Situated Anonymity: Impacts of Anonymity, Ephemerality, and Hyper-Locality on Social Media

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ABSTRACT

Anonymity, ephemerality, and hyper-locality are an uncommon set of features in the design of online communities. However, these features were key to Yik Yak's initial success and popularity. In an interview-based study, we found that these three features deeply affected the identity of the community as a whole, the patterns of use, and the ways users committed to this community. We conducted interviews with 18 Yik Yak users on an urban American university campus and found that these three focal design features contributed to casual commitment, transitory use, and emergent community identity. We describe *situated anonymity*, which is the result of anonymity, ephemerality, and hyper-locality coexisting as focal design features of an online community. This work extends our understanding of use and identity-versus-bond based commitment, which has implications for the design and study of other atypical online communities.

Author Keywords

online communities; anonymity; ephemerality; hyper-locality; commitment; transitory use; community identity

ACM Classification Keywords

H.5.m. Information Interfaces and Presentation (e.g., HCI): Miscellaneous

INTRODUCTION

Online communities have been broadly defined as "any virtual space where people come together with others to converse, exchange information or other resources, learn, play, or just be with each other" [57]. Within this definition, scholars have begun mapping out attributes that contribute to successful online communities. One focus of this work involves investigating what leads users to commit to an online community. Specifically, commitment is concerned with what causes users to care about and become dedicated to a community, a crucial component of success.

Typically, commitment to an online community has been characterized as either *bond-based commitment*, meaning attachment to specific users within the community (like on Facebook), or *identity-based commitment*, meaning attachment to a topic or characteristic—such as home-town pride, surviving cancer, or anime fandom (like 4chan) [56]. However, when a community deviates from established practices and thrives, it introduces a compelling opportunity to probe standard understanding.

Yik Yak, a social media application that became the 9th most downloaded app in the U.S. within its first year of operation, is by many measures a successful online community, especially on American college campuses [70]. Nonetheless, several key features of Yik Yak are at odds with evidence-based design guidelines, particularly when considering how to inspire commitment among users [31,32]. For instance, theories about bond-based commitment predict that users will become more committed to a community when they have repeated interactions with the same users. Correspondingly, theories of identity-based commitment suggest that clearly articulating a community's values, goals, and purpose will improve user commitment [56]. Yik Yak's feature set, however, does not support either of these.

To illustrate how Yik Yak, an anonymous social media application with hyper-local, short-lived discussion threads, is atypical, it is helpful to contrast it with communities that exemplify these theories. Facebook, for example, can be seen as a prototypical example of a community that establishes bond-based commitment—users maintain consistent, long-term connections to identified individuals. Likewise, 4chan can be seen as an exemplar of identity-based commitment, where socially anonymous users come together around topic-based bulletin boards. In contrast, to these examples, Yik Yak at the time of this study supported neither persistent names, friends, or relationships, nor did it feature clear topic-based discussion boards.

Considering Yik Yak's success along with its deviation from prototypical design guidelines, we set out to develop a holistic understanding of this atypical online community.

RELATED WORK

Prior work on Yik Yak focuses primarily on characterizing and classifying posted content [27,30,35,45,51], using content analysis, qualitative coding, and interviewing to classify the different types of posts on Yik Yak [27,45,51]. McKenzie, Adams, and Janowicz determined that posts on Yik Yak and geo-located tweets in Los Angeles use clearly distinguishable language through modeling [45]. Heston and Birnholtz found language on Yik Yak is suffused with content that calls upon users' hyper-local context [27]. Across these studies, researchers identified similar themes for content: users divulge confessions, jokes, information requests, and questions, all of which frequently contain location-specific information [27,51]. Unlike prior work that focuses on the content of posts and the impact of an individual's on/offline identity on Yik Yak, our focus is on how participation materialized as a whole—particularly regarding the convergence of anonymity, ephemerality, and hyper-locality. In the remainder of this section, we focus on studies that address these three aspects of Yik Yak's design.

Anonymity

Discussions of the virtues and the vices of social anonymity have a long history of study in the CHI and CSCW communities going all the way back to Group Decision Support Systems. In this early work, unidentified users were seen as a major advantage in collaborative systems because individual anonymity removed status markers that prevent people from contributing to discussions on equitable grounds [26,29,46,66,68]. With the growth of online communities, however, researchers soon came to understand that social anonymity in computational systems (ranging from fully unidentified users to pseudonymity to throwaway accounts) has both positive and negative effects [29,68], as it can support pro-social discussions as well as enable anti-social behaviors [12,50]. In this paper, we use anonymity to denote fully unidentified social anonymity.

Regarding behavioral affordances, Suler explains how anonymity creates disinhibition online that permits users to behave in ways they would not otherwise—like behaving deviantly or confessing personal secrets [65]. Refuting concerns about the negative impact of anonymity, Nissenbaum advocates for its importance in upholding significant social and societal institutions [50].

With the upswing in anonymous social media platforms, a growing body of research has focused on understanding the effects of anonymity on these sites [13,27,30,34,67]. Bernstein et al. demonstrate how anonymity helps users on 4chan conform to disinhibited, mob-like behavior [5]. Schoenebeck observes how anonymity encourages disinhibition in moms on YouBeMom.com, enabling them to share content and behave in ways they would not if they were connected to their offline identities [60]. Kang et al. focus on individual users' motivations for participating in anonymous, ephemeral social media applications, predominantly analyzing Whisper and Secret [30].

Ephemerality

Data permanence is a standard feature of many social media sites. On platforms such as Facebook, Reddit, and Twitter, posted content generally persists until it is explicitly deleted. However, scholars have argued that ephemerality online is invaluable [1,7,22,44,49,54]. For instance, Mayer-Schönberger reasons that forgetting and data non-permanence were the default model for human remembering until the information age. He argues that these values should be incorporated into modern technology as forgetting is a crucial part of the human experience [44].

While not universal, some systems do embody non-permanence using mechanisms that systematically discard content rather than preserve it. These systems change not only the interactions users have with content but also the characteristics of the content itself. For example, Bernstein et al. demonstrate how 4chan users develop mechanisms for interacting with ephemeral content to increase the duration of its lifespan [5]. Studies of Snapchat, an image messaging platform, report that ephemerality promotes spontaneous interactions between users, encourages sharing of mundane content, and reduces concerns about self-presentation [4,69]. Moreover, ephemeral interactions on Snapchat were compared to face-to-face exchanges because both modes of communication rely on data non-permanence [4,69].

Locality

Geographically-focused online communities have a long history of study. Many of these communities like the PEN project in Santa Monica [58], the Blacksburg Electronic Village [11], and the Netville project outside Toronto [23], were tied to cities and neighborhoods. These projects sought to provide community portals that enabled users to chat with neighbors, get locally-targeted information, or gather in collective action. Notably, these early community portals struggled to develop and maintain participation [47].

More recently, researchers have implemented and studied interventions that focus on supporting specific functional goals within local communities. These include tools for hyper-local information sharing [41], exchange of healthy eating tips [21], encounters between strangers in the same place [28], and raising awareness about crime prevention [16–19,36]. Research has found that the inclusion of location-based data changes the way people interact with their location and local social-network, fundamentally altering the very nature of the location itself [20,62]. As with early work, a common problem in these projects is getting enough participation to develop a reliable and constant amount of content at the neighborhood level [38].

Researchers have also studied commercially implemented location-based social media systems, including neighborhood-centric online communities for sharing recommendations and opinions [39], and communities for contributing restaurant reviews [40]. These location-based platforms have a variety of identity mechanisms that contrast strongly with Yik Yak's anonymity. On Nextdoor,

for example, users are identified by their real world names and their physical home addresses, which caused concerns around privacy and increased self-moderation when posting content. [43]. Likewise, Facebook Confession Boards (FCBs), which are pages for anonymous disclosures in local college communities, make use of anonymity for posting confessions (like Yik Yak); however, replies on these boards are connected to users' real identities [6].

In this study, we examine how users perceive the community as a whole in the presence of these three design features. By investigating the ways these concepts interact in a widely adopted, publicly available application, we aim to shed new light on how uncommon affordances for social media can lead to new forms of online communities.

AN OVERVIEW OF YIK YAK

Yik Yak, shown in Figure 1, has evolved substantially since its launch. To contextualize our findings, we describe attributes of a previous version of Yik Yak that were stable throughout our study. Although we characterize this system in the present tense, we note that the system has undergone dramatic changes, resulting in a system that differs in many ways from the one studied here.

Yik Yak's central feature is a single message board where users within a bounded geographical region can post and view content. All users of this system are completely anonymous to each other—they have no persistent identities nor are they allowed to use names in the application. A benefit of this anonymity is an extremely low barrier to entry: once the application is downloaded and a phone number is verified, users have access to all the application's functions—no account creation or registration required (it is worth noting that phone number verification means users are not anonymous on the application backend). Effectively, the system is an anonymous bulletin board, accessible only by users who are nearby one another.

Basic participation on Yik Yak involves posting, commenting, upvoting, and downvoting. To keep conversations within a given post (called a "yak") organized, Yik Yak randomly assigns an avatar to each unique commenter on that post. Avatars consist of a color and an icon (e.g., green sailboat, pink lantern, black anchor). The original poster (OP) is assigned a special avatar that displays "OP." This allows users within a single Yik Yak post to converse by using persistent, anonymous identifiers, helping users keep track of who said what. These identifiers are only associated with the user within the context of a single thread.

Community moderation on Yik Yak consists of upvoting and downvoting posts and comments. If a post or comment receives a net score of -5, it is removed from the feed entirely. Yik Yak users choose whether to view their feed by "hot" content, posts sorted by the most upvotes, or "new" content, posts sorted by the most recent additions.
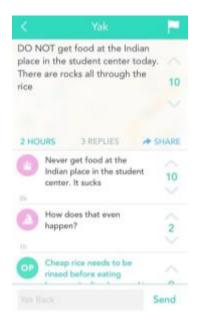

Figure 1. Yik Yak post and replies from August 2015.

The volume of content in a particular location on Yik Yak determines the radius that bounds viewable content, ranging from 1.5 to 10 miles [64]. Only the most recent posts are displayed before being deleted from the feed entirely. The precise radius and timeout for viewing content is dependent on the amount of content being generated in that area: in very active communities, like college campuses, this results in a dense radius and a high degree of message turnover.

Optionally, a user can set a particular location to be their "herd," which allows them to participate in that feed regardless of their current location. To set their herd, users need to be present at the desired geographic location. Using this feature, a student who attends a given university might have set their university as their herd, allowing them to participate on their university's feed remotely.

In addition to its core functionality, Yik Yak incorporates a number of other features, like posting photos (so long as they do not contain faces), a "peek" feature that allows users to look at feeds in other locations, and topic-based global feeds. To encourage participation, individual users build up "Yakarma," which numerically scores their activity in the community. This score is affected by the upvotes and downvotes a user's posts receive, as well as that person's participation in moderating other posts. This score is not seen publicly.

Yik Yak has not been not immune to the problems that plague other anonymous online communities. Controversy over cyberbullying and abuse on the application garnered a lot of attention from American news media [15,42,55]. Yik Yak took a number of measures to mitigate abuse and reduce cyberbullying on the application. They billed the application as intended for use by individuals who are "college-aged and above" [55] and implemented geofencing restrictions around K-12 schools [15] to disable use of the

application from locations in proximity to elementary, middle, and high schools.

In response to continued concerns, Yik Yak introduced optional user handles in March 2016, followed by requiring the use of handles in August 2016. This change increased barriers to entry and shifted Yik Yak from socially anonymous to socially pseudonymous. After backlash from users, Yik Yak reversed this decision in November 2016 and made handles optional again [48]. At the time of our study, however, Yik Yak users were anonymous.

METHODS

Data for our study consisted of in-depth, semi-structured interviews. Both current and past users of Yik Yak—whose use ranged from daily use to highly sporadic use to discontinued use—were recruited for this study. Given Yik Yak's relationship to local geographic communities, we restricted our study to a single location, an urban university campus, in order to understand how members of a discrete local community interacted with Yik Yak.

Because Yik Yak represented an unusual feature set, it was crucial to let the data speak for itself in order to discover what contributed to its success. Building on the principles of qualitative inquiry [37,63], we began an interview-based study of Yik Yak without positing a set of questions for our data to answer. We were interested in exploring how users perceive a social media application with such unusual affordances. To support this open-ended investigation, interviews were semi-structured so that participants' responses could guide the conversation [63]. During interviews, we asked participants about what they found interesting, challenging, and notable about Yik Yak; about experiences they had using the application in other locations; and about moderation. We also asked about use habits, about non-use, and about how Yik Yak differentiates itself from other social media applications. Through this inquiry we discovered a heterogeneous set of interests, values, and motivations that contributed to involvement and commitment on Yik Yak. Further inductive analysis revealed three focal design features that were integral to encouraging involvement and commitment on Yik Yak, *anonymity*, *ephemerality*, and *hyper-locality*. Notably, we did not include questions specifically on anonymity, ephemerality, or hyper-locality in our interview guide.

We interviewed 18 participants who use or used Yik Yak in their university community. Participants were recruited through in-person canvassing, campus email lists, social media posts, and snowball sampling. The first three authors conducted in-depth, semi-structured interviews, either in person or via video conference, lasting from one-half to one hour each. One participant, P7, was interviewed twice to better understand their cyclic user pattern.

Interviews were transcribed for data analysis. Transcriptions were coded by the first author using the qualitative analysis software MAXQDA. Working with a grounded, inductive approach, we used thematic analysis to uncover emergent themes in the data [8]. As such, a codebook was iteratively derived and refined throughout the analysis process. Emerging themes were discussed and refined by all authors throughout the coding process. During the coding process, anonymity, ephemerality, and hyper-locality surfaced as prominent themes. Table 1 summarizes select demographic information for each participant; the *usage pattern* column is elaborated in the findings section.

Participants	Sex	Age	Usage Pattern*
P1	Male	23	Casual Usage
P2	Male	19	Casual Usage
P3	Male	20	Casual Usage
P4	Male	23	Casual Usage
P5	Male	27	Power Usage
P6	Female	21	Casual Usage
P7	Male	33	Burst Usage
P8	Male	31	Casual Usage
P9	Female	32	Casual Usage
P10	Female	22	Power Usage
P11	Female	22	Waning Usage
P12	Female	27	Regular Usage
P13	Female	21	Curious Usage
P14	Female	19-20**	Waning Usage
P15	Male	22	Curious Usage
P16	Female	23	Regular Usage
P17	Female	22	Casual User
P18	Female	19	Regular Usage

Table 1. Participant demographics.
*Usage patterns described further in the findings section.
** Traditionally-aged college sophomore, exact age not given.

Interviews took place between September of 2015 and April of 2016. Only one interview, the second interview with P7, occurred after the introduction of handles. The first interview with P7 and all other interviews were conducted prior to the introduction of persistent pseudonyms.

FINDINGS

In the following section, we present our findings on how the emergent themes of anonymity, ephemerality, and hyper-locality impacted motivation, participation, and perception on Yik Yak. This section is organized according to the following topics: 1) users' perceptions of Yik Yak and their orientation to its distinguishing features, 2) interactions between anonymity and ephemerality in identity exploration and sensemaking, 3) interactions between anonymity and hyper-locality in producing grounding and context, 4) interactions between anonymity and hyper-locality in encouraging pro-social behavior, 5) interactions between anonymity, ephemerality, and hyper-locality in influencing contentious debate, and 6) an overall characterization of patterns of participation on Yik Yak.

User Perceptions of Yik Yak Regarding Anonymity, Ephemerality, and Hyper-Locality

Our participants spoke about the effect, value, and importance of Yik Yak's focal features. They reasoned about how anonymity, ephemerality, and hyper-locality influenced their perception of the system—what content was appropriate for Yik Yak, how they chose to interact with it, and what value they saw in it.

As anticipated by prior work, anonymity gave participants an opportunity to partake in disinhibited behavior and explore their feelings, values, and personalities. Confirming Kang et al.'s [30] findings, nearly half of our participants said that they or other people on the system would be more disinhibited when posting due to anonymity. For example,

I really like the anonymity... [It's] one of its core tenets. It gives [Yik Yak] a different, unique interaction that you can't have normally in person. –P1

Not only did participants value anonymity for the opportunities it presented to be forthright when posting content, they also appreciated that it provided greater freedom in upvoting and downvoting. When users were unbridled from pressure to like or dislike content, the feedback they provided to others could be a candid representation of their opinions. Many participants regarded the anonymous feedback they received more highly than non-anonymous feedback on platforms like Facebook, since it was not obligated through friendship or other social ties.

It's the validation of people you don't know thinking you're funny. If you post something on Facebook like 'got this internship' and you get all these likes, yeah, you're getting validation from people ... your friends your family, whereas if you post on Yik Yak and you get 150 upvotes, you're like, 'there's 150 people out there who think I'm funny.' –P11

The hyper-locality of the system was highly noted by participants, who valued how Yik Yak connected them to local peers, regardless of whether they were friends, enemies, acquaintances, or strangers. Access to this audience helped users connect to their local community through social media and worked to ground discussions.

I like that it ties me to my location, a little bit more than say some of the more worldwide anonymous and friend wall social network[s]. –P7

Many participants told us that Yik Yak was *the* place to go to find out what was happening on campus. This included not only up-to-date local news but also frivolities such as "strange things that happen [nearby]," free food opportunities on campus, or local recommendations.

In addition to experiencing social media tied to a particular *place*, the message timeout feature also allowed users to experience Yik Yak in sync with a particular moment in *time*, creating a temporal grounding in addition to a physical one. Participants spoke of how ephemeral content

reflected moments in broader temporal rhythms, resulting in change throughout the course of the day. P7 said,

In the morning people seem a little bit more helpful... by the evening, that's when you start to see the general group sorrow start to set in. –P7

Likewise, P5 noted that the closer you get to midnight the more users seek out anonymous, sexual meet-ups. Other participants talked about content reflecting the rhythms of campus life, responding to course work, sports events, and momentous occasions.

If I were to check now, and if there was a test today, there would be yaks about tests. –P18

Another way participants understood ephemerality on Yik Yak was through how it shaped their own engagement with the system. Some users oriented to constantly changing content by responding quickly before content had a chance to disappear, while others adapted to constant change by supporting reposting of the same content at different times throughout the day.

You have to act faster because it is ephemeral. –P9

Posting the same stuff at two different times... might be seen by totally different set of users. In a way, the ephemerality on Yik Yak justifies the reposting behavior. –P17

Yik Yak's ephemerality lent itself to short interactions with time-dependent, fleeting content, and helped the community connect in conjunction with the rhythms of the day and year.

Anonymity and Ephemerality Influence Exploration and Sensemaking

While participants perceived the importance of the three focal features in isolation, as discussed previously, they do not exist independently from one another. Rather, they are intertwined, influencing users through their joint interactions. Anonymity and ephemerality—qualities that trend towards diminished user accountability—are put into dialog with hyper-locality—shared context—on Yik Yak.

Participants noted that the lack of identified, persistent content that anonymity and ephemerality support, meant users did not need to be consistent in what they posted, the style they posted in, or the types of things they said about themselves and others. It was easy for individuals to explore or "try on" different online personas in the absence of prior history, which promoted changes in perspective.

Additionally, participants were intrigued by the trace ephemeral content left behind. Users would talk about posts that were no longer present on their feed, keeping the memory of old threads alive in the community for a little longer than the original thread. A similar phenomenon would happen within comments on a post as well. Sometimes comments within threads would be removed or moderated out, leaving gaps in the discourse of a thread. Especially since these posts were anonymous, it could be difficult for participants to identify when content was

missing, to understand why it was missing, and to make sense of the conversation that remained. Because there were no identifiable attributes outside of the randomly assigned icons, participants could not look at profiles of users who were participating in the thread to understand who was posting or why. Rather, users could only make sense of the material immediately in front of them.

I think some had been removed because there were parts of the conversation that seemed to be replying to things that weren't there anymore. –P5

This combination of anonymity and ephemerality produced moments in time where participants had to make sense of the situation presented to them at that instant; they could not obtain cues from users' past personas or past posts.

Anonymity and Hyper-Locality Provide Grounding: Shared Context, Shared Laughs

Although anonymity prevents users from knowing exactly who is online at any given time, users knew that other Yik Yak users were generally members of the local campus community. This awareness of not knowing your peers *specifically* but knowing them *generally* came up when participants spoke about their relationship to the Yik Yak community. Some spoke about Yik Yak creating a connection to others on campus, even though it was anonymous. One user explained that the more she participated the more she was invested because of the "you're all in this together mentality."

Perhaps surprisingly, participants did not frequently talk about school spirit or the sense of pride one may associate with belonging to a college community. School spirit was displayed most straight-forwardly during interviews when participants would boast that their school had one of the best Yik Yak feeds. When participants talked about displaying local pride on Yik Yak, they reported observing posts about school rivalries only occasionally, which allowed users to come together over jokes at the expense of other schools. More frequently, students would talk about school by communicating a joint struggle through self-deprecating humor about how hard school was, how little they slept, and how frequently they received bad grades.

Some participants talked about how these self-deprecating jokes spoke to "important truths," albeit delivered in a humorous way. Users' ability to draw on context and discuss local matters in a forthright and wry fashion was aided by the veil of anonymity. This veil meant that people were more honest on Yik Yak than they were on non-anonymous social media like Facebook. This openness embedded within a local context allowed for keenly tailored, highly-relatable content that could be humorous or serious. For example, during the campus career fair:

The yak [I posted] is, 'You know you're in a bad place when you read resume on Netflix as résumé and freak out about job applications.' –P10

Anonymity and hyper-locality worked together, allowing users to vent shared frustrations and to provide emotional support to each other through hard times. As P9 put it,

We may joke about each other and we may say stupid shit, but it's kind of its own little support group. –P9

Similar to sharing the stress of a job search, users spoke of receiving emotional support as they trudged their way through a difficult semester. Participants discussed seeing questions about a particularly hard homework for a specific class and communal complaints about failing grades. Anonymity afforded participants a means to be more honest in what they said without losing face, like posting about failures and disappointments that may be hard to admit in person. Anonymity and hyper-locality provided a support structure for coping, whether by making fun a college rival or by sharing the stress of receiving a failing grade.

Anonymity and Hyper-Locality Support Pro-Social Behavior: Helping Anonymous Locals Cope

Campus life can be stressful for students. Posts about the stress of coping highlight how shared context and anonymity interacted both negatively and positively. Some of our participants described the frustration with people posting about depression and other mental health issues. They disliked how anonymity prevented them from knowing who it was that needed help.

I've actually seen people post… depression posts and it upsets me because no one on Yik Yak can do anything about it. We don't know you, but we want—people that care about you definitely want to help you. It almost upsets me when I see people post that because I'm like, 'go talk to someone who cares about you.' –P11

Anonymity may support these types of posts because it is easier for people to disclose highly personal content when their real identity is shrouded. Nevertheless, our participants thought about how shared local context could be used to aid others in these situations. For example, one participant thought of an extension she'd like to build:

I actually plan on a side project to use the anonymity to maybe do a self-help Yik Yak addition to the API so that if people tend to show signs of depression or anything they could be directed to the appropriate college resources to help them out with that. –P12

Another participant described an instance where a user went a step further and reported an alarming post about mental health to Yik Yak. By reporting this post, Yik Yak was able to determine the identity of the student who posted and alert a third party to reach out to them.

You want to help but the problem is that he didn't voluntarily share his information… someone reported that post so that Yik Yak administrators would see it and when they saw it, they immediately took that information and contacted the police so that they could help them. –P10

Other participants spoke about encouraging users who needed support to connect with other users who had volunteered identifying information about themselves. For instance, P14 explained a scenario where she observed the community provide social support to someone reportedly suffering from suicidal tendencies:

It was kind of late at night and someone was saying they felt really lonely and they couldn't do it anymore. And there was just all these responses to it that were really really encouraging and telling them to 'hang in there.' And 'if you needed anyone seriously text me'... I saw a post or a comment later... like at the very bottom: 'You guys helped me so much, thank you, you don't know how much this means to me'... the OP had come back and responded. That was nice to see that that was possible. –P14

Understanding the local context of the community enabled users to provide support to their peers, even though they did not know the identity of the person they were helping. The shared local environment gave users a richer understanding of the problems and feelings their peers were struggling with, allowing users to provide context-rich replies.

Anonymity, Ephemerality, and Hyper-Locality Impact Controversial Content: Contention Over Discourse
In spite of positive outcomes like community support, the combination of Yik Yak's design features led to tensions around highly contentious topics. These included political posts and posts around matters of "political correctness," which would generate ample attention (often 50-60 replies).

Two participants spoke of enjoying either participating in or watching these debates. For users that enjoyed these posts, having content disappear after accruing too many downvotes made ephemerality a blight to their participation. However, these users were only a small fraction of our participants. The majority of participants found highly contentious posts frustrating. For some, these posts interfered with the real value of hyper-locality—informational or humorous postings about their surroundings. Some of our participants spoke about how these posts and comments did not constitute a debate, rather, they encouraged fighting within the local community. These participants felt that anonymity pushed civility out the door, resulting in users speaking *at* each other instead of *with* each other. Further, some users found the content produced by these types of posts to be offensive. The capacity of their community to produce vile subject matter brought out distrust in their local community. For example,

I've seen it a couple times... the community comes together to downvote that [racist content] and get it off there because no one likes reading stuff like this. It's deleted pretty quickly and that's great, but just the fact that people think that it's okay to put it out there [is a problem]. –P10

Like other participants, P10, was uncomfortable with what she saw as racism within the campus community. She was grateful when the community came together and quickly downvoted these contentious messages, causing them to be deleted from the system. Here, ephemerality gave users the ability to shut down inappropriate content by downvoting it away. However, another participant was frustrated that such posts lingered as long as they did.

I would start to see all these really misogynistic posts happening like overnight...There wasn't a lot of backlash, you felt like it was actually being embraced. It felt like it was a hate site after a while. –P8

P13 also disliked the subtle forms of sexism and racism that persisted on the system longer than she would have hoped.

Subtle negativity, like systemic sexism, that was just kind of left to exist in that environment. –P13

Whether or not participants thought contention and debate on Yik Yak were a great use of a hyper-local platform, the application's main design features curbed aggravated discussions from getting too heated and encouraged more moderate discussions, despite the tendency of anonymity and ephemerality to produce disinhibited behavior.

Patterns of Participation
The ways our participants described their use of Yik Yak varied in respect to their affinity for Yik Yak's three design features. In this section we describe six patterns of use on Yik Yak that we uncovered in our data; these patterns embody a heterogeneous array of relationships to anonymity, ephemerality, and hyper-locality. Crucially, different orientations towards each of these features resulted in varied levels of commitment to Yik Yak.

Some of our participants exhibited *curious usage*. They tried Yik Yak for a short time after friends or a group project encouraged them to download the application. These users left quickly, often citing negativity as the reason for leaving. In one case, a participant left in response to negativity directed at his own post.

I remember feeling, even though you're anonymous, still feeling like they knew me, my identity because of all the negative feedback. I just, out of reaction, deleted the post... and then deleted Yik Yak. I haven't been on it since. –P15

For these initially curious, now-skeptical non-users, there remained a feeling that Yik Yak served a particular role in getting information about their local community. They valued hyper-locality, but could not overcome their disdain for the disinhibition anonymity and ephemerality produce.

Casual usage also depended on the value of getting information about what was happening nearby. Yik Yak was there when these users had a few minutes to fill but this application was not a priority. As P9 explained,

[I use Yik Yak] during classes or in between work or school. Right before bed, if I was just bored and not ready to fall asleep, I would look through it and see what was going on around the area. –P9.

Ephemerality was exactly what these users had time for. A community where the pacing of the content lined up well with the pacing of their day, especially since lulls and peaks in these users' schedules lined up with the schedules of other community members.

We characterize the usage of those who participated consistently on Yik Yak as *regular usage*. Users who talked about regular usage not only used the system more frequently than other categories of users, but they also self-reported commenting on yaks and posting content, including hyper-local news. For example,

I use it in the morning, when I'm making coffee. And also when I have to wait for something… between classes, when I'm bored. Or if I find something frustrating, or something is happening on campus and I realize that other people might have something to say about it, that's when I post. Ex: Bathrooms broken in [this building]. You post it! –P16

Although these participants were using Yik Yak more regularly than others, they still described their own use as minor. For regular usage, all three features of Yik Yak were tied to participation. These users valued being able to vent anonymously, engage briefly, and stay connected locally.

Burst usage had patterns similar to regular usage; however, using in this pattern was cyclical. Participants reporting burst usage would use Yik Yak for a few months at a time, cease participation for an extended period of time, and then begin heavy usage again. Bursts were dependent upon participants' schedules, like whether they had increased free time. These users were invested in Yik Yak's hyper-locality and their cycles were encouraged by ephemerality.

I still kind of go through these bursts. Right, so periods of a couple months where I'll be on Yik Yak daily, I would say. And then, you know, then weeks and weeks and weeks of not really doing anything. –P7

Power usage also involved using Yik Yak daily. However, power usage differentiated itself through users who had developed comprehensive understanding of local memes. For participants displaying power usage, deepening their connection to their hyper-local environment was an immense reward. For example, out of all our participants, only these users knew that a long-standing local joke about an albino squirrel was based off a real squirrel.

There's an albino squirrel floating around campus. This albino squirrel is worshiped in approximately the same way a small minor god would be worshiped in an ancient culture. –P5

The final usage pattern, *waning usage*, describes users who were transitioning away from Yik Yak. Users who exhibited waning usage had once been regular or power users, but were beginning to transition away from their local community. As these users removed their ties to their community, they began to lose interest in hyper-locality.

It's not that I don't find Yik Yak funny because when I go back and look at the yaks they're still just as funny… I guess I have come out of the little [college] microcosm that I was in. I have a job off-campus now, my interests are just a little bit more off-campus and more in the adult world, rather than in the college kid world so I think that I'm spending a bit more time away. Can't really relate I guess as much to Yik Yak as I could before. –P14

Ultimately, local community had a significant impact on usage patterns. The demographics of a Yik Yak herd are intrinsically tied to the changing demographics of its geographical location. On college campuses, demographic change is a way of life. As students prepare to graduate and leave, they begin to separate from their local community and their Yik Yak herd, resulting in discontinued use.

DISCUSSION

We use the term *situated anonymity* to describe this convergence of anonymity, ephemerality and hyper-locality. While anonymity and ephemerality both lend themselves to disinhibited participation, hyper-locality means that users know they are participating in near proximity, mitigating some of this disinhibition. Likewise, ephemerality connects users through a shared temporal context. Thus, users are interacting in a common spatial and temporal grounding, which creates a sense of the community here and now. Additionally, anonymity provides the freedom to speak openly. Participants often referred the "pulse" as a materialization of these features. In this section, we explore how situated anonymity provides a lens on use, commitment, and community.

Situated Anonymity and Transitory Use

Irrespective of their pattern of use, all participants used Yik Yak in a fleeting, casual way—reading the feed in spare moments and posting at most two times per day. Situated anonymity supported this behavior by providing no extrinsic accountability for participation (via anonymity) and creating a "pulse" (via a combination of ephemerality and hyper-locality) that drew many users in for only a short amount of time. They reported their use of Yik Yak to be relatively low compared to their use of other online communities. All of our participants, in one way or another, recount a phenomenon we describe as *transitory use*. Transitory use is highly dependent upon the volatile, inconsistent capacity users have for additional commitments to an online community. Our study shows that users are interested in casual online communities, places where they can be fully engaged when they're online but can also quickly start or stop participating. Situated anonymity supports this type of engagement. No one knows when you are off or online, and, when you are online, you are sharing a contextualized experience of a particular moment in time and space.

We situate this idea within critiques of "use" that have emerged in the past decade [3,24,59]. Collectively, these critiques call for unpacking the concept of use—moving

away from binaries like use versus non-use, and testing the assumption that "more use" is better. Transitory use contributes to the unpacking of *use*, and adds depth to the spectrum of user behaviors between use and non-use. While researchers have studied why people quit social networks and whether or not they are successful in quitting [2,9,61], transitory use is not about permanently leaving or avoiding a community nor is it about being a regular user. Rather, it is characterized by movement back and forth between use and non-use [33]. It is about casual commitment.

Another attribute of transitory use reported by participants was the repeated deletion and reinstallation of the application over time. Participants across the usage spectrum, two from casual usage (P8, P9), one from burst usage (P7), and one from regular usage (P18), reported this behavior. They described a strong need to curb their usage of the system through deleting the app when they felt their commitment become too involved.

In an attempt to change their behaviors towards more lightweight commitment, users would delete the application and transition that time to other activities. After a while, the strong impulse to cease participation would dissipate and users would seek out the unique place that situated anonymity produced. Further, participants appreciated how easy it was to reinstall Yik Yak and continue participating as if they had never left due to low barriers to entry, like no username. This ease encouraged the cycle of transitory use to continue. Participants would use Yik Yak, then stop using it (either through nonuse or through deliberately deleting the application), and then start using it again when something drew them back (like boredom or an unknown event on campus). None of our participants seemed troubled by this pattern. Situated anonymity made this type of participation possible. This pattern of fluctuating engagement exemplified the non-permanent, transitory nature of participants' commitment to Yik Yak.

Our findings suggest that transitory use, which is supported through low barriers to entry, is an integral feature of situated anonymity. However, previous work by Ren, Kraut, and Kiesler suggests using a high barrier to entry to encourage commitment—implying that a low barrier to entry is a problem for commitment [56]. Nevertheless, Yik Yak thrived with a low barrier to entry. Further, other work by Dabbish et al. suggests that high turnover rates, a side effect of low barriers to entry, can increase commitment to an online community by increasing the perception of popularity and activity in an online community [14]. Thus, even if high-barriers to entry are ideal for commitment in online communities with standard design features and traditional commitment schemas, there are numerous, sometimes counterintuitive, ways to attract commitment in atypical online communities.

Different sets of design features, like those represented by situated anonymity, create a wide variety of potential environments and commitment models for online communities. Developing a deeper understanding of transitory use will help us develop more nuanced understandings of what qualifies as a "successful" pattern of use. For example, systems might be designed with situated anonymity in mind specifically to support transitory use, so that users can meaningfully engage with the content in casual, inconsistent, cyclic ways. This type of future work can help us develop a richer vocabulary of what it means to "use" social media applications.

Situated Anonymity, Casual Community, and Commitment

Despite broad definitions for online communities, the concept of community online still garners much debate [10]. Previous research on communities that deviate from standard design practices, like Pater et al.'s study of the Something Awful Forums [53], have expanded our understanding of what kinds of community are possible online. On Yik Yak, situated anonymity impacted the way community as a whole materialized, encouraging novel interactions and commitment. Even without directly naming Yik Yak's focal design features, our participants spoke with acute awareness of the importance of this combination of features. Situated anonymity contributed to creating an online community that was unlike any other they had participated in.

The affordances of situated anonymity allowed users to interact with each other and participate in ways that were distinct from other online communities with different design affordances. 4chan features anonymity and ephemerality [5], but it is not tied to a particular location. Snapchat thrives off of ephemeral interactions between identified friends [4,69]. Although it has geographically-bounded features, like location dependent filters and location-based stories, these features are not a focal part of its default user interaction. On the secret sharing community Whisper, users experience anonymity and sometimes engage with location-based features—such as posts from users in their same city [30,67]—but without the level of ephemerality or hyper-locality on Yik Yak.

Commitment to the Yik Yak community came from an interest in the sense of place participants found there, rather than an interest in specific people or specific topics. Harrison and Dourish differentiate between space and place, arguing that place consists of behaviors, norms, and thoughts that span the otherwise unremarkable spaces individuals inhabit online and offline [25]. On Yik Yak, place was about casual, no-strings-attached anonymous connections, and about tapping into the "pulse" of a particular moment. Place was entangled with the design features of situated anonymity.

Casual epitomizes this kind of place. Users knew they inhabited a shared time and location in the offline world, but did not know any one user within the application. They also had no in-application means of keeping track of the history of the community as a whole, or of an individual

user. These affordances (or lack thereof) prevented users from developing continuing relationships with *individuals*, but encouraged a casual yet compelling commitment to the *community* comprised of those individuals. On Yik Yak, the convergence of anonymity, ephemerality, and hyper-locality gave the community its own iterative, emergent identity. By engaging with this communal identity, participants could deepen their connection to their "real" hyper-local community in addition to their community on Yik Yak.

Just as anonymity was foundational for allowing the group to take precedence over the individual, connection to one's hyper-local community offline played a key role in user' commitment online. Investment in one's herd was similar to an identity-based commitment founded on a geographical community; however, the transitory use of and commitment to Yik Yak differentiated itself from commitment to communities where people intentionally gather around shared, location-based interests. On Yik Yak, the identity of the community was emergent rather than preordained. As a result, users became invested based on the process of learning and creating their community's identity rather than on its identity *a priori* (e.g., shared illness). Users developed affinities for the community identities that emerged. This gave the sum of their collective, anonymous participation an active role in the formation of Yik Yak's ever-changing, hyper-local group identity, its pulse.

The impossibility of creating persistent relationships in conjunction with the lack of a cohesive identity-based purpose might appear counter-intuitive for encouraging investment in an online community; however, this was certainly not the case with our participants. Rather, the technical infrastructure of Yik Yak afforded by situated anonymity created new opportunities for our participants. Situated anonymity inspired an investment in a casual, constantly-changing online community.

LIMITATIONS AND FUTURE WORK
One limitation of this study is the exclusive use of qualitative data. While a mixed methods study incorporating data mining may have provided additional insights, scraping data from the application is against Yik Yak's Terms of Service (TOS). Thus, we focused our data collection on in-depth interviews with participants.

Another feature of this study that is both a limitation and a strength is that we worked with a single group within a single geographic area. This constraint allowed us to develop detailed representations of how community and commitment manifested on Yik Yak in a particular time and place. Additionally, university students are not representative of the identities and experiences of the population at large. They do, however, provide an insightful baseline into how situated anonymity plays out in an environment where there is a unifying shared context. Shared context in time and space is an integral part of situated anonymity. Further research is necessary to understand how important a unifying shared context, like a university setting, is to situated anonymity. Nonetheless, there are numerous environments with unifying shared contexts (e.g., corporations, religious institutions, third places [52]) that have features similar to the environment in this research. This makes these contexts prime environment for transferring the results of this study.

As mentioned previously, Yik Yak has changed tremendously since the completion of this study—abandoning the combination of features we speak about in this work, and then bringing some of them back. Future work on situated anonymity will enhance our understanding of this concept. However, based on the continuing changes to Yik Yak, different communities featuring situated anonymity may need to be the site of new studies.

CONCLUSION
This research offers insight on how an atypical social media application expands our understanding of commitment to online communities. We describe *situated anonymity*, which materializes when anonymity, ephemerality, and hyper-locality co-occur as focal design features of an online community. In uncovering an unconventional mechanism for inspiring commitment to an online community, this study describes how situated anonymity affords opportunities for users to connect with each other in casual, lightweight, and fluid ways.

The long-term success of any new internet platform is not assured, and Yik Yak is no exception. What is interesting here is not the specifics of one system; rather, it is the transferability of implications from an application that leveraged situated anonymity into a thriving place. The lessons here about the coexistence of anonymity, ephemerality, and hyper-locality are broadly applicable and relevant for designers of future systems. We found that situated anonymity encourages participants to commit to an online community by giving them an active role in the creation of an emergent, iterative group identity. We believe that this research can inform future work on designing social media with flexible group-identity and situated, transitory use. This work will continue to expand our understanding of "successful" use and commitment in online communities.

ACKNOWLEDGMENTS

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