

## The Impacts of Territorial Communication Norms and Composition on Online Trolling

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There is little research into online trolling on platforms with anonymity and geolocation features. On platforms such as Jodel, Whisper, and Yik Yak, anonymity may trigger online trolling and deviant behaviors, but geolocation features may hinder these behaviors through the imposition of territorial community norms and composition. Our study aims to address this gap through content analysis of 3,697 unique posts on Yik Yak, an anonymous geolocal platform that ceased to exist in 2017. Based on code co-occurrence, we found that trolling posts frequently include community-harming behaviors, such as insults, snark, and the use of vulgar language, and are more likely than other posts to include memes and vulgar language. We also found that territorial community events mediated the extent of community-building and community-harming behaviors, which increased or decreased on the platform according to changes in community composition context. Thus, we conclude that sociotechnical features of the platform in dynamic contexts affected online trolling behaviors by enabling and constraining manifestations of community-harming and community-building behaviors.

*Keywords: trolling, Yik Yak, anonymity, online communities, geolocation*

Despite the prevalence of trolling and the increased media and scholarly attention to the phenomenon, there is little consensus about the definition of *trolling*. For example, Herring, Job-Sluder, Scheckler, and Barab (2002) and Hardaker (2010) explained trolling using the terminology of politeness theory, whereas Maratea and Kavanaugh (2012) concluded that the realm of online deviance requires a different vocabulary than has been used more generally for social deviance. Fichman and Sanfilippo (2016) analyzed a wide range of trolling definitions, noting that trolling behavior could have a variety of manifestations, meanings, contexts, and effects; they define *trolling* as “a repetitive, disruptive online deviant behavior by an individual toward other individuals or groups” (p. 6). In our study, we have used their definition of trolling, but expanded our focus to include deviant behavior more generally, such as community-harming acts.

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Anonymity has been one of the key enabling factors for online deviance in general and online trolling more specifically, and anonymous platforms, such as Yik Yak, Whisper, and Jodel, enable online deviant behaviors, partially because of online disinhibition. At the same time, online communities establish and follow their own norms of behaviors, which can change when the community composition changes (Hara, Shachaf, & Stoerger, 2009) and can support or condemn trolling behaviors (Fichman & Sanfilippo, 2016). On anonymous platforms, anonymity may increase undesirable behaviors, such as trolling and community-harming behaviors, while geolocation may hinder such undesirable behaviors through the imposition of and adherence to behavioral norms from the territorial community.

Our study focuses on the impact of online anonymity and territorial community on online deviance and trolling behaviors using data from the Yik Yak platform, which was a popular app among students from 2013 to 2017. First, we identify the typical relational online community norms of behaviors and the trolling that occurred on the platform in this location, with particular attention to the intertwined posts with trolling messages on this particular anonymous platform. Then, we examine how two local events in the territorial community impacted online behaviors on the platform. Given the stable platform features of anonymity and geolocation and the platform's appropriation by the Yik Yak community, the two events provide unique interferences to their online interactions on the platform. It allows us to examine the impact of the changes in composition of territorial community context on deviance, trolling, and community-harming behaviors.

### **Background**

Online deviance is as old as the Internet itself, with today's trolls following the well-established path of the earliest hackers. Much research on trolling and other deviant behaviors has focused on the motivations for, behaviors of, perception of, and reaction to online trolling (e.g., Fichman & Sanfilippo, 2016; Jordan & Taylor, 1998; Nekmat & Lee, 2018; Shachaf & Hara, 2010; Turgeman-Goldschmidt, 2005; Utz, 2005). There are trolls who troll regularly and seriously as a form of deviance, and those who troll sporadically and casually (Jordan & Taylor, 1998; Turgeman-Goldschmidt, 2005). Although most research has focused on the former type of troll, research on casual trolls suggests that they have different internal and external motivations for their behavior (Jordan & Taylor, 1998), and some are motivated by an ideological or political agenda (Bulut & Yörük, 2017; Sanfilippo, Fichman, & Yang, 2018; Sanfilippo, Yang, & Fichman, 2017).

Scholars argue that online enabling factors, such as anonymity, lack of accountability, and online disinhibition, encourage these behaviors (e.g., Binns, 2012; Denegri-Knott & Taylor, 2005; Douglas, McGarty, Bliuc, & Lala, 2005). An anonymous environment allows trolls to conduct their trolling acts without direct consequences for themselves, but with broad impact on the online community because such an environment allows users to perceive that their online and offline presences will not be connected (e.g., Barak, 2005; Denegri-Knott & Taylor, 2005; Maratea & Kavanaugh, 2012). As a result, some users create separate identities online that act differently than their offline personas do (Turkle, 1999). Some even create multiple online identities using sock puppetry techniques and giving each online identity a different persona (Fichman & Sanfilippo, 2016). Real-name environments inhibit negative actions and language (Ma, Hancock, & Naaman, 2016), but the possibility of dissociated and transient identities allows for deviant behavior because individuals can reinvent their online presences as necessary or desired (e.g.,

Barak, 2005; Denegri-Knott & Taylor, 2005; Turgeman-Goldschmidt, 2005). Even in nonanonymous online environments, participants are less likely to be held accountable for their actions. Because interactions on the Internet are not always immediate, there is less social accountability than with in-person interactions. In many cases, this leads to atrophied development of group expectations and norms, a situation that can be only partially remedied by active group moderation or control (Binns, 2012). There is also low legal accountability online and a perception of invulnerability (Barak, 2005; Denegri-Knott & Taylor, 2005); this intensifies in anonymous environments, where there is no personal identity that can be linked to deviant behaviors (Fichman & Sanfilippo, 2016; Hardaker, 2010; Underwood & Welsler, 2011).

When participants perceive they have no fixed online identity or community belonging and have little accountability for their actions, they see less of a reason to filter their actions in order to conform. This results in online disinhibition, with participants acting more freely in environments that are more technologically mediated and dispersed than their offline equivalents (Barak, 2005). Such disinhibition can give participants an outlet to express otherwise suppressed thoughts and emotions, but it can also provide an outlet for exhibiting deviant behavior with few consequences (Suler, 2004). Deviant behaviors break social norms of politeness and civility and give rise to vulgar, aggressive, and abusive interactions where face-attacks are common (Hardaker, 2010; Maratea & Kavanaugh, 2012).

A troll's target, tactics, and competency, as well as the perception of a troll's motivations, can have a large effect on the community's reaction to the trolling itself (Sanfilippo et al., 2017; Utz, 2005). Both the troll's behavior and the reactions of the community need to be accounted for in determining the best response to a trolling incident (Binns, 2012). There is some degree of consensus on the rule of "don't feed the trolls," which encourages participants in an online forum to entirely ignore any trolling comments in hopes that, deprived of the attention he or she seeks, the troll will grow bored and give up. However, perception of and reaction to online trolling behaviors vary from one community to another (Nekmat & Lee, 2018; Sanfilippo et al., 2017), as well as by the gender of the troll and the observer (Fichman & Sanfilippo, 2015). Additionally, the reaction to ideological trolling can even be encouraged by the community, because this type of trolling can trigger empathy from followers (Bulut & Yörük, 2017). The design of a forum, particularly moderation policies, can also have an effect on the prevalence and success of trolls (Binns, 2012; Douglas et al., 2005; Shachaf & Hara, 2010). Moderation policies can range from strict procedures whereby every post must be individually approved before it is posted (Binns, 2012; Gillespie, 2017), to forums with no moderation whatsoever (Hardaker, 2010). Wikipedia uses volunteer moderators who hold administrator privileges while fighting trolls and blocking vandals (Shachaf & Hara, 2010).

Yik Yak, which was launched in 2013 by Brooks Buffington and Tyler Droll (Crook, 2016) as an anonymous platform similar to apps such as Whisper and Secret, has received little scholarly attention but widespread media coverage, largely with regard to allegations of enabling or even encouraging cyberbullying, harassment, and cyberthreats (e.g., Mulhere, 2014; North, 2015). Although these news media focused mainly on issues of cyberbullying, harassment, and even cyberterrorism that occurred within Yik Yak, some scholars tried to understand content norms and trends (Black, Mezzina, & Thompson, 2016; Heston & Birnholtz, 2016). They found that posts on Yik Yak mainly included content associated with campus life, profanity or vulgarities, asking rhetorical questions, and dating, sex and sexuality (Black

et al., 2016; Northcut, 2015). Most posts were highly context specific, much more so than other frequently studied social media platforms such as Twitter (McKenzie, Adams, & Janowicz, 2015), perhaps because of Yik Yak's geolocation feature. Yik Yak automatically placed users into "herds" based on their location, encouraging communities to form around a local place and its existing local norms, history, and membership and to develop a sense of community. This sense of community was described as "a feeling that members have of belonging, a feeling that members matter to one another and to the group, and a shared faith that members' needs will be met through their commitment to be together" (McMillan & Chavis, 1986, p. 9). On Yik Yak, it was based on physical proximity and the specific context of a residential campus where students, for example, posted about their (shared) exams and their (similar) struggles around specific facilities on campus; they shared daily experiences with others, who were members of the same territorial community. There are four dimensions of sense of community—membership, influence, fulfillment of needs, and shared emotional connection—and these can apply to both territorial community and relational community (MacMillan & Chavis, 1986). In many online communities, only the relational sense of community matters, but on Yik Yak, because of the geolocation feature, the territorial sense of community was also relevant. Geographic context was particularly salient because of Yik Yak's herd feature, with some studies showing that 35%–50% of yaks<sup>1</sup> were location dependent, meaning that understanding them required knowledge of the local environment and community (Black et al., 2016; Heston & Birnholtz, 2016; Northcut, 2015). Some scholars found that 20% of yaks have a purpose of "insulting, offending, trash talking, targeting, shocking, or demeaning" (Northcut, 2015, p. 3) and that Yik Yak posts included more vulgar language when compared with Twitter (Saveski, Chou, & Roy, 2016). However, others did not find a significant number of posts associated with the type of negative and inflammatory content that has caused so much uproar in the popular media (Black et al., 2016; McKenzie et al., 2015). Yik Yak used a democratic and user-driven form of moderation whereby up- or down-voting posts was a part of a user's primary interaction with the platform, and users were encouraged to report any posts that violated community standards. Still, because scholars and the media perceive Yik Yak as facilitating online deviance while at the same time allowing for a strong territorial and relational sense of community, it was a good platform to study the sociotechnical manifestation of trolling behaviors online.

Thus, we aimed to examine trolling behaviors on this platform and its sociotechnical features of anonymity and geolocation. First, we wanted to explore the intertwined relationship between trolling posts and other types of messages through a detailed and nuanced co-occurrence analysis. We expected that trolling posts would include more insulting and vulgar language than other posts and that trolling would co-occur more frequently with community-harming behaviors than with community-building behaviors. Second, we wanted to explore how sociotechnical features in dynamic contexts affected these behaviors by enabling and constraining manifestations of community-harming and community-building behaviors. We expected that trolling and community-harming behaviors, and relational and community-building posts would vary among four weekends, when the community had outside visitors or did not, and that the variations would differ in nature, reflecting the nature of the specific local events—a sporting event and the graduation event—and the visitors they attract. We expected that the campus atmosphere around these two events would differ in nature and would thus trigger variations in Yik Yak behaviors. On one weekend, we expected young visitors to join the celebrations around a sports event. On the other weekend, we expected parents

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<sup>1</sup> Yaks are Yik Yak posts.

and relatives to join the celebration of academic achievements. On both weekends, an influx of visitors arrived to campus and influenced the offline (and Yik Yak) community. Both weekends are annual events associated with a different atmosphere on campus; thus, we could expect that this context would also affect Yik Yak posts accordingly. Community-harming posts include, for example, the use of vulgar language, trolling, snaking, and insulting others, whereas sharing information, experiences, opinions, and advice help support the community. Relational posts included thanking and joking, as well as seeking advice, information, company, sympathy, and so on. Thus, we examined the following propositions concerning the effect of territorial community context on trolling: We expected that the frequency of community-harming posts would increase with an influx of young visitors around a local sporting event and that the frequency of community-harming posts would decrease when an influx of parents and relatives visited to attend the graduation event.

### **Methodology**

We designed a study on the Yik Yak platform, taking advantage of its two most salient sociotechnical features: anonymity and geolocation. We collected data from the herd centered at a Midwestern campus on four weekends, two of which involved an influx of external visitors drawn by major annual local events. The site anonymity and geolocation features were stable during the entire period of data collection, allowing us to assume that changes in posting behaviors were contextual and affected by the study design. The study design involved manipulation of the composition of the territorial community by collecting posts on four dates (W1, W2, W3, W4) that included posts of the territorial community (W1 and W3), as well as posts on dates when the territorial community was exposed to an influx of outsiders (W2 and W4). By collecting data on these dates, we could identify the impact of local events on the Yik Yak community, focusing on posts that aimed at building a sense of community or harming it through antisocial and trolling posts. We expected that, given stable platform features of anonymity and geolocation, the frequency of trolling posts would change based on the size and composition of the community.

### **Data Collection**

Data were collected from Yik Yak, via the Web client, at a Midwestern college on four Saturdays during spring 2016 at 6:00 a.m., 9:00 a.m., noon, 3:00 p.m., and 6:00 p.m. each day. The built-in GPS emulator in the Google Chrome browser was used to ensure that the feed was accessed from the same location at the center of the campus (the campus's main library) every time. We collected a total of 3,697 individual posts (yaks), of which 866 were unique posts and 2,831 were unique reply posts. Each yak and reply was voted up or down by users, and the composite scores (up-votes minus down-votes) were also included in the data. The dates of data collection were chosen to include high-profile local events happening on campus when an influx of visitors arrived to town for the weekend. Two weekends were typical (W1 and W3), representing the community on campus and its typical Yik Yak posts and trolling behaviors. Two weekends (W2 and W4) included an influx of outside visitors. These latter weekends differed from each other in the nature of the event and the demographics of visitors.

Specifically, W2 was the Little 500,<sup>2</sup> a weekend that included two bicycle races and a concert in the university football stadium that traditionally attracts a large number of outside visitors for parties and alumni events. W4 was the undergraduate graduation ceremony (the graduate ceremony was the previous afternoon), which also attracts many outside visitors, while a portion of the underclassmen had left campus for the summer. Because we aimed at investigating the impact of changes in the local community on the extent of deviant, trolling, and harming behaviors, we chose two weekends to represent the local community and its Yik Yak posting, and two to represent weekends that attract many visitors who may affect the extent of deviant, trolling, and harming behaviors.

As expected, W1 and W3 were approximately equivalent with regard to Yik Yak activity (Table 1). Both had 200–220 unique yaks posted in the 12-hour period, and those yaks were posted at the same rate of eight yaks per hour. However, this pattern was not replicated on any of the other two weekends when a large number of visitors came to town. On W2, there was a large increase in the number and rate of unique yaks and a large decrease in the number of replies posted, but on W4, there was a large decrease in the number of unique yaks posted. Possible explanations for the variation in number of posts on W2 and W4 include an increased size of the local community on W2 because of many additional young visitors, and a smaller community on W4, when many students had left town for the summer, and many of the visitors were parents and relatives. The similarity in number of posts between the two other weekends reflects the activity of the local community in this college town.

**Table 1. Data Summary by Date.**

	# of Unique Yaks	# of Unique Replies	Total Posts
Wx1	207	766	973
W2	278	746	1,024
W3	213	727	940
W4	163	592	755
Total	866	2,831	3,697

Similar to previous studies (Saveski et al., 2016), Yik Yak activity on all four weekends was slowest between 6:00 a.m. and 9:00 a.m., gradually increased until 3:00 p.m., and then slightly tapered off until 6:00 p.m. (Table 2). The same trends are visible in replies, although these begin to taper off slightly earlier than new yaks; most replies were posted between noon and 3:00 p.m.

<sup>2</sup> Little 500 is an annual bicycle race held on the Indiana University Bloomington campus during the third weekend in April. It includes two races of four-racer teams and is attended by more than 25,000 fans. The men's race is 200 laps (50 miles), and the women's race is 100 laps (25 miles).

**Table 2. Data Summary by Hour.**

Data Collection Time (Time Period)	# of New Yaks	# of New Replies	Total Posts
6:00 a.m. (10:01 p.m. – 6:00 a.m.)	404	1,239	1,643
9:00 a.m. (6:01 a.m. – 9:00 a.m.)	20	95	115
12:00 noon (9:01 a.m. – 12:00 noon)	112	368	480
3:00 p.m. (12:01 a.m. – 3:00 p.m.)	172	569	741
6:00 p.m. (3:01 a.m. – 6:00 p.m.)	153	560	713
Total	866	2,831	3,697

### Data Analysis

Data analysis included content analysis of 3,697 posts at the individual post level and comparative case analysis of 160 trolling threads. First, a coding scheme with 24 codes (see the appendix) was developed based on previous research on online trolling behaviors (Fichman & Sanfilippo, 2016) and from research that analyzed content of Yik Yak posts (Black et al., 2016; McKenzie et al., 2015; Northcut, 2015). The codes were tested on a sample of data for modifications by the two authors. We then grouped the codes under four categories, with particular attention to community-harming behaviors, relational behaviors, and outward behaviors, as well as others. It was evident early on that the narrow definition of trolling that we used did not capture all the community-harming behaviors we observed in the data and that relational and outward behaviors were frequently evident. The coding scheme was developed and refined by the two authors in two iterations of sample coding, when each code was discussed and modified when needed. Then, one author coded the entire data set at the individual post level, and the other author coded a subset of the data in two iterations to ensure coding reliability; intercoder reliability was high, at 84% agreement, and Cohen's kappa was .85, which is very good. Content analysis at the individual post level was conducted to identify community-harming, relational, and other common behaviors. Coding frequencies were then used in identifying the variations in community-harming posts during significant local events when many outsiders visited the community. Codes were not mutually exclusive; multiple codes could apply to any single posts as the need arose. Then, we performed comparative case analysis on 160 trolling threads (of 866 threads) that we identified in the previous analysis of community-building, community-harming, and trolling behaviors; each thread included a post and all of its replies. Comparative case analysis was done mainly to enrich our findings by identifying perceived motivation for, and reaction to, trolling.

### Limitations

One of the limitations of this study is that its scope includes only one local community; it is possible that other communities differ in the prominence and tactics of trolling, community norms, and

reaction to trolling. The local community in our study and the local events are unique to this Midwestern campus, and transferability of findings should be made with great caution. Nevertheless, the variations and unique Yik Yak trolling behaviors found in our study increased our understanding of trolling in general, and trolling on Yik Yak in particular, as well as the impact of anonymity and geolocation features on online behaviors.

### Findings and Discussion

Given Yik Yak's sociotechnical features of anonymity and geolocation, this study analyzes activity first to identify the community trolling norms and then to examine the extent to which local community events impact deviance, trolling, and community-harming behaviors.

We identified trolling norms on Yik Yak through code co-occurrence in 3,697 posts and comparative case analysis of 160 trolling threads. Based on code frequencies, code co-occurrence, and comparative case analysis, we also discuss typical community reaction to trolling threads. This discussion is based on data analysis at two distinct levels: the level of the individual yak and the level of the thread, which includes a yak and all of its replies. Then, we focus on variations in posts between the four weekends, based on code frequencies, and conclude with a discussion of the impacts of the sociotechnical features of the platform, anonymity, and geolocation on deviance, trolling, and community-harming behaviors.

#### Community Building, Community Harming, and Trolling

First, we provide here a descriptive account of our data (Table 3), showing that the most common type of post involved outward projecting and sharing with the community, specifically through *experience-sharing* (23.4%;  $n = 864$ ), *information-sharing* (18%;  $n = 662$ ), *opinion-sharing* (14.8%;  $n = 548$ ), and *advice-sharing* (9.9%). However, community-harming posts, such as use of *vulgar language* (10.9%;  $n = 402$ ), *insulting* (8.4%;  $n = 314$ ), *trolling* (6.0%;  $n = 224$ ), *snarking* (7.3%;  $n = 270$ ), *complaining* (7.2%;  $n = 265$ ), and *dismissing* (3.5%;  $n = 131$ ), were also very prominent. The frequency of relational posts that intend to foster connection among members of the community were the least common and included posts involving *thanking* (1.4%;  $n = 50$ ), *correcting* (1.6%;  $n = 59$ ), *complimenting* (1.7%;  $n = 62$ ), *joking* (2.1%;  $n = 79$ ), and *sympathy-sharing* (3.9%;  $n = 143$ ). When we considered outward projection posts as posts that help form a sense of community along with the community-building posts, the impact of community-harming posts was minimized within our data set and was consistent with previous studies, which found no more than a fifth of Yik Yak content to contain negative and inflammatory content (Black et al., 2016; McKenzie et al., 2015; Northcut, 2015).



**Table 3. Code Co-Occurrence With "Trolling" Code.**

Category	Code	Percent (Code Frequency/ Total Yaks)	Code Co-Occurrence With "Trolling" Yaks	Code Co-Occurrence as a Percent of "Trolling" Yaks
Outward	Advice-sharing	9.9	16	7.1
Projecting/ Sharing	Experience-sharing	23.4	5	2.2
	Information-sharing	18.0	19	8.5
Community- harming	Opinion-sharing	14.8	16	7.1
	Complaining	7.2	1	0.4
	Dismissing	3.5	7	3.1
	Insulting	8.5	18	8.0
	Snarking	7.3	16	7.1
	Trolling	6.0	224	100.0
	Vulgar	10.9	30	13.4
Relational	Advice-seeking	1.2	0	0.0
	Agreeing	4.6	2	0.9
	Company-seeking	4.4	5	2.2
	Company-sharing	4.4	2	0.9
	Complimenting	1.7	0	0.0
	Correcting	1.6	1	0.4
	Joking	2.1	4	1.8
	Meme	1.2	5	2.2
	Opinion-seeking	1.1	1	0.4
	Quoting	1.2	1	0.4
	Sympathy-seeking	2.8	0	0.0
	Sympathy-sharing	3.9	1	0.4
	Thanking	1.4	0	0.0
Neutral/ Mixed	Information-seeking	12.0	12	5.3
	Observing	7.3	5	2.2

Code co-occurrence and comparative case analysis helped us better understand Yik Yak trolling norms. We found that trolling posts on Yik Yak were more likely than other posts to include community-harming behaviors such as vulgar language and insulting. Trolling also served as a way to enforce community boundaries through the use of memes.<sup>3</sup> The outwardly projecting nature of trolling served to incite others to react, which is a primary goal of trolling (Herring et al., 2002).

More specifically, an examination of code co-occurrence revealed nuanced patterns of trolling behaviors, particularly as trolling co-occurred frequently with *vulgar language* (13.4%), *insulting* (8%), and

<sup>3</sup> According to the *Merriam-Webster Dictionary*, a meme is "an idea, behavior, style, or usage that spreads from person to person within a culture."

*snarking* (7.1%) posts (Table 3). Trolling posts were more likely to include vulgar language than posts on the whole (13.4% vs. 10.9%) and were almost as twice as likely to contain memes compared with all Yik Yak posts (2.2% vs. 1.2%). The higher rate of vulgarity within trolling posts was notable, however, because it affirmed that trolls seek to incite others emotionally, in this case by expressing strong emotions themselves through vulgar language (Shachaf & Hara, 2010). Still, in our study, only 10.9% of vulgar language posts co-occurred with trolling posts. Some of the vulgar language co-occurred with other community-harming behaviors, such as insulting, while many co-occurred with community-building behaviors, such as sympathy-sharing. Clearly, although trolling posts were more likely than posts in general to contain vulgar language, use of vulgar language was common among these Yik Yak users in general. Similar to other online communities, Yik Yak was "likely to exacerbate deviant or otherwise harmful behaviors," including impolite and vulgar language (Maratea & Kavanaugh, 2012, p. 106). However, it is possible that the use of vulgar language became an accepted form of communication on Yik Yak, not only because of the anonymous nature of platform, but also because swearing is common among college students (Jay & Janschewitz, 2008).

Furthermore, code co-occurrence analysis revealed that trolling posts were almost twice as likely to use memes as posts on the whole (2.2% vs. 1.2%). Such an increase, although absolutely small, confirmed that memes make "a good vehicle for trolling" (Fichman & Sanfilippo, 2016, p. 74) because they are simple, concise statements that invite guttural, rather than verbal, response. The relationship between memes and trolling is that of a Venn diagram—most memes are not used by trolls, and most trolls do not use memes, but a subset of memes are frequently or exclusively used to troll. Memes serve to define community boundaries between those who recognize them and those who do not; adding an aspect of trolling to a meme enhances that function. Because memes require specific insider knowledge to be understood, they often serve to define community membership. By reacting to the troll, a responder is also outed as an outsider who lacks the shared knowledge of the community. Through our comparative thread analysis, we identified trolling threads in which this distinction between insiders and outsiders was manifested. The use of a meme unique to the local community during Little 500 weekend (W2) follows the pattern of "[X] for Little 5" meme. The meme developed when local Yik Yak users were speculating then about who would headline the concert during W2. Instances of the meme used in a tongue-in-cheek or trolling manner appeared to increase after the headliner was announced. Specifically, some examples of memes include "Your mom for little 5," "Beer for Little [*sic*] 5," and "More beer for little 5." The meme, even when co-opted by trolls, served to include those community members (insiders) participating in that weekend's festivities and to exclude visitors (outsiders) because this meme had begun a few months earlier, when those visitors were not involved with this community. Because of the relatively long life of this meme and its reference to a specific local event, the set of users who were privy to its humor was restricted to those insiders who had been actively following the local yak feed over a period of months, excluding those whose home feed was elsewhere and those who were new members to the local Yik Yak community. Although this meme was specific to the local community, many other memes were not specific to the offline campus community, such as the "trigglypuff" meme. One user in this trolling thread was able to separate the community into insiders and outsiders by adapting the meme in a trolling context: Those who took the original post seriously were outsiders, whereas those who recognized the meme, including the troll, were part of the insiders' club.

While we examined trolling norms within our local Yik Yak community, we also focused attention on the ways the community reacted to trolling given that one of the most pressing issues for online communities is managing trolling. We aimed at identifying reactions to trolling both through our coding of individual posts and through the comparative thread analysis. We found very little evidence for typical coping strategies within our data. For example, whereas the literature suggests that, in many instances, users will attempt to stop trolls by calling them out and encouraging others to ignore the trolls or be wary of taking them seriously (e.g., Binns, 2012), our Yik Yak data provide little evidence for the use of these strategies. There are fewer than five examples (of 224 trolling posts) of other posters explicitly acknowledging a troll. At times, the trolls immediately out themselves as trolls by admitting they were sarcastically making an exaggerated point to get a reaction. The self-awareness of the trolls suggests that they might be trolling for amusement rather than acting out of boredom or malice (Shachaf & Hara, 2010; Thacker & Griffiths, 2012). Trolling across the board appears to be an accepted facet of interaction on Yik Yak.

Furthermore, in our comparative thread analysis, we made an effort to indicate our perceived troll motivation and found that the vast majority of trolling threads involve the humorous, lighthearted side of trolling (153/160), with only seven threads of deviant trolling and only three trolling threads driven by ideological or political motives. The lighthearted trolling appears to be an accepted, almost obligatory, facet of interaction among Yik Yak users; this online community seemed to encourage and accept humorous, nonmalicious trolling.

### **The Impact of Territorial Community Context Change on Trolling Behaviors**

Analysis of Yik Yak data by date illustrates the variations in deviance, trolling, and community-harming behaviors once local events influenced the community size and composition at two of the four weekends (Table 4). We compared frequencies of code on each of these weekends (W2 and W4) with the average of the frequencies on the other two weekends (W1 and W3).

On W2, a higher frequency of community-harming behaviors than on any other weekend was evident. Specifically, *complaining* (100 vs. 55), *insulting* (98 vs. 79), and use of *vulgar language* (131 vs. 96). The total posts with community harming codes on this weekend was much higher (510 vs. 391), however, chi-square statistic was 1.68 with a *p* value of .19, which is not statistically significant.

In contrast, on W4, community-harming behaviors occurred significantly less frequently, specifically *trolling* (24 vs. 66) and *insulting* (57 vs. 79). There were also significantly more *thanking* posts (24 vs. 9) on W4 compared with any other weekend. The number of community-harming posts on W4 was the lowest of all weekends (311 vs. 391), the chi-square statistic was 19.23, with a *p* value of .0001, which is statistically significant.

**Table 4. Code Frequency by Date.**

Category/ Date	Code	W1	W2	W3	W4	Total	Average for W2 & W4	Percent (Code Frequency/Total Yaks)
Outward	Advice-sharing	81	110	93	83	367	87	9.9
Projecting/ Sharing	Experience-sharing	136	261	238	229	864	187	23.4
	Information-sharing	183	177	161	141	662	172	18.0
Community- Harming	Opinion-sharing	104	151	175	118	548	139.5	14.8
	Complaining	55	100	56	54	265	55.5	7.2
	Dismissing	12	49	47	23	131	29.5	3.5
	Insulting	74	98	85	57	314	79.5	8.5
	Snarking	65	68	63	74	270	64	7.3
	Trolling	87	66	46	24	224	66.5	6.0
Relational	Vulgar	92	131	100	79	402	96	10.9
	Advice-seeking	15	14	6	9	44	10.5	1.2
	Agreeing	25	55	60	30	170	42.5	4.6
	Company-seeking	63	43	31	24	161	47	4.4
	Company-sharing	51	52	28	31	162	39.5	4.4
	Complimenting	12	22	15	13	62	13.5	1.7
	Correcting	9	22	16	12	59	12.5	1.6
	Joking	22	23	20	14	79	21	2.1
	Meme	11	16	11	7	45	11	1.2
	Opinion-seeking	5	12	10	12	39	7.5	1.1
	Quoting	11	15	14	6	46	12.5	1.2
	Sympathy-seeking	42	41	7	13	103	24.5	2.8
	Sympathy-sharing	59	25	15	44	143	37	3.9
Thanking	10	8	8	24	50	9	1.4	
Neutral/ Mixed	Information-seeking	129	121	100	93	443	114.5	12.0
	Observing	31	67	93	79	270	62	7.3

Clearly, W2 and W4 were characterized by special events that influenced the local Yik Yak community. The content of Yik Yak posts on these two special weekends differs from the content of posts on other weekends. Specifically, we found a (nonsignificant) spike in trolling, community-harming, and antisocial behaviors on W2. This was expected, because many of the visitors on W2 are college-age students, and parties to support the cyclist teams and celebrate their achievements characterize the weekend. This is an environment that encourages raucous and risky behavior often exacerbated by alcohol and recreational drug use. However, although there was a (nonsignificant) increase in trolling and community-harming behaviors on this weekend, there was also an increase in posts as the community of visitors came to town. Thus, the differences among the proportions of community-harming behaviors on typical weekends, W1 and W3, and W2 were not significant. On the contrary, on W4, friends and relatives from out of town visited to celebrate the academic achievements of their loved ones; thus, the posts reflected the more socially desirable behaviors encouraged

by a ceremonial atmosphere. Thus, as expected, on W4, trolling decreased to half the frequency of any other weekend, perhaps also because the local community was smaller as many students left town for the summer. Still, although W4 accounted for 20.6% of posts analyzed for this study, it accounted only for 10.8% of total trolling posts. Thus, although Yik Yak was significantly less active, trolling activity on W4 was proportionally lower than on any other weekend, and the differences among community-harming behaviors were statistically significant.

Throughout the four weekends of data collection, anonymity on the platform did not change, but variations in posting, community-harming behaviors, and trolling behaviors were at times significant. These variations align well with our research design: A general decrease in population, and events that encourage solemnity and nostalgic retrospection (as on graduation weekend) correlate with a decrease in community-harming posts.

Although these differences can be attributed to the impact of the local events, it is also possible that other intervening variables and alternative explanations exist. For example, it is possible that as the semester comes to an end, students are busy with schoolwork and have less leisure time, and therefore, they troll less. Others have argued that boredom triggers trolling (Shachaf & Hara, 2010), meaning that a decrease in free time (in which to be bored) would coincide with a decrease in trolling. Still, the decline is not only in trolling, but also in Yik Yak posts on a whole, meaning that boredom cannot fully explain our findings, nor help us explain the increase in trolling on W2, when students are busy with parties and other local social events. It is possible that the increase in community-harming behaviors during W2, aligned with an increase in the number of posts, reflects a temporary increase in the size of the local community; the visitors bring similar posting norms from other Yik Yak communities. It is likewise possible that members of the local community simply posted more on that weekend, including more community-harming posts. But because Yik Yak posts are anonymous, one cannot identify whether the yaks at any given time were posted by local community members or by visitors. We speculate that on W2, when 25,000 fans, both locals and visitors, participated in a weekend of partying, cheering, and drinking, their online and offline language naturally involved more frequent use of vulgar language. An influx of people from out of town and events that encourage partying and risky behavior correlate with a rise in the number of posts as a whole and a rise in community-harming posts.

### **Conclusions**

We focused on identifying the intertwined correlations between trolling and other type of posts and on the mediating effect of the sociotechnical platform's features, anonymity and geolocation, and territorial community norms on deviance, trolling, and community-harming behaviors. Although anonymity enables trolling and hinders a sense of community, geolocation fosters sense of community, both relational and territorial. We examined community norms and the effect of the context of community events, size, and composition on deviance, trolling, and community-harming behaviors.

Generally, we found a persistent presence of trolling and community-harming behaviors on Yik Yak. Trolling in this sociotechnical context was characterized by co-occurrence with community-harming behaviors and compared with other posts by the intensive use of vulgar language and the use of memes;

although the former was expected, the latter may call for future research. Still, trolling was consistently less prevalent on the platform than self-expressing and community-building activities. The frequency of trolling varied based on changes in the makeup of the local community as a result of local events. Specifically, an influx of visitors, coupled with events that encouraged rowdiness, corresponded with an increase in Yik Yak posts and trolling behavior, whereas an influx of family and relatives visiting town, coupled with events that encouraged reflection, corresponded with a significant decrease in community-harming behaviors and trolling. We also found that trolling was characterized by isolated incidents of humorous and nonmalicious trolling and that the community reacted positively to trolling incidents, recognizing their humorous intent.

In sum, we conclude that sociotechnical features of the platform, anonymity and geolocation, in dynamic contexts affected online trolling behaviors by enabling and constraining manifestations of community-harming and community-building behaviors.

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**Appendix**  
**Coding Scheme**

Category	Code	Code Definition	Example
Outward Projecting/ Sharing	Advice-sharing	Giving advice, in response to either a previous post or a general situation.	B: "Make sure you aren't loud." (Advice in response to A: "Sorta wanna have sex in a secluded spot on campus before graduation, but I also sorta don't feel like getting caught.")
	Experience-sharing	Statement of achievement, experience, or other completed event. Includes "When you do xyz" statements.	"I'm thinking weed might be my thing after last night." "College, where you ignore people you've slept with but feel obligated to nod and smile at that person that lived at the end of the hall 3 years ago when you were a freshman."
	Information-sharing	Announces information of use to the community. Often a response to another post.	"Psa: the water has been shut off in Wells. Allegedly, maintenance is fixing something. Personally, it feels like they are encouraging us to leave. #yolo"
Community- harming	Opinion-sharing	Statement of opinion. Could be political, social, etc.	"Guys who cheat on their girlfriends are the biggest jerks in the world. Maybe its cuz I've never had a girl & been in their position, but I dont see how someone could take a girl for granted like that."
	Complaining	Complains of a situation, illness, relationship, etc.	"What the shit, literally? Every single men's toilet on the ground floor of Wells is covered in shit and clogged."
	Dismissing	Dismissing a previous post or poster as irrelevant, ignorant, or a troll.	"Fuck out of here thirsty dudes."  "Without a response from me you really fail to exist."

Category	Code	Code Definition	Example
	Insulting	Statement meant to insult an individual or group of people.	"You sound beta as fuck."
	Snarking	Sarcastic comment making fun of persons, events, or situations.	"Red flag #1, when someone doesn't know the difference between pass and past." "There are people who are straight, and then there are Straight People™."
	Trolling	"repetitive, disruptive online deviant behavior by an individual toward other individuals or groups"	A: "My friend got so upset that I suggested she should get tested but I'm just worried about her, ya know? :/" .... [26 replies debating the appropriateness of posting it on Yik Yak, including active involvement of A in the debate, that ends with a post suggesting that A is a troll, saying:] .... X: "Socks is a troll. Remember kids, don't feed the trolls . . ."
	Vulgar	Cursing or using otherwise vulgar language. Includes common abbreviations such as "WTF."	"Fuck you m8. I'm just trying to help this dude out. Why don't you back off."
Relational	Advice-seeking	Asking others' advice or help for dealing with an issue. Includes statements of suicidal thoughts.	"What's the best place to eat around here? Just visiting for a track meet."

Category	Code	Code Definition	Example
	Agreeing	Agreeing with a previous post.	A: "For all the ladies considering hooking up with a guy who writes 'Horny af,' just remember: He doesn't even have the time to write 'as fuck.' Imagine what he'll do to your sweet pussy." B: "Good point." C: "Oh god so true."
	Company-seeking	Seeks others to meet up and share an in-person experience. Often posters looking for hook-ups, but also rides, partiers, card game partners, etc. Includes "Upvote for..." posts.	"Any girls want some rough sex then cuddles after?" "Hey kinda hungry anyone want to split some pizza or something?" "...kik?"
	Company-sharing	Offering company, either virtually or physically.	A: "Does any girl up genuinely just want to cuddle to sleep?" B: "yes where are you"
	Complimenting	Offering praise or a positive comment to a previous poster or an individual or group known offline.	"You da real MVP for helping her through OP [thumbs-up icon]"
	Correcting	Correcting a previous post. Often denoted by "*"	A: "Craving some insain passionate sex" B: "Insane**"
	Joking	Humorous question or statement. Can make reference to current or local events, or can be a regular joke (like "how did the chicken cross the road").	"What do you call it when a molecule of methanol gets another carbon atom added to it? Alch-ylation"
	Meme	A meme is an idea, behavior, style, or usage that spreads from person to person within a culture ( <i>Merriam-Webster Dictionary</i> ).	"Your mom for little 5"

Category	Code	Code Definition	Example
		Plays on a commonly repeated theme, phrase, or image.	
	Opinion-seeking	Asking others' opinion on a given topic.	"Jcole better than Kanye?"
	Quoting	Quoting song lyrics, poetry, etc.	"I could see us holding hands walking down the beach our clothes in the sand, I could see us on the country side laying in the grass sittin side by side."
	Sympathy-seeking	Seeks others who have experienced a similar situation and who can offer sympathy.	"Everyone says heartache gets better with time but right now it is impossible for me to imagine ever feeling better. I feel so alone now."
	Sympathy-sharing	Providing sympathy for another's predicament.	A: "When you just want to cuddle and pass out after along ass day . . ." B: "Amen." C: "Yep yep so simple and yet so difficult." D: "I feel you."
	Thanking	Expressing thanks either to a previous poster or to an individual or group known offline.	A: "Is culture fest lit?" B: "It's in some building on campus like the srcs." A: "Thanks guys."
Neutral/Mixed	Information-seeking	Asks a question or otherwise solicits information from the community.	"Best breakfast in Bloomington?"
	Observing	Statement of observation about oneself, a group of people, or people in general.	"Drunk girls are the purest creatures on this earth all they want to do is support you and befriend you and compliment your outfit God bless them."