Cross-Modal Management of Trolling during Live Streaming on Periscope: A Micro-analysis

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1 Introduction

The emergence of online streaming platforms such as Periscope, Meerkat, and Twitch provides individuals with easy, affordable, and accessible channels to present themselves in front of others (Friedländer 2017; Licoppe and Morel 2018; Tang, Venolia, and Inkpen 2016; Yus 2021). In addition, the anonymity of technology-mediated communication enables viewers to ask questions they otherwise would be afraid to ask in face-to-face communication, constituting a primary motivation for viewers to participate (Wang 2019). For example, viewers can seek help and support from the streamer and other viewers who co-constitute that community.

Nevertheless, anonymity also instigates online incivility and impoliteness because online participants tend to have little face concern for themselves and others (Lange 2014; Lorenzo-Dus, Garcés-Conejos Blitvich, and Bou-Franch 2011). Particularly, trolling becomes a common behavior in online blogs and forums, disrupting the flow of ongoing topics (Herring et al. 2002; Hardaker 2015; Jenks 2019). To manage trolling behaviors, online users have designed different strategies to offset the derailing effects of trolls (Hardaker 2015; Jenks 2019).

While much has been discussed in asynchronous text-based websites such as online forums and Wikipedia pages (Dynel 2016; Hardaker 2010; Herring et al. 2002; Shachaf and Hara 2010), few studies have examined the interactional dynamics in synchronous live streaming, especially in the management of trolling (but see Graham 2018). These streaming services deserve further examination because participants have asymmetrical communicative affordances that are not observed in other mediated platforms (Licoppe and Morel 2018). The different semiotic resources that are available to streamers and viewers imply that participants are likely to employ different strategies to manage trolls which is underexplored in the existing scholarship.

To address this gap, this study adopts digital conversation analysis to explore the communicative treatment of trolling among streamers, viewers, and troll-

ers during live streams. Digital CA is particularly suitable for the present study because it allows researchers to understand the systematic organization of interactions in design-specific online interactions (Meredith 2019; Licoppe and Morel 2018). This chapter contributes to research on cross-modal online communication by demonstrating how differences in affordance shape interpersonal interactions.

This chapter is organized as follows. Section 2 reviews previous research on the emerging features of cross-modal communication in live streaming services and digital conversation analysis. Section 3 introduces the Periscope data analyzed in this chapter. Section 4 presents a series of critical incidents of how streamers and viewers responded to trolls that are communicated via phone-ins and chats. The results from the case study are further discussed in Section 5.

2   Literature Review

2.1   *Cross-modal Communication in Live Streaming Services*

Online communication is pervasively multimodal, with a combination of texts, pictures, and videos (Yus 2019). In platforms such as iMessage, Skype, WeChat, and Reddit, interlocutors have access to symmetrical semiotic resources and can choose different modes of communication. Previous studies have mainly focused on exploring how the varying affordances in these platforms shape people's interactional features (Arminen, Licoppe, and Spagnolli 2016). However, the rapidly growing live streaming services such as Periscope, Twitch, and YouTube Live have created new modes of mediated interaction (Licoppe and Morel 2018; Wang 2019; Yus 2021). They represent a mixture of synchronous video-mediated communication and asynchronous text-based forum discussion. Typical live streaming features one streamer doing video broadcasting and viewers interacting with the streamer and other viewers through textual comments (Wang 2019). The streamer generally does not change scenes or background settings during the stream, except for showing a particular object or showing a particular content on their computer screen. When commenting, the handles of the commenter will show up on the screen where both the streamer and viewers can see them.

Live streaming services involve three interactional modes (Yus 2021). The first two modes represent cross-modal communication in which "the production channel is different from the interlocutors' preferred feedback channel" (Rosenbaun, Rafaeli, and Kurzon 2016, 29). The first mode is streamer-audience interaction. The streamer usually communicates with the audience

via talk and various nonverbal behaviors, such as gesturing and showing objects via video streaming. When trying to address a specific viewer, the streamer tends to read out the viewer's comment as literally as possible (Licoppe and Morel 2018). This is because viewers' comments only appear on the screen for a very short period of time, which is referred to as the "scroll factor" (Yus 2021, 201). If the streamer chooses to stream on computers, however, they can scroll back and forth in the chat column and find previously unread messages.

The second mode is audience-streamer interaction. Unlike streamers, audience members usually interact with the streamer with texts and emojis, which is similar to text-based chats (Recktenwald 2017). In addition, viewers can also express their liking of the streamer by donating money or clicking likes. These functions are explicitly featured on the streamer's screen. For example, in Periscope, streamers will see colorful hearts on the lower right side of their screen when viewers clicked the "like" button (Friedländer 2017). Since it would take some time for viewers to type their comments in the chat box, the viewer may not be able to respond to the streamer in time (Licoppe and Morel 2018). Moreover, the text interaction in live streaming services shares a similar floor management rule as asynchronous text-based contexts in that viewers can engage in multiple conversations at the same time (Jenks 2019). Unlike face-to-face communication where only one person usually holds the floor in a particular turn (Levinson 1983), viewers' text messages do not necessarily compete with the streamer's floor holding (Licoppe and Morel 2018).

While the audience-streamer interaction in live streaming services shares many common features across platforms, some interactional options are more pronounced in one platform over the other. For example, on Twitch, a computer bot usually reads out viewers' text comments so that streamers can concentrate on their games (Yus 2021). In contrast, this function is not salient in platforms such as Periscope and Meerkat because they are primarily used for chatting (Tang, Venolia, and Inkpen 2016). Streamers can also enable viewers to interact by integrating functions from other media. For example, the streamer can provide a phone number and allow viewers to ask their questions over the phone. While multiple audience members can comment with texts in the chat box at the same time, the streamer usually takes only one phone call from the audience in one conversation.

The third mode is audience-audience interaction. Similar to other text-based chats, audience members can engage in multiple sequences of activity at the same time (Jenks 2019; Virtanen, Vepsäläinen, and Koivisto 2021). One common way to specify the addressee is to use "@" to tag their Periscope handle. Moreover, the streamer can select certain viewers to become the moderator to

monitor the chats. If a viewer sends out trolling messages via chat, the moderator from the audience can use the built-in functions to expel that person from the stream (Yus 2021).

2.2   *Trolling and Digital Conversation Analysis*

Although conversation analysis was originally proposed to analyze face-to-face interactions, it has been widely used to examine various digital interactions such as asynchronous text-based discussions (e.g., Reddit), mobile chats and instant messaging, video-mediated interaction (e.g., Skype), and cross-modal communication (e.g., Twitch, Periscope) (Arminen, Licoppe, and Spagnolli 2016; Giles et al. 2015; Licoppe and Morel 2018; Recktenwald 2017). This section discusses how conversation analysis (CA) is particularly suitable for analyzing the management of trolling behaviors in live streaming services.

First, the emphasis on interactional achievement in CA is consistent with the shift from adopting researchers' etic definition to participants' emic definition of trolling behaviors. For example, Hardaker (2013) problematizes that previous etic definitions of trolling entail an understanding of the potential troller's intention, which is unattainable from the researchers' perspective (Haugh 2008). In actual online communication, online users hold varying evaluations of the same message in that a genuine message may be perceived as trolling and a troll may be perceived as sincere. Similarly, by examining trolling behaviors across 14 platforms, Coles and West (2016) highlight that the meaning of trolling is not fixed and the same message can be evaluated positively and negatively by the discussants. These studies all have demonstrated the complexity of trolling in online communication and the necessity to study trolling in interactions. Several studies have also demonstrated the utility of using CA to analyze trolling behaviors in text-based discussion forums, such as examining the conversation structure of successful troll-like strategies (Paakki, Vepsäläinen, and Salovaara 2021) and the floor management of trolling behaviors (Jenks 2019). One shared observation from these two studies is that trolls are co-constructed by the troller and the members of that online community.

Second, conversation analysis is particularly helpful to understand the design-sensitive features in mediated interactions. For example, in a recent review, Meredith (2019) shows that CA approaches have been used to study how online interactions shape the norms of turn taking, sequence organization, repair, opening sequences, and embodied conduct that have been observed in face-to-face interactions. For example, using digital conversation analysis, Licoppe and Morel (2018) found that the ephemeral nature of chat messages in Periscope streaming imposes temporal constraints for streamers to respond to all incoming messages in time. Moreover, to solve the issue of addressivity,

streamers often employed the "read-aloud and respond" practice by reading out the message sender's username and the message in verbatim, helping the audience to locate the specific text comment. In the context of trolling, using floor management as a central analytical framework, Jenks (2019) shows that trollers co-construct trolls by taking the floor space with appropriate answers to previous questions. In the meantime, since online forums allow multiple floor spaces at the same time, forum members can strategically manage the troll by creating new floor spaces to direct people's attention away from the trolls.

To sum up, previous studies have shown that trolling is inherently evaluative, and it needs to be interpreted in interactions by jointly examining the trolling message and its responses. While research has extensively examined trolling in asynchronous text-based online platforms, few studies have systematically examined how streamers and audience members jointly identify and manage trolls in live streaming services. Using digital CA, therefore, the present study seeks to understand how the three different modes of interaction influence streamers' and audience members' treatment of trolls during live streaming.

3   Data and Analytical Procedure

The data used in this paper were extracted from a collection of Periscope recordings that were collected in early 2019.[1] The streamer was a Ph.D. candidate in brain science from an American University at the time of data collection. The streaming is a regular program that features the scientist streamer answering questions related to brain science or related disorders. The streamer has enabled the phone-in option in which participants can ask their questions via phone calls. The audio call was in speaker mode so that all other participants can hear the question. This case study features a series of trolling incidents that happened during a two-hour Periscope live streaming. The streamer and the audience engaged in a wide range of topics such as mental health issues (e.g., depression, epilepsy, bi-polar disorder), general science topics (e.g., deja vu, healthy diet), and casual small talks (e.g., babysitting, painting). The regular participants of the stream include researchers who study brain sciences, people who are suffering from mental health disorders, and people who generally are interested in related topics (personal communication with the streamer, April 2019). The typical setup of this streamer on Periscope is presented in Figure 10.1.

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1 Periscope discontinued its service in early 2021, but most of the recordings are still viewable on their website.
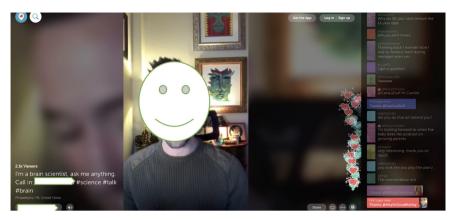
FIGURE 10.1   Typical setup of the interface on Periscope

The trolling messages were identified following the next-turn proof procedure in conversation analysis (Sacks, Schegloff, and Jefferson 1974; Jenks 2019). Specifically, trolls were not determined by their linguistic features but were evaluated based on streaming participants' explicit comments (e.g., *I just got trolled; That person is definitely trolling*) or the streamer and moderator's explicit behaviors (e.g., using the built-in function to block the troller from joining the stream, terminating the phone call before the troller completes their sentence). As a result, five critical incidents were identified when the streamer started to allow phone-in questions in the second half of the stream. Although there were a few instances of potential trolling posted in the chat box (e.g., *Putin Trump are worst. My mind decided*), these instances did not elicit any responses from the streamer and the audience. The trolling event happened in the second half of the stream revolves around the streamer and MsJ (or Joy) who is a regular viewer of the broadcast and the moderator assigned by the streamer.

All trolling incidents were transcribed following a slightly modified version of the conventions proposed in Recktenwald (2017). This convention was used because it is specifically designed for cross-modal communication in live streaming platforms such as Twitch and Periscope. For example, timestamps are added to demonstrate the temporal relations between lines, and separating audio and chat into two columns is to highlight that they are different modes of communication (i.e., verbal vs. textual). To save up space, some of the streamer's longer scientific explanations were omitted and marked in square brackets. Since the streamer did not use Periscope's own phone-in function, the quality of the audio call was relatively low for all participants, including the streamer. Those unclear parts were marked inaudible in the transcripts.

Across all extracts, STM stands for the streamer and TRO stands for the identi-
fied troller in that extract. All text chats are displayed in their original spellings.
A full list of transcription conventions is presented in the appendix at the end
of the chapter.

Although approval from Institutional Review Board is often regarded as
optional for these online data because they are publicly accessible to every-
one, it still imposes ethical issues of revealing participants' identities without
obtaining their consent (Stommel and Rijk 2021). To help protect the privacy
of online users, I acquired formal approval from the university's Institutional
Review Board. Moreover, although participants' Periscope handles generally do
not reveal their real identities (Licoppe and Morel 2018), they still provide clues
that may help others to track down that person. I only uses the first three letters
from their handles, which both helps to protect their identity and is sufficient
to distinguish between participants.

4   Analysis

This section analyzes five critical incidents in this Periscope streaming, focus-
ing on how the streamer and viewers separately and jointly manage the phone-
in and textual trolls. Three incidents involve only phone-in trolls, and two incid-
ents involve both phone-in trolls and textual trolls.

4.1   *Phone-In Trolls*
Extract 1 features a female caller who does not comply with the streaming
activity's agenda to discuss science-related topics but just wants to express her
affection to the streamer. In this case, the audio caller is identified as a troller.

Following the completion of a question-answer sequence about self-intro-
duction, in line 4, the streamer initiates another question-answer sequence by
inviting the caller to ask a question which is the expected agenda of the call.
Instead of subsequently raising a question in line 6, the caller chooses not to
comply with the agenda and initiates another greeting sequence (i.e., what's
up). After responding to the caller's greeting, the streamer tries to resume
the conversational agenda by initiating another question-answer sequence
(line 10). This, however, is followed by another line that shows excitement
(line 12). This extract constitutes a trolling incident because the caller has con-
tinuously deviated from the expected agenda.

Although this call disrupts the streamer's discussion on science-related top-
ics, the audience does not make explicit efforts to manage the troll. Instead,
many of them find this call to be laughable or humorous. For example, MsJ

EXTRACT 1

Timestamp	Line	Audio call	Chat
00:58:09	1	STM: okay calling from a 214 area code. what's your name and where are you calling from?	
00:58:14	2		bla: Or such as very luminous projector screens causing headaches.
00:58:14	3	TRO: my name is Trap King	
00:58:16	4	STM: Oh. Trap K-. hahaha Trap King from YouTube. what-what's on your mind?	
00:58:19	5		Max: Yes. It's buggy. You can't share while call in enabled
00:58:21	6	TRO: YEAH ⟩what's up?⟨	
00:58:22	7	STM: hahaha, Trap King how old are you?	
00:58:25	8	TRO: Oh ⟩my⟨ god. We are 18 years old? WE love you	
00:58:29	9		NF1: @jo7 not the place or space here. Have u Researched it?
00:58:31	10	STM: oh (..) you are 18 years old. uh? that's a very "tumultuous" time= in your life. eh= do you have= any questions?	
00:58:36	11		MsJ: Wow
00:58:37	12	TRO: I just wanted to … I'm just so excited.	
00:58:40	13	STM: hahaha alright Trap King. thank you SO much. ⟩It's very lovely for you to say it⟨. But I'll have to let you go. hahaha.	
00:58:44	14		Chr: She doesn't sound like she traps
00:58:48	15	TRO: I don't know. I just want to talk to you and "that's it"?	
00:58:50	16	{phone call ended by the caller}	Che: Hahahahaha
00:58:51	17		gie: I need a brain cleanse
00:58:51	18	STM: hahaha that's YouTube for you right? All right (..) man. 18. what a horrible time in development. right? although I guess some people enjoyed it. But uh man (..) BY the way. if someone IS interested in "attraction" and how is it different you know between ⟩different people attracted to different people⟨. I talked about it on "my Podcast". it is called WTW.	
00:58:53	19		MsJ: Ian's young fans! 😂
00:58:55	20		Max: Gee
00:58:57	21		jo7: @NF1 I've read some
00:58:58	22		jud: She's nuts!
00:59:04	23		jo7: 😂
00:59:09	24		big: @MsJ 😂
00:59:10	25		Max: @gle just reboot it
00:59:12	26	[phone ring tone] STM: oh. it's a different call. so= ⟩feel free to check it out⟨.	

expresses her excitement (*Wow* in line 11) and categorizes the female caller as the streamer's fan (line 19) which is an in-group identity marker. Another audience member (jud) indicates that the caller's conduct is laughable by categorizing her as *nuts* (line 22). Moreover, four audience members use laughing face with tears (😂) or the laugh particle (hahahahaha) which are often used to indicate shared laughter (König 2019; Sampietro 2021). Aligning with the audience's reactions, the streamer also acknowledges that this call is humorous by laughing out aloud throughout the conversation (lines 7, 13, 18) and explicitly acknowledging that people may enjoy it (line 18).

Unlike the audience members, the streamer employs multiple efforts to manage the troll. First, after recognizing that the caller is not asking any science-related questions, the streamer steps in and explicitly asks the caller to leave (line 13). The streamer also goes a step further by relating the incident back to his discussion on science. In line 18, using the misplacement marker *by the way*, the streamer directs the audience's attention to the scientific notion of attraction embodied by the caller and the scientific explanations he gives in his podcast. As a result, the streamer transformatively reorganizes the incident as an introduction to his educational program, shifting back to his agenda to distribute scientific knowledge.

Furthermore, unlike the streamer's full devotion to the caller, some other participants are not affected by the streaming and proceed with their own topic. For example, NF1 and j07 continue their discussion on other brain science-related research (lines 9 and 21). They maintain their floor space by using the @ function to directly address each other.

In Extract 1, the caller's trolling behavior is only sanctioned by the streamer, the trolling incident in Extract 2 is jointly managed by the streamer and one audience member. Prior to this instance, another audio caller has impersonated Joy who is an audience member in the stream and asked a question about fetishism.

EXTRACT 2

Timestamp	Turn	Audio call	Chat
01:06:15	1	**STM**: okay you are calling from a 747 area code. what's your name and where are you calling from?	
01:06:17	2		**Man**: interesting scope, I have tbi, thx for the share/scope
01:06:20	3	**TRO**: hello this is Joy I'm from Texas.	
01:06:24	4	**STM**: I'm sorry (..) you are calling from Texas but what's your name?	

EXTRACT 2 *(cont.)*

Timestamp	Turn	Audio call	Chat
01:06:26	5	TRO: Joy, J-O-Y	
01:06:27	6	STM: oh Joy "okay" Joy what's on your mind?	
01:06:31	7		**MsJ:** Stop
01:06:35	8	TRO: (inaudible) the last question was really a silly question.	
01:06:37	9		**Max:** @Man very. Ian is great 👍
01:06:36	10	STM: oh so this is-(..) it isn't actually Joy right?	
01:06:38	11		**@v_t:** i am from texas
01:06:40	12	TRO: yeah it is	
01:06:42	13	STM: okay well I know Joy ⟩as now indicated to me⟨ (..) she is married. she is a lovely lady a lovely woman. so= BUT it gives us the opportunity to talk about fetishism.	
01:06:42	14		**tig:** why do you get headaches after my teeth hurt?
01:06:49	15		**MsJ:** It's not me
01:06:57	16	TRO: okay I appreciate you for handling that question.	
01:06:58	17		**Man:** thx!!
01:07:04	18	STM: So so be it. evidently (..) that's not you. I'm sure that she appreciates it too for defending her. {Hung up the phone}	

In Extract 2, the streamer and an audience member jointly determine the caller as trolling. The caller identifies herself as Joy from Texas in line 3 and repeats her name in line 5. To manage this incident, Joy (MsJ) in the audience comments "stop" in line 7. Having observed Joy's comment, the streamer initiates another question to clarify the caller's identity (line 10), but the caller maintains that she is Joy (line 12). Following the caller's response, the streamer uses *I know* to claim his knowledge about the actual identity of Joy (line 13). This clarification is further backed up as MsJ explicitly states in line 15 that the caller is a different person.

The streamer adopts two strategies to manage this trolling incident. First, the streamer discursively orients the audience to previously discussed topics about brain science. Before line 13, the discussion has derailed from the original agenda to discussing the identity of the caller. In line 13, after detailing the information about the actual Joy, the streamer transitions to the previously discussed topic of fetishism with a discourse marker *so* that is often used to advance the interactional agenda (Bolden 2009). Second, the streamer chooses to hang up the phone to terminate this call (line 18). This happened after the

troller continues derailing from science-related topics and talks about the previous incident in line 16.

In the first two extracts, the management of trolls only occurs between the streamer and the troller as well as between the audience and the troller. Extract 3 adds another layer of complexity by demonstrating how the streamer manages the troll by addressing the audience member.

EXTRACT 3

Timestamp	Turn	Audio call	Chat
01:11:55	1	STM: okay you are calling from a 464 area code. what's your name and where are you calling from?	
01:11:58	2	TRO: hey there this is Steve. I'm calling from New York City.	
01:12:02	3	STM: {laughing} alright, I happen to know that 464 is a New York City area code. Steve (..) but uh (..) are you sure your name isn't Phil (..) or uh= Mike? {giggling}	
01:12:15	4	TRO: oh I'm not a troll.	
01:12:18	5	STM: okay what's on your mind?	
01:12:18	6		**Man:** lolol!!!
01:12:19	7	TRO: okay ... (inaudible). I agree with schizophrenia and all that stuff it seems to be a growing stressor ... but I'm looking for therapists now. there's one. she has helped a lot of people out there. my wife Joy who uh- {hung up by the streamer}	
01:12:20	8		**v_t:** your are very smart
01:12:48	9		**Mar:** Same guy
01:12:49	10		**Man:** Phil or Mike!!! lmprao!!!
01:12:50	11	STM: {giggling} man= Joy (..) you can feel free to leave the stream. you don't feel like you have to stay. uh= alright. why don't I allow calls in through Periscope? &continues to explain the reason of not using Periscope in-built calls&	
01:13:03	12		**joh:** @MsJ 😂😂😂😂
01:13:18	13		**MsJ:** I will. Bye Ian and idiots!

In Extract 3, the caller's trolling identity is discursively negotiated and categorized among the streamer, the audience, and the caller. Having experienced multiple trolls in audio calls, the streamer becomes more cognizant about examining the caller's identity. After the caller introduces his name and his location, in line 2, the streamer explicitly states that he knows that the caller's area code matches his self-claimed location (line 3). In the same line, the streamer also initiates another question-answer sequence to verify the caller's name. And the

caller explicitly denies that he is trolling (line 4). After that, the streamer shifts back to the agenda by inviting the caller to ask a question (line 5), completing his examination of the caller's identity. Nevertheless, the caller disrupts the stream by claiming that Joy is his wife (line 9). Another member of the audience also acknowledges that this caller is the same troller whom they have identified in previous calls (line 9). Moreover, MsJ categorizes these callers as "idiots" in line 13.

The streamer also responds to this trolling incident in three ways. First, similar to what he did in Extract 2, the streamer hangs up the phone once the troller mentions Joy as his wife (line 7). Second, in line 11, the streamer redirects the audience's attention back to another question from the audience with the discourse marker *alright* which is commonly used to indicate a major shift of topics (Filipi and Wales 2003). Finally, in addition to responding to the troller or orienting the audience back to the agenda, the streamer exerts more effort to protect and comfort MsJ by suggesting that she can choose to leave the stream (line 11). The streamer's supportive message also receives MsJ's explicit acknowledgment in line 13.

4.2   *Phone-In and Textual Trolls*

In addition to managing trolls from audio callers, the data also show instances that involve trolls initiated by the caller and the audience members in the chat (Extract 4 and Extract 5).

Extract 4 involves two explicit trolling events that happened shortly after the critical incident described in Extract 1. The first is initiated by a male caller who pretends to be Joy when he first introduces himself in line 3. This person is later jointly identified as a troller by the streamer and the audience. Specifically, in line 4, the streamer uses *I know* as a marked display of his epistemic access to the true identity of Joy. Later on, the streamer again uses *I know* to indicate that he has identified the speaker as a troller (line 24). In the same line, using the first-person plural pronoun *we*, the streamer establishes a consensus that his treatment of the caller is consensus among the audience. To echo the streamer, the actual Joy (MsJ) uses "liar" as a membership categorizing device to indicate that the caller's identity is fake (line 5). Later in the interaction, MsJ once again acknowledges that she does not know this person (line 10), explicitly states that she is being trolled (line 21), and expresses her negative emotions (line 29).

This trolling incident is managed by the streamer in two ways. First, using a series of discourse markers such as *but* (lines 11 and 19) and *so* (line 28), the streamer responds to the troller by reorienting the audience back to the agenda such as discussing attraction and the differences between males and females'

EXTRACT 4

Timestamp	Line	Audio call	Chat
00:59:15	1	STM: okay calling from a 510 area code. what's your name and where are you calling from?	
00:59:18	2		**big:** @MsJ 😂
00:59:20	3	TRO: HEY how are you? a big fan of your scope. my name is Joy. I have a question. so … (inaudible)	
00:59:27	4	STM: AH, no, wait. Joy. okay I know this isn't specifically Joy. but what's your name? hahaha	
00:59:31	5		**MsJ:** Liar
00:59:34	6	TRO: my name is Greg.	
00:59:37	7	STM: okay (..) what's on your mind?	
00:59:39	8		**pee:** the pill ….
00:59:40	9	TRO: I have a question about foot fetishism (inaudible) I just wanted to know if it is wired in the brain (inaudible)	
00:59:49	10		**MsJ:** I don't know that person
00:59:57	11	STM: you know I actually have been interested in how fetishism and its varieties ⟩you know⟨ are developed. the foot fetishism is frankly mystifying to "me" &continues to explain fetishism& but ATTRACTION in human beings is ⟨extremely⟩ complicated &continues to explain attraction& alright what else is on your mind?	
01:00:11	12		**gle:** @Max I did but it seems nothing happening
01:00:37	13		**Max:** @gle do a hard reset. Unplug for 5 min off power
01:00:44	14	TRO: thank you. I just want to know about foot fetishism. this is what confused me a lot.	
01:00:51	15	(phone ring tone) STM: {mute the incoming call}	
01:00:54	16		**Ash:** We need better MRIs to understand that 🤣🤣🤣
01:00:55	17	STM: So= let me ask you this. why do you think it develops?	
01:00:57	18	TRO: I don't know. I don't really have any- I just wanted to talk to you about it. it's so much in the media (inaudible) and I just want to find out the [reason why].	
01:01:20	19	STM: [so so] it's not quite as simple as that. right? different sexes have different secondary characteristics as you said mammary glands boobs on female for heterosexual male tend to be more attractive than their elbows for example … ⟨But⟩ that said, attraction &continues to discuss attraction&	
01:01:28	20		**MsJ:** I'm being trolled

EXTRACT 4 *(cont.)*

Timestamp	Line	Audio call	Chat
01:01:47	21		**Chr:** @MsJ lemme see your ankles
01:02:02	22		**MsJ:** @Chr Stop it
01:02:09	23	TRO: well MsJ I'm happy to see you tonight. (inaudible) [I just-]	
01:02:15	24	STM: [I see that.] I know you are trolling. but anyways we are all (..) patient with our trolls. interesting conversation	
01:02:15	25		**Max:** We could be gay or lesbian in principle
01:02:19	26		**Yun:** My dude, attract to beasts is a cultural thing
01:02:20	27	TRO: (inaudible) [I'm just happy to ...]	
01:02:27	28	STM: [alright, I'm gonna let you go buddy]. {hung up the phone} ⟨So⟩ males versus female brains &continues to talk about brain differences&	
01:02:37	29		**MsJ:** WTF?
01:02:38	30		**Chr:** but I'm serious if your not

brains. Specifically, in line 11, the streamer rephrases the topic of fetishism to attraction which he has discussed in Extract 1. Second, similar to what he did in Extracts 2 and 3, the streamer chooses to hang up the phone before the troller finishes his sentences in line 28.

While the streamer is handling the caller's question about fetishism and attraction, a second trolling event is initiated by an audience member in the chat box. When discussing the different secondary characteristics between genders, the streamer gives an example that heterosexual men are more attracted to certain female body parts (e.g., breasts) than other parts (e.g., elbows). Picking up from this example, one viewer (Chr) uses the @ function to directly address MsJ by asking her to show her ankles (line 21). This is considered to be another instance of trolling because MsJ immediately responds with "stop it" and uses @ to tag Chr in the text. Compared to MsJ's immediate reply, the streamer does not explicitly regulate Chr's behavior.

Finally, Extract 5 displays a similar pattern to Extract 4 in that the audio troller is jointly managed by the streamer and the audience, whereas the text troller is exclusively managed by the moderator in the audience.

In this extract, the audio troller is jointly identified by the streamer and several audience members. Specifically, after the caller connects his remarks to Joy, the streamer immediately terminates the call (line 12) and identifies the call

EXTRACT 5

Timestamp	Turn	Audio call	Chat
01:18:24	1	**STM**: okay 570 area code (..) just hold up we are talking about the olfactory system &continues to talk about the olfactory system and aroma therapy&	
01:18:39	2		**joh**: Olfactory is smelling
01:18:44	3		**joh**: @MsJ hey girl! Haha
01:19:06	4		**MsJ**: @joh You will be moderated out of here
01:19:07	5		**joh**: @MsJ 😂 ☺ ☺
01:19:58	6		**Ysq**: my eye is twitching all the time does that mean i had a stroke?
01:20:47	7		**joh**: @MsJ follow me
01:21:01	8		**MsJ**: @joh I'm blocking you
01:21:05	9		**Bri**: Is any particular section of the brain affected substantially more that others by sleep deprivation
01:21:06	10		**Tha**: @joh😂
01:21:38	11	**STM**: okay sorry 570. It has been a "long" time. what's your name and where are you calling from?	
01:21:40	12	**TRO**: uh I'm calling about an individual Joy. I was wondering if there is any legal ramification if she raped young children {hung up the phone by the streamer}	
01:21:58	13	**STM**: GEES= that's getting really depressing. that dude stayed on the line for that entire olfactory explanation. (giggles) yes Joy, I agree that it is harassment. I don't know if you are able to find out what that account was. but uh= we should report it.	
01:22:05	14		**MsJ**: This is harassment
01:22:28	15	**STM**: so= interesting question. Sleep deprivation &continues to talk about sleep deprivation&	
01:22:27	16		**hal**: Just ignore them Ian
01:22:28	17		**MsJ**: I will
01:22:38	18		**x_a**: That was very disturbing
01:22:45	19		**Non**: That's actually pretty scary, to say the LEAST
01:22:59	20		**MsJ**: @x_a It's been happening over and over
01:23:22	21		**x_a**: @MsJ Some people just won't give up I suppose

as depressing and harassing (line 13). In the same line, he also uses the plural pronoun *we* to indicate that his decision to report this caller represents the opinions of other viewers. In the meantime, several audience members echo the streamer by explicitly recognizing the call as disruptive (lines 14, 18, 19, 21), suggesting solutions (line 16), or endorsing his decision to report (line 17). The collective identification of the troller's identity is consistent with findings in previous extracts.

In contrast, the textual trolling that happened in the beginning of the extract is only managed by the moderator (MsJ). While the streamer is elaborating on the olfactory system and aroma therapy, one viewer (joh) sends a potentially flirtatious message to MsJ (line 4), and his flirting intention becomes more pronounced as he uses the winking face emoji (😉) in line 5 which is commonly used in romantic and sexual contexts (Thomson, Kluftinger, and Wentland 2018). This viewer's comments are evaluated as trolling because MsJ explicitly states that she will moderate him out of the streaming (lines 4 and 8). Apart from MsJ's response, the data do not show any explicit management from other audience members and the streamer.

5   Discussion and Conclusion

The above analysis demonstrates how trolling behaviors and their responses are shaped by different affordances in live streaming. The varying communicative affordances of audio phone-ins and textual chats create two possible types of trolling behavior. First, the troller can use the phone-in function provided by the streamer to verbally cause disruption. Second, the troller can send text messages that intentionally disrupt the ongoing agenda. Moreover, the difference in affordances between streamer-audience and audience-audience interactions also creates two patterns of response. First, the streamer can manage the troll through his verbal language or terminate the conversation if the troller uses the phone-in function. Second, the audience can respond to the troller with chat messages or use the built-in moderation function to block the troller who is in the audience.

The data show that the streamer is expected to address trolls from phone-in conversations by terminating the call or redirecting the audience's attention back to the agenda. Actively managing phone-in trolls are important because the audio troller's response is simultaneous and accessible by all participants, causing more disruptions to the live streaming. One salient strategy the streamer employed is to reframe the trolling message as science-related topics. This strategy is grounded in the co-operative nature of human interac-

tions in that interlocutors transformatively build up their meaning by reusing materials from previous speakers and laminating their new meaning onto others' existing meaning (Goodwin 2018). In the above Periscope streaming, for example, the streamer shifts the caller's discussion on fetishism to a discussion on attraction, converting the trolling message into a more constructive discussion. Apart from strategically disseminating scientific knowledge to his viewers, the streamer also actively takes care of the feelings of the participants who have been trolled. For example, in extracts 2, 3 and 5, the streamer consistently expresses his caring for Joy, suggesting that live streaming also entails a sense of community which has been reflected in other online interactions (e.g., Graham 2007; Graham and Hardaker 2017).

In addition, managing phone-in trolls also requires joint efforts from both the streamer and the viewers. Since trolling is deceptive in nature (Dynel 2016; Herring et al. 2002), how to see through the troller's apparently sincere message becomes important. The above analysis shows that viewers can contribute to trolling management by providing critical information and explicit evaluations of the troll, which subsequently influences the streamer's treatment of the troll. For example, to expose the troller's impersonation of Joy, she and other viewers explicitly comment that the caller is a different person (Extracts 2 and 4), or the present caller is the same troller in previous calls (Extract 3).

When trolling happened in the chat discussion, both the streamer and most viewers tend to ignore the trolling message. Since the text messages in live streaming platforms are ephemeral (Yus 2021), ignoring the textual trolls prevents trollers from getting undue attention from other participants. This finding is consistent with previous research on trolling in text-based asynchronous discussions in that ignoring is a common and effective means of responding to the troll (Binns 2012; Hardaker 2015). As an emerging form of online polylogue, Periscope streaming allows multiple speakers to hold the floor simultaneously. Similar to the design of multiple floors in text-based online discussions (Jenks 2019), trollers are less likely to disrupt all communications with their trolls. In several extracts, viewers still engage in their own conversations with each other. And the affordance of directly addressing one participant with the @ function also helps interlocutors to maintain their floors. Taken together, these design features help participants to continue their ongoing conversations, even during phone-in trolls. When the trolling message becomes disruptive, the moderator intervenes and removes the troller from the stream (Extract 5).

To sum up, this chapter contributes to this volume's theme on interpersonal interaction by exploring the diverse semiotic affordances used in a novel technological platform of Periscope. Through micro-analysis of a series of trolling incidents that happened in the live stream, the study demonstrates

that streamers and viewers adopt different strategies to manage trolls communicated in audio and textual modalities. Managing trolls not only involves the streamer directing participants back to scientific discussions but also includes relational work that contributes to a sense of online community. This paper echoes Graham and Hardaker's (2017) call for examining the intersecting norms of multiple modalities in online communication. The findings of this study could also help scientist streamers to better communicate science to the public during live streaming.

Appendix: Transcription Conventions

TEXT	Emphasis or higher volume
.	Falling final intonation
?	Rising final intonation
-	Word cut off
(..)	Brief pauses
"	Audible shift in voice quality such as rise in pitch
{ }	Physical action by the streamer or the caller
=	Latching
[ ]	Overlap in speech
⟨text⟩	Slower speech
⟩text⟨	Faster speech
&text&	Summary of abridged lines

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