increasing community awareness through CP emphasizing that CP improves the visibility of diverse local news information. More specifically, they believed CP allowed them to access less visible local news information (M: 4.8, SD: 1.2) and were positive about the fact that CP shows tweets that are relevant to the local news topics that are otherwise not accessible on conventional news sites (M: 5.5, SD: 1.1). The pre-survey results already indicated that participants use social media to get up-to-date local news information. However, social media content is quite scattered and dispersed, and even the ones that pertains to a local community are hardly visible unless people have friendship or followship oriented relationships on popular social media platforms. Users of CP expressed that CP provides them with an easy way of accessing and interacting with local news information (M: 4.9, SD: 1.4).

> *"It presented topics that would not have caught my attention otherwise"* (P2)

> *"It helped me discover different sources (twitter) of local news. I never realized how many different sources of information there were"* (P5)

Participants mentioned that local Twitter users are quite active in creating and sharing local news information. The use of CP gave them a sense of a vibrant community actively sharing and discussing important news and events together (M: 4.8, SD: 1.3). CP aggregates a stream of online social activities that are constantly shared by local people, organizations, or groups. Because of this, participants believed that CP creates a new online conversation space for local news, events, or activities (M: 5.4, SD: 1.2). For example, some participants mentioned,

> *"I get to see what other people are saying and which articles are more popular or have more activity"* (P10)

> *"I really enjoyed reading others' reactions to articles from tweets"* (P12)

As part of online participation, a number of participants augmented some tweets or retweets through CP during the study. A total of 85 tweets or retweets were added by CP users during the study (about 5.3 posts per participant in a 2-week period). In the pre-study survey, participants indicated that although they frequently access news updates on Twitter as information consumers, they have only used it very sparingly to express their personal opinions (M: 2.7, SD: 2.0), and they used Twitter once per week on average. Out of 5.3 tweets and retweets that the participants averaged in the 2-week deployment, they added 2.4 tweets and 2.9 retweets (not significant by a paired t-test comparison). Prior literature has consistently reported a high retweet-to-tweet ratio (e.g., Suh et al., 2010). The fact that the CP users tweeted about the local news topic nearly as much as they retweeted shows that CP has the potential of increasing people's online participation in sharing and disseminating local information. As many of them were already accustomed to using Twitter, it seems that adding content through CP was an easy extension. We found that motivations for participation were diverse, including simply expressing one's interests to the topic, sharing community information to others, or getting involved in local discussions or conversations.

> *"Because I thought the news was interesting and wanted to share it with my community"* (P4)

> *"I posted a tweet to add to the discussion about a current topic or to share local information with followers outside of [anonymized]"* (P12)

Moreover, the increase of information visibility through CP encouraged some participants to more engage in local news activities. The aspect of getting their voice heard by someone in the same community seems to be a strong influence that would make people more interested in their local community. This result shows a potential of utilizing social media channels to increase and facilitate social interactions in a local area and even further to increase one's deliberation toward local issues.

> *"CP made me want my voice to be a bit louder in the State College community. As a student I often times feel our viewpoints are under-represented considering what we put into this township"* (P15)

Externalizing public sentiment of tweets relevant to community topics

Another main goal of this study was to investigate impacts and challenges of CP with respect to an additional way of reading and interacting with local news information. As previously mentioned, there have been a lot of research studies on understanding public sentiment, but little has reported how end users perceive the results and any articulation of their experiences.

There were a number of examples that showed a positive and a negative public attitude to the local news topics during the study. For example, our local community holds an annual event where university students raise funds and awareness for the fight against pediatric cancer through a 46 hour no-sitting, no-sleeping dance marathon over the

weekend (Figure 3, left). This event was quite successful again this year, which generated substantial excitement among students and other residents. The event also seemed to motivate many of the local Twitter users to share their excitement and experiences with the public, where CP collected those tweets and displayed a positive public attitude result.

Another example refers to the university sports event (Figure 3, right). The university's women's basketball team completed the regular season as the top team in its conference, but did not perform well in the conference tournament. For example, allowing an opponent (who had been beaten by an average of more than 20 points in two previous games) to score nearly 100 points in the tournament game. Many local people were quite disappointed about this early exit from the conference tournament, resulting in more negative tweets (66%). It is worth noting that in both examples, the interpretation of the PAM score is context-dependent, and in many cases, very subjective and personal. In the case of the basketball tournament, a wide range of sentiments was expressed about the future prospect of the team, the players, and the events in addition to the tournament results. The aggregated PAM score appears to average out the inherent noise and depicts the overall community sentiment about a local topic with reasonable accuracy.

Regardless of positive or negative results, participants in general mentioned that having PAM has positively influenced on their user experience during the study. They perceived that PAM makes CP more interactive and

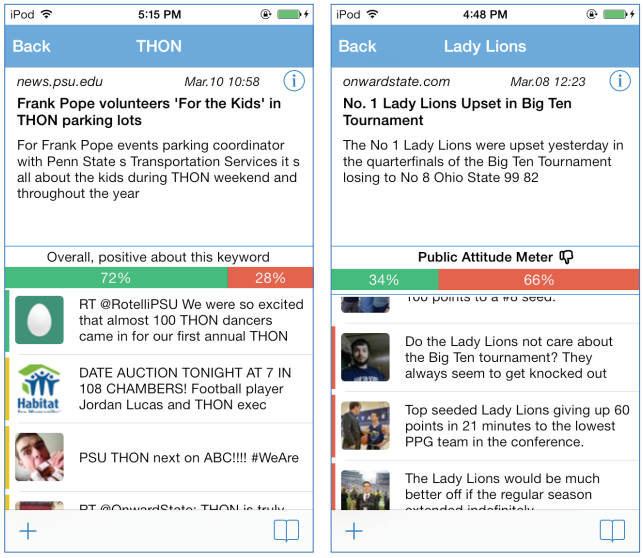

Figure 3. Screenshots of news articles and tweets presented during the user study. The left screenshot depicts an annual event in local area, and the right screenshot shows a NCAA tournament result.

engaging (M: 6.0, SD: 1.1) and allows them to quickly access the community opinion about a local topic (M: 6.0, SD: 0.6). In fact, participants stated that they prefer to read local news topics with PAM, and it drove them to read more local news topics than they would otherwise (M: 4.8, SD: 1.6). Participants liked the idea of accessing a public attitude summary about the local topics, and utilize them as a primary means to become more aware of overall community sentiment to the local topics. Especially, participants mentioned their increased participation through the interface, as they were able to see a very short summary of local reactions toward the topic that they were reading.

> *"The Public Attitude Meter got me involved with CP more"* (P7)

> *"This interface actually increased my participation with the app"* (P16)

Most participants told us that CP helped them broaden their insight on how other local people generally thought about the local topics. We then specifically asked how they actually reacted to the CP interface during the study. Some participants reported that they would click on a news tag just so that they could see the PAM score about a topic, and this was true even for topics that they do not normally care to read about. Interestingly, it seemed more participants wanted to read local topics that had a positive rating than the one with a negative rating. Confronting with negative expressions or responses is one of the common experiences in online space (Kietzmann et al., 2011), but many participants wanted to see and get more involved in more positive atmosphere. Perhaps this is because of the fact that participants dealt with news related to their own community and with people who were co-located in the same space. Supporting this perspective, one participant mentioned his own expectation on sharing more positive and encouraging content through CP.

> *"... online bashing is pretty prevalent but I feel that it is that way because people feel so removed from one another. I think the app showed some potential of connecting people, I'm guessing that the psychology of the interactions would differ and be friendlier because everyone in the app would know they're interacting with their neighbors"* (P10)

This perspective is also aligned with their responses to other questions. On the one hand, when they disagreed with the PAM score about a local topic, it seems they added or at least wanted to add some tweets to express their perspectives (M: 4.8, SD: 0.9).

"I was inclined to clarify some misunderstandings that the tweeters had about local laws ..." (P13)

On the other hand, when they agreed with the rating, they showed even stronger reactions, wanting to be part of activities to share their support or excitement about the said local topics (M: 5.4, SD: 0.9). As discussed in the previous section, having a shared interest or opinion is one of the main motivations for people to tweet or retweet, which also seems influenced by PAM to some extent.

"The poll results made me come to see people's enthusiasm looking forward to the next season. I am not into football so far, but I would like to know more about football (retweeted once), and hope to discuss next football season with other students someday" (P11)

Based on these results, it seemed that participants did appreciate accessing a brief summary of public sentiment from the tweets, and PAM increased their awareness and participation.

Furthermore, it is worth noting that some participants were somewhat concerned about posting their personal opinions or thoughts just based on the PAM scores. They mentioned that sometimes they felt that the PAM score primed them even before reading the tweets.

As a result, participants were worried about how other people's opinions may be biased by PAM if they do not read the articles and the tweets carefully.

"I tried not to think too much on the result. I had a small concern what if there is any possibility of manipulating the vote, for personal interests or commercial purpose. It might be relatively easier to become interrupted by small number of the participants." (P2)

Interestingly, however, participants reported that there is no strong influence from PAM that would alter or change their personal belief or opinions (M: 4.2, SD: 1.3). Daschmann (2000) had previously designed a controlled experiment to investigate how poll results could affect voting behaviors on political issues, and they found no significant effects. Gelman and King (1993) theorized that people's voting behaviors are primarily guided by the information they have learned during the campaign, as well as basic political cues such as ideology and party identification. Our findings echo this insight and further demonstrate that being aware of other people's opinions on local issues does not generally have an effect on the users' personal opinions, and this is true even on less contested and more context-specific local topics of lesser political relevance.

In terms of voicing their opinions publicly on Twitter and in the conversation place created by CP, Many participants said that showing their Twitter activities (especially ones related to their local community) in CP was not a problem, and in fact preferred to make them more visible to the general public. However, there were cases in which they reported feeling uncomfortable to tweet about. This was especially true for the tweets that did not comply with their thoughts. Participants mentioned that they were quite reluctant to add new tweets that could go against the majority, which made them decide to read them mostly but not to provide any reactions.

"It is a small town. I would run into people I know wherever I go. I would have to be careful about expressing my opinions if they go against the majority" (P14)

In summary, our investigation of CP presents overall positive impacts and consequences on reading and interacting with local news information. Most participants said that the interface increases awareness of local sentiment and motivates participation in creating and spreading more positive reactions and attitudes toward local news topics, although some of them expressed some concerns. Participants wanted to know more about and be more engaged in their community. CP shows the potential for creating an online space to discuss and share information about local topics and providing a social channel to interact with other local residents. As we mentioned previously, low participation and interaction of local news is indeed a major challenge that many local communities are facing. We believe CP, which local people can easily adopt, suggests one possible technological innovation to address this issue to some extent.

Conclusion and Future Work

Twitter has been widely adopted as a social media platform to disseminate real-time news information and personal opinions, but it contains a lot of noisy and irrelevant content that can be burdensome for the users to identify relevant information, especially in a local community context. Research has previously applied content analysis techniques such as sentiment analysis to understand public sentiment on nationally relevant issues, such as the presidential election. However, very little work has been done on externalizing the results of public sentiment on real-time local issues. In this work, we designed Community Poll (CP) that filters and associates tweets relevant to local news topics, and provides the public sentiment in a Public Attitude Meter. In a 2-week

deployment study of 16 users, we found that the users of CP have successfully adopted it as a consumption and discussion platform for local issues. Users found the addition of relevant tweets and the associated public sentiment score to be engaging, and led them to be more aware and actively participate in discussions on local issues using CP. Curiosity about a score-based representation is an important element that drove them to consume local news topics that they wouldn't otherwise be exposed to.

Our study found that while externalizing public sentiment expressed in tweets about local topics was regarded as informative, it did not alter people's personal opinions about topics and issues. In fact, it only seems to reaffirm pre-existing personal stances and encourage people to more actively in discussion activities to further substantiate their arguments. Unlike commonly observed flaming behaviors in public forums, we did not observe any overtly negative online behaviors in our user population, perhaps because CP is designed for a local community context and participants are identified. Since users are aware that their comments are viewable by other users in the same local community, they tended to participate politely. Because of this, our users have expressed concerns about the potential consequences of alienating themselves by voicing their opinions when their personal stances go against the majority view.

One interesting findings in the study is that although we did not explicitly measure the validity of Pennebaker et al. (2001)'s content analysis algorithm in accurately assessing people's positions on local topics, users seemed to hold high trust the results displayed by the Public Attitude Meter. They did raise concerns about the possibility of having a few malicious users gaming the algorithm to express a biased view, and future interface design should safeguard this concern of users. Daschmann (2000) reported that showing exemplary examples of either positive or negative sentiment could alter people's opinions on politically sensitive issues. Future improvements of the CP interface could provide more detailed sentiment categories that allow the users to drill down to specific tweets that reflect most strongly about the sentiment.

In this paper, we reported a deployment study that generated useful insights about users' experiential outcomes of reading local news topics with a community sentiment score. We are currently working on a controlled study that includes a baseline system that does not provide the community sentiment scores expressed in tweets. This will allow us to more directly investigate the specific effects of the sentiment scores on how people consume local news topics, formulate opinions, and voice their thoughts.

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