Strangers on Your Phone: Why People Use Anonymous Communication Applications

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ABSTRACT

Anonymity online is important to people at times in their lives. Anonymous communication applications such as Whisper and YikYak enable people to communicate with strangers anonymously through their smartphones. We report results from semi-structured interviews with 18 users of these apps. The goal of our study was to identify why and how people use anonymous apps, their perceptions of their audience and interactions on the apps, and how these apps compare with other online social communities. We present a typology of the content people share, and their motivations for participation in anonymous apps. People share various types of content that range from deep confessions and secrets to lighthearted jokes and momentary feelings. An important driver for participation and posting is to get social validation from others, even though they are anonymous strangers. We also find that participants believe these anonymous apps allow more honesty, openness, and diversity of opinion than they can find elsewhere. Our results provide implications for how anonymity in mobile apps can encourage expressiveness and interaction among users.

Author Keywords

Anonymous communication, anonymity, self-disclosure, computer-mediated communication, privacy, social media.

ACM Classification Keywords

H.5.3. Group and Organization Interfaces.

INTRODUCTION

"Solitude is fine but you need someone to tell that solitude is fine."

— Honoré de Balzac

Given the proliferation of communication platforms and traceability of online activities, most people believe that it is difficult to be completely anonymous online without any identifying trace [28]. At the same time, many Internet

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Figure 1. An example post on Whisper

users seek anonymity in their activities online [16]. Anonymous communication applications such as Whisper (Figure 1), Secret (now closed), and YikYak provide ways for people to connect through smartphones and interact anonymously on any topic to an anonymous audience. Previous work has documented broad motivations for being anonymous online [16] but not looked at how communication tools empower these motivations.

We need to reexamine anonymous communication now because the communication landscape has dramatically changed from the early days of the Internet. Many people are constantly connected through multiple social media to almost everyone in their lives everywhere they go [10]. Social media users on Facebook and Twitter experience context-collapse as their communications across each channel hit multiple audiences, each related to a different social identity for the user with different expectations of behavior [39]. People may choose to communicate anonymously with certain friends or acquaintances, or a deviant or hobby group, to keep those interactions separate and secret from other people they know [2,16]. Earlier work described how people communicate on their computers in web-based MUDs, Usenet, and Second Life [9, 35, 39], but the rise of mobile devices and apps has made casual, even constant, location-based anonymous communication possible. This technological change leads us to ask how

people interact with others anonymously through smartphones and why they do so. What benefits do people get out of mobile communication without identification? Can people find community in these anonymous communication apps?

In this study we extend our understanding of motivations for anonymity by analyzing users' activities and motivations on anonymous communication applications on their smartphones. We find that these applications provide a place for people to share personal emotions and experiences, positive or negative, without their needing to track their disclosure boundaries and to fear negative reputational consequences. Unlike designated confessional online communities in which people mainly share confessions and secrets [36], people using mobile apps such as Whisper also share funny, entertaining posts. Also, despite the lack of a cohesive and persistent set of identifiers, as users have in many online communities, people in our sample reported that these apps provide social support and validation for their feelings, experiences, and self-identity. They said people are honest and open in this setting. They said they were able to open themselves because of the lack of accountability for what they said and lack of connection to their real world identity. These benefits have been observed in studies of some online communities but in the case of anonymous mobile apps, the benefits occurred even without such pro-social features as moderation and group identity markers of those communities [18, p.79-83].

Anonymous Communication Applications

Anonymous communication applications (e.g., Whisper, YikYak, and Secret) are software programs designed mainly for mobile devices. They allow people to share messages with other users of the same application without any connection to their identity or among their messages. Unlike the quasi-anonymous email and Web communities that support group identity and specific topics such as financial trading, transgender transition, new motherhood, or cancer treatment (which often require moderation and/or registration), anonymous mobile apps are designed for crowds without an agenda or specific topic. Users can find very little identity information on these apps except others' general location at the city or state level. Previous research on these apps suggests that people using Whisper interact more often with co-located than with distant users [38].

Research so far indicates that people disclose personal information and express their personal needs and wishes on these apps. Linguistic analysis of Whispers shows a higher frequency of first person pronouns in Whisper posts than in other social media such as Facebook and Twitter [7,38]. The social psychological literature suggests that self-disclosure may be motivated by social approval, intimacy, relief of distress, social control, or identity clarification [8]. People are more willing to disclose to strangers because doing so can mitigate some disclosure risks [30]. Disclosure

risks include rejection by listeners, reduction of one's autonomy and personal integrity, loss of control or self-efficacy, and the possibility of hurting or embarrassing others [24]. Disclosing online can feel safer. People disclose more about the self in the online context compared to what they do in the offline context [15], and they disclose more online when the medium contains less information about real identity [27]. Correa et al [7] asked MTurk workers to annotate 477 Whisper posts, and found the most popular category was "confessions," followed by "relationships," "meetup," and "QnA/Advice." Along with self-disclosure, questions and advice seeking posts are common in Whisper [38], as they are in 4chan/b/ [4] and Facebook Confession Board [5]. People may feel anonymous advice is more honest than advice from identified sources [22].

Ephemerality is another characteristic of anonymous communication. According to Bernstein et al. [4], the median life of a post on 4chan /b/ is 3.9 minutes, and 43% of the posts do not receive any reply. The authors propose that ephemerality removes a "rich get richer" effect and raises community participation because users have to quickly reply to a thread to keep it alive. Similarly, more than 50% of Whispers receive no replies, and most replies arrive within 1 day after a post has been made [38]. Although Whisper posts do not automatically expire, a significantly higher proportion of this content gets deleted either by moderators or by users themselves than other social media (18% vs. 4% on Twitter).

There is limited qualitative work delving into the subjective experiences of users of anonymous apps; most existing research uses text analyses to detect behavioral patterns. There remain open questions about the nature and form of participation in these apps given their limited affordances for developing interpersonal bonds or common group identity, two theoretical factors that sustain social groups online [29].

Identity in Online Communities

In online communities that lack persistent user identifiers, group identity can play an important role. There is rich literature on self-expression and image management associated with one's self-identity [12]. Online identity signals the credibility of an information source, helps to build trust between group members, and motivates people to contribute to online communities in order to build reputation. In Donath's study of Usenet groups [9], anonymous accounts were commonly used when people wanted to reveal personal information or discuss legal matters, or when they just wanted to keep their participation secret from others they knew. Studies of anonymity in the early days of the Internet suggested it could be a dangerous medium leading to angry, antisocial behavior towards others, such as "flaming" – angry or hateful speech [17]. Nonetheless, researchers also discussed the benefits of anonymity for equalizing participation in groups [17], for

encouraging communications among weak ties [39], and for the freedom to share ideas and be open and honest without social constraint (e.g. GDSS research by [23]).

The anonymity of the Internet provides people opportunities for identity experimentation. Gross [14] proposed the Internet as a so-called identity playground for teens. Half of the students in their study had pretended to be someone other than themselves on the Internet – mainly someone older – a desired or future identity. Similarly, in Stern's work [32], adolescents constructed personal websites as “touched-up versions of themselves.” (p.106) Using the shield of online anonymity to explore alternative identities is not only seen in teens, but also in adults. In Turkle's early work of MUDs [35], she describes the virtual communities as “laboratories” for people to explore and experiment with their different selves (p.12). Recent work shows that people create online dating profiles to reflect an “ideal self” instead of their actual self [11]. On the other hand, Bargh et al. [2] argued that people are more able to disclose their so-called true self on the Internet because the anonymous environment reduces expectations and the risks of social sanction that exists in face-to-face interactions. The disinhibiting effect of anonymity online can lead to a higher level of self-disclosure [2], discussion of taboo topics and unpopular opinions [5], and unusual acts of generosity [34].

To explore how anonymity influences communication on mobile anonymous communication apps, we asked:

RQ 1. *How and what do people post on anonymous communication apps?*

We also wanted to examine why people participated.

RQ 2. *What experiences or contexts motivate people to use anonymous communication apps?*

Community Development

Wellman and Gulia's work in the beginning days of online communities explored the question of whether or not people can form communities in the virtual world [39]. They found that Usenet, IRC channels, and discussion groups not only served the purpose of information exchange, but also provided emotional support and companionship for their members. In Turkle's book, *Alone Together* [36], she explored how people use anonymous confessional sites like PostSecret. She observed that these sites are not communities because “communities are places where one feels safe enough to take the good and the bad.” (p.238) Some users she interviewed were discouraged by the amount of criticism and negativity they experienced on the site. We hope to explore the same question as applied to these new anonymous communication apps.

To explore whether or not these anonymous communication apps encourage community among the members, we asked:

RQ 3. *Are there virtual communities in these anonymous communication apps?*

Anonymous vs. Identified Online Communication

Social network sites like Facebook allow people to build their images and history online and maintain relationships with real life connections. Over the years since these sites were introduced, however, people have become increasingly cautious about sharing their personal information or opinions on social network sites because of the higher risks associated with their identity tied to the content they post [33]. Disclosure on Facebook carries risks such as social rejection and damage to self-presentation [20,37]. Others may block or unfriend posters because they post too often about politics [31]. Participants in some studies describe how they attempt to mitigate posting risks by moving communication to other channels [37]. Marwick & boyd [21] describes how, in order to manage different social boundaries, adults and teens both use different sites (e.g., Facebook and MySpace) to communicate with different connections, or to switch among communication channels (e.g., post in Facebook vs. text message). In addition to maneuvering in identified social networks to protect their identity and privacy, some people choose to share anonymously without their real names attached to the content they post. Leavitt [19] describes how Reddit users use anonymous throwaway accounts to disclose personal information (such as asking for advice or feedback about controversial problems), and to manage boundaries between their different accounts on reddit.

To explore these phenomena as they might or might not apply to anonymous communication apps, we posed the following research question:

RQ 4. *How do people choose to use anonymous communication apps versus identified social networks?*

METHOD

We conducted eighteen semi-structured interviews with anonymous communication application users to better understand how and why people participate in these apps. The first thirteen interviews (P1-P13) were conducted in Summer 2014, and the last 5 interviews were conducted in Spring 2015 (P14-P18). The findings were not different across these two time periods, so the data have been combined. Participants were recruited through flyers posted in a major city in the east coast of U.S., a participant pool of a research university in the east coast, and through Craigslist postings. We recruited participants who had used at least one of the anonymous communication apps Whisper, Secret, and YikYak. The majority of our participants used Whisper.

Each interview session lasted approximately one hour and focused on how participants used the application, the posts they made and viewed, and their perceptions of the application dynamics and other users of the application. We conducted interviews in person (4 out of the 18 interviews) or over the phone, Gtalk or Skype. Participants also sent specific posts mentioned during the interview via email for later reference during analysis and coding.

Features of The Apps

All three applications were available on iOS and Android smartphones. Users could only post via their smartphones. Whisper had a website displaying popular whispers and various categories of whispers that people can access on their computers (<https://whisper.sh/>). Users on both Whisper and YikYak were not connected to other users on any existing social networks. Posts on both Whisper and YikYak contained location information: each Whisper post displayed city level location information, and each YikYak post showed a blurred area map in the background. Whisper posts always had a background image and texts on top of the image. Each reply also included a background image. YikYak posts only contained text. Secret connected users with their friends and friends of their friends based on existing social networks such as email contacts. Secret posts that were not from a friendship circle were displayed with city-level location information. At the time when we conducted the first 12 interviews, Secret allowed users to add a background image but later they removed that feature.

Whisper randomly assigned a username to each user at initial signup, but users could change their usernames any time. The default setting for posting on YikYak did not require users to attach a username to their posts, and replies on YikYak were identified by random avatars. YikYak users had the option of editing a “handle” if they want to add an identifier to each post. Secret posts did not have usernames attached, and replies were identified by avatars randomly assigned to each user. Users’ avatars changed every time they replied to a different post.

Users interacted with others in three ways: posting, acknowledging another’s post (hearting a post on Whisper or Secret; upvoting or downvoting in YikYak), replying to a post (on Whisper, YikYak, and Secret), or sending direct messages to another person (only available on Whisper and Secret). Users could flag posts on all three apps.

Participants

Participants in the study reported ages between 19 and 29 (mean age 23.5 years); 11 were female participants and 7 were male participants. Our sample is typical of the demographic breakdown of Whisper, according to a prior count by [7], who reported that most of Whisper users are between age 17 and 28 and 70% of them are women. Table 1 shows some demographic information of our participants and the anonymous communication apps they use. Seventeen participants used Whisper and 5 participants had also tried Secret (but they mainly talked about their usage of Whisper during the interviews). One user used the application YikYak. Nine participants also mentioned using other anonymous communication services during the interview, including TextSecure (a private messaging app), PostSecret, FML (<http://www.fmylife.com/>), Facebook confession board, and Reddit. Our sample used a variety of other social apps as well (16/18 used Facebook, 11/18 used Twitter, 11/18 used Instagram, and 8/18 used Snapchat).

ID	Gender	Age	Occupation	Anonymous app(s) they use
P1	M	19	Student	Whisper, Secret
P2	M	20	Student	Whisper
P3	F	22	Hospitality worker	Whisper, Secret
P4	F	19	Student	Whisper
P5	F	22	Student	Whisper
P6	F	23	Student	Whisper
P7	M	21	Student	Whisper
P8	M	26	Student	Whisper, Secret
P9	F	29	Admin. assistant	Whisper
P10	F	27	Admin. assistant	Whisper
P11	F	22	Student	Whisper
P12	F	29	Yoga teacher	Whisper, Secret
P13	M	23	Student	Whisper
P14	M	23	Student	Whisper
P15	M	22	Student	Whisper
P16	F	22	Student	YikYak
P17	F	29	Research specialist	Whisper
P18	F	24	Student	Whisper, Secret

Table 1. Study participants.

In recruiting, we stratified our sample across usage duration with one third of our sample being new users (1-3 months in the app), one third being moderate duration users (4-8 months in the app), and one third long term users (12 months or more). We also split our sample across users who had posted in the application (10/18) versus those who only browsed and read posts by others (8/18).

Interview Analysis

We transcribed our interview audio records and analyzed the transcripts following a grounded theory approach [6]. The transcripts were coded using Dedoose software (<http://dedoose.com/>). Within the interviews we identified descriptions of application usage, the posting and reading behavior. Two researchers independently coded subsets of the interviews, discussed and resolved differences, and clarified code definitions. We first open coded participant responses about their motivations for using the application, posts they made and viewed on the site, and social perceptions. We then performed axial coding, conducted affinity diagramming to group categories of concepts, and developed a series of themes on each topic: application use, types of posts people made and why, and types of posts they liked and disliked, motivations for using the application, perceptions of the other users of the applications and contrasts with other social media. We refined the themes during the writing process.

Post-Coding

We supplemented our interview responses with qualitative analysis of posts on the applications. The posts we coded

were from three sources: we randomly collected 125 posts from the applications Whisper and Secret in June 2014; we also coded the posts that our participants had posted on those applications; and we extracted the posts that our participants reported seeing on those applications. Three researchers worked together to code the posts according to their topic, to the emotion expressed, and to the motivations that seemed to be behind the posts. We used the categories from this analysis to confirm and extend the themes from our interview analysis, and to validate the types of posts that participants described in our interviews. Table 2 below summarizes the result of the integrated coding of posts we collected from the applications and posts mentioned during interviews.

RESULTS

We found that participants interacted on anonymous communication apps to disclose predominantly personal information or emotions (positive and negative), and that they felt short-lived connections with other users in response to content or aspects of content they could relate to. In the following sections, we first present how people used Whisper, YikYak, and Secret, the types of posts they made in the applications, their motivations for making posts and what they got out of reading others' posts, and their perceptions of community on the app. Lastly, we discuss how participants viewed anonymous communication apps versus identified social networking sites.

How People Used the Apps

Anonymous apps provided a periodic distraction and diversion from everyday life for the participants, but also an

emotional outlet without social consequences. A majority of our participants (browsers and posters) visited the app for five to fifteen minutes a day. They reported browsing and liking posts before they went to bed, or to pass time when they had some downtime throughout the day, e.g. when they were on the bus or waiting in line. They tended to look at popular posts, nearby posts, and occasionally search for topics, such as music, technology, and fashion, in which they were interested.

Some participants in our sample reported their usage of the apps declined over time. Two longer-term users of Whisper mentioned that they visited the app very frequently when they first started using it (several times a day) but used it much less now (two to three times a week) because were irritated by seeing lots of rude argumentative or overly sexual posts (P17 and P18). Participants who posted frequently early on also said they posted less frequently over time, especially after getting unwanted responses to their posts. For example, P1 who posted when he first began using Whisper had switched to only browsing because he received too many direct messages and requests for further contact in response to the posts he made.

What People Posted on Anonymous Applications

We next examined the types of posts people made on the applications. Table 2 summarizes main categories of posts revealed in our analysis. Our findings echo prior research showing that the majority of posts were personal disclosures [7,38]. Many of these posts expressed strong personal opinions, or shared personal experiences, confessions, and negative feelings such as anger or sadness

Types of posts	Subcategories	Example posts
Personal		
Distress release	Sad, negative emotions, confessions of bad behavior, bad experiences	"I was like I can't believe I wanted to get through school to work full-time." (posted by P17)
Social venting	Conflict, relationship problems	"You're extremely difficult to work with. I wish I could clone you make them your manager so you know how much you suck." (Seen by P3)
Self-expression	Self-reflection about identity, personal opinions, aspirational	"I love being a solitary human being. I enjoy reading in a park, the library, at a bar, at a restaurant. I don't need many friends to have fun." (posted by P3)
Entertaining confession	Funny self-observations, funny habits, pranks	"I swear about my bosses all of the time in a language I know they don't speak. Their dog too." (posted by P10)
Positive stories	Overcoming challenges, achievements, positive experiences, news	"I've got five kids and I'm a single mom. I woke up to my oldest son helping his younger siblings clean their rooms and get read. Parenting done right." (seen by P5)
Seeking interaction	Meet-ups, asking for advice, question discussion starters	"I never know what to do with my hair – What's a hairstyle that works for curly hair?" (posted by P12)
Impersonal		
General entertainment	Non-personal jokes, quotes, observations	"Summertime and the living is easy" (posted by P16)
Information sharing	Interests, facts, local information	"I like Game of Thrones. I can't wait until next season." (seen by P2)

Table 2. Post categories identified in our study. (These categories are not mutually exclusive.)

(coded in Table 2 as distress release and social venting). Some posts served the purpose of identity clarification and did not always contain strong emotions (Table 2; self-expression). People also shared posts that were more lighthearted, fun, and entertaining (Table 2; entertaining confessions & positive stories). Many posts were made seeking responses (Table 2; seeking interaction) either in person, in replies and one-on-one messages, or chat in other channels. People also made impersonal posts with quotes, facts, or information about topical interests (Table 2; general entertainment, Information sharing).

Why People Post on Anonymous Applications

Despite the lack of affordances for social identity or relationship development, participants had mainly social reasons for posting on the applications. Sometimes people explicitly sought social interaction, asking for replies to their posts or interactions outside of the app such as chatting or a “meetup”. Sometimes they just wanted to share their personal stories or momentary feelings without any expectation of responses.

Using The Crowd for Social Validation

According to participants, a primary motivation for creating posts in the apps was to obtain social validation from the crowd of application users. They used the diffuse members of the application as a social litmus test of their behaviors, opinions, and admissions of frailty or unusual characteristics. They wanted to know whether their opinions or thoughts were normal, whether people would disapprove of something they had done, how bad it would seem to others, or how a wide set of people thought about an issue of personal relevance.

For example, a 22-year-old hospitality worker posted about being a solitary person (Figure 1; Table 2, self-expression category example post) and said she posted it on Whisper to see whether others were like that too. She said she always felt pressured to go out with friends and colleagues in real life but what she really enjoyed was reading by herself. The hearts to her post made her feel like there were other people who felt the same way. She said:

“It’s nice to have some validation that you aren’t the only one that feels that way.” (P3)

Despite the anonymity in the apps, participants sometimes sought opinions about their own behavior indirectly. Seemingly impersonal questions to the crowd or statements were another way to acquire opinions about the user’s own behavior. For example, after P4 got a tattoo, she posted a question to get people’s opinions about tattoos. The post read “tattoos on a girl yes or no?” not revealing anything about herself or the fact that she had one. As she said: *“it’s interesting to figure out what people think about that.”*

Participants used the apps to get opinions from the (presumably) more diverse and more objective audience than they would find on their other social media. For instance, P6 said:

“I guess anyone who has Whisper can check it so it’s beyond your Facebook friends, 1,000 people you already know. So they might have other interests, might be cooler to like Lord of the Rings on Whisper than to like it on Facebook.” (P6)

Nevertheless, participants were aware that anonymity took away accountability and responsibility. Two participants said that they did not want advice from random strangers on the Internet and they would prefer advice from friends because they knew them better.

The social validation motivation for posting we observed seems similar to the approval and identity clarification goals described in the previous literature mainly among teenagers. Teenagers share personal information on their personal webpages for the purpose of seeking connection and validation [32]; we found young adults doing so on these apps. According to prior work, a goal of self-disclosure is to be liked or accepted by others, and previous work has found these disclosures can help communicators clarify their identity by allowing them to convey accurate information about themselves [3,8]. In the anonymous applications, people shared their personal opinions, habits or stories even without sustained interaction. When the anonymous audience responded positively with hearts or upvotes, even with no further conversation, they felt they were not alone and that their behavior was acceptable.

Making Short-Term Connections

Although it was unusual in our sample of interviewees, many posts on the anonymous applications were explicitly looking for interactions or “hookups” with other users. These could be online one-on-one chat interactions or meetings in real life. For example, P1 had used the app to talk to people online and to meet them in real life. He had also posted specifically to get responses from people who wanted to chat one-on-one, with a post saying, “if anybody wants to chat, message me.” It seems like most of these posts were seeking short-term communication or sex, but we do not have evidence to discover whether these interactions ever developed into longer-term, intimate relationships. Four participants, all female, expressed an aversion to this type of posts, saying they were “spammy,” “disgusting,” or defeated “the purpose of the app.”

Some of our participants responded to requests for contact. For example, P2 sent a direct message to another user in his local area asking if anyone had Game of Thrones DVDs and offering to buy them. Posts aiming at making connections may have a higher level of risk of exposing the poster, and these posts were more likely to include identifying information such as selfies (photos of the poster), or the poster’s location, or personal interests. For example, P7 saw a friend posting a selfie on a post that said “Anyone in [his city] want to talk or something?” using the “Nearby” feature of Whisper (Figure 2).

Avoiding Social Risk and Context Collapse

Participants also used the apps to release emotions or secrets without risking social consequences such as offending others, secrets being found out by others, or harming one's image online. In the social psychology literature, it has been reported that writing about a secret can improve people's health conditions [26]. Turkle [35] has argued that the virtual world is a "safer place to ventilate" (p.199). This motivation seemed to be prominent in the posts coded as distress release and social venting (Table 2). For example, P18 complained about work-related issues on Whisper, and said she did not care about getting feedback or responses because she just needed to get her opinion out there.

The lack of social boundaries on Whisper meant participants did not have to deal with conflicting expectations from different social groups, or the context collapse problem in social media [21]. The above participant P18 indicated that she posted her complaints about her work on Whisper rather than other social media because her coworkers were friends on the other social media she used (Facebook and Instagram). This motivation is similar to what Kang et al. [16] reported about the motivations to seek anonymity. They reported that people used anonymity as a way to manage overlapping and difficult social boundaries in their lives, essentially eschewing all of them by being completely anonymous. An administrative assistant talked about freedom from differential audience expectations on Whisper versus other social media:

"I didn't really have an audience in mind. It's one of the things I like about Whisper is that I don't have to think about that. When I post to Facebook, et cetera, because I have so many family members and then people that I'm sort of in touch... I have to always make really careful decisions about what's public vs. what's for just these people." (P10)

In addition to removing the concern of managing one's social boundaries, sharing on anonymous communication apps, as implied in the above quote, did not require as much effort to construct or polish one's post as did posting on identified social networking sites.

Participants said they did not need to consider how to manage their online image on these apps. P1, who also used Tinder to find connections, said he cared less about his grammar on Whisper as compared with Tinder; when he talked to others on Tinder, he would phrase his words better. A woman who had shared her story about an unrequited love to PostSecret thought posts on Whisper were easy to make, in contrast to the effort required when she had to buy a post card, write her secret down, and mail the post card to PostSecret (P9).

Sharing Momentary Information

Some participants posted to share feelings or thoughts they had that were stimulated by the situation they were in at

Figure 2. View of the Nearby tab in Whisper app

that moment. For example, P15 posted a joke in frustration while she was driving and stuck in traffic because of construction she saw everywhere on the road. Her post read: "In [her town] it's either winter or construction." She said she wouldn't post something like that on Facebook because it wasn't important enough, expressing that some things are not "monumental enough to post on Facebook."

These in-situ posts often involved observations or thoughts about people around the poster that couldn't be shared or said out loud. Frustration was a common driver for these in-situ posts. They also included posts about conflicts or arguments with other people (Table 2, social venting). The administrative assistant also posted after a drunken fight with her husband, saying that, "I'm pretty sure I made a mistake marrying my husband but I have two more weddings to get through before I can get a divorce." She appreciated the anonymity of this post the next morning because there were no real consequences. She said:

"In the morning I look at this and even though I know it doesn't matter because nobody's seen it I'm just kind of mortified that I even thought that... But that's why I like Whisper is you can post something like that and there's not really consequences since it is anonymous." (P10)

How People View Anonymous Communications

The majority of our participants used the apps for browsing posts made by others. We were interested in why they enjoyed reading posts from others and what benefit they got out of reading these posts, given the barriers of anonymity and ephemerality to forming relationships with the posters. We found that participants' motivations for reading posts fell into three main categories: connection, entertainment,

and social comparison. We also noticed aversion towards offensive content people saw on the site.

Feeling Connected to People Like Me

Our participants liked the posts that sparked feelings of similarity or empathy, and estimated that the posts they could resonate with were more likely to get popular. These posts were about funny habits, similar life experiences, or similar problems they had gone through or were experiencing (such as the loss of a close relative, being saddled with student loans). Three participants mentioned they liked to see people overcoming difficulties in their lives that seemed relevant to their own lives. For example, P5 liked a post by a single mom about raising five kids (Table 2, positive stories) because she had a big family and could empathize with how hard that situation must be:

“It’s nice to see that people are fighting through things, and like in this situation that would really stink. I’m a child of four, and so I know how crazy it gets just from both of our parents. So then it’s like someone with five kids I’d be like wow. I’d give them props.”(P5)

People also resonated with objective topics that signaled a common social identity outside of the app, such as posts about the school attended, local news, or local restaurants. Participants did not restrict their activity or viewing to a single topic or interest, but especially liked posts that connected with their own interests. Some participants mentioned they were more attracted to posts about music, fashion, technology, or TV shows that matched their own interests. On the other hand, the anonymous apps did not seem to serve interest-based information needs very well. Two participants mentioned searching for things they were interested in but failed to find satisfying results.

Being entertained

Participants enjoyed reading entertaining or sensational posts made by others for their amusement or shock value. Several participants enjoyed reading personal negative confession posts for their shock value (Table 2, distress relief and social venting). For example, P18 said: “it’s like a reality TV on your phone.” P13, an undergraduate student majoring in engineering, said: “It’s kind of a madhouse. Like, people will post some of their deepest, darkest secrets.” He liked reading about people’s “life-changing problems” because he believed people were sharing the actual problems they had.

Half of the participants said they enjoyed reading more lighthearted confessions and entertaining posts for amusement. For example, P11 said:

“A lot of people just post these really intense confessions, or things like that. And it’s kind of good to see that people can also just post these really funny things on it.”(P11)

Aiding Downward Social Comparison

Distressing posts also stimulated downward social comparison or schaudenfreude [40]. Two participants (P5

and P11) said learning about other people’s problems helped them put their own lives into perspective, and made them feel more motivated to handle their own problems.

“It kind of put things in perspective for me... There were times where I would be like oh my gosh in my life. And then I would see other people and their issues, and then I would be thankful for what I have, and like myself.” (P5)

Disliking Misinformation and Offensive Content

An obvious drawback of anonymity is that it lacks social (and legal) accountability for rumors, misinformation, and offensive content. Several participants complained about seeing posts that were offensive to women, posts that included nudity or overly sexual content, and prejudicial posts about people’s religion or race. As in Turkle’s work [36], a few of our participants doubted the truthfulness of posts and mentioned that stories they saw on Whisper were farfetched and did not seem realistic. The engineering student (P13) thought popular posts he saw were “presented in a way that can grab your attention.” P4 said, “some people might just exaggerate details to get people to feel sorry for them.”

Perceptions of the Crowd and Level of Community

We were interested in whether there really was a sense of community among users of this application despite the lack of affordances for connection and identification. Users in the application couldn’t associate individuals with posts most of the time and posts didn’t persist for long periods in the application. It was often difficult to refind a particular post seen in the past. Our analysis of posts and responses to posts revealed, perhaps counter intuitively, that participants still felt connection to the messages and emotions of other users sometimes motivating direct interaction.

User Identities

Our participants perceived other users of the applications to be mostly teenagers or young adults. Some described user identities using specific demographics such as “LGBT group, female.” Most of them made this estimation based on the type of content they saw in the app. One said, “It’s a lot of people talking about things like hooking up and like meeting people out at bars and stuff. It makes me think of a younger population (P18).” The YikYak user guessed there were other college students on the application because of her location (a college neighborhood) and the fact that the application used her location to show nearby posts.

Location provided an identity signal unique to these apps in comparison to other web-based online communities. Posters could use the “nearby” feature of Whisper and YikYak to focus their attention on the people geographically close to them. This shared identity increased the level of informational or emotional support they gained from interaction. There were other ways of signaling identity through posts, such as by indicating special interests or affiliations. For example, one participant posted about a local baseball team, using a phrase that only fans would

understand, signaling he was a fan and intended to elicit responses from other fans (P16).

We asked participants to estimate how anonymous they were on the site, and most of them were quite confident that they were anonymous. One exception was the woman who also used PostSecret; she thought Whisper was not as anonymous as PostSecret because Whisper posts could potentially be tracked electronically. The engineering student (P13) even took additional steps to anonymize his identity such as using a Burner app to create temporary phone number for Tinder or Craigslist and using an app TextSecure to send encrypted messages.

Self-deanonymizing and deanonymizing others were frowned upon by our respondents, and not something they had done through their posts in the app. One participant (P7) deanonymized a friend on Whisper when he recognized him, later deleting his identifying reply because the original poster became upset after being publicly deanonymized and he did not want to hurt his friend's feelings. Our participants observed other users occasionally deanonymizing themselves by posting selfies as the background of their posts, typically in posts requesting in-person meetups.

User Interactions

Participants mentioned seeing a variety of replies ranging from supportive and encouraging messages, suggestions, to extreme opinions, criticism, and offensive comments. P7 said Whisper was similar to a "giant psychologist" whereby people unload their problems and others console them. People seem to bond with others based on the similar problems they have experienced or on their shared interests, but this connection may be weak and short-lived. As described earlier, hearts (or upvotes on YikYak) could signal validation or support, and people tended to heart (or upvote) posts that they felt were relevant to them or funny posts they liked. However, the meaning of "heart" could be ambiguous (similar to the ambiguity of likes on FCB [5]). P11 said she usually hearted funny posts on Whisper, but would feel awkward if she hearted sad posts.

It can be challenging to keep one's interactions appropriate while using anonymous communication apps because of the disinhibiting effect of anonymity. The engineering student noted regarding some spiteful replies he saw to a woman's post: "These people were just digging into this woman and showing absolutely no remorse" (P13). Replies on Whisper usually consisted of personal opinions, which sometimes could be considered as crossing the line of appropriateness, especially because they were coming from complete strangers. For instance, P4 posted about her relationship problems on Whisper, but erased her original posts after getting inappropriate responses from other men. She said:

"They were just people putting their two cents in about things that I didn't post about. People were saying, 'Oh, he must not be making you happy in other ways,' and things

that I didn't say anything about, so just people looking way too far into the situation. And this feels really personal really fast for things that I wasn't asking for." (P4)

Whisper allowed people to send direct messages to others, usually initiated by posts. Some people used them to seek further interactions such as meeting in real life. These interaction requests sometimes drove people away when they were unwanted or inappropriate. The college student who was looking for responses on her tattoo received replies asking for her ASL (age, sex and location), and pictures of her tattoo. Eventually she stopped replying to the messages when they got "too personal" (P4). P1 enjoyed messaging others on Whisper, but did not pursue further interactions when a 30-year old guy asked him out.

Rules to Behave on Anonymous Apps

Maintaining anonymity on the apps was considered important by a lot of users. Several people mentioned that they would advise newcomers not to disclose overly personal information, and not to post pictures of themselves. In general people tended to say there was no rule or norm in the community, because it should be a place where people can say whatever they like to say. However, vulgarity, explicit sexual language, spam, and harsh replies showed some negative effects on the community. Sometimes these types of content made people leave the app. P18 used Whisper less frequently now because she was turned off by too much sexual content on the site; P17 used it less because she was irritated by some posts and replies.

People had conflicting views of what the purpose of the community was. P5 thought Whisper was a serious app, saying *"everyone is vulnerable here."* P8 said the purpose of the app was for getting support from other people or just for getting something off your chest. On the contrary, P15 would advise new comers to not to take Whisper too seriously, because anonymity makes it untrustworthy. P4 also held similar view of Whisper - *"I would never use [it] for really intimate parts of my life."* Several participants were mainly using the apps for entertainment purposes. P7 even deleted one of his posts when he thought the replies overstepped the fun boundary. The YikYak user P16 didn't think people should post serious opinions on the app at all.

Comparison with Other Communities

Each anonymous communication app had some unique characteristics that were different from other anonymous applications or communities that had different appeal. Our participants reported being anonymous on other systems like reddit, Tumblr, Facebook Confession Board, FML app, and PostSecret but sometimes for different reasons. Three Whisper users also used Tumblr, but they thought Whisper was designed for people to vent about their problems, whereas Tumblr was for entertainment purposes and sharing impersonal fun stuff (such as fandom and artistic content). P3 noted that she has Tumblr friends in real life and even meets them or connects with them on Facebook, but she would never do that with other users on Whisper.

P11 thought Whisper was similar to FML in serving the purpose of making people feel better about their lives by looking at others' problems, but the stories on FML were more extreme, and probably only happened to one person, whereas the posts on Whisper were more common.

All but two participants we interviewed had Facebook accounts. Four participants mentioned that they used Facebook much less frequently recently and rarely shared their personal status. They considered Facebook as a place for the "older generation," and they only shared big events or links and photos on it. On average, each participant used 3 other social sites or apps. When we asked them to compare the anonymous communication apps with identified communities, participants said anonymous posts were more personal, more open and more honest – "you can be yourself because there's no retribution (P9)." P1 thought people were more honest and truthful on Whisper because they did not need to worry about managing others' impressions of them. Participants thought the communities on anonymous communication apps tolerated different religious and political beliefs than the more identified communities they were in and had a more diverse audience. As in previous research [22], our participants reported that the feedback they received on Facebook was more personal and in-depth than anonymous feedback (P2). Some people said they saw similar types of posts and interactions on Whisper and Facebook or Twitter, such as quotes, and encouraging responses like "good job."

DISCUSSION AND IMPLICATIONS

Our study shows that many people share their personal opinions, experiences and confessions with others on anonymous applications, for the reasons of seeking or providing social validation, building connections, avoiding problems of context collapse and impression management on identified social media, and sharing momentary feelings. A lack of accountability can mar interactions in these apps, but the unique interaction patterns and the benefits people gain from using these apps suggest design implications for online communities and social networking sites.

Exchanging Social Support Without Identification

The main anonymous feature on these apps is that there is usually no consistent username or handle. Unlike previous work [35] in which users adopt different identities with different personalities in the virtual world, people cannot build consistent identity or reputation on these apps. There is no need to play an "ideal self" on these apps since there is no reputation or personal history. People likely use these apps to disclose fragments of their multifaceted identity or the unconventional parts of themselves. It is known that self-disclosure increases intimacy among group members [8, 37]. We also found people easily bond with a complete stranger on these apps when they share similar experiences or feelings.

A primary reason that people post and view anonymous posts is to gain social validation and social support from the

community. Our finding suggests that social support and social approval can be provided by strangers in anonymous communities. This finding strikingly resembles early research on Usenet nearly 20 years ago [39] – online groups often are supportive in nature. Hearts and upvotes in these apps are lightweight methods to signal validation and connection. However, we do not know whether or not the connections users find on these apps would evolve into longer-term, intimate relationships. Even the veteran users we interviewed have only used the apps for about a year. Future research should examine whether or not this temporary support and connection lasts, and whether or not it contributes to users' well-being in the long run.

The Ephemerality of Anonymous Communication

The new form of location-based interaction on smartphones enables momentary and in-situ information sharing which was previously impossible in web-based communication. Our finding suggests that some user-generated content might be ephemeral by nature and could be shaped by the design of the communication media. For instance, our participants reported that they seldom went back to find previous posts they have made on Whisper or YikYak. An important self-disclosure goal on identified social networks such as Facebook is to keep a record of personal history for one's own use [37,41]. These anonymous communication apps may not support this purpose. P9 compared Whisper to reddit, and pointed out the lack of history in Whisper: "It's kind of meteor flashes in the pan." The fact that people's identities are not tied to the content they created also makes it impossible to establish reputation or history as in other online communities. The recent demise of Secret [1] raises the question of the sustainability of these communication apps. Post ephemerality might contribute to decreased user engagement: without a reputation attached to a community, it is easy for user to quit and join other communities.

The lack of identity association, however, also reduces the burden of generating and sharing content, which could lead to more content generation. People sometimes post very momentary feelings, and these types of content may not need to stay long on the Internet. SnapChat's feature of allowing user to set how long their content lives before they share it with their friends seems to support this need for ephemerality. An important design question is: can people accurately estimate how long their data need to persist before they share the content?

Mitigating Negative Interactions

The challenge of introducing anonymity into other online communities is how to mitigate negative interactions such as offensive or sexually explicit content. Birnholtz et al [5] shows that using anonymity in a localized identified community (FCB) only produces a small amount of negative comments, but the responders on FCB are identified by their own Facebook profile. We could expect the amount of negativity to increase if the identities of those who responded are removed. A possible solution is to use

identity signals to mitigate the negativity of anonymous communication, such as location, affiliation, or domain of interest. Our findings also suggest that shared identities such as location or school might motivate more positive interactions in anonymous communications.

Future work could conduct experiments to examine the relationship between the level of identification and the amount of negativity people receive in anonymous or quasi-anonymous online communication environments. Some existing communities already give users the choice of temporary anonymity such as Quora (an online Q&A site), and a significant minority chooses to be anonymous when replying or following certain questions [25].

Limitations

A limitation of our work is that we did not get rich data about negative interactions on these apps. A few of our participants talked about their discomfort when received unwanted connecting requests or harsh comments, but we did not talk to anyone who has sent these messages. Social desirability bias might make this problem challenging for qualitative research: people tend to under-report behaviors that may be viewed unfavorable by others. Future research could examine the characteristics of negative or undesirable interactions on these apps or on other communities such as Quora or reddit. The result of these studies could help build automatic content filters of these apps.

Another limitation is that we have a comparatively small sample size, and most of our participants lived in the same city. Although our sample matches the demographic characteristics of Whisper users described in other larger scale study [7], our small sample size may prevent us from detecting all possible reasons that motivate people to use these apps. Individual demographic differences such as gender identity, profession, and location may also influence people's behavior and motivations. These questions can be more appropriately answered in a larger-scale quantitative study using methods such as online survey.

CONCLUSION

We have conducted an interview study to explore how and why people use anonymous, location-based communication apps. Many people share personal experiences, confessions, or opinions on these apps to gain social validation from the anonymous crowd. People also benefit from sharing or reading lighthearted, entertaining posts. Anonymous responses are sometimes considered as more honest and valuable than what people would get from identified social networks. Our findings suggest that incorporating anonymity and ephemerality in online communities may foster content generation, and raise some future research questions of how to manage undesired interactions in anonymous communication.

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