

Characteristics of Shared Health Reflections in a Local Community

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ABSTRACT

We performed a content analysis of the information shared in a locally and culturally focused health application, EatWell. In EatWell, information is shared via the creation of audio recordings. Our results highlight the reflective nature of these recordings, in particular, 1) the topics discussed in these reflections as well as their tone, 2) how these reflections were contextualized (locally and culturally) and 3) how system users addressed one another in their reflections. We compare our findings with the dominant technological approach to supporting health information exchange amongst lay people: online support groups. In particular, we reflect upon why, though many of the community-building features of online support groups did not translate into EatWell, our users felt a sense of community empowerment. Based on our results, we discuss implications for designing locally and culturally focused health applications that leverage reflection as a contribution method.

Author Keywords

Community, culture, health, information sharing, local, nutrition, online support groups, reflection.

ACM Classification Keywords

H.5.3 Group and Organization Interfaces: Collaborative computing.

General Terms

Human Factors.

INTRODUCTION

For years, researchers within CSCW and related disciplines have examined the role that technology can play in health care. While much of this work has explored the impact of technologies in hospital settings [3,15,35], researchers are increasingly examining how technology can help lay people address health issues outside of the hospital. For example, a number of researchers have studied the dynamics of online

support groups, environments where everyday people can discuss health topics and receive social support [2,19,23,38]. Group members typically share their problems or concerns, and receive directed (one-to-one) informational or emotional support from other group members [18,25,34]. While there are variations to this model, this has been a dominant mode of computer-mediated social support documented in previous health research. Furthermore, when discussing the demographics of these groups, most researchers have focused on the benefits of having a geographically dispersed and culturally heterogeneous membership [2,8].

In our research, we investigated an alternative approach to helping lay people discuss health (specifically nutrition) topics with one another. We developed EatWell, an application that 1) allows users to create audio recordings describing how they have tried to eat healthfully in their local community and 2) bounds the user population by culture¹ and geography. Once users create a recording, it is immediately accessible by other system users from their local community. We examined the way in which this system was appropriated in a specific socio-cultural context: low-income, predominantly African-American neighborhoods in Atlanta, GA, USA. We studied this particular group because of the serious diet-related health disparities that they face. Numerous studies have shown that African-Americans disproportionately experience diet-related diseases such as diabetes and obesity [7,20]. Furthermore, low-income neighborhoods face particular challenges with eating healthfully because, for example, there are typically fewer sources of nutritious foods [27].

Thus, our work has focused on a design space of health information sharing that can be characterized (and distinguished from previous work on online support groups) in the following way: it is culturally focused, locally bounded, and enabled through the creation of audio (spoken) reflections. While previously we used interview data to discuss participants' overall user experience [12], we wanted to systematically examine the nature of the

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¹ We use the following definition of culture in this paper: an ethnic group that is distinguished by its “values, beliefs, norms, practices, patterns of communication, familial roles, and other social regularities” [21].

content created in a system with these dimensions. To this end, we conducted a content analysis [4] of the reflections that people shared in EatWell. In our previous work we described our participants' reactions to the content in EatWell, including the sense of community empowerment and the inviting nature of the clips. Through our content analysis, we gained more insight into the nature of the information shared, and to what extent the characteristics of this information can help explain the reactions to our system that we saw arise in our previous work. Thus, the work we describe in this paper serves to extend and enrich our previously reported results.

In this paper, we discuss the results of our analysis of audio clips created over a one-month period. We contribute to the field of CSCW by describing how our findings compare to previous research on information exchange, emotional support and community building in online support groups. Through this critique, we broaden the space for future work on using technology to support lay people in discussing health topics with others.

We begin this paper by describing related work on online support groups and then move into a discussion of our content analysis methodology. We then describe our results, which provide initial insight into how people reflected on health in EatWell. In particular, we detail the topics discussed in the reflections as well as their tone, how these reflections were contextualized, and finally how system users addressed one another in their reflections. We then describe how our findings are useful for the future design of technologies that support people in sharing their reflections on health with others in their socio-cultural context. In particular, we discuss the implications of sharing positive versus negative experiences, facilitating a sense of community, and finally, expectations of contextualization.

RELATED WORK: ONLINE SUPPORT GROUPS

In this section we overview previous research on technologies that help lay people discuss health topics with one another. In particular, we describe the body of research on health-related online support groups. Online support groups are the canonical example of computer-mediated environments that support health information exchange amongst everyday people. These environments have been implemented in a number of formats, including discussion boards and chat rooms [11]. Online support groups exist for a range of health topics, including injuries, addiction, and cancer [11,25]. They supplement services that health care providers give by helping individuals address health-related needs beyond medical treatment, including their cognitive, spiritual, and affective needs [18]. In this section, we provide an overview of online support groups. First, we discuss the ways in which they facilitate interpersonal relationships and emotional support. Next, we discuss information exchange, the impact of geographic boundaries, and the role of culture in these groups.

Emotional Support

Online support groups are an effective means through which people can solicit and receive emotional support [10]. The exchange of emotional support can happen when one person expresses negative feelings and another group member expresses sorrow, conveys hope or confidence, or shows understanding of the issue shared [11]. Braithwaite *et al.* [5] found that the most common form of support provided in one disability community was emotional support, often in the form of sending messages that expressed empathy and provided encouragement. Pfiel and Zaphiris [29] also examined the ways in which empathy is expressed and solicited in a depression-oriented discussion board for seniors. They found that most members took on the role of an empathy-recipient versus the role of an empathizer. As compared to face-to-face environments, in online groups people may find it easier to locate empathic individuals [6]. Furthermore, the social risk of online conversations may be seen as lower than in face to face conversations (*e.g.*, because of the anonymity that is often afforded) and thus individuals may be more willing to discuss personal or upsetting topics [6]. Based on these previous findings, we explored the extent to which the content in EatWell conveyed emotional support in the form of encouragement.

Giving & Seeking Information

Another benefit of online support groups is that they help lay people give and receive health information [33]. In studies of online support groups for people with disabilities and shared health conditions, researchers have found that close to half of the messages relate to information exchange and problem solving [10,14]. Group members provide technical and factual information about an issue or problem, referrals to experts, interpretations of illness symptoms, and guidance for coping with the disease [8,11]. The model of information exchange is typically characterized by people sharing their problems and questions with the group, and receiving answers from the group based on personal experience or knowledge gained from medical sources [18].

Online support groups are particularly well suited for helping people share personal information. For example, Salem *et al.* [34] found that in an online group for individuals coping with depression, the most common types of comments were those containing personal information. This is in contrast to previous work on face-to-face support groups, in which researchers have found that impersonal information is shared more than personal experiences [34]. One reason for this may be the anonymity that online communities provide for information sharers. In our work, we explore the extent to which people reflected on personal experiences versus information obtained from outside sources in EatWell.

Referencing Messages & People

Researchers have also compared the extent to which messages in online support groups address the general group versus specific individuals. Braithwaite *et al.* [5]

found that the majority of messages in a support group for people with disabilities were addressed to specific people, versus the entire group. In a study of an online support group for people coping with depression, Salem *et al.* [34] found that 76% of responses were directed to a specific person. Similarly, in the knee injury group that Maloney-Krichmar and Preece [25] studied, they found that 93% of messages were one-to-one exchanges between two members of the group. Thus, various researchers have found that the dominant model for communication in online support groups is that they facilitate one-to-one messaging versus the sharing of messages for the general group (one-to-many).

Online community researchers outside of the health domain have investigated a related topic: *message interactivity*. The interactivity of a message refers to the extent to which it refers to previous messages. Jones [19] argues that message interactivity is as a precondition for classifying a virtual environment as a virtual “community”. Jones partially supports his argument by drawing upon Rheingold’s [32] definition of a virtual community: “social aggregations that emerge from the Net when enough people carry on...public discussions long enough, with sufficient human feeling, to form webs of personal relationships”. Jones posits that interaction between individuals is necessary for a discussion to reach the level of meaning and longevity noted in Rheingold’s definition. Rafaeli and Sudweeks [30] hypothesize that message interactivity leads to longer membership in a community and a sense of belonging.

Positive & Negative Content

Researchers have also studied the tone of messages in online support groups, looking particularly at positive versus negative content. Salem *et al.* [34] found that comments that conveyed a positive sentiment (agreement, humor, and emotional support) were present over seven times more frequently than comments conveying negative sentiments. The authors note that this is consistent with previous research on face-to-face support groups: positive, supportive comments also dominate the conversations in these settings.

While communities do facilitate the sharing of problems (*e.g.* speaking about the negative implications of being ill [36]), there are group norms that govern how this should be done appropriately. In one group, researchers found that the members actively moderated messages to identify what they considered to be inappropriate tones [24]. In particular, members who complained too much were scolded and told to, “stop whining about their knee problems, take charge, and get on with their lives”. van Uden-Kraan *et al.* [36] similarly reported that some members of a support group became irritated with people who constantly complained.

Thus, researchers have articulated the various characteristics of information exchange in existing online support groups. In our work, we similarly investigate the ways in which our study participants shared information in

EatWell. In particular, we examined the degree of message interactivity, the way in which content creators referred to other users (one-to-one or one-to-many), and the presence of positive versus negative content.

Geographic Boundaries

One oft-cited benefit of online support groups is their ability to transcend geographical boundaries and help people to communicate about health with a much broader group of people [2,5]. Because of this, few researchers have examined the implications of connecting individuals in the same geographic context, or facilitating the sharing of locally relevant health information. However, research outside of the health domain has documented the benefits and potential of virtual environments for supporting a sense of locality. For example, a 2001 study found that 28 million people have used the Internet to strengthen ties to their local community [16]. Furthermore, this study found that the most common way in which the Internet facilitates local engagement is by acting as an information source (*e.g.* for information about local merchants).

Other researchers have examined how technology can empower neighborhoods to address issues that matter to them [26]. For example, Redhead and Brereton [31] studied how one community protested a proposed motorway (highway) project. Community members became knowledgeable about the project and the steps being taken to stop it as they participated in the protest. Redhead and Brereton [31] described how these efforts could be further supported by technology that helped this knowledge to persist. This persistence of information would become valuable as old protestors disassociated themselves from the protest and new people joined. While Redhead and Brereton examined the potential for new technologies, Hampton and Wellman [13] examined a community’s use of an existing technology. These researchers studied how a neighborhood email list helped residents mimic their real-life neighborhood surveillance in an online community. While these projects are not health-focused, they are examples of how geographically constrained online communities can mobilize neighborhoods to address locally relevant issues.

These examples show the benefits of using technology to connect people to local information and community members. In our research, we discuss the implications of taking a similarly local approach to support the sharing of health information in EatWell.

Cultural Groups

Researchers note that another benefit of online support groups is that they connect individuals from different cultural and socio-economic groups [8]. This is useful because it can help people seek the insight and support of individuals from a diverse set of backgrounds [2]. However, researchers have rarely examined the implications of supporting online support groups for individuals within a shared cultural context. One exception is the research Donelle and Hoffman-Goetz [9] conducted on an online support group for Aboriginal women in Canada. Aboriginal

Canadians experience serious health disparities: their life expectancy is shorter than other Canadians and they experience chronic diseases more frequently. Donelle and Hoffman-Goetz [9] found that group members' posts reflected a strong sense of cultural uniqueness. For example, they discussed the health disparities in their community, the cultural insensitivity of mainstream health education materials, and the importance of educating future generations about native rituals and traditions. This work shows the value of understanding how online support groups help address the needs of specific cultural groups.

Public health research has overwhelmingly shown that there is great benefit to supporting interaction amongst individuals with similar cultural backgrounds, because culture shapes health behaviors and attitudes [1,20]. This is particularly true when addressing the health disparities that exist within populations such as the African-American community [37]. For example, the African-American culture has a distinct cuisine, *soul food*, which grew out of the dishes that slaves prepared using whatever foods were available to them [17]. Accounting for the unique foods in different cultures is one way of appreciating the distinctive context in which different people may be trying to eat healthfully [17]. In addition, researchers have described how cultural values affect health behaviors. For example, researchers argue that the cultural construct of *collectivism* is influential in African-American health attitudes [21]. In collectivist cultures, the wellbeing of the group is the focus, as opposed to just the individual. Thus, when designing health interventions to address African-American health issues, researchers argue that it is beneficial to take into account this cultural perspective [21].

In our research, we examine the implications of helping members of a low-income African-American community share health-related experiences. We explore the culturally situated nature of EatWell by examining the extent to which people discuss traditional African-American cultural foods and express certain collectivist (community and group-oriented) sentiments in their audio clips. While there are many ways to examine the ways that EatWell content is culturally situated, we use our analysis as a starting point for spurring future exploration.

METHOD

We analyzed the content created during a four-week deployment of EatWell. EatWell allows users to share how they have tried to eat healthfully in their local neighborhoods. Using their cell phones, users dial into the system and record audio clips that detail their experiences. Users can also listen to the clips that others in their community have created. Users can contribute clips to five categories: Cooking at Home, Fast Food, Restaurants, Grocery Stores, and Other. Twelve people participated in our study, and they created a total of 38 clips. For the most part, participants did not know the other system users. (As we recruited participants from a local community center, two people indicated knowing another participant.)

Additional details about our participants, the system, and the study design are available in our previous report [12].

In this paper, we report on our content analysis of the audio clips created in EatWell. In particular, we examined 1) the topics and tone of the reflections contained in the clips, 2) the extent to which the reflections were culturally and locally focused, and 3) how users interacted with one another through the reflections. To assess these aspects of reflection in each clip, we developed a set of codes based on themes that emerged from interviews with EatWell users (discussed in our previous research [12]), an initial examination of the clips by the researchers and our literature review on online support groups. Next, we present our codes and a brief description of how we applied each code. Due to the scope of this paper, we constrain our list to the codes that we report upon in our results section.

Topics & Tone

When users first call the EatWell system, they hear a prompt that tells them that they can, "record memories about trying to eat healthfully in [their] neighborhood." Thus, they are encouraged to share their thoughts on nutrition by reflecting on previous experiences. To determine the nature of the information provided and how users engaged in creating reflections, we used the following codes:

- *Personal experience* – While EatWell solicited accounts of personal experiences, we coded for personal endeavors to eat healthfully in the local community to determine whether user reflections were indeed personal.
- *Positive experience* – applied if the clip described positive reflections on eating healthfully.
- *Negative experience* – applied if the clip described negative reflections on eating healthfully.
- *Positive adjective* – as another means of assessing the positivity of experiences we coded for positive adjectives.
- *Negative adjective* – as another means of assessing the negativity of experiences we coded for negative adjectives.
- *Referencing outside sources* – Though sharing personal reflections was the focus of EatWell, we suspected people would include outside information sources (e.g., doctors and news media). We coded for instances of users referring to ideas gathered from sources other than personal experience.
- *State of the community* – applied to clips that referenced the well-being of the cultural and local community (e.g., culturally specific health issues or availability of fresh vegetables in the local area).

Contextualization

Because EatWell was designed to be a culturally and locally focused health application, we also included codes to identify cultural and local references in the clips. The first three codes specifically shed light on local contextualization whereas the final code helped us to explore the extent to which the clips were culturally focused:

- *Geographical directions* – applied if the clip contained directions (e.g., “Take Highway 1 and get off on Exit 12”, etc.).
- *Street names* – applied if the clip mentioned names of roads and highways where listeners could locate particular establishments.
- *Local establishment* – applied when names of local grocery stores, restaurants and other places were mentioned.
- *Cultural foods* – applied to clips that mentioned foods typically associated with African-American soul food cuisine.

Addressing Other Users

We used the following codes to examine how EatWell users addressed and interacted with one another through the clips. In addition, the first code, *collective effort/desire*, also helped us to examine the extent to which the clips included a sense of collectivism. As we described earlier, collectivism has been shown to be an important cultural construct to consider when addressing African-American health issues.

- *Collective effort/desire* – applied to instances of clips that made statements about hopes for the community to improve its health (e.g., working together to reduce the rate of diabetes within the community).
- *Referencing other clips* – applied if a clip mentioned another EatWell clip.
- *Referencing audience* – applied when clips referenced people who might listen to the clip in the future.
- *Instruction* – applied to clips in which users presented ideas or strategies in a manner that indicate there is no other way to engage in healthy behavior (e.g., “you must drink 8 glasses of water each day”).
- *Suggestion* – applied to clips in which users suggested ways to engage in healthier eating without indicating their approach is the only option (e.g. “this would be a great dish to try”).
- *Encouraging statement* – applied to instances where clips encouraged other users of the system to eat more healthfully or engage in healthier behaviors.

Establishing Inter-rater Agreement

When performing a content analysis, it is essential to calibrate the raters of the data to ensure consistent coding.

To establish inter-rater agreement, two of this paper’s authors met to review the proposed coding protocol and discuss how the codes would be applied. The outcome of this meeting was a set of codes including those presented above. We randomly selected a subset of the 38 clips (20% \approx 8 clips) to rate. The two raters independently coded these sample clips. Each rater listened to the audio as well as read the transcripts for each clip when coding. The transcripts were coded at the sentence level (*i.e.* every sentence in each clip transcript was examined for the presence or absence of each code in the coding scheme).

To determine agreement between the 2 raters, we computed Kohen's Kappa (k) statistic [4]. A total of 560 observations (8 clips x 35 codes x 2 raters) were made and agreement was computed as $k = 0.83$. According to Landis and Koch [22], 0.70 or more is considered an acceptable k value. With considerable agreement established, we randomly assigned the set of 38 clips to the two raters (19 each) and conducted a complete analysis of the dataset.

In addition to the content analysis, we analyzed usage data logged by EatWell. However, the majority of our results and discussion will focus on the content analysis.

RESULTS

When users first enter EatWell, they are told that they can “Listen to or record memories about eating healthfully in [their] neighborhood.” In asking people to record *memories*, the system encourages personal reflection. Given this prompting, we examined the features of the clips shared in EatWell. In this section we characterize the content’s reflective nature and how people contextualized these reflections. In addition, the system allowed users to create their reflections for public consumption (*i.e.*, to be listened to by others) versus private use by the content creators. Thus, we also discuss the extent to which people addressed other system users, as one way of examining to what extent the sense of community that participants described in our previous work [12] is evident in the content they shared. By examining the content created by a small user group over a month, we provide initial insights into the creation patterns in a system that supports the sharing of reflections in a specific local and cultural context. In the Discussion section, we describe the implications of our results for future work in this area.

Topics & Tone

We begin by describing the topics discussed in EatWell, as well as their tone. In particular, we discuss 1) the frequency with which people make reference to outside sources that inspired their experiences, or from whom they obtained the information they shared, 2) the degree to which people discussed positive versus negative experiences and 3) the extent to which people discussed other EatWell clips in the content that they shared.

Information Sources: Experiential vs. Outside Sources

In almost every clip (92%), people spoke about things that they had done personally. However they very rarely (11%)

made reference to outside sources, that is, the people or places that may have inspired those experiences, or from whom they gained information about healthy eating. Our results echo previous work that has shown experiential knowledge to be the most common type of information shared in online support groups [34]. In the four clips that did mention outside sources of information or inspiration, users spoke about a doctor, a relative, and television network. For example, one clip that was coded as referencing an outside source is:

“I have a great memory for a lentil loaf. I actually got it off the Food Network. That Italian cook, the one they say is so sexy, did a lentil loaf.”

In this clip, the woman speaks of a personal experience (obtaining a recipe) and also references an outside source, a chef on the Food Network.

Positive vs. Negative Experiences

In our previous research, we noted that the clips our participants created seemed mostly positive [12]. In our content analysis, we examined this observation more systematically by coding clips for expression of positive and negative adjectives and experiences. Participants used many more positive adjectives (79%) than negative adjectives (16%). Similarly, they spoke much more about their positive experiences (66%) than their negative experiences (11%). (The remaining clips describing personal experiences could not be clearly classified as positive or negative.) Furthermore, of the four clips containing negative experiences, only one described a solely negative experience, while the other three contained a combination of negative and positive experiences. These results indicate that not only did people speak mostly about positive personal experiences, but also that when they spoke about a negative experience they usually coupled that with a reflection about a positive experience. Positive contributions were the norm in EatWell, which parallels the findings of Salem *et al.* [34], concerning online support groups.

Discussing other EatWell Clips

In examining usage logs for EatWell, we found that in most instances people created a clip immediately after listening to other clips (79%). However, few clips (11%) mentioned other clips in the system. It is surprising that so few clips discussed other clips as participants tended to listen to others' clips prior to sharing their own. One could imagine creating a clip in response to another clip or using clips in the system as cues for what to reflect on. For example, one user discussed the fast food idea provided by another user:

Hi um, I heard the gentleman talking about the fast food Burger King veggie burger. So I just went by there 'cause I hadn't had anything to eat before I went to work. And I actually enjoyed the veggie burger. And it was very cheap... It's actually real good, and it's an experience. I let my girlfriend try it and she loved it too. So I recommend the veggie burger from Burger King. I got it from 2 different burger kings so that means it's at every burger king. So, I just wanted to share my experience. Thank you.

The EatWell prompt that asks users to record their “memories about eating healthfully in their neighborhood” might explain the low amount of audio clip interactivity. Soliciting reflections clearly invites the content creator to speak about him or herself. However, it is interesting to see that very few people – despite listening to other clips first – mentioned the relationship of the content they shared to other clips. It may be the case that participants were scanning the clips to ensure they would not duplicate information. Further research in this direction could help determine the impact of reflection-based information sharing on message interactivity.

Contextualizing Information

As EatWell was a locally and culturally focused health application, we examined to what extent people provided contextualized information in the reflections that they shared in their clips. In particular, we examined to what extent people spoke about local establishments and cultural foods.

Local Establishments

Given the fact that EatWell users all lived in a specific geographic location (southwest Atlanta, GA, USA), we examined the extent to which clips described local places. We found that 47% of clips referenced specific local food establishments such as restaurants and grocery stores. When we excluded clips in the Cooking at Home category, we found a much larger percentage of the clips (72%) referenced local establishments. Interestingly, only 16% (25%, excluding Cooking at Home) of all the clips provided geographical directions and/or street names to help others locate the recommended establishments in the community. It may be the case that people assumed listeners would know where the businesses were located because they all lived in the same community. However, it may also be the case that users neglected to provide the appropriate amount of information for users to benefit from suggestions. Further work is needed to explore the level of local information required of a locally situated user group, and how users might be encouraged to provide that information.

Cultural Foods

Food serves as one of many markers that identify a cultural group. Thus, we examined how frequently people spoke about preparing or consuming traditional African-American cultural dishes (soul food). We found that strategies for healthy preparation and consumption of these foods were essentially absent, as only 5% of the clips mentioned cultural foods. For example, in the following clip, one participant spoke about cooking collard greens, a common soul food dish:

“One thing that someone – my aunt – just hipped us to over Thanksgiving holiday that we haven't yet to try but we're gonna try is she uses her crockpot to do collards, for her greens. Because greens, you know, take a long time to cook. So my wife is talking about trying that with her greens, and using the crockpot for that.”

However, in the majority of clips, rather than discuss soul food dishes, participants more frequently spoke about more general American foods (e.g., fruit smoothies and steamed vegetables). This result contrasts with the findings of Donelle and Hoffman-Goetz [9]. While they found expressions of cultural uniqueness in a culturally bounded online support group, a strong sense of culture was not visible in EatWell. We suspect a longer deployment of EatWell might yield different results.

Addressing other EatWell Users

As EatWell facilitated the creation of reflections for public consumption, we examined if and how users interacted with one another through their reflections. In this section we describe the frequency with which people referenced the broader EatWell audience, the tone of the reflections shared (as being suggestive versus instructive), and the presence of explicitly encouraging or collectivist (group-focused) statements.

Referencing the Audience

While people rarely referenced other clips, they often referenced the anonymous EatWell audience when creating their clips (68%). That is, the audio clips they created were not simply personal reflections but people also spoke as if they were acknowledging the other users who were listening to them. This is an interesting finding, given that EatWell does not explicitly indicate how many other people were using the system, nor does it provide a means for indicating how many people have listened to each clip. Thus, without a clear sense of their listeners, clip creators spoke as if they were addressing an audience. For example, one participant spoke about going to restaurants that offer healthier options in this way,

“And also if more of us do things like that, we would show to those who set up establishments that there is a market for healthy eating in our neighborhood.”

In another EatWell clip, one participant said,

“Hi everyone, it’s Joy! ... For the last 6 months, I have been cutting away 100 calories per day and I have currently destroyed 30 lbs. Small, small, small changes have been made basically. First change was I started changing the way I ate. Um, everything is fresh/frozen... I have taken away all the canned goods in my home and everything is in the freezer. That cuts the caloric and the salt intake in half. ... Anyway, I have destroyed 30 pounds. I say destroyed because if I lose them, I just might find them again. And I am not looking to find them. Alright people! It’s going to be great in 2008. keep your healthy eating alive.”

Thus, we saw that even though EatWell users were not creating content that was directed towards a specific person, they still referenced the general EatWell audience. This was interesting to see because clip creators could have very easily recorded their clips in a manner more akin to a personal diary entry. With such an approach, users would have simply recounted their experiences without acknowledging their audience. However, our results show that the clips had a more engaging style, as EatWell users drew in their audience by acknowledging them in the

content they shared. While users knew that others could listen to their clips, what we point out here is the fact that they verbally acknowledged this audience in their clips.

Suggestions versus Instructions

In addition to analyzing the degree to which EatWell users referenced their audience, we examined the tone with which people spoke to the EatWell audience. In particular, we explored to what degree people created clips that were instructive versus suggestive. Suggestive clips offer information in a way that indicates there are alternatives to the option being presented. Instructive clips take a more authoritative tone and imply that there is no other option. We were motivated to conduct this portion of the analysis by the results of previous research, which showed that some participants felt that the content in EatWell was approachable and not “preachy” [12]. By examining the presence of instructions versus suggestions we sought to provide one possible explanation for this sentiment.

We found most clips contained suggestions (63%) and few included instructions (5%) – the remaining clips did not fall under either code. Thus, instead of telling users what to do and what not to do, the clips in EatWell were mostly presented in a manner that encourages users to judge which clips are of value and which they should disregard. The woman who spoke about the lentil loaf (above) instructed listeners concerning preparing this dish:

“In reality it’s not that much trouble but you just gotta remember to soak the lentils like a day ahead of time.”

In contrast, another woman spoke about ordering broiled seafood at a local fast food establishment and suggested,

“So if you want something at a minimal cost and something if you like seafood, that would be a great dish to try.”

Thus, the clip creator does not instruct the other EatWell users to order this dish, but instead offers up her experience as one that they might want to try. This subtle difference in tone may be part of what kept people engaged with content in EatWell.

Lack of Explicit Encouragement & Collectivist Statements

Finally, we studied the extent to which clip creators included statements of encouragement and collectivist (group-oriented) statements in their clips. Previous research has found that explicit emotional support, such as encouraging statements, is a critical benefit of online support groups. As EatWell is similar to online support groups in that it facilitates the discussion of health topics, we analyzed the clips to see if they also contained encouraging statements. In addition, our previous work showed that people felt a sense of hope when listening to the EatWell clips because they were excited to see that others like them were trying to eat healthfully [12]. By coding for encouraging statements, we were able to examine to what extent people explicitly encouraged one another in their clips.

In addition, we coded for the existence of collectivist statements because previous research has shown the

importance of collectivism (focusing on the wellbeing of the group as opposed to the individual) in African-American health [21]. In particular, we coded for statements expressing “collective effort” because in our previous research, we found that one of the main benefits of EatWell was the sense of collective effort that it inspired amongst the users [12]. Our participants were excited to see that there were other people like them who cared enough about the state of health in the community to share their experiences with trying to eat healthfully. By coding for collective effort, we examined whether or not people spoke explicitly about their desire to see the community work together to improve the state of its health.

Through our content analysis, we found that few clips provided encouraging statements (3%). Because EatWell promotes reflections rather than questions or open-ended contributions, users may have been dissuaded from offering explicit emotional support through the messages they left. In addition, few clips contained statements that referred to a sense of collective effort (5%). While the African-American community has been characterized as collectivist, the content in the clips did not express a sense of collective effort. These results are interesting in light of our previous findings from interviews with our participants [12]. In particular, it is interesting to see that while the clips in EatWell did not express encouragement and a sense of collective effort, our participants still felt a sense of community empowerment. In other words, our findings suggest that users did not have to explicitly encourage one another to feel a sense of collective effort and hope.

DISCUSSION

Our findings describe initial insight into the nature of the reflections that people shared in EatWell. Based on these findings, we now present implications for the future design and longer-term study of systems that support people in sharing reflections about health. Furthermore, we discuss our findings in light of the benefits and characteristics of online support groups (the dominant model of technologically supporting health discussions) that previous researchers have identified.

Positive & Negative Content

Our results show that in a system that encourages reflection on previous health experiences, people mostly use positive language and speak about their positive experiences much more than their negative ones. Furthermore, when negative experiences were mentioned, people mostly coupled that discussion with a description of a positive experience. While our findings do not conclusively indicate why people chose to share content in this way, they do show that there was a strong pattern of information sharing. Our results are thus similar to previous research that has shown that people express positive sentiments more frequently than negative ones, and that strong group norms arose regarding how negative content was shared [24,36].

While we report elsewhere that the positive tone of EatWell clips was something that people enjoyed [12], here we

question the implications of a system that leads to the sharing of mostly positive content. Future work should examine whether systems should include scaffolding for sharing a more balanced or diverse set of experiences: both positive and negative. While previous research has shown that most of the discussion in online support groups is positive in nature, here we raise the question of whether or not there are any drawbacks to this phenomenon. While positive experiences can provide potential strategies for others to try, negative experiences can highlight approaches to avoid. Furthermore, speaking about negative experiences can be a cathartic experience in itself. Indeed, Lieberman and Goldstein [28] found that the expression of certain negative emotions in an online breast cancer support group was actually associated with a higher quality of life. Further research is needed to examine the appropriate mechanisms and contexts for encouraging reflection on negative experiences.

Facilitating a Sense of Community

In our previous reports on interviews with our participants, we noted that using EatWell helped them to feel a sense of community empowerment [12]. This feeling was facilitated as they felt a sense of hope and encouragement by seeing that others like them were trying to eat healthfully. They were also excited to see that people cared enough about improving the community’s health to share their experiences. In addition, EatWell users felt a sense of identification with other users because they were members of their local community. However, our content analysis of the clips showed few signs that the content itself facilitated this sense of community. First, previous work has hypothesized that message interactivity is associated with a greater sense of community because it indicates a feeling of belonging [30]. In contrast, we found very low message interactivity in EatWell. Second, while our participants said they were excited by the collective effort exemplified in EatWell, we found that very few clips included statements relating to collective effort. Third, while one of the major benefits of online support groups is the interpersonal support that members feel as they provide encouragement for one another, the EatWell clips rarely included encouraging statements.

Thus, our analysis showed that the clips people shared did not frequently contain features that previous work suggests are necessary for facilitating a sense of community. However, features of the user group itself seem to be enough to facilitate a communal experience. That is, the locally and culturally bounded nature of EatWell provided users with implicit connections to one another that were enough to facilitate a communal experience. For locally and culturally specific groups of people (particularly collectivist cultures), community building through message interactivity and explicit encouragement may not be necessary.

Another explanation for the sense of collective effort may be the fact that the clips often referenced the EatWell

audience, and this may be part of what drew people into the system. From our data we cannot conclude this, but these findings do suggest that in future work, researchers should examine the relationship between referencing the generic audience and feelings of community cohesion in systems that facilitate sharing health reflections via a one-to-many model.

Expectations of Contextualization

In this final section, we discuss the implications of locally and culturally contextualizing health content in information sharing environments. Previous research on online support groups has described the benefit of connecting people from geographically and culturally diverse settings and backgrounds. While this is certainly an asset of these groups, through our research we articulate the implications of a system that supports information sharing amongst people within a shared geographic and cultural context.

In particular, our results speak to the degree to which people spoke about local establishments and cultural foods. First, we saw that the EatWell clips frequently discussed local establishments but often did so without geographical directions or street names. This may be a benefit of a locally bounded system – that users can assume listeners know where different places are. Or, it could be viewed as a drawback of the system – that the users should have provided more detail, or that the system should prompt content creators to provide further contextual information (such as directions to the recommended locales). Second, we were surprised to see that our users rarely spoke about cultural foods. These results raise the question of whether or not one should expect that people that will want to speak about traditional cultural foods (that are commonly available in the context studied) in applications like EatWell. Furthermore, if people do desire to discuss these foods, future research should examine what features of the system and user group facilitate and inhibit such discussion. Together, these findings point to the importance of understanding what it means for content to be well contextualized in applications that are designed for specific local and cultural contexts.

CONCLUSION

In this paper, we discussed the nature of reflection in a locally and culturally focused health information sharing application. We found that users appropriated EatWell in ways that mostly differed from common patterns of interaction in online support groups. For example, users rarely interacted with one other through the clips in the system and rarely shared statements of encouragement. In further contrast to most previously studied online support groups, we supported information sharing amongst individuals in a shared geographic and cultural context. Consequently, we were surprised to find that while the local and cultural focus of EatWell played a role in building a sense of community, it was often not visible in the content that users created. Additional research is needed to further understand how users' shared local and cultural context

shapes their interactions with one another and their approach to content creation. Furthermore, we encourage future research on the implications of applications that support the sharing of health information via the rhetorical convention of reflection.

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REFERENCES

1. Airhihenbuwa, C.O., Kumanyika, S., "Cultural Aspects of African American Eating Patterns," *Ethnicity & Health* 1, 3 (1996), 245-260.
2. Barak, A., Boniel-Nissim, M. and Suler, J., "Fostering empowerment in online support groups," *Computers in Human Behavior* 24, 5 (2008), 1867-1883.
3. Bardram, J.E., Hansen, T.R. and Soegaard, M. AwareMedia: a shared interactive display supporting social, temporal, and spatial awareness in surgery *CSCW'06*, ACM, Banff, Alberta, Canada, 2006, 109-118.
4. Bernard, H.R., *Research Methods in Anthropology: Qualitative and Quantitative Methods*. Altamira Press, Walnut Creek, CA, 2002.
5. Braithwaite, D.O., Waldron, V.R. and Finn, J., "Communication of social support in computer-mediated groups for people with disabilities," *Health Communication* 11, 2 (1999), 123-151.
6. Caplan, S.E. and Turner, J.S., "Bringing theory to research on computer-mediated comforting communicationstar, open " *Computers in Human Behavior* 23, 2 (2007), 985-998.
7. Chin, M.H., Zhang, J.X. and Merrell, K., "Diabetes in the African-American Medicare population. Morbidity, quality of care, and resource utilization.," *Diabetes Care* 21, 7 (1998), 1090-1095.
8. Coulson, N.S., "Receiving Social Support Online: An Analysis of a Computer-Mediated Support Group for Individuals Living with Irritable Bowel Syndrome," *CyberPsychology & Behavior* 8, 6 (2005), 580-584.
9. Donelle, L. and Hoffman-Goetz, L., "An Exploratory Study of Canadian Aboriginal Online Health Care Forums," *Health Communication* 23, 4 (2008), 270 – 281.
10. Finn, J., "An Exploration of Helping Processes in an Online Self Help," *Health and Social Work* 24, 3 (1999), 220-231.
11. Frey, L.R., *Group communication in context: studies in bona fide groups*. Lawrence Erlbaum Associates, 2003.
12. Grimes, A., Bednar, M., Bolter, J.D. and Grinter, R.E., "EatWell: Sharing nutrition-related memories in a low-income community," *CSCW'08* (2008), 87-96.

13. Hampton, K. and Wellman, B., "Neighboring in Netville: How the Internet Supports Community and Social Capital in a Wired Suburb," *City & Community* 2, 4 (2003), 277-311.
14. Hansen, D., Neal, L., Frost, J. and Massagli, P.M., "Social Uses of Personal Health Information Within PatientsLikeMe, an Online Patient Community: What Can Happen When Patients Have Access to One Another's Data," *Journal of Medical Internet Research* 10, 3 (2008), e15.
15. Heath, C. and Luff, P. Documents and professional practice: "bad" organisational reasons for "good" clinical records *CSCW'96*, ACM, Boston, Massachusetts, United States, 1996, 354-363.
16. Horrigan, J.B., Rainie, L. and Fox, S., *Online Communities: Networks that nurture long-distance relationships and local ties*, 2001.
17. James, D.C.S., "Factors Influencing Food Choices, Dietary Intake, and Nutrition-Related Attitudes among African Americans: Application of a Culturally Sensitive Model," *Ethnicity & Health* 9, 4 (2004), 349-367.
18. Johnson, G.J. and Ambrose, P.J., "Neo-tribes: The Power and Potential of Online Communities in Health Care," *Communications of the ACM* 49, 1 (2006), 107--113.
19. Jones, Q., "Virtual-Communities, Virtual Settlements & Cyber-Archaeology: A Theoretical Outline," *Journal of Computer-Mediated Communication* 3, 3 (1997).
20. Karanja, N., Stevens, V.J., Hollis, J.F., Kumanyika, S.,K., "Steps to Soulful Living (Steps): A Weight Loss Program for African-American Women," *Ethnicity & Disease* 12 (2002), 363-371.
21. Kreuter, M.W. and McClure, S.M., "The Role of Culture in Health Communication," *Annual Review of Public Health* 25 (2004), 439-455.
22. Landis, J.R. and Koch, G.G., "The measurement of observer agreement for categorical data," *Biometrics* 33, 1 (1977), 159-174.
23. Leimeister, J.M. and Kremer, H., "Evaluation of a Systematic Design for a Virtual Patient Community " *Journal of Computer-Mediated Communication* 10, 4 (2005).
24. Maloney-Krichmar, D., Eckert, K.J. and Preece, J., "A Critique of an Ethnographic Approach to the Study of an Online Health Support Community: Advantages, Disadvantages, and Lessons Learned," *Annual Conference on Ethnographic and Qualitative Research* (2003).
25. Maloney-Krichmar, D. and Preece, J. The Meaning of an Online Health Community in the Lives of Its Members: Roles, Relationships and Group Dynamics *ISTAS'02*, 2002, 20-27.
26. Millen, D.R. and Patterson, J.F. Stimulating social engagement in a community network *Proceedings of the 2002 ACM conference on Computer supported cooperative work*, ACM, New Orleans, Louisiana, USA, 2002.
27. Morland, K., Wing, S., Roux, A.D., Poole, C., "Neighborhood characteristics associated with the location of food stores and food service places," *American Journal of Preventive Medicine* 22, 1 (2001), 23-29.
28. Morton A. Lieberman, B.A.G., "Not all negative emotions are equal: the role of emotional expression in online support groups for women with breast cancer," *Psycho-Oncology* 15, 2 (2006), 160-168.
29. Pfeil, U. and Zaphiris, P. Patterns of empathy in online communication *CHI'07*, ACM, 2007, 919-928.
30. Rafaeli, S. and Sudweeks, F., "Networked Interactivity " *Journal of Computer-Mediated Communication* 2, 4 (1997).
31. Redhead, F. and Brereton, M. A qualitative analysis of local community communications *CHISIG*, ACM, Sydney, Australia, 2006.
32. Rheingold, H., *The virtual community: Homesteading on the electronic frontier*. Addison-Wesley, Reading, MA, 1993.
33. Rodgers, S. and Chen, Q., "Internet community group participation: Psychosocial benefits for women with breast cancer," *Journal of Computer-Mediated Communication* 10, 4 (2005).
34. Salem, D.A., Bogat, G.A. and Reid, C., "Mutual help goes on-line," *Journal of Community Psychology* 25, 2 (1997), 189-207.
35. Tang, C. and Carpendale, S. Evaluating the deployment of a mobile technology in a hospital ward *CSCW'08*, ACM, San Diego, CA, USA, 2008, 205-214.
36. van Uden-Kraan, C.F., Drossaert, C.H.C., Taal, E., Shaw, B.R., Seydel, E.R. and van de Laar, M.A.F.J., "Empowering Processes and Outcomes of Participation in Online Support Groups for Patients With Breast Cancer, Arthritis, or Fibromyalgia " *Qualitative Health Research* 18, 3 (2008), 405-417.
37. Williams, J.H., Auslander, W.F., de Groot, M., Robinson, A.D., Houston, C., Haire-Joshu, D., "Cultural Relevancy of a Diabetes Prevention Nutrition Program for African American Women," *Health Promotion Practice* 7, 1 (2006), 56-67.
38. Wise, K., Hamman, B. and Thorson, K., "Moderation, Response Rate, and Message Interactivity: Features of Online Communities and Their Effects on Intent to Participate," *Journal of Computer-Mediated Communication*, 12, 1 (2006).