"You can't imagine how hard it is": hardship streamers in live crowdfunding

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Abstract

Introduction. The combination of Live streaming and E-commerce also offers opportunities for people whose family members are severely ill, disabled, or old and facilitates their ability to raise funds by selling commodities and receiving virtual gifts. Unlike other streamers, hardship live streamers are driven by unique motivations and may employ distinct self-presentation techniques.

Method. We analysed TikTok video clips and sales data from 14 male and female hardship streamers.

Analysis. We used both quantitative and qualitative analyses of the data, including topic modelling, sentiment analysis, and thematic content analysis.

Results. We found that 1) hardship streamers used multi-modal cues to facilitate interactivity and authenticity, as they emphasized their hardship and promoted the product; 2) higher literacy level of the streamers and the use of a positive tone positively correlated with better sales; 3) hardship storytelling positively correlated with the time the audience stayed in their live streaming sessions; and 4) females focused more on their hardships, used a more negative tone, and talked faster than males.

Conclusions. We provide a unique understanding of the effectiveness of self-presentation strategies used by marginalized live streamers in raising funds on TikTok.

Introduction

Social live streaming services (SLSSs) are online platforms where users can broadcast real time content. China has witnessed rapid growth in its e-commerce markets and live streaming communities with the establishment of platforms like Douyin (the Chinese version of TikTok, hereafter referred to as TikTok) and Kuaishou (Tang et al., 2022). Alongside receiving virtual gifts from audience members, live streamers on these platforms can promote products in their broadcast rooms and in return, get a cut of the e-commerce revenue. This is known as *E-commerce live streaming* (ELS). In 2023, the ELS industry reached a market size of 4.9 trillion RMB (around 700 billion dollars) in China (IResearch, 2024).

And ELS has empowered a lot of marginalized population, like rural women (Tang et al., 2022), rural farmers (Yu and Zhang, 2022) and minority enterprisers (Li and Kang, 2021) in China. This study looks into another group of people who seek help online by engaging in ELS. In China, countless people and their families continue to face challenges in covering medical expenses that surpass the insurance coverage provided by the government (Huang et al., 2021). Some of them then turn to live streaming to earn money through the virtual gift received and the product sold. Online crowdfunding is defined as a process whereby people utilize internet platforms to solicit financial support from the public (Kim et al., 2018). Thus, we refer to live streaming to raise funds for a cause as *Live Crowdfunding* and live streamers seeking financial contributions by streaming about their life challenges as *hardship streamers*.

Many hardship streamers are elderly or come from rural backgrounds. However, much of the existing research on SLSSs has focused on the information behaviour of young, popular micro-celebrities or influencers (Fietkiewicz et al., 2018; Li et al., 2022; Lu et al., 2019; Zimmer & Scheibe, 2019), particularly on non-E-commerce topics such as video gaming, E-sports, and live performances. Regarding ELS, few studies have explored the strategies employed by streamers from marginalized groups or those facing significant challenges. Notably, there are significant differences in the self-presentation strategies used by traditional E-commerce live streamers and hardship streamers. For example, strong fan bases and opinion leadership typically associated with influencers—factors that affect purchase intentions (Farivar & Wang, 2022; Jegham & Bouzaabia, 2022)—may be absent in hardship streamers. Additionally, high-quality visuals and polished presentations that positively facilitate consumers' reactions to advertisements (Pozharliev et al., 2022) may be lacking in hardship live streams, because these streamers are often broadcasting in their rural houses. Understanding their technology usage is crucial to gain insight into its influence on marginalized groups and to better support their needs and further empower them with better design.

Previous research of online crowdfunding has typically focused on specific sites like GoFundMe and Kickstarter. These sites are characterized by a spatial and temporal separation between fundraisers and donors and an absence of significant non-verbal communication cues. However, SLSSs allow streamers to communicate and answer questions synchronically with their contributors; this immediacy enables nuanced expression and clarification, similar to face-to-face communication (Trevino et al., 1987). Contributors, in turn, consider the synchronous visual and verbal cues that the streamers express to make informed decisions on the spot. It is believed that more sophisticated communication mediums are more appropriate for the context of crowdfunding (Koch et al., 2015), and richer media can have a positive influence on decision quality (Kahai & Cooper, 2003). However, little research has looked at this specific type of online crowdfunding. Our study will explore the potential of *live crowdfunding* by investigating the effectiveness of self-presentation strategies used in synchronous communication by hardship streamers.

This study uses a mixed methodology to examine the multi-modal practices and self-presentation strategies used by hardship streamers on TikTok by analysing data from 14 streamers whose family

members are seriously ill, disabled, or old. Walther (1996) has found that impression management and selective self-presentation vary by gender, a claim also verified in the context of live streaming self-presentation (Freeman & Wohn, 2020; Wu et al., 2022). It is possible that self-presentation strategies of hardship live streamers will vary by gender as well, which may impact their crowdfunding effectiveness. Thus, we investigate the self-presentation strategies of 14 hardship live streamers, their variations by gender, and their effectiveness in crowdfunding by addressing the following questions:

- How do the hardship streamers present themselves?
- Do hardship streamers' presentations vary by gender?
- What self-presentation strategies of hardship streamers impact their effectiveness?

Data analysis revealed that hardship live streamers followed the same techniques used by other E-commerce live streamers when utilizing multi-modal cues in presentation, but they would emphasize their hardships when promoting products. Compared with males, females talk faster, use a more negative tone, and focus more on stories of personal hardship. There is evidence of a moderate correlation between hardship storytelling and audience watch time and a correlation between the emotion score and sales data.

Our research addresses a critical gap in the study of SLSSs by providing valuable insights into the diverse strategies marginalized streamers employ to present themselves online. These self-presentation practices help us better understand the empowering effects of ELS on marginalized communities in China. Furthermore, this study intersects social media practices with crowdfunding. The effectiveness of these strategies can inform the design of crowdfunding platforms and improve live streaming practices for fundraisers. Additionally, the research offers a fresh perspective on the information behaviour of rural and elderly populations—an area that remains underexplored in SLSSs studies. Ultimately, this research sheds light on the broader impact of live streaming on marginalized groups in non-Western contexts.

Literature review

E-commerce live streaming (ELS) in China

The rise of this new form of crowdfunding in China can be linked to the rapid expansion of the country's live streaming industry in recent years. Live streaming in China began in 2005 with users leveraging online chatrooms for indoor, performative broadcasts (Li & Lu, 2017), and it wasn't until 2015 the industry significantly extended its reach (Lu & Siegfried, 2021). Unlike in North America and Europe, China's live streaming industry is characterized by a higher prevalence of professional, full-time streamers who offer a more diverse array of content. Additionally, platforms have integrated more advanced features and linked with other online services (Lu et al., 2018).

However, previous studies from the perspective of streamers have mainly been conducted on video gaming live streaming platforms like Twitch (Freeman & Wohn, 2020) and Douyu (Gong et al., 2023; Wu et al., 2022) or popular chatting live streaming services, such as YouNow and Ustream (Fietkiewicz et al., 2018). These studies analyse the motivations (Fietkiewicz et al., 2018; Lu et al., 2019; Zimmer & Scheibe, 2019) and self-presentation (Freeman & Wohn, 2020; Wu et al., 2022) of the producers. They find that streamers adopt various self-presentation strategies to attract the audience (Wu et al., 2022), and that they make use of content outside the live streaming room to complement their self-presentation (Lu et al., 2019).

Driven by technological advancements such as 5G, virtual reality (VR), and artificial intelligence (AI) (Liu, 2020), ELS in China experienced significant growth and the market size reached 4.9 trillion CNY (around 700 billion USD) in 2023 (IResearch, 2024), which is about 10 times increase from 2019. The integration of live streaming and e-commerce allows consumers to purchase products directly from streamers within the live broadcast, facilitating immediate feedback and offering

deeper insights into consumer preferences (Lu & Siegfried, 2021). Some streamers on TikTok act as 'salesman' for the TikTok Shop, where companies put their product and set commission rates; streamers choose the products they want to sell and then put them into their live streaming session's cart to gain a portion of the sales. The ELS has notably empowered a lot of people in China, including ethnic minority startups (Li and Kang., 2021), rural women (Tang et al., 2022) and Intangible Cultural Heritage workers (Lu et al., 2019). Lu et al. (2019) focused on streamers who promote Intangible Cultural Heritage, revealing their altruistic motivation, and Li and Kang (2021) studied the ethnic minority startups flourishing on Chinese live streaming platforms, highlighting the diversity of participants in live streaming and their varied self-presentation.

Prior research on ELS focused on factors that influence sales performance. It is found that streamers/influencers play significant roles in the sales process (Zhang et al., 2022); thus, the self-presentation of streamers interests many researchers. Findings show that particular physical and linguistic characteristics are crucial for improving sales (Liao et al., 2023). Coherence between verbal and facial emotions promotes live sales (Yu et al., 2022), and consumers' purchase behaviour is affected by the product, social information contained in the streamer's speech, and emotional information (Chen et al., 2024). In ELS, female streamers often use discussions on everyday life to connect with customers, while male streamers tend to focus on popular topics to attract consumer attention (Wang & Jiang, 2021). This study aims to investigate the specific strategies used by hardship streamers in ELS and variations in gender.

Online crowdfunding

A growing number of people are using online medical crowdfunding platforms to request financial help from the public (Kim et al., 2018). The existing body of research on online crowdfunding tends to focus on asynchronous platforms tailored to charitable (Higueras et al., 2022; Sher & Su, 2019) or entrepreneurial objectives (Anderson & Saxton, 2016; Korzynski et al., 2021; Kromidha & Robson, 2016). Koch et al. (2015) found that sophisticated communication mediums are more appropriate in the context of crowdfunding: including video, pictures, and a well-formulated project description can increase success. Zhao et al. (2022) discovered that maintaining emotional consistency between visual and verbal modalities can alleviate challenges faced by online charity crowdfunding campaigns, with verbal signals being more impactful.

Many researchers have textually analyzed the narratives and project descriptions of web-based crowdfunding websites to investigate successful medical crowdfunding behaviour online (Hou et al., 2022). However, relatively few studies have used these methods to explore communication cues presented within live crowdfunding on short-video platforms. Previous research has examined the self-presentation strategies of individuals facing hardship, describing how they emphasize positivity and express their concerns anonymously (De Choudhury and De, 2014; Newman et al., 2011), and how they navigate expectations in asynchronous medical crowdfunding (Kim et al., 2018). Unlike traditional web-based fundraising platforms, live crowdfunding operates within a richer medium where fundraisers can talk with the audience in real time. This setting also offers a wider range of interactions, such as gifting, commenting, and e-commerce, potentially asking for varied self-presentation strategies from the fundraisers.

Methods

Data collection

To address our research questions, we used purposive sampling to choose eligible hardship streamers from TikTok in China (known as Douyin). First, we searched for 'hardship live streaming' ('苦难直播') and observed several live streaming rooms. Then, we identified more than 20 hardship live streamers and examined their profiles and live streams. We chose 14 of them, 7 male and 7 females, based on the following criteria: streamers that 1) stream at least once a week, as indicated by their streaming activities log and 2) sell commodities during their live streams. Since they are

all TikTok users, we were able to examine their profiles and the videos they previously posted to gain important contextual information, including the relationship between the fundraiser and the beneficiary. Typically, they pinned a video on their main page that addressed their hardship, offering further insights into the context of their fundraising efforts. As determined by the information they shared on their profiles or during their live streams, they are all from rural areas, and eight of them are over 60 years old (Table 1).

Streamer (Gender)	Beneficiary relationship to streamer	Talking pace (# of sentences/ second)	# of followers	RPM (yuan)	RPP (yuan)	Stay (seconds)	Viewers (# of viewers/ minute)
P1 (F)	Daughter-in-law	0.391	6436k	143.3	0.11	94	1859
P2 (F)	Grandchild, Self	0.118	5.77k	7.67	0.60	88	13
P3 (F)	Sons	0.197	635k	29.1	0.31	76	105
P4 (F)	Granddaughter	0.306	5k	20.05	1.15	41	14
P9 (F)	Daughter	0.270	50k	12.4	1.22	46	20
P10 (F)	Daughter	0.258	1242k	8.33	0.02	96	721
P11 (F)	Daughter	0.360	300k	144.5	0.78	67	113
P5 (M)	Mother	0.176	24k	2.68	0.01	24	136
P6 (M)	Son	0.262	17k	134.13	1.21	36	104
P7 (M)	Wife	0.158	49k	4.23	0.16	28	18
P8 (M)	Granddaughter	0.092	610k	272.6	0.42	71	726
P12 (M)	Son	0.272	70k	7.81	0.65	31	11
P13 (M)	Son	0.195	8k	80.8	1.25	53	47
P14 (M)	Sister	0.092	168k	4.26	0.02	95	1290

Table 1. Demographics, beneficiary relationships, and effectiveness of the selected streamers

Most streams lasted for over one hour, mainly between 8:00 PM and midnight in the streamers' time zone. Due to their streaming consistent patterns, we determined that video recordings of hour-long sessions would provide rich, suitable data. We recorded 45-60 minutes of live streaming from each of the 14 streamers, adjusted by their actual streaming length. Using iflyrec, which was designed by iFlytek (https://www.iflyrec.com), a well-known Chinese language processing company, we generated transcripts from each of the video clips. The first author checked the accuracy of each transcript manually, and the transcripts were translated by iFlytek into English to facilitate the second author's analysis and to ensure the study's reliability.

We collected the sales data and other live streaming-related information, including viewership and average viewing time, for all 14 streamers from kaogujia.com, a website that analyses data from *Douyin* (https://open.douyin.com). We used five measures to examine the effectiveness of live crowdfunding: the average number of viewers per minute in each recorded session ('Views'), the number of followers, the revenue earned per minute (RPM), the revenue per person (RPP); and the average audience stay time (Stay) for each session. The average revenue per streamer in our sample is 62.3 Yuan (approximately 9 US dollars) per minute (calculated based on the streaming session we recorded), the details are shown in Table 1.

Data analysis

First, we observed the live streaming sessions of the 14 streamers, alongside the featured products and the streamers' interactions with their audiences. We then performed a content analysis on the recorded videos to examine their multi-modal presentation. Next, we performed sentiment analysis, topic modelling, and thematic analysis on the recorded videos.

To develop a codebook for the multimodal cues and gain contextual information, we observed streaming sessions and joined some of the streamers' fan groups, focusing on 1) the reason for live streaming and the relationship between the streamer and the beneficiary; 2) the interaction between the streamer and the audience, especially the streamer's reactions to comments; 3) the

type of products sold alongside product selection and promotion; 4) the challenges of live streaming; and 5) the visual and audible multimodal cues utilized by participants.

Since research suggested that streamers' emotions could influence the sales and users' purchase intentions (Yu et al., 2022; Liao et al., 2023; Chen et al., 2023), we conducted sentiment analysis on the transcripts. We utilized Vader (Valence Aware Dictionary and Sentiment Reasoner; Hutto & Gilbert, 2014), which is a sentiment analysis tool designed for social media text, of the translated Chinese corpus. Then, we extracted the compound scores for each sentence. The compound score can range from -1 to 1, and it serves as an indicator of sentiment strength, where larger positive values represent stronger positive sentiments, and larger negative values indicate stronger negative sentiments (Hutto & Gilbert, 2014). We computed the mean of the compound scores across all sentences in each streamer's transcript as indicators of their final emotional tone.

Then, we conducted topic modelling and employed Jieba, a useful Chinese segmentation package in Python (https://github.com/fxsjy/jieba), for word segmentation. We manually added the words used frequently in the live streams into the dictionary when doing segmentation, then we calculated the TF-IDF (Term Frequency-Inverse Document Frequency) for each word. We selected the top 25 words for each streamer based on the TF-IDF score and generated the list of topics based on these words.

Supported by the topic modelling results (Table 2), we developed a code book for the thematic analysis (Table 3) with 6 codes. And then we sampled 4,200 sentences (300 sentences per streamers) to do the analysis.

Findings and discussion

How do hardship streamers present themselves?

We first describe the topics the streamers discuss during their live streaming sessions through the results of the topic modelling (word level of analysis), thematic analysis (sentence level of analysis), and multimodal cues (recorded video/streamer level of analysis). We end the section by discussing the relationships we found between the topics and the multimodal cues.

Based on our topic modelling, we found that the streamers portray a resilient image, sharing their struggles along with hopefulness. Based on the 25 most significant words identified by TF-IDF scores we identified the top six topics (Table 2).

	Topics	Example words	TF-IDF score
1	Welcoming	Welcome ('欢迎'), good evening ('晚上好')…	0.065
2	Appreciation	Thanks, support, company…	0.164
3	Promoting	Link, Cart, Click on…	0.120
4	Interaction	Follow me, Give me a like…	0.051
5	Prospect	Come on, Hang on…	0.030
6	Storytelling	Grandma, Brother, Child…	0.082

Table 2. Top topics

The first topic involves welcoming the audience as they enter the streaming room. The second topic focuses on expressions of gratitude for audience purchases and support; this is a crucial aspect for fundraising streamers who rely heavily on audience goodwill for financial sustenance. The third topic involves introducing commodities in the streamer's virtual cart, which is called in Chinese the 'Little Yellow Cart' ('小黄车'). The streamers introduce the products in the cart and encourage the audience to check them out. Most of the items are everyday essentials offered at relatively low prices, making them suitable for audience members to purchase. The fourth topic encourages audience interaction with the streamers, wherein streamers prompt actions such as

'Follow me' or 'Give me a like'. They also direct the audience to their accounts' main profile, where they post short videos explaining their hardship. To further facilitate ongoing interest in and financial backing of the streamers, they often display their bank account information on profiles and fan group chats. These actions also algin with previous studies where streamers would make use of content outside the live streaming room to complement their self-presentation (Lu et al., 2019).

The fifth includes expressions that demonstrate perseverance and hopefulness, aimed at uplifting both themselves and their audience, featuring motivational phrases like 'I will overcome it' or 'It will be better'. The sixth topic revolves around the hardships faced by the streamer or their family, in which streamers often invoke the names of family members, such as 'Grandma', 'Child', and 'Brother', most of whom are the beneficiaries of their fundraising efforts.

We analysed 4,200 sentences (300 sentences from each streamer) by assigning codes to each sentence and calculated the percentage of the themes in the data. We found that streamers most often promoted products, followed by hardship storytelling, and expressions of appreciation for audience participation and purchasing (Table 3).

	Themes	Description	Examples	Percentage[1]
1	Welcoming	Welcoming the audience who went into their streaming room.	Welcome to the room! (欢迎来到直播间), Good evening, everyone (大家晚上好).	0.037
2	Appreciation	Showing gratefulness for the audience's behaviours, like purchasing and staying in the room.	Thanks for the support and company (谢谢大家的陪伴和支持).	0.146
3	Promoting	Introducing the products for sale.	This is the extra-size trash bag (这是加厚加大的垃圾袋).	0.429
4	Interaction	Reading or answering audience comments; Encouraging the audience to follow or like their streaming.	Give me a like (点点赞); Please follow me (可以给我点个关注).	0.086
5	Prospect	Expressions of hopefulness.	I will overcome it. (会加油的); It will be better (会越来越好的).	0.024
6	Storytelling	Talking about their personal stories, focusing on their hardships.	This medicine needs to be taken for life. (药终身的); All I want is the child to live well (我只求孩子过得好). You can't imagine how hard it is. (你不知道有多难)	0.22

[1]percentage out of 4,200 sentences

Table 3. Prevalence of themes.

By observing, we get six multi-modal codes, as illustrated in Table 4. And then we count the number of the frequency of each code. Based on the analysis of the multimodal cues, we found that most of the hardship streamers used Mandarin and played hopeful music in the background. Most of the streamers 1) did not dress up nor design their background, opting instead a simple background; 2) used cues of their hardship in their usernames; and 3) promoted multiple products.

Cues	Code	Description	# of streamers
Audio	Language use	Streamers use of Mandarin (or dialect).	10
	Background music	Streamers use background music with hopeful melodies and sounds.	9
Visual	Retail type	Streamers promote multiple products (or single product).	9
	Hardship username	Username contains hardship cues (or not).	8
	Streaming background	Streaming background is simple (or well designed).	11
	Dressing	Streamers dress up during their live streaming (or not).	6

Table 4. Multimodal cues

Using the Mann-Whitney test, we found significant relationships between the multi-modal cues and the six themes. While most of the streamers spoke Mandarin (10 streamers), four streamers' dialects were evident; these four are all streamers over 60 years old. Streamers who used Mandarin put more emphasis on their interaction with the audience compared with those with a dialect; we found that language use is correlated with the Interaction theme (U=38.0, p=0.007). It is possible that those who spoke a dialect, were illiterate and thus unable to read the comments, barring them from interacting with their audience as much as the literate Mandarin-speaking streamers.

Nine streamers used background music to create a specific crowdfunding atmosphere during their live streams to enhance their presentation and potentially induce the audience's empathy with the streamer. Previous studies have found that live streaming with background music increased consumers' purchase intentions and arousal (Zhang et al., 2023). In the context of live crowdfunding, most of the streamers used soft and hopeful background music, including lyrics like 'Hello, tomorrow, smile with tears' ('明天你好，含着泪微笑'), 'My love protects you like an angel' ('我的爱像天使守护你'). Interestingly, streamers who used background music interact with the audience more; the usage of background music was related to the Interaction theme (U=41.0, p=0.008).

Two retailing models are common on TikTok; the first occurs when streamers collaborate directly with specific companies, and the other is when streamers choose any products that are available on the TikTok Shop and add them into their yellow cart to promote said products. Evidence shows that selling more products and spending more time on each product in a live stream drive both gross merchandise volume (GMV) and fan growth (Chen et al., 2023). Nine of the 14 hardship streamers did not have collaboration with specific companies while five of them focused on one or two products. Promoting one product allowed streamers to have a more centralized focus., while promoting multiple products allowed the streamers to appeal to wider audiences.

Eight of the 14 hardship streamers used the name of and their relationship to the beneficiary in their streaming username; at times, they added words to their usernames that indicated their hardship or their current condition. Their usernames were, for example, 'XX's father is the bravest' or 'The disabled XX'. Usernames are an important visual code that helps the audience understand the purpose of live crowdfunding. This strategy is useful for allowing streamers to attract their audience by indicating their purpose up front.

A streamer's background influences consumers' purchase intentions, and the visual design that encourages consumers' positive emotions and purchase involves moderate visual complexity (Shang et al., 2022; Tong et al., 2022). Eleven of the 14 streamers streamed from their home using a simple or plain background, while only three of them designed their background to appear more professional. We found that the designed background is correlated with the theme of product promotion (U=0.0, p= 0.006). It is possible that streamers who designed their background live stream similarly to other e-commerce streamers; a designed background and heavy promotion of

products and can intentionally lead to their larger economic gain. Streamers with a random or empty background were less engaged in promoting products in their live streaming.

Lastly, while professional e-commerce streamers dress up and put obvious effort into steaming by projecting an appealing physical appearance (Gao et al., 2021), less than half of the streamers in our sample dressed up, most opting instead to dress casually. The audience estimates the streamers' trustworthiness based on simple cues such as the streamer's appearance, which, alongside their perception of e-commerce, impacts the audience's purchasing decisions (Sun et al., 2019). However, hardship live streamers' crowdfunding differs, because it is possible that a less appealing appearance can increase the audience's perception of their trustworthiness; just like the rural female streamers who also promote products online to make a living (Tang et al., 2022), they demonstrated their authenticity mainly through showcasing local traditions, living spaces and landscapes.

In summation, our findings demonstrate how hardship live streamers use multi-modal cues during their ELS by adopting an authentic, grateful, and resilient image through a combination of hardship storytelling and production promotion. They take advantage of the richness of live streaming that helps them share more visual and verbal cues to provide and receive immediate feedback from their audience (Daft & Lengel, 1986). Compared with other E-commerce live streamers, the hardship live streamers in our study try to differentiate themselves by highlighting their unique circumstances.

The streamers in our sample use visual, audible, and verbal (textual) cues to present an authentic and comprehensive self-image as grateful, resilient, and polite individuals in need of help. ELS streamers play a key role in establishing the audience's trust in the products through their interactivity and authenticity (Greenwald, 2020). Hardship streamers aim to establish their audience's trust in their authenticity and their hardships. To do this, streamers play soft and encouraging music, have simple backgrounds, and wear modest outfits. Some streamers speak with a dialect and stream from their simple, unfurnished house, which helps to establish their authenticity. They differentiate themselves from other popular E-commerce live streamers, who stream with decorated backgrounds (Tong et al., 2022) and utilize appealing visual presentations. Incorporating elements of their hardship into their usernames to provide immediate context for viewers is another aspect of their self-presentation that differ from other ELS streamers.

Do hardship streamers presentations vary by gender?
We did not find gender differences in the multi-modal cues, but we did find that females demonstrate a faster talking pace, use more negative tones, and emphasize their hardships more often than male streamers do.

We found that females tend to use a more negative tone compared to males (Table 5); the sentiment score generated from Vader for females is significantly lower than for male streamers (U=9.0, p=0.028). Female streamers tend to have a faster-talking pace, in terms of the number of sentences per second, than males (U=39.0, p=0.037). Female live streamers have significantly longer audience retention (Stay) length (U=15.0, p=0.030) than males, in terms of the average viewing time per audience. Importantly, RPP and RPM did not vary based on streamer gender (Table 5).

	Talking pace	Sentiment score	RPM	RPP	Stay (s)
Female	0.271	0.120	52.193	0.600	72.571
Male	0.178	0.208	72.358	0.531	48.286
Mann-Whitney U	39.0	9.0	18.0	20.5	15.0
P-value	0.037	0.028	0.222	0.327	0.030

Table 5. Variations by Gender

Analysis of the 6 themes by gender revealed no gender differences in any of themes, except for one: female hardship streamers are significantly more inclined to discuss their hardships (storytelling) in live streaming (Table 6). Like other female e-commerce live streamers who tend to talk more about their everyday life (Wang & Gong, 2017; Wang & Jiang, 2021; Wang & Liu, 2019), the female hardship streamers also talked more about their personal life to effectively appeal to the audience.

	Welcoming	Appreciation	Promoting	Interaction	Prospect	Storytelling
Female	0.019	0.119	0.384	0.065	0.017	**0.351**
Male	0.054	0.172	0.474	0.106	0.031	**0.089**
Mann-Whitney U	21.5	17.0	20.0	19.0	20.0	6.0
P-value	0.373	0.186	0.305	0.264	0.301	0.011

Table 6. Theme Frequency by Gender

In summary, female and male hardship live streamers adopt similar visual and verbal cues in their live streaming. They differ in the pace of their speech, their speaking tone, and the extent of their hardship storytelling. Hardship streamer's effectiveness, in terms of RPM and RPP, is not significantly different based on gender, but audiences tend to stay significantly longer on female live streaming sessions.

What self-presentation strategies of hardship streamers impact their effectiveness?

In this session, we begin by exploring the correlations among effectiveness measurements, followed by an examination of the relationship between emotion scores and these measurements. Finally, we talk about how multi-modal cues relate to effectiveness metrics.

The results of the Pearson correlation between the five measures of effectiveness with the sentiment scores and the six themes are shown in Table 7. As shown in Table 7, we found that the number of views per minute (Views) is positively correlated with the time the audience stayed (Stay) and the money they spent per minute (RPM). The revenue of the fundraiser (RPM) is positively correlated with the number of followers (Followers) and the average number of audience members per minute (Views). However, the longer the audience stayed in the streaming session (Stay) does not relate to a higher revenue per minute (RPM). It may be results of that the variation of the number of followers in our samples and interests in the live streaming content doesn't necessarily contribute to the purchase. They may contribute in other ways like gifting.

We also found a positive correlation between the emotion score and sales data (RPP), and a negative correlation between the emotion score and the time the audience stayed in the live streaming room. Expression of hardship (Storytelling) is correlated with the number of followers and with the time the audience spent in the live streaming room (Stay). Mentioning hardship through storytelling increased the time the audience stayed in the live streaming room and was correlated with a higher number of followers. While accentuating their hardship struggles helps

the hardship live streamers achieve their fundraising objectives, we found that it can negatively influence the streamer's emotion presented, which may adversely affect sales. However, the streamers' expressions of gratitude and hopefulness help mitigate this negative impact. Instead of keeping talking their hardship while streaming, nearly all streamers maintain a grateful and resilient image, frequently expressing appreciation to their audience for purchases, staying in the room, or showing goodwill in the comments. They also convey hopefulness for the future to keep the emotional tone positive, positively contributing to the consumers' purchase intention, which is consistent with previous study in ELS. Therefore, it is suggested that fundraisers balance product promotion and hardship storytelling to maintain a positive atmosphere, which would be beneficial for sales.

	Views	Followers	Stay	RPP	RPM	Sentiment score	Welcoming	Appreciation	Promoting	Interaction	Prospect	Storytelling
Views	1.00	0.79	**0.67***	-0.54*	**0.54***	-0.50	-0.42	-0.51	-0.27	0.37	0.21	0.38
Followers		1.00	0.47	-0.34	**0.60***	-0.45	-0.28	-0.43	-0.18	-0.15	-0.20	**0.54***
Stay			1.00	-0.41	0.25	-0.51*	-0.64	-0.28	-0.19	0.36	0.18	**0.30***
RPP				1.00	-0.03	**0.22***	0.14	0.16	0.14	-0.45	-0.06	0.13
RPM					1.00	0.07	-0.21	-0.43	0.22	-0.18	-0.15	0.16
						1.00	0.68	0.63	0.42	-0.21	0.01	-0.75
* $p < 0.05$												

Table 7. Correlation matrix

To examine the relationship between the multimodal cues (visual and audio) and the effectiveness of streamers, we used the Mann-Whitney test. We found that 1) language use is related to RPP: streamers who used Mandarin made more money (RPP) than the streamers using dialect (U=29.5, p=0.050); and 2) streamers who focused on promoting multiple products kept the audience in their streaming session for longer (Stay) (U=41.0, p=0.008), but did not generate higher revenues (either RPP or RPM). It is possible that the use of Mandarin correlates with another explanatory variable that may or may not differ from other streamers, but we did not examine that in this study and hope that future research may uncover it.

Though we don't find significant correlation between the theme of interaction and sales performance examined in this study, it would potentially improve fundraising outcomes in a long term. Taking advantage of the interaction features like following, gifting, and liking, the hardship streamers encouraged the audience to interact with them by suggesting liking their videos, following their account, and join their fan groups. These strategies help turn the audience's short-term, one-time contribution into long-term, potentially continuous contributions.

Limitations
One of the limitations of the study is its small sample size, and given the sampling method, the hardship streamers in the sample may not represent hardship streamers as a whole. Hardship streamers from other countries or those who face other challenges may present different strategies and may exhibit other behavioural patterns; future research may examine larger and more heterogeneous samples. In addition, we analysed the live streaming session, but a better understanding of the motivations and intentions of the streamers calls for in-depth interviews of these streamers as they engage in live crowdfunding; future research may utilize other methods to address these types of research questions.

Conclusions

Through an analysis of 14 male and female hardship streamers engaged in ELS, this study examined how these individuals leveraged technology to seek online assistance and empowerment through fundraising live streams on the Chinese TikTok. Streamers employed visual, audible, and textual cues to project an authentic, grateful, and resilient persona, particularly when focusing on hardship narratives and product promotion. While they followed the same techniques used by other E-commerce live streamers when utilizing multi-modal cues in presentation, they distinguished themselves from other ELS streamers by highlighting their struggles through strategic use of background settings, music, and content. The study found a moderate relationship between the portrayal of hardship and the length of time audiences spent in live streaming sessions. However, rather than continually emphasizing hardship, maintaining a positive atmosphere in ELS was found to be more effective for fundraising success. While gender of the streamers didn't play a role in their fundraising success, there were gender differences in their streams: females had a faster talking pace, used a more negative tone, and focused more on personal hardship storytelling than their male counterparts. Overall, this study makes a significant contribution to the literature by illustrating how ELS can empower marginalized populations and identifying potential strategies to enhance this empowerment.

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