



Continuance intention to use audio live-streaming applications: Understanding the influence of gratifications-technology fit and gratifications obtained

النوايا الاستمرارية في استخدام تطبيقات التدفق الصوتي المباشر: تفهم تأثير ملائمة التكنولوجيا-المرغبات والرغبات المكتسبة

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Abstract:

Given that different social media platforms satisfy different uses and gratifications, understanding why users intend to continue to use them is important for practitioners and academics alike. This research provides an empirical perspective on the antecedents of the continuance behavior of using audio live-streaming services, applying the uses and gratifications theory combined with other factors from the perspectives of the task-technology fit model and social presence theory. The sample consisted of 200 members of three clubs in the Clubhouse application. Structural equation modeling was employed to test the research model. The results indicate that escapism, sociability, entertainment, and information gratifications are associated with the intention of continuance use behavior. The results further reveal that the gratifications-technology fit influences all the gratifications obtained from using audio live-streaming services. The implications for both theory and practice are provided based on the findings.

Keywords: uses and gratifications theory; task-technology fit model; social presence theory; live-streaming platforms; voice streaming services; Middle East

المستخلص :

نظرًا لأن منصات الوسائط الاجتماعية المختلفة تحقق استخدامات ورغبات متعددة، فإن استيعاب سبب رغبة المستخدمين في الاستمرار في استخدامها أمر ضروري للممارسين والأكاديميين على حد سواء، لذلك يقدم هذا البحث منظورًا تجريبيًا لسلوك استمرارية استخدام خدمات التدفق الصوتي المباشر من خلال تطبيق نظرية الاستخدامات والرغبات جنبًا إلى جنب مع عوامل أخرى من منظور نموذج ملائمة التكنولوجيا-المهام ونظرية الظهور الاجتماعي. تكونت العينة من ٢٠٠ مستخدم مسجلين في ثلاثة أندية في تطبيق كلوب هاوس Clubhouse، وتم استخدام نمذجة المعادلة البنائية لتحليل البيانات ولاختبار نموذج البحث. تشير النتائج إلى أن الهروب من الواقع، والتواصل الاجتماعي، والترفيه، ورغبة الحصول على المعلومات ترتبط بسلوك النوايا الاستمرارية للاستخدام. تكشف النتائج أيضًا أن "ملائمة التكنولوجيا-الرغبات" تؤثر على جميع الرغبات التي يتم تحقيقها من استخدام خدمات التدفق الصوتي المباشر. وبناءً على النتائج تم مناقشة الآثار المترتبة على كل من النظرية والتطبيق.

1. Introduction

Since the outbreak of the pandemic and the restrictions on people's movements around the world, individuals have become keen to use virtual environments, including live-streaming services such as Facebook Live, YouTube Live, and Amazon Live (Kim et al., 2021). COVID-19 has accelerated the level of use of digital technologies, and many of these uses could continue as permanent, long-term measures that can provide tangible benefits (Dey et al., 2020). Live-streaming services have become increasingly influential in the lives of many people because they offer real-time human interaction between speakers and listeners, facilitating their ability to interact with each other. Several studies have confirmed that users prefer these services over other services due to their convenience, better content, low or no cost, exclusiveness, appointment viewing, innovative shows, latest premieres, break-free shows, etc. (Yang & Lee, 2018).

A new live-streaming service, Clubhouse, has emerged. As a special form of social-audio network, Clubhouse allows users to listen to live conversations, interviews, and discussions from exciting and famous people on various topics (Zhu, 2021). As well as just listening, Clubhouse users can also open chat topics (rooms), share stories, collaborate, and discuss. Compared with other social media platforms, audio live-streaming services are categorized as synchronous communication in which there is a real-time occurrence of interaction between human beings (Clubhouse, 2022).

The sustainability of an information system (IS) is a significant challenge that IS developers and providers endeavor to overcome. Many studies have delivered meaningful insights regarding users' IS acceptance; however, the initial acceptance of an IS does not guarantee its long-term viability. The reason relates to users' dissatisfaction with their initial adoption of the system and the discontinuance of repeated use as a consequence (Kang, 2020). Thus, for an IS's sustainability, users should continue to adopt the system after its introduction, and hence, understanding users' continuous usage of systems has become critical (Kang, 2020).

The exponential growth in the number of live-streaming service users has prompted IS researchers to focus on what motivates people to devote a substantial amount of their time to live-streaming services (Hilvert-Bruce et al., 2018; Li & Guo, 2021). Our review shows that the uses and gratifications theory (UGT) is a prominent approach in explaining the social and psychological gratifications that facilitate and sustain individuals' adoption of ISs (Chen, 2018; Ishii et al., 2017; Lo & Leung, 2009), including social media (Bae, 2018; Hilvert-Bruce et al., 2018). According to Ishii et al (2017), such gratifications depend strongly on the technological and aesthetic features of a media, yet little attention has been paid to combining the fit between the uses and gratifications perspective and the technological perspective.

The task-technology fit (TTF) model is a widely used theoretical model for assessing how information technology (IT) leads to performance and usage influence. Good and Thompson (1995) asserted that for an IS to positively impact technology utilization, IT must be a good fit with the tasks it supports to have a performance impact. Since its publication, the TTF model has been used in various context (Aljukhadar et al., 2014; Parkes 2013; Wu and Chen, 2017). Live-streaming platforms are new ISs, and the services provided by them are usually new and unknown or unfamiliar to users. Due to the fact that the TTF model does not provide psychological and social constructs, Lu and Yang (2014) indicated that the application of TTF the research on social networking service adoption is still insufficient. Consistent with Goodhue and Thompson's (1995) conclusion, we argue in this study that technological services must be a good fit with users' gratifications so that the fit has a positive impact on utilization, which is the gratifications obtained by users, and performance, which is the continuous intention to use audio live-streaming applications. Hence, the current study aims to identify whether and to what extent the construct of gratifications-technology fit impacts the gratifications factors. It also aims to investigate the influences of gratifications on live-streaming continuous intention.

2. Literature review

2.1 Live streaming

In the context of social media, there are two types of computer-mediated communication: asynchronous, in which users may not necessarily be online at the same time (e.g. Facebook, Twitter, Instagram) (Lo & Leung, 2009); and synchronous, in which there is a real-time occurrence of communication between participants, such as video, audio, and computer conferencing (Li et al., 2021). The latter type occurs in what are known as “live-streaming services.” Top-performing players in the live-streaming industry include YouTube Live, Facebook Live, Periscope, and Twitch. Live streaming is becoming an important channel of content dissemination, which can be general, without any subject restrictions (e.g. YouTube Live), or live-streaming services with specific themes (e.g. Twitch) (Scheibe et al., 2018).

Unlike other live-streaming services, Clubhouse is a live-streaming application that can only perform synchronous voice communication through internet-connected smart devices such as smartphones, tablets, laptops, and desktop computers. Although it is novel, the application has recorded significant growth in the rate of use. At the end of 2020, for instance, Clubhouse had recorded over 1 million downloads, while in 2021 this had increased to 13 million downloads. In the application, users conduct voice calls, referred to as “rooms,” which have titles that users can view to see the topic of conversation in that room and join any public room that they find through different functions in the application. Clubhouse announced that about 700,000 rooms had been opened every day by the end of 2021 (Clubhouse, 2022). All Clubhouse users are either listeners, who do not have the ability to speak without getting permission from the moderator, or speakers, who can unmute their microphone and be heard by everyone in the room. In addition, there are moderators whose role it is to create the rooms, end the rooms, invite users to speak, mute speakers, and share the moderator role with others (Bajpai et al., 2021). In fact, moderators sometimes play the role of speaker in Clubhouse rooms. Among the application’s users, there is a high-

quality audience of celebrities, such as Tesla CEO Elon Musk and Facebook CEO Mark Zuckerberg, who were considered the first to enter the Clubhouse application (Strielkowski, 2021). Due to the fact that users prefer to spend a great deal of time on the application and that a large number of rooms are opened every day, Clubhouse is expected to become the next big knowledge-sharing platform (Zhu, 2021).

The application's developers have become concerned about the exponential increase in Clubhouse use. The popularity of the application could not have been achieved without the COVID-19 pandemic, which introduced social distancing and strict lockdowns (Strielkowski, 2021). Thus, the current significant increase might be substantially weakened once pandemic restrictions are lifted. In addition, the functional overlap between such social media platforms can competitively replace older apps with newer media (Scherr & Wang, 2021). The technology of live-streaming audio chat, for example, has recently been tested and applied in several popular social platforms, such as Twitter and Facebook (Bajpai et al., 2021), which could increase their dominance and decrease Clubhouse's superiority. These challenges may lead to the risk of discontinuity after the application has been oriented by developers and marketers and adopted by the general public. Thus, an investigation of factors that influence users' continued use of the Clubhouse application may reveal insights into its visibility and sustainability.

2.2 Uses and gratifications theory (UGT)

UGT is an influential psychological and social theory that investigates the questions of "how" and "why" individuals actively use certain media to satisfy specific needs (Katz et al., 1974). The theory is built on an assumption that media use is selective and motivated by a rational self-awareness of one's own needs and an expectation that those needs will be satisfied by particular types of media and content. In this context, needs are defined as "the combined product of psychological dispositions, sociological factors and environmental conditions" (Katz et al., 1973, p. 179). UGT has five general categories of need: cognitive (information), emotional

(entertainment), social (connection), personal integrative, and escape. Gratifications are conceptualized as satisfactions that are obtained when an individual's needs are fulfilled through media use (Palmgreen, 1984). In this case, gratifications that individuals actually experience through the use of a particular medium are called "gratifications obtained" (Katz et al., 1973). Gratifications obtained from a medium are the antecedents behind the existence and continuation of a particular medium (Menon & Meghana, 2021).

With the advent and popularity of computer-mediated communications, several media companies are now offering live video and audio streaming services. UGT provides an excellent and relevant foundation for research on motives for live-streaming platform usage in various contexts (Gan & Li, 2018; Hilvert-Bruce et al., 2018; Hsu & Lin, 2021; Meng & Leung, 2021; Scherr & Wang, 2021). For example, Gan and Li (2018) identified four types of gratifications in the context of WeChat: hedonic, social, utilitarian, and technology. Hilvert-Bruce et al. (2018) developed an eight-factor socio-motivational model to explain four aspects of live-stream viewer engagement. In a subsequent study, Scherr and Wang (2021) examined the influence of five gratification niches on TikTok's competitive displacement potential among its users during the day and night who are actively posting content. Although researchers have identified several gratifications obtained by using live-streaming platforms, most of the research still limits the focus to specific streaming content, such as video streaming. Not all streaming services are the same; instead, they are highly varied, ranging from different technological features to different content types. Thus, this study aims to investigate gratifications obtained from using only audio streaming content, focusing on the Clubhouse application.

2.3 Task-technology fit to gratifications-technology fit

Investigating only gratifications to determine the antecedents behind IT usage is considered a simple model and not sufficient for sustainability. To profoundly understand usability and usage continuance behavior in the context of social media, researchers have focused on the technological attributes dimension alongside the

gratifications factors dimension (Kim & Kim, 2019; Lo & Leung, 2009; Meng & Leung, 2021). Kim and Kim's (2019) work on the behavior of social media users, for example, suggested that the gratifications factors and the technological attributes are related in social media usage.

The TTF model is widely employed for explaining and predicting how the fit between task characteristics and technology characteristics positively affects task performance and technology utilization (Goodhue & Thompson, 1995). However, TTF has been modified several times to successfully fit further IT contexts. For example, TTF was used in the information context to investigate the fit between information quality and task characteristics (Zha et al., 2018), to assess the fit between website design quality and task characteristics (Dedeke, 2016), and to examine the fit between information quality and the university choice task (Alajmi & Said Ali, 2021). Meanwhile, Lu and Yang (2014) extended the context of TTF to include social factors in the context of social media, such as social integration. With the rapid development of social media, including live-streaming services, various gratification factors have been recorded in social media research (Kim & Kim, 2019) due to the different technological characteristics of each social media platform. In the current study, TTF is modified to be addressed in the context of gratifications; specifically, the construct of "gratifications-technology fit" has been developed to investigate the fit between the technology of social media platforms and the gratifications obtained.

3. Conceptual model and hypotheses development

Figure 1 depicts the relationships of the constructs in the research model, which extends the UGT by introducing the constructs of gratifications-technology fit and continuous intention to use audio-based applications. Specifically, the model is used to explore the impact of gratifications-technology fit on five gratifications obtained (entertainment, sociability, information, escapism, and social presence) which, in turn, affect continuous intention to use audio live-streaming applications.

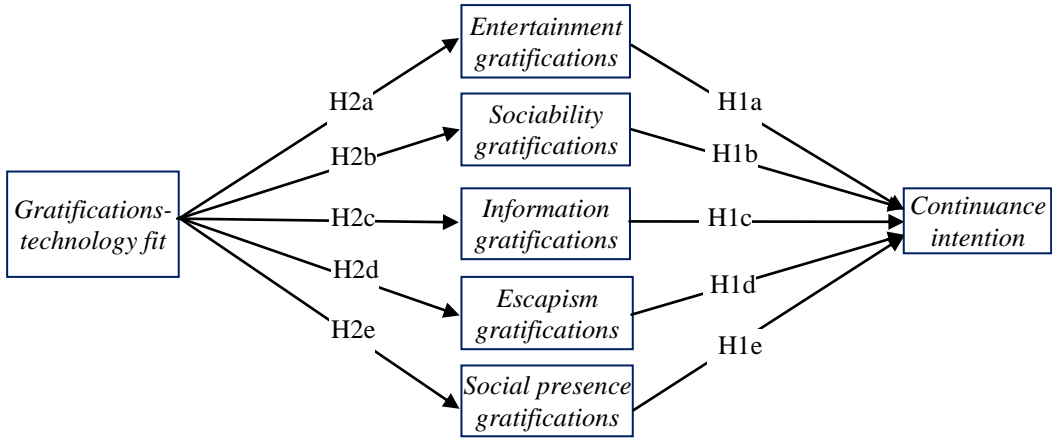


Figure 1. Research model

3.1 Gratifications obtained and continuous intention

Gratifications obtained refers to the gratifications that users actually experience through the use of a particular platform (Katz et al., 1973). From the viewpoint of UGT, media utility depends on individuals' tendency to portray a specific behavior to better satisfy their needs. In other words, when streaming service members are gratified with their online use, they are more likely to respond by engaging in beneficial behaviors toward the medium, such as continued use. Thus, people have different needs to consume the same media, and different users' motivations can be met differently by the same media. Given the importance of engaging users to continue using streaming services, it is important to explore the gratifications that are associated with the continuous intention behavior in the audio live-streaming context.

Based on UGT's general categories of needs, social presence theory, and the gratifications identified in the context of social media, we used the top five key gratifications obtained (entertainment, sociability, information, social presence, and escapism) to explore the relationships between these gratifications and the continued usage intention of audio live-streaming services.

Entertainment gratification refers to the benefits derived from the fun and enjoyment of interacting and playing with streaming services. A study conducted by Dickinger et al. (2008) suggested that

perceived entertainment plays an ornamental role in improving continued intentions with regard to IT and IS services. Further, Gan and Li (2018) and Li et al. (2015) underlined the role of perceived enjoyment in the continued intention to use IT and IS services. In the video streaming services context, perceived entertainment plays a salient role as it includes the exciting content that leads to the user's entertainment (Singh et al., 2021). Perhaps one of the paramount reasons why individuals view audio streaming services is to be entertained. This encourages us to hypothesize the following:

H1a. Entertainment gratification positively affects the continued intention of audio live-streaming usage.

Sociability gratification relates to the social benefits received from the connection with family, friends, and the world (Cheung & Lee, 2009). Research has consistently shown that socializing needs are important gratifications derived from social media use (Bae, 2018; Chang, 2018; Hsu & Lin, 2021). That is, the desire to connect and interact with others improves one's own social worth and motivates online media usage. In the context of streaming services, social needs, such as meeting new people, social interaction, and sense of community, were identified as important factors in viewing the Twitch platform (Hilvert-Bruce et al., 2018). Although audio streaming services specifically depend on audio-based functions to connect members with each other, the importance of sociability gratifications, identified in other social media platforms, is still vague in the audio live-streaming context. Thus, we hypothesize:

H1b. Sociability gratification positively affects the continued intention of audio live-streaming usage.

Information gratification, in this study, refers to the activities of information seeking and information sharing and, further, to their consequences for individuals' cognition enhancement through interaction within the live streaming. The importance of information gratification has become salient as a motivation for using social media (Hilvert-Bruce et al., 2018; Sjöblom et al., 2017). People are likely to pay more attention to issues they care about and be willing to provide their opinions, especially when they have a wealth of understanding

and knowledge in a particular field (Li & Guo, 2021). For example, moderators sometimes invite groups of politicians, business leaders, or professors as speakers, and give listeners the opportunity to share information in real time through a short conversation, which is much more immediate than posting comments in other streaming services (Zhu, 2021). In audio live streams, Clubhouse in particular, all conversations follow the functions of synchronicity and ephemerality (Bajpai et al., 2021), which might provide pros or cons for users' interaction. Thus, we put forward the following hypothesis:

H1c. Information gratification positively affects the continued intention of audio live-streaming usage.

Escapism gratification refers to the positive emotion of distracting an individual from the stresses of daily life. Previous studies have discovered a variety of individual needs for viewing social media, including relaxation, tension release, passing time, and escaping from reality (Chang, 2018; Kim & Kim, 2019; Leiner et al., 2018; Li et al., 2015; Menon & Meghana, 2021). In previous research on streaming services, escapism was also found to be a major motivation driving continuous intention to view live video streaming services (Camilleri & Falzon, 2021; Sjöblom et al., 2017). However, to our knowledge no research has identified the influence of escapism on applications that depend only on audio streaming functions. We argue that when users are immersed in conversations with other members, they can easily escape from the problems of real life. Based on the above reasoning, we propose the following hypothesis:

H1d. Escapism gratification positively affects the continued intention of audio live-streaming usage.

Social presence gratification, in this study, refers to an individual's success in creating an ideal image that is accepted by others. According to media psychology researchers, social presence is a medium's warmth, and thus, social presence is a motive that drives people to select a particular medium (Gan & Li, 2018). Social presence has been found to be a very influential factor predicting individuals' intentions toward various IS usage, such as online travel communities (Ukpabi et al., 2019), online shopping (Dash & Saji,

2008), and social media usage (Chang, 2018). Live-stream platforms are a unique form of social media that enable members to interact with streamers (moderators or speakers) as well as with other viewers (listeners) (Zhao et al., 2018). Unlike video live-streaming platforms, many audio streaming services provide simple or limited affordances (Bajpai et al, 2021), which may restrict or encourage users to gratify their social presence. Based on the above reasoning, we propose the following hypothesis:

H1e. Social presence gratification positively affects the continued intention of audio live-streaming usage.

3.2 Gratifications-technology fit and gratifications obtained

Unlike TTF, which focuses on the influence of the fit between technology and task on utilization, gratifications-technology fit refers to the influence of the fit between gratifications and technology on gratifications obtained by using streaming services. Thus, in the current study, gratifications-technology fit is a construct defined as individuals' perception of the extent to which technology functions provided by streaming services assist an individual to fulfill their gratifications.

In the online learning literature, a number of studies have revealed the effects of users' perceived TTF on adoption (Khan et al., 2018; Rai & Selnes, 2019). The literature on individuals' behavioral intentions toward social media has also showed successful application of TTF (Li et al., 2019; Lu & Yang, 2014). Recent empirical work on social media adoption and usage has largely emphasized that individuals perceive and utilize user-generated media according to similar interests and motivations (Kim & Kim 2019; Meng & Leung, 2021), but each type of gratification might change depending on the fit between technologies and gratifications. The positive scenario is that the more a technology fits specific gratification characteristics, the higher the probability that the technology will contribute to an improved level of gratification obtained (Goodhue et al., 2000; Kim & Kim 2019; Lo & Leung, 2009; Meng & Leung, 2021). Thus, we assume that a good fit between individuals' needs and technology functions positively affects the gratification that users obtain by using

live-streaming services.

H2. Perceived gratifications-technology fit positively affects users' gratifications (H2a. entertainment gratification, H2b. sociability gratification, H2c. information gratification, H2d. escapism gratification, and H2d. social presence gratification) from using audio live-streaming services.

4. Methodology

The research instrument used for gathering data was a questionnaire designed on the basis of relevant literature. The authors used previously validated instruments for all the constructs, which preserved content validity. The appendix lists all measurement items and sources. All items were measured on a 5-point Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree). The questionnaire was translated into Arabic based on the back-translation method suggested by Brislin (1970) because the target population were mostly Arabic speakers. A pre-test was conducted with a total of 12 data points – 2 academics and 10 academic students – to resolve any ambiguity in the wording or measurement. Based on their feedback, some modifications were made to improve the comprehensiveness of the measurement items.

The target population were all individuals who use audio live-streaming services, Clubhouse in particular. Clubhouse is a relative newcomer to the streaming services marketplace and offers an entirely audio-based platform, where users can participate in group audio conversations. Clubhouse enables the creation of rooms, where users can find a place for conversations about specific temporary events, and allows the establishment of clubs, where users enter permanent communities that share the same interests and events. For the purpose of this research, data were collected from the members of three clubs that are famous, at least in the context of Kuwait, on the Clubhouse platform (with 1,301, 1,029, and 1,005 members) to achieve more generalizability and to cover a larger portion of the population.

With the help of the clubs' administrators, who have lists of contacts, including followers, an invitation containing a hyperlink to an online survey administered via SurveyMonkey was sent to the

members of the three clubs. In fact, the three administrators each created a public room corresponding to the hyperlink of the online survey within the clubs to be shared with the members of each club. A total of 404 members attended the three rooms (165, 127, and 112). The survey ran for four weeks following the creation of the rooms and announcing the event, and 255 responses were received. The response rates for each room were 57% (N=94), 64% (N=81), and 72% (N=80), respectively. Responses were eliminated if they met certain conditions, such as missing data or uniform answers given for all items. Eventually, 200 valid responses were used for the subsequent analysis. The responses from each club were compared using a series of t-tests. No significant differences between the groups were identified, thereby indicating a minimal threat from non-response bias. Table 1 summarizes the demographic characteristics of the sample respondents.

Table 1. Demographic analysis

Characteristics	Values	Frequency	Percentage (%)
Gender	Male	125	62.5
	Female	75	37.5
Age	≤ 18 years	15	7.5
	19–29 years	95	47.5
	30–40 years	80	40.0
	≥40 years	10	5.0
Job status	Student	55	27.5
	Employee	125	62.5
	Retired	5	2.5
Education	Other	15	7.5
	High school or less	40	20.0
	Diploma or Bachelor	140	70.0
	Master or PhD	20	10.0
Duration of use	Less than 30 minutes	55	27.5
	30 minutes – 1 hour	30	15.0
	1–2 hours	20	10.0
	2–3 hours	30	15.0
	Greater than 3 hours	65	32.5

5. Results

The study applied Anderson and Gerbing's (1988) two-step approach: confirmatory factor analysis (CFA) for the validity of the measurement model and structural equation modeling (SEM) for the verification of the proposed hypotheses. Amos 25.0 was utilized to apply SEM to evaluate the model's fit and test the causal hypothesized relationships of the study's variables.

5.1 Measurement model assessment

A CFA was performed to validate the measurement model. The model consisted of seven constructs – gratifications-technology fit, entertainment gratification, sociability gratification, information gratification, social presence gratification, escapism gratification, and continuance intention – which were reflected by 25 indicators. In the initial measurement analysis, the CFA highlighted a few validity and reliability issues with respect to four of the indicators, and these were deleted to overcome these problems. Based on the results following deletion of the indicators, the overall fit of the measurement model was satisfactory, as shown in Table 2.

Table 2. Model fit measures

Measure	Measurement model	Structural model	Recommended value	References
χ^2/df	3.86	3.18	< 5	Byrne (2001)
GFI	0.935	0.985	> 0.90	Hair et al. (2018)
NFI	0.897	0.987	> 0.80	Hooper et al. (2008)
CFI	0.958	0.988	> 0.90	Byrne (2001)
RMSEA	0.069	0.077	> 0.08	Byrne (2001)

Note: χ^2/df is the ratio between chi-square and degrees of freedom; GFI: Goodness of Fit Index; NFI: Normed Fit Index; CFI: Comparative Fit Index; RMSEA: Root Mean Square Error of Approximation

Table 3 illustrates all standardized factor loadings that were greater than 0.70 at a significance of $p < .001$. Reliabilities of each construct ranged from 0.78 to 0.92 in Cronbach's alpha coefficients; these were higher than the reference value of 0.7. The average variance extracted (AVE) for all constructs exceeded 0.50, ranging from 0.567 to 0.808. Lastly, all composite reliabilities of constructs

were above the threshold value of 0.70, ranging from 0.796 to 0.926. Based on Fornell and Larcker's (1981) guidelines, the values asserted that convergent validity of the measurement scale was supported. Discriminant validity was examined by comparing the squared correlation between a pair of constructs with the AVE (Fornell & Larcker, 1981). If the squared correlation between two constructs of interest is lower than the AVE for each construct, this is an indication of discriminant validity (Fornell & Larcker, 1981). As presented in Table 4, discriminant validity of all constructs was statistically supported.

Table 3. Internal validity

Construct	Items	Factor loadings	CR	AVE	Cronbach's alpha
Entertainment gratification	EG1	0.798	0.906	0.763	0.910
	EG2	0.891			
	EG3	0.927			
Sociability gratification	SG1	0.794	0.908	0.769	0.905
	SG2	0.941			
	SG3	0.889			
Information gratification	IG1	0.790	0.916	0.786	0.902
	IG2	0.954			
	IG3	0.907			
Escapism gratification	EsG1	0.801	0.796	0.567	0.780
	EsG2	0.702			
	EsG3	0.752			
Social presence gratification	SPG1	0.842	0.910	0.772	0.904
	SPG2	0.878			
	SPG3	0.915			
Gratifications-technology fit	GTF1	0.885	0.926	0.808	0.924
	GTF2	0.956			
	GTF3	0.852			

Continuous intention	CI1	0.874	0.840	0.638	
	CI2	0.778			0.835
	CI3	0.738			

Note: CR = composite reliability, AVE = average variance extracted
Table 4. Correlations among latent constructs and square root of AVE (in bold)

ENG	GTF	CI	ESG	SOG	IG	SPG
0.753						
0.653	0.899					
0.735	0.756	0.799				
0.663	0.778	0.742	0.874			
0.684	0.841	0.731	0.845	0.877		
0.711	0.701	0.725	0.779	0.770	0.886	
0.683	0.701	0.689	0.777	0.642	0.591	0.879

Note: ENG = entertainment gratification, GTF = gratifications-technology fit, CI = continuous intention, ESG = escapism gratification, SOG = sociability gratification, IG = information gratification, SPG = social presence gratification

Finally, the common method bias was evaluated by considering Harman's (1976) statistical strategy. Harman's single factor test was conducted for all seven factors. They were adjusted to Harman's single factor test using exploratory factor analysis and inspected using an unrotated factor solution. The results asserted that common method bias is unlikely to be a serious concern for this study because the largest factor extracted (39.3%) was less than the recommended level of 50% (Harman, 1976).

5.2 Structural model assessment

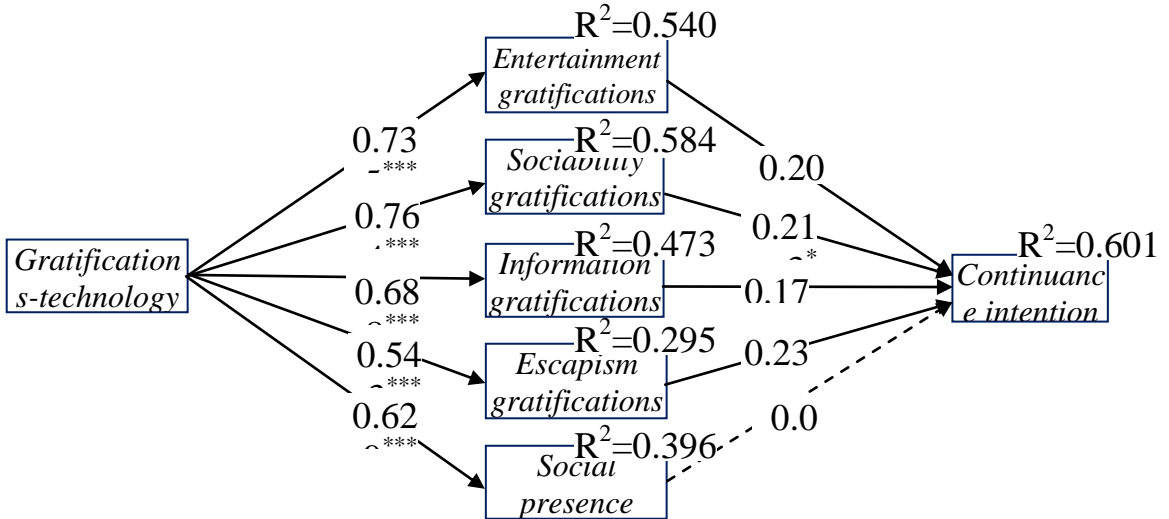
With an acceptable fit in the measurement model, SEM was conducted using Amos 25.0 for the overall model. The overall structural model yielded a similarly reasonable model fit with the data (see Table 2). To test the hypotheses, the authors measured the explained variance (R²) of the dependent variables, path coefficients, and their levels of significance (t-values), which were obtained from bootstrapping with resampling (5,000 resamples) to assess the

significance of the hypothesized relationships (Hair et al., 2018). In terms of the influence of gratifications-technology fit, the theoretical model was able to explain 54.0%, 58.4%, 47.3%, 39.6%, and 29.5% of the variance in entertainment gratification, sociability gratification, information gratification, social presence gratification, and escapism gratification, respectively. With regard to the gratifications obtained, the theoretical model was able to predict 60.1% of the variance in continuance intention to use audio live-streaming services. The results are summarized and described in Table 5 and Figure 2.

Table 5. Outcome of the hypotheses – evaluation of structural model

Hypothesized path	Direct path ^a	t-value	Result
H1a. ENG → CI	0.204	2.209*	Supported
H1b. SOG → CI	0.213	2.407*	Supported
H1c. IG → CI	0.175	1.852*	Supported
H1d. ESG → CI	0.236	3.126**	Supported
H1e. SPG → CI	0.098	1.228 ^{ns}	Not supported
H2a. GTF → ENG	0.735	15.272***	Supported
H2b. GTF → SOG	0.764	16.720***	Supported
H2c. GTF → IG	0.688	13.372***	Supported
H2d. GTF → ESG	0.543	9.117***	Supported
H2e. GTF → SPG	0.629	11.414***	Supported

Nine hypotheses were supported and one was abandoned. The construct of gratifications-technology fit significantly influenced each gratification, making all the corresponding path coefficients greater than 0.54. It had the strongest positive effect on sociability gratification ($\beta = 0.764$, $t\text{-value} = 16.720$, $p < 0.001$). The results also showed that gratifications-technology fit influence entertainment gratification ($\beta = 0.764$, $t\text{-value} = 15.272$, $p < 0.001$), information gratification ($\beta = 0.688$, $t\text{-value} = 13.372$, $p < 0.001$), social presence gratification ($\beta = 0.629$, $t\text{-value} = 11.414$, $p < 0.001$), and escapism gratification ($\beta = 0.543$, $t\text{-value} = 9.117$, $p < 0.001$). Therefore, H2a, H2b, H2c, H2d, and H2e were supported.



Note: **p < .01 ***p < .001; solid lines indicate significant relationships

Figure 2. Test results of the structural model

With respect to the antecedent of continuance intention to use audio live-streaming services, the main gratifications obtained, namely escapism gratification ($\beta = 0.236$, $t\text{-value} = 3.126$, $p < 0.01$), sociability gratification ($\beta = 0.213$, $t\text{-value} = 2.407$, $p < 0.05$), engagement gratification ($\beta = 0.204$, $t\text{-value} = 2.209$, $p < 0.05$), and information gratification ($\beta = 0.175$, $t\text{-value} = 1.852$, $p < 0.05$) were found to have significant influences. Thus, H1a, H1b, H1c, and H1d were supported, while H1e, which proposed the positive influence of social presence gratification, was not supported in this study.

6. Discussion and implications

6.1 Discussion

While audio live-streaming services, particularly the Clubhouse application, provide spaces for authentic and fascinating conversation and expression in which users can entertain, learn, make meaningful connections, and share rich experiences with others around the world (Clubhouse, 2022), there has been no empirical research unpacking the uses and gratifications of audio live-streaming services. Moreover, the service's developers face a challenge regarding their ability to maintain the current increasing demand, especially once the crisis of

COVID-19 has passed. Thus, the primary purpose of this study was to explore users' continuous intention to use audio streaming services from the uses and gratifications and gratifications-technology fit perspectives.

With respect to the uses and gratifications perspective, the results indicate that intentions of repeated use (continuous intentions) become greater when the gratifications obtained are met. This finding is consistent with the idea that when a medium surpasses the expected gratifications initially sought, this leads to repeated use intention of the medium (Palmgreen & Rayburn, 1979). Among the five main antecedents of continuance intention, escapism gratification was found to be most significant and had the strongest impact on the continuous intention to use audio live-streaming services, followed by sociability gratification, entertainment gratification, and information gratification. The findings generally are in accordance with similar motivations found for using instant messaging and e-mail (Lo & Leung, 2009), social networking games (Li et al., 2015), social networking platforms (Bae, 2018; Leiner et al., 2018), Facebook and Instagram (Kim & Kim, 2019), and TikTok (Meng & Leung, 2021).

Interestingly, despite audio streaming service's dependence on audio technologies only, their users intend to continue using the current services for passing the time, relaxation, and tension release. This is probably related to the users' needs for different ways to escape and put aside real-world problems rather than dependence only on watching videos, viewing pictures, or reading comments, as happens in other social media and video streaming platforms. This finding supports Gan and Li's (2018) argument that users seek alternative ways to escape when needed. It is also in line with past research in the context of video live-streaming (Camilleri & Falzon, 2021; Sjöblom et al., 2017). Continuous intentions also increased when users felt that audio streaming services were more sociable than they expected. This finding supported Strielkowski's (2021) possible scenario that audio platforms, especially Clubhouse, might profile themselves as a type of social media where users could relieve themselves of their troubles and problems by talking about them to

family, friends, or other like-minded people. Thus, individuals can obtain sociability gratification not only through social media platforms that allow sharing videos, viewing images, and writing comments (Chang, 2018; Hsu and Lin, 2021; Li et al., 2015), but also through platforms with a high quality of audio functions, as proved in the current study.

Furthermore, consistent with previous findings of hedonic social media research, as well as with our expectations, entertainment gratification was found to be an important antecedent to the continuance intention of audio streaming apps. This finding is in line with the results of some previous studies (Gan & Li, 2018; Li et al., 2015; Singh et al., 2021), indicating that the fulfillment of personal needs, such as entertainment and enjoyment, facilitates users' continuance intention toward audio streaming services. Users perceive the use of an audio streaming service as enjoyable, pleasant, and engaging when they audibly interact with entertaining content. Lastly, information gratification has been a buzzword in the literature on social media use (Gan & Li, 2018; Hilvert-Bruce et al., 2018). The current study provides additional evidence confirming that when audio streaming services meet users' information gratification, users intend to repeat the use in the future. This is probably related to the growing number of global celebrities who are appearing as speakers on Clubhouse, such as Tesla CEO Elon Musk and Facebook CEO Mark Zuckerberg, and are taking part in discussions on many interesting topics (Strielkowski, 2021). In the context of the current study, Kuwaiti politicians, economists, and other influencers have also launched conversations and discussions on Clubhouse, where users have opportunities to learn useful things and obtain updated information. However, the results confirm only a small influence on the continuous intention. The possible reason for that may be the fact that all conversations in Clubhouse follow the functions of synchronicity and ephemerality (Bajpai, et al. 2021), which, as a result, guides users to have alternative preferred options for receiving information when needed.

Contrary to the prediction stated in H1e, the data indicated that

social presence gratification has an insignificant impact on users' continuous intention to use audio streaming services. This result is somewhat surprising because live-streaming services characterized by popularity and interaction are among the main reasons why individuals use live-streaming services (Chang, 2018; Gan & Li, 2018; Li & Guo, 2021). There could be several reasons for this result. The platform in the current study, Clubhouse, is still novel – it was launched in March 2020 – and members still aspire to find appropriate ways to create an ideal image that is accepted by others. This was supported by IS researchers (Bae, 2018; Long & Tefertiller, 2020), who highlighted the role of previous usage experiences in the gratifications obtained. Moreover, politicians, celebrities, and influencers, who were already well-known before joining Clubhouse, might restrict the chances for others to interact with other users, especially because audio platforms depend strongly on voice-based communication rather than video- or image-based technologies. Finally, the participants filling out the study questionnaire might be mostly categorized as listeners in the application, which means they pursue utilitarian or hedonic gratifications rather than social presence gratification. Thus, more empirical studies are needed to increase knowledge of the relationship between social presence gratification and behavioral intention to continue using audio streaming services by investigating the impact of users' roles (e.g. moderators, speakers, or listeners) on the relationship.

Evaluating social media's uses and gratifications is contingent upon the fit between technological affordances and gratifications obtained (Chang, 2018; Kim & Kim, 2019). The results of this study reveal the influence of gratifications-technology fit on the five gratifications obtained in the context of audio live-streaming services. These findings suggest that when the gratifications and the functionality of the platform are in alignment, perceived usability – such as obtaining sociability, entertainment, escapism, social presence, and information gratifications – improves. In other words, the prerequisite for the gratifications obtained through using audio streaming services is that individuals find a profound match between

gratifications and technology. When individuals intend to repeat the use of audio streaming services, the mechanism behind this choice is quite likely that gratifications-technology fit influences the gratifications obtained. This finding is similar to the standpoint of Lu and Yang (2014) that when users perceived a social media fit for their gratifications needs, they will continue with a high degree of utilization, and thus, this will affect users' perception of performance. Table 5 suggests that the effect of gratifications-technology fit on the sociability obtained is the greatest one. This result demonstrates that Clubhouse's users are taking advantage of the current functions and services for sociability gratification, such as connecting with people, making new friends, and finding people with the same interests, more than the other gratifications. This research therefore adds useful knowledge about the relative importance of gratifications-technology fit as an antecedent of gratifications obtained within the context of audio streaming platforms.

6.2 Theoretical implications

This study contributes theoretically in a number of ways to the existing literature on using live-streaming services, particularly audio streaming. First, the dominant theories are in IS continuance research, but there is no specific research framework for exploring audio IS continuance research. Thus, this study proposes a model that integrates the perspectives of the TTF model, social presence theory, and UGT, to comprehend the continuous intention of audio live-streaming services.

Second, the findings of this study reinforce the applicability and suitability of UGT for understanding the phenomenon of live-streaming continuous usage in general, and audio live-streaming continuous usage in particular. It is revealed that gratifications obtained that relate to escapism, sociability, entertainment, and information positively impact the continuous intention to use audio live-streaming platforms. Despite the focus on voice-based technologies, the findings help to explain how audio ISs are becoming multi-purpose-oriented ISs. However, social presence gratification did not record any influence. Such research would be an important next

step in understanding further gratifications obtained from live-streaming platforms, particularly audio-based technologies, and in examining the influences of important characteristics (e.g. experience) and roles (e.g. speakers and listeners) on gratifications and continuous intention to use audio-based platforms.

Third, investigating the antecedents of gratifications obtained is rare in the literature; thus, this study contributes, based on the TTF perspective, by providing the construct of gratifications-technology fit. The motivation to develop the construct of gratifications-technology fit was based on the fact that the existing TTF model lacks gratification constructs. This research provides evidence that gratifications-technology fit influences gratifications obtained by using audio streaming platforms. Goodhue and Thompson's (1995) theory of TTF states that for an IS to have positive impact, it must be utilized and be a good fit for the tasks it supports. Our version of Goodhue and Thompson's proposition is that for users to continue to use a live-streaming platform, it must be utilized and be a good fit for the gratifications it supports. With the amount of total variance explained ranging from 29.5% to 58.4%, this study suggests that extending the applicability of the TTF model and UGT would be important by applying individual-technology fit and technology characteristics.

6.3 Practical implications

Along with the theoretical implications, this study has several practical implications for practitioners who are interested in the field of audio streaming platforms. The findings indicate that different gratifications obtained lead to sustained audio streaming use. Increasing the opportunities for users, especially those who are listeners (or viewers, in video streaming platforms), to obtain more exciting content, and fulfilling users' needs for relaxation, information, social communication, and entertainment will increase users' intention to continue using audio streaming platforms. To accomplish this, streaming platform developers should establish encouragement mechanisms that can motivate moderators to provide users with opportunities for escaping, having fun, learning useful

things, and connecting with others. For example, developers should provide eligibility criteria for providing rewards to users (moderators and speakers) who establish rooms for events that attract high numbers of attendees. Hilvert-Bruce et al. (2018) suggested that moderators as well as speakers could use techniques such as viewer polls to help make decisions, give viewers attention (e.g. greeting them personally, acknowledging and showing appreciation of their participation), and enhance membership identity (e.g. providing additional social perks for subscribers). The more mature and prominent social media platforms have their own criteria for rewards (Li & Guo, 2021).

Moreover, in this study, the appropriate fit between gratifications and technology is important for achieving each gratification obtained by users. Not only moderators and speakers but also listeners need to access sophisticated services and functions that properly fit with gratifications derived from usability as well as the continuous intention to use audio streaming services. Thus, developers of audio streaming platforms should consider appropriately presenting high-quality services and functions that satisfy the four gratifications to lead to an increased likelihood of a stronger continuance intention to use audio live-streaming. Audio streaming platforms, especially Clubhouse, come with unique features that have attracted millions of users within a short period; developers should take full advantage of their unique features as well as the current research findings to further increase the level of gratification obtained and to enhance the opportunities for sustainability. Because other social media platforms have already established their own audio live-streaming technologies alongside video and image services (Kim et al., 2021), developers should pay special attention to the developments in other social media platforms to promote their platforms' strategies and operations, and in particular the interaction strategies.

7. Conclusion and future research

Similar to other empirical studies, our study imposes certain limitations that also represent opportunities for further research. One limitation of this study is that the focus is on audio streaming users

generally. In the context of audio streaming, and Clubhouse in particular, users appear in one of three roles (moderator, speaker, or listener), which means that it is not clear to what extent the users' roles can modify the results of the hypotheses, especially for the construct of social presence gratification. Outside the realm of audio streaming platforms, users' roles (user types in other research) have been shown to impact the associations between gratifications and usage behavior in the context of social media (Leiner et al., 2018; Meng & Leung, 2021). Thus, it is worth conducting a future study to compare audio streaming users based on the roles mentioned. Another limitation is that other gratifications obtained that might also affect users' continuous intention to use audio streaming services, such as uses and gratifications 2.0 (Meng & Leung, 2021), are excluded from the boundary set of the proposed model. Although the total variance explained by the main types of gratifications obtained on audio streaming use is 60.1%, modern digital media might afford further gratifications, such as quickness and asynchrony (Ishii et al., 2017), navigability, modality, and interaction (Meng & Leung, 2021), and novelty (Scherr & Wang, 2021). Because users on each media platform have different social networking needs, it is worth conducting a future study to compare the influence of the common gratifications – the gratifications examined in this study – with the modern gratifications also mentioned. How the constructs of the TTF model can integrate and affect any of these two groups of gratifications is another area for future study. Finally, this research was conducted in the context of the Middle East, specifically in Kuwait, which might restrict the generalizability of the findings to audio streaming users in other contexts. Although there are no borders in cyberspace preventing people in other contexts from joining rooms in Clubhouse, future research needs to consider sampling views from other countries.

Despite these limitations, this research has successfully developed the construct of gratifications-technology fit and integrated it with UGT, and this can be used in future studies on the usage behavior of other digital applications. This study provides additional

evidence for the applicability of UGT in modern digital media, and audio streaming applications in particular. More importantly, the current study highlights the important role of the construct of gratifications-technology fit in predicting gratification needs, which, in turn, influence the continuous use of audio streaming services.

Appendix. Questionnaire items

Construct	Survey Question Items	References
Entertainment gratification	Using Clubhouse made me feel entertained. Using Clubhouse gave me pleasure. Using Clubhouse was enjoyable.	Bae (2018); Lo and Leung (2009)
Sociability gratification	Using Clubhouse helped me to make new friends. Using Clubhouse helped me to find others like me. Using Clubhouse helped me to find people with the same interests.	Bae (2018); Lo and Leung (2009)
Information gratification	Using Clubhouse helped me to share information that is useful to other people. Using Clubhouse enabled me to learn about useful things. Using Clubhouse allowed me to receive advice and recommendations.	Bae (2018) Hsu and Lin (2021)
Social presence gratification	I felt connected to others in the Clubhouse environment. In my interactions with users in Clubhouse, I was able to show what kind of person I really am. I felt like I was a member of the Clubhouse community when using it.	Li et al. (2015)
Escapism gratification	I used Clubhouse when I felt bored. Using Clubhouse helped me to get away from what I was doing. Using Clubhouse enabled me to escape from everyday life.	Bae (2018)
Gratifications-	The services in Clubhouse were	Lu and Yang

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technology fit	<p>effective for gratifying my needs. The services in Clubhouse were sufficient to gratify my needs. <i>(deleted)</i> The services in Clubhouse were appropriate for gratifying my needs. The Clubhouse has interactive features that helped me gratify my needs. The services in Clubhouse were useful for gratifying my needs. <i>(deleted)</i></p>	(2014)
Continuous intention	<p>I intend to continue using Clubhouse services rather than to discontinue its use. I will continue using Clubhouse services rather than the alternative means. <i>(deleted)</i> I will keep using Clubhouse services as regularly as I do now. I will recommend others to use Clubhouse services in the future. I plan to increase my use of Clubhouse in the future. <i>(deleted)</i></p>	Bae (2018)

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