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PILOTING TEST SCALES TO MEASURE PERCEPTIONS OF "LIVENESS" REGARDING ICT-ENHANCED PERFORMANCES AT MUSIC FESTIVALS

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Music festivals are increasingly utilizing ICT to augment live music performances. This research project proposes and trials three liveness scales to measure attendee's perceptions of authenticity regarding liveness across a broad spectrum of formats for, and viewpoints of, live performances at, or emanating from, music festivals. The research addresses the thesis that: It may be possible to develop liveness scales to measure attendee perceptions of liveness regarding ICT-enhanced performances at music festivals. Following item development processes, pretest liveness Likert scales were developed, and two iterations of primary research were carried out to collect and interpret empirical evidence from 164 respondents. Formats and viewpoints generating the greatest acceptance or resistance were identified. Significant differentiation in responses was tested for by gender regarding audience viewpoints and by occupation regarding audience size. Potential to further develop/simplify the liveness scales, and for future research into ICT-enhanced experiences at music festivals, was ascertained.

Key words: Music festivals; Information communication technology (ICT); Live performances; Liveness; Authenticity

Introduction

The nature of music festivals is fluid over time (Harsølf, 2020). In response to the negative economic impact of restrictions and lockdowns associated with COVID-19 on music festivals, a rapid global proliferation in the generation of digitized live music content and on-line music festivals occurred. This phenomenon built upon previous growth in the use of information communication technologies (ICT) to enhance live performances at music festivals. Prior to COVID-19, Bossey (2019) identified reluctance to engage with digitized content at music festivals among industry gatekeepers, which may persist post-COVID-19 (Bossey, 2022). Usage of ICT-enhanced performances at music festivals remains contentious, despite increases in uptake, which may partially relate to perceptions around the authenticity and "liveness" of augmented live performances.

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To align with Auslander (2008, 2012), this article employs an Oxford English Dictionary definition of liveness as "a performance, heard or watched at the time of its occurrence, as distinguished from one recorded on film, tape, etc." This assumes simultaneous engagement from performers and audience members, although any requirement for colocation in place and time remains subject to academic debate. Evolution in audiences' perceptions of liveness relating to ICT-enhanced performances may be key to further adoption at music festivals. Opinions of liveness can evolve within changing environments (Van Es, 2017) and within virtual environments, where liveness is created through mediatization. "Virtual liveness" (Sanden, 2013, p. 11) itself exists as a perception of liveness, primarily related to senses of sight and sound.

Perception can be defined as "an idea, a belief or an image you have as a result of how you see or understand something" (Oxford Advanced Learners Dictionary, 2023). Therefore, personal experience of an ICT enhanced viewpoint or format at music festivals is not a prerequisite for holding an opinion on it's likely authenticity or relative degree of liveness. Whatever their basis, positive audience/potential audience opinions related to ICT-enhanced music performances may be a significant factor in driving their uptake and vice versa. Perception of liveness relating to performances is also one of a broader set of factors contributing towards an overall sense of authenticity in relation to live music experiences. It is acknowledged that the relative importance of liveness will vary across audiences and that other factors including communitas, copresence, and motives for incorporation will contribute to any overarching sense of authenticity in terms of the broader live music experience. Therefore, the ability to measure audience and potential audience perceptions of liveness may prove commercially valuable, because any growth in acceptance of ICT-enhanced live performances could inform new business models for music festivals. Both ICT-enhanced live performances and liveness remain underresearched in relation to music festivals.

This research project proposes and pretests three scales of perceptions of liveness in performances at, or emanating from, music festivals. These are intended to enable an exploration of attendee's feelings of authenticity regarding liveness across a broad spectrum of formats, on-site audience sizes, and audience viewpoints for live performances at, or emanating from, music festivals. Perceptions of liveness were considered relating to acoustic, amplified, DJ, networked, holographic, and virtual formats. Audience sizes from 50 to 50,000 were considered. On-site, augmented, and remote viewpoints were included.

Following an analysis of existing literature, engagement with the population of interest during previous research and item development, pretest liveness scales were produced. In an initial pilot study to pretest the performance of individual questions within the scale (Gehlbach & Brinkworth, 2011), two iterations of primary research were carried out to collect and interpret empirical evidence. A series of closed questions elucidated quantitative information to address the thesis that: it may be possible to develop liveness scales to measure attendee perceptions of liveness at music festivals. The article also addresses the following secondary questions:

- Can any significant differences in perceptions of liveness be identified between different ICT enhanced performance formats at music festivals?
- Can any significant differences in perceptions of liveness be identified between different on-site audience sizes at music festivals?
- Can any significant differences in perceptions of liveness be identified between different ICT-enhanced audience viewpoints at music festivals?
- Can significantly different responses regarding perceptions of liveness be observed from individuals who work in, study, or attend events delivered by the live music industry?
- Can significantly different responses regarding perceptions of liveness be observed by gender?

Literature Review

Music Festivals

Festivals are short-term, public events providing entertainment linked to a place or community (Mair, 2019). Festivals have also been more narrowly defined as "a concert, usually outdoor, often

held over several days" Shuker (2012, p. 130) reflecting that for some people the term "festival" is tantamount to "music festival." While academics have identified a variety of audience motivators for attending music festivals, the most frequent are "socialization and musical content" (Perron-Braulta et al., 2020, p. 1). Social identity theory states that people derive their social identity from the groups to which they belong (Scheepers & Ellemers, 2019). This applies to being a "fan of a certain musical style" (Tekman & Hortacsu, 2002, p. 284), which can be "a criterion for in-group membership" (Lonsdale & North, 2009, p. 325). Social identity theory associates group identification and self-esteem, which can be influenced by gender (Shepherd & Sigg, 2015).

Occurring outside the everyday, music festivals entail copresence, often around live music, dancing, and socialization, and enable "communitas" (Turner, 1969, p. 94) to create feelings of belonging, further motivating attendance for social and personal reasons (M. Mulder & Hitters, 2021). Live music is an important cultural component of society (Kronenburg, 2020) and 35.3 million people visited UK outdoor music events in 2018 (Jackson et al., 2019). Ideally music festivals facilitate inclusive, collective celebration (Banke & Woodward, 2020); however, they may generate social exclusion (Duffy et al., 2019). While music festivals are often multifaceted, live performances form a central element that has increasingly utilized ICT (Bossey, 2020) so potential exists for experimentation with ICT-enhanced music festival formats and viewpoints.

ICT-Enhanced Performances

ICT covers a broad range of technological resources or tools "used to transmit, store, create, share or exchange information" (UNESCO, 2019, p. 1) and within the context of music festivals includes live and recorded broadcasting technologies. The adoption of ICT can be explored using innovation diffusion theory. This attempts to explain how, why, and at what speed innovations spread, to help identify user needs and design user-friendly systems (Miller, 2015). Innovation adoption theory describes speed of adoption by categorizing users as innovators, early adopters, early majority, late majority, and laggards (Rogers, 2003). The early stages of the consumer innovation decision process include stages of active or passive acceptance and resistance (Nabih et al., 1997). The adoption of ICT across the music industry has been very high, fundamentally changing the industry by displacing previously dominant physical formats with digital ones (Askin & Mol, 2018).

ICT has amplified the expectations of audiences at music festivals (Martin & Cazarre, 2016) who are often open to innovation including new experiences (Hudson & Hudson, 2013). ICT enhancements at music festivals include communitas on social media, digitized audio and visual production, live streaming content, holographic performances, virtual reality (VR), augmented reality (AR), virtual environments, and entirely virtual artists. These often combine to facilitate hybrid events that can, for example, simultaneously engage remote live audiences with venue-based music festivals (Cal, 2020).

Social media has enabled audience members to create year-round digitalized communities linked to, yet separate from, music festivals in a geographic, time-limited sense. This may further enhance a sense of communitas among music festival audiences. Mobile devices become lenses through which to experience music festivals and create additional content; to be viewed in real time "on site" at festivals or shared thereafter. Research into social media usage at festivals suggests physical participation is stronger among female attendees (Shuhua et al., 2023) whose electronic word-of-mouth posts focus on different aspects of festival experiences than male attendees (Ahn et al., 2020).

ICT has already driven change within production arts for live performances at music festivals. From an audio perspective, the idea of "true to life" vocal performances are now challenged by sound engineering techniques at larger events where pitch processing now occurs in real time (J. Mulder, 2015, p. 43). Therefore, audiences may no longer be hearing a true representation of an artist's vocal performance on stage, while increasingly sophisticated lighting techniques and the use of live screens alter what they see.

Streaming recorded music on-demand has "almost single-handedly saved" the music industry's major labels (Knox, 2021, p. 18). Livestreaming

video and sound is deployed by music festivals so remote audiences can enjoy the event "over the internet as it happens" (Cambridge Dictionary, 2022) to "access audiences that are not reached by live concerts in physical venues" (Haferkorn et al., 2021, p. 5). Audiences are growing for communal livestreaming "livecasts" (Barker, 2013, p. 17), featuring music performances broadcast live into multiple secondary venues. However, the potential of streamed gigs has yet to be maximized by the entire music industry (Thomas, 2020) and potential exists to create additional content by further building streaming into the creative process. Livestreaming can act as a "channel of music discovery" (Aguiar, 2017, p. 13) and may also facilitate the development of hybrid events.

Usage of holographic performances is growing in some live music markets, where audiences accept the format as live music (Hughes, 2020). Musical innovations often grow at speed (Getz & Van Niekerk, 2019), with evident growth in the format since the noteworthy virtual performance "by" Tupac Shakur (deceased) at the Coachella Valley Music and Arts Festival (Coachella) in 2012 derived authenticity "through the liveness of the audience and other performers" (Fusco, 2015, p. 37). Subsequently, the ethics of creating holographic content by living and dead pop stars were described as unethical, "unlive," and "a form of ghost slavery" by Simon Reynolds (Myers, 2019, p. 14). Virtual "holograph" representations of living artists are also emerging onto the live music market. The ABBA Voyage production, featuring "ABBAtars," created by Industrial Light & Magic, performing in a bespoke ABBA Arena (ABBA Voyage, 2022) cost a reported £140 million (Moore, 2022).

VR or "near reality" (Virtual Reality Society, 2020) is developing rapidly, so may be deployed to offer "live" content from a music festival site remotely. VR could potentially become a dominant music format (Katz, 2017) having mutated incrementally over recent years (Jones, 2018). Computer-generated VR environments are already hosting immersive live music events, which exponentially increase the spectacle of a live performance and enable audience interaction. For example, Travis Scott's first concert on Fortnite "let you float through the air while a Godzilla-sized rapper walked across an ocean" (Webster, 2020, p. 5).

AR could transpose elements of a live performance from a music festival onto the physical environment that an individual user inhabits by adding to the reality a viewer would ordinarily see instead of replacing it (Emspak, 2018). This could perhaps be further enhanced through transhumanism whereby technology would actively merge human and artificial intelligence (Regalado, 2017) to enable the sharing of sensual or emotional experiences, overlaying them into a user's environment. Mixed reality (MR) further extends AR as an immersive technology by enabling interaction in real time where virtual objects appear in the real world (Marr, 2019).

Entirely virtual artists have already performed on site at music festivals. Hatsune Miku is a Vocaloid humanoid persona, created in 2007 to encourage fan-led content creation by Japanese software company Crypton in order to promote Yamaha Vocaloid software. Anyone can download creative commons freeware to use Hatsune Miku's vocals in a song and over 100,000 such recordings have been released, creating a virtual pop idol. Humanoid performers may be an acquired taste; a concert by Hatsune Miku at O2 Academy, Brixton was "oddly sterile, with none of the unpredictability or imperfections that make live music thrilling" (Cliff, 2020, p. 4). Hatsune Miku performed briefly at Coachella in 2018 and was described as "the most exciting addition to Coachella 2020's line up" (Levesley, 2020) before the festival was canceled due to COVID-19.

Coronavirus disease (COVID-19) is an infectious disease caused by the SARS-CoV-2 virus (World Health Organization, 2021) which will lead to permanent changes in global usage of digital solutions (NESTA, 2020). COVID-19 was "devastating" for the live music industry (UK Music, 2022) causing the "vast majority" of UK music festivals to be canceled in 2020 (Digital, Media, Culture & Sport Committee, 2020, p. 4) and generating 90% fall in sector revenues (Carey & Chambers, 2020). By the autumn of 2021 live/digital hybrid events emerged, and while overall engagement in digital content reduced slightly in the UK, "even typically less engaged audiences expressed an interest in iterative digital experiences" (Walmsley et al., 2022, p. 39). Overall, COVID-19 has created on-going uncertainty around the future of live music (Khylstova et al., 2022).

COVID-19 stimulated musicians and bands to move performances on-line (Khylstova et al., 2022) with planned music festivals migrating on-line and innovation in on-line event formats occurring. In the UK, the creators of Glastonbury's Shangri-La space produced Lost Horizon, the world's largest arts and music festival in virtual and mixed reality (Arrigo, 2020). Subsequently, Glastonbury Festival 2021 "Live at Worthy Farm," which comprised a high production value livestream event, was described as "superb" (Petridis, 2021, p. 1) despite being "made free after technical issues" (ITV News, 2021). Arguably, Glastonbury 2021 neatly encapsulated both the potential of new ICT-driven music festival formats and their vulnerability to technical challenges. The virtual 2021 "Tomorrowland Around the World" festival featured DJ sets on the "magical online island of Pāpiliōnem" (The DJ Revolution, 2021). However, both events were "prerecorded" and having livestreams "that exist in that moment and then vanish" (The DJ Revolution, 2021) may be the best way to create a sense of occasion as an authentic "live" experience.

Authenticity

The Oxford Learners Dictionary (2023) defines authenticity as "the quality of being genuine or true." In music, authenticity is a relational institutional practice, performed by: "producers, consumers, and selectors of music" (Askin & Mol, 2018, p. 181). Audiences at music festivals are inevitably multifaceted, comprising individuals who are attending for work or pleasure, who may hold opinions regarding the authenticity of a live performance. Accomplishing authenticity in a musical performance has been described as "not a thing achieved, but a perpetually self-renewing challenge" (Taruskin, 1984, p. 12). Here, Taruskin understands authenticity as fidelity towards the musical score (Stoicescu, 2020), which relies on the skills of the performer(s) involved. Both technique and choice of instruments will be important as, for example, to recreate authentic historical music, the sounds and styles used must be perceived by performers and audiences "as timeless" (Upton, 2012, p. 8).

Jaimangal-Jones (2017) identified musical evolution, progression, cultural contribution, commitment, technical ability, and performance as key factors relating to audience perceptions of authenticity in DJ performances and alludes to the impact of audience response. While most research into music performances "places the audience on one side and the artists on the other" (Picaud, 2022, p. 289), the effectiveness and quality of a live performance itself can also be influenced by the presence of an audience responding directly to the artist as they perform (Moelants et al., 2012; Radbourne et al., 2014). To measure audience responses while listening to live performances versus recordings thereof, researchers have considered indicators including the vigor of head movements (Swarbrick et al., 2019) and degrees of pleasure experienced (Belfi et al., 2021). Because audiences are actors in live performances, audience size/proximity from the performer may be a factor in the perceived authenticity of a performance.

A sense of authenticity is essential to satisfy most audience members' perception of a successful live music festival experience (Girish & Ching-Fu, 2017). From a theoretical perspective, existential authenticity (Wang, 1999) appears key to the perceived validity of digital experiences at music festivals (Bossey, 2022). It is experience related and refers to a state of being linked to emotions, sensations, and sense of self. Managing authenticity in a digitized music industry, where a sense of having an authentic live experience is important, has become increasingly challenging (Askin & Mol, 2018). ICT may offer mitigation where, for example, smartphones can be deployed to enable additional audience participation in live music (Hodl et al., 2020). When audience members, or potential attendees, consider an authentic or genuine performance as "one that isn't deceptive or false" (Maxwell Keller, 2023, p. 6) they are often associating authenticity with liveness.

Liveness

In music, "live" is "a complex subject" (Mazierska et al., 2020, p. 1) where debate around liveness "pivots around oppositional ideological positions" (Dixon et al., 2007, p. 125). Historically, music festival attendees may have concurred that "performance's only life is in the present (it) cannot be saved, recorded (or) documented" (Phelan, 1993, p. 146). Long (2016) implicitly supported Phelan,

while identifying value in digitized live recordings being viewed on-line after the event to memorialize a live performance. Phelan's notion of "classic liveness" implies that live music requires the physical, geographical, and timely copresence of musician and audience (Tsangaris, 2020, p. 200) and argues against the influence of technology. Phelan's perspective is inherent to the traditional view of live music as a shared experience created during a "face-to-face meeting between artist and fan" (Bennett, 2015, p. 3), which, to a degree, continues (Bossey, 2019). Echoes of "classic liveness" can be heard in claims that live music "depends on a surrounding material culture" when considering music venues (Behr et al., 2016, p. 19).

Conversely, Auslander (2008) stated live performances are generally produced either as copies of mediatized iterations (of the performance) or as raw materials for ensuing media content. For example, in the context of music festivals, a televised performance or live album. This was critiqued by Dixon et al. (2007, p. 129) who stated that liveness concerns the temporality of "being there." However, Auslander (2012) subsequently suggested it may be that "liveness can (now) no longer be defined in terms of either the presence of living human beings before each other or physical and temporal relationships" (p. 6). The harvesting of content derived from music festival performances for mediatization is increasing, so incorporating media into live performance does not make it less live (Meyer-Dinkgräfe, 2015). To some contemporary audiences "live" could mean a virtual event within an online archive, free of the restrictions of time and place (Mallinder, 2020, p. 55). These audiences may already derive emotional satisfaction and sense of self from ICT enhanced music festival experiences that are therefore validated by "existential authenticity" (Wang, 1999, p. 352).

"Live" music's increasing reliance on ICT has changed perceptions so that arguably it has already become more than just "the unmediated performance experienced in a natural face-to-face contact" (Tsangaris, 2020, p. 202). In this scenario, liveness is used to describe mediated experiences and is therefore functioning as a "conceptual and perceptual" signifier (Sanden, 2019, p. 180) within a category of "virtual liveness." An individual audience member's perception of liveness in any given performance can be said to respond to their perception of authentically "being there" (Dixon et al., 2007) at a genuine performance (Maxwell Keller, 2023). This can extend to concerts from Vocaloid performers, where audience members' participation and imagination combine to create a shared sense of liveness and communitas (Michaud, 2022). Overall, liveness can be conceived to relate to both socialization and musical content attendance motivators (Perron-Braulta et al., 2020). Post-COVID-19, audience groups/segments coexist that do, or do not, consider colocation in place and time to be a prerequisite of liveness in a viewpoint or performance format.

The contention is that the perception of liveness is a significant factor relating to music performances and one of a broader set of factors that contribute towards an overall sense of authenticity in relation to live music experiences. It is acknowledged that factors including communitas, copresence, and motives for incorporation will contribute to any overarching sense of authenticity in terms of the broader live music experience and that the relative importance of liveness will vary across audiences. Understanding conflicting audience perceptions of liveness may offer insight into consumer decision making regarding adopting ICT-enhanced format innovations at/of music festivals. It would be useful to explore innovation diffusion and the consumer innovation decision process regarding perceptions of liveness for ICT enhanced performances at music festivals. However, there is a gap in the literature regarding scales to measure these perceptions.

Methodology

The scope of the research was limited by artform to live music festivals. A conceptual framework considered ICT-enhanced performances, authenticity, and liveness. The principle investigator previously represented clients who regularly performed at significant music festivals. This enabled abductive research, supplementing prior knowledge of the live music industry with a literature review to identify the broad issues for questioning.

Following a process of item development, the domain was identified and content validity considered, aided by expert feedback on proposed questions from accessibility specialists. Scale

Table 1.
Responses on Performance Formats

Likert Scale Question: Please indicate the extent to which you feel that the following represent an authentic live performance	1 Agree	1 Neutral	1 Disagree	1 *p* Value[a]	2 Agree	2 Neutral	2 Disagree	2 *p* Value[a]	1 & 2 Average Combined Acceptance
Q6(a): An acoustic performance, featuring vocals and traditional instruments without amplification, to an on-site audience	95%	3.7%	1.2%	0.001	92.7%	4.9%	2.4%	0.001	93.85%
Q6(b): An acoustic performance, featuring vocals and traditional instruments with amplification, to an on-site audience	97.6%	0%	2.5%	0.001	98.7%	0%	1.3%	0.001	98.15%
Q6(c): An amplified performance featuring vocals and electric (analogue) instruments with amplification, to an on-site audience	96.4%	3.8%	0%	0.001	98.7%	1.2%	0%	0.001	97.55%
Q6(d): An amplified performance, featuring vocals and some electric (analogue) instruments, augmented with ICT, to an on-site audience	95%	5%	0%	0.001	96.3%	1.2%	2.5%	0.001	95.65%
Q6(e): An amplified performance featuring vocals and some electric (analogue) instruments, augmented with ICT and using pitch processing for vocals, to an on-site audience	83.9%	7.5%	8.8%	0.001	80.1%	6.3%	13.9%	0.001	82.00%
Q6(f): An amplified performance featuring live vocals with a pre-recorded backing track, to an on-site audience	74.3%	11.5%	14.2%	0.001	77.6%	8.8%	13.8%	0.001	75.95%
Q6(g): An amplified performance from a DJ, using physical staging, to an on-site audience	86.3%	7.5%	6.3%	0.001	80.2%	8.6%	11.2%	0.001	83.25%
Q6(h): An amplified performance from a DJ, using virtual staging to create the appearance of a virtual environment, to an on-site audience	72.2%	15.2%	12.6%	0.001	61.7%	16%	22.2%	0.001	66.95%
Q6(i): An amplified performance, featuring vocals and some electric (analogue) instruments, augmented with ICT, where one performer appears remotely from another venue in a 'networked performance' to an on-site audience	60.8%	15.2%	24.1%	0.001	50.6%	12.3%	37%	0.001	55.70%
Q6(j): An amplified performance, featuring vocals and some electric (analogue) instruments, augmented with ICT from a human 'backing band' with a hologram of a living performer to an on-site audience	46.4%	12.5%	41.3%	0.001	44.5%	14.8%	40.8%	0.002	45.45%
Q6(k): An amplified performance, featuring vocals and some electric (analogue) instruments, augmented with ICT from a human 'backing band' with a hologram of a deceased performer to an on-site audience	40.6%	13.9%	45.6%	0.001	40.1%	15%	45.1%	0.002	40.35%
Q6(l): An amplified performance, featuring vocals and some electric (analogue) instruments, augmented with ICT from a human 'backing band' with a hologram of an entirely virtual artist (E.G. Hatsune Miku), to an on-site audience	43.8%	16.3%	40%	0.005	40%	10%	50%	0.001	41.90%
Q6(m): A human artist performing in an entirely virtual environment (E.G. Travis Scott's concert on Fortnite) to an on-line audience	41.3%	12.5%	46.3%	0.001	23.8%	18.8%	57.6%	0.001	32.55%
Q6(n): An entirely virtual artist performing in a virtual environment to an on-line audience	23.8%	16.3%	60%	0.001	13.7%	12.3%	73.9%	0.001	18.75%

Note. [a]From chi-square test.

development (Boateng et al., 2018) was commenced by generating three 7-point Likert scales, to enable field pretesting under realistic conditions and garner respondent opinions on relevant topics. The first (Table 1) asked whether differing performance formats represented an authentic live performance. The second (Table 2) considered whether a range of on-site audience sizes represented an authentic live performance when watching an amplified performance, featuring vocals and some electric (analogue) instruments, augmented with ICT, at a music festival. The third (Table 3) considered the authenticity of differing audience viewpoints when watching an amplified performance, featuring vocals and some electric (analogue) instruments, augmented with ICT, to a crowd of 5,000 people at a music festival.

Two iterations of primary research were carried out, adopting a quantitative approach and using a structured e-mail questionnaire on Microsoft Forms. Using two similar iterations enables comparison between them in the future, if required. Calls for contributions for both iterations were made via public Linked-In posts (viewed 1,470 and 623 times, respectively), to students studying event, festival, or music management at Falmouth University, to professional contacts of the principle investigator and via an artist fan group on Facebook. The same approach to generating contributions was taken for both iterations. The first cohort of respondents (cohort 1) contributed their answers between October 21, 2020 and May 31, 2021. The second cohort of respondents (cohort 2) contributed their answers between December 1, 2021 and May 31, 2022.

Closed questions related to name, country of residence, age, gender, and engagement with music festivals. All respondents indicated whether they were working in the live music industry, a student studying the live music industry, attending festivals but not working in or studying the live music industry, and not attending music festivals or working in or studying the live music industry. A recoding exercise amalgamated respondents from each cohort into three groups. Those self-identifying as working in/studying the live music industry were coded as corresponding to Askin and Mol's (2018) "producers/selectors" (p. 168), with respondents attending festivals but not working in/studying the live music industry coded as "consumers." Respondents not attending music festivals or working in/studying

Table 2
Responses on Audience Size

Likert Scale Question: Please indicate the extent to which you feel that the following represent an authentic live audience experience when watching an amplified performance, featuring vocals and some electric (analogue) instruments, augmented with ICT, at a music festival	1 Agree	1 Neutral	1 Disagree	1 *p* Value[a]	1 Gender K-W Test	1 Engage K-W Test	2 Agree	2 Neutral	2 Disagree	2 *p* Value[a]	2 Gender K-W Test	2 Engage K-W Test	1 + 2 Average Combined Acceptance
Q7(a): Being an on-site audience member in a crowd of 50 people	89.8%	7.6%	2.5%	0.001	0.734	0.898	93.9%	2.1%	3.7%	0.001	0.956	0.132	91.85%
Q7(b): Being an on-site audience member in a crowd of 500 people	97.4%	2.6%	0%	0.001	0.204	0.168	97.6%	1.3%	1.3%	0.001	0.982	0.382	97.5%
Q7(c): Being an on-site audience member in a crowd of 5,000 people	98.6%	1.3%	0%	0.001	0.372	0.533	96.3%	2.5%	1.3%	0.001	0.803	0.824	97.45%
Q7(d): Being an on-site audience member in a crowd of 50,000 people	90.9%	5.2 %	3.9%	0.001	0.412	0.590	90%	5%	5.1%	0.001	0.905	0.648	90.45%

Note. [a]From chi-square test.

Table 3
Responses on Audience Viewpoints

Likert Scale Question: Please indicate the extent to which you feel that the following represent an authentic live audience experience when watching an amplified performance, featuring vocals and some electric (analogue) instruments, augmented with ICT, to a crowd of 5,000 people at a music festival	1 Agree	1 Neutral	1 Disagree	1*p* Value[a]	1 Gender K-W Test	1 Engage K-W Test	2 Agree	2 Neutral	2 Disagree	2 *p* Value[a]	2 Gender K-W Test	2 Engage K-W Test	1 & 2 Average Combined Acceptance
Q8(a): Being an on-site audience member predominantly watching the performers on-stage during the performance	99.9%	0%	0%	N/A as constant	1.000	1.000	98.7%	1.2%	0%	N/A as constant	1.000	1.000	99.3%
Q8(b): Being an on-site audience member predominantly using a handheld device to watch/film the performance	51.3%	15%	33.8%	0.001	0.432	0.469	50.1%	8.8%	41.3%	0.001	0.275	0.096	46.3%
Q8(c): Being an on-site audience member at a festival predominantly watching the video screen at the side of the stage during the performance	81.3%	10%	8.8%	0.001	0.172	0.297	67.6%	6.3%	26.3%	0.001	0.724	0.340	74.75%
Q8(d): Being a remote audience member watching a live stream of the performance at home alone	36.5%	13.8%	50.1%	0.001	0.162	0.590	35.4%	17.7%	46.8%	0.006	0.298	0.697	35.95%
Q8(e): Being a remote audience member watching a live stream of the performance at home with a group of friends	48.8%	16.3%	35.1%	0.002	0.585	0.610	40%	20%	40.1%	0.041	0.387	0.303	44.4%
Q8(f): Being a remote audience member watching a live stream of the performance from a music festival at a cinema with strangers	38.9%	17.5%	43.8%	0.009	0.521	0.741	37%	16%	46.9%	0.002	0.203	0.052	42.9%
Q8(g): Being an audience member watching live content a performance from a music festival remotely utilizing VR technology	45.1%	21.3%	33.8%	0.034	0.426	0.439	20.5%	26.9%	52.6%	0.001	0.573	0.842	48.85%
Q8(h): Being an on-site audience member watching live content a performance at a music festival remotely utilizing AR technology	35.1%	21.3%	43.8%	0.046	0.067	0.581	25%	28.8%	46.3%	0.046	0.559	0.305	30.05%

Note. [a]From chi-square test.

the live music industry were coded as "neither." It is noted that respondents coded as "producers/selectors" may also attend as "consumers."

The pretest scales purposefully measure "perceptions of an authentic live performance," to explicitly refer to the performance itself. This approach represents "liveness," which is not a commonly understood term, and emerged following discussion with industry accessibility experts. Seven-point Likert scales were adopted to attempt to allow for greater sensitivity of measurement. The intention was to code outcomes, so that degrees of agreement corresponded to degrees of active or passive "acceptance" and degrees of disagreement corresponded to degrees of passive and active "resistance" using Nabih et al.'s (1997) "conceptual framework of innovation responses" (p. 193). However, as 20% or more of categories in each Likert scale contained less than five responses, the scales were collapsed to ensure sufficiency of sample size for accuracy (Fox et al., 2014). Outcomes of collapsed scales were coded so that agreement corresponded to "acceptance" and disagreement corresponded to "resistance" using Nabih et al. (1997, p. 190).

Quantitative analysis using nonparametric chi-square testing was applied to ascertain asymptotic significance (p value) for all responses using SPSS, when assuming that all categories would be equal as a null hypothesis. Nonparametric Kruskal–Wallis testing was applied to selected responses to address the null hypothesis that the distribution of responses for on-site audience sizes and differing audience viewpoints is the same across categories of gender and engagement with the live music industry.

Following consideration of ethical principles regarding objectivity, the questionnaire was shared beyond personal contacts to ensure inclusion of respondents unknown to the author. The research was approved by institutional research ethics processes.

The limitations of the research include the relatively small number of respondents based outside the UK and limited scope of artform.

Results

Overview

A total cohort of 81 respondents completed the first iteration of the structured e-mail questionnaire. In total by location, 73 respondents were based in the UK, 4 in the European Union, 1 in Norway, 1 in Switzerland, 1 in Canada, and 1 in Indonesia. By gender, 45 respondents were male, 35 female, 0 nonbinary, 0 gender fluid, and 1 preferred not to say. There were 14 respondents under 20, 29 aged 20–29, 10 aged 30–39, 15 aged 40–49, 8 aged 50–59, and 4 aged 60 and over. Coding against Askin and Mol (2018) identified 36 respondents as "producers/selectors," 36 respondents as "consumers," and 9 respondents as "control group." All respondents agreed to take part in the research.

A total cohort of 83 respondents completed the second iteration of the structured e-mail questionnaire: In total by location, 73 respondents were based in the UK, 5 in the European Union, 2 in the US, 1 in New Zealand, 1 in Canada, and 1 in Vietnam. By gender, 35 respondents were male, 45 female, 0 nonbinary, 1 gender fluid, and 3 preferred not to say. There were 13 respondents under 20, 21 aged 20–29, 10 aged 30–39, 18 aged 40–49, 19 aged 50–59, and 2 aged 60 and over. Coding identified 41 respondents as "producers/selectors," 37 as "consumers," and 5 respondents as "control group." Eighty-one respondents agreed to take part in the research.

Goodness of fit testing confirmed all 26 sets of Likert scale responses were statistically significant, with each scoring under 0.05.

Performance Formats

An acoustic performance, featuring vocals and traditional instruments with amplification (through a PA system), to an on-site audience was identified as the most authentic live performance across both cohorts (97.6%/98.7% acceptance). An amplified performance featuring vocals and electric (analogue) instruments with amplification to an on-site audience received similar results (96.4%/98.7% acceptance), whereas an acoustic performance, featuring vocals and traditional instruments without amplification, was less popular (95%/92.7% acceptance).

Escalating reductions in acceptance for commonly used ICT-enhanced formats were observable. An amplified performance, featuring vocals and some electric (analogue) instruments, augmented with ICT, to an on-site audience received

95%/96.3% acceptance. When pitch processing for vocals was included, acceptance reduced to 83.9%/80.1%. Where a performance featured live vocals with a prerecorded backing track, acceptance fell to 74.3%/77.6%.

When considering DJs, an amplified performance, using physical staging, to an on-site audience received 86.3%/80.2% acceptance. However, when using virtual staging to create the appearance of a virtual environment, acceptance fell to 72.2%/61.7%.

Graded reductions in acceptance for less commonly used ICT-enhanced formats were also observable. An amplified performance, featuring vocals and some electric (analogue) instruments, augmented with ICT, where one performer appears remotely from another venue in a "networked performance" to an on-site audience received 60.8%/50.6% acceptance. Where a performance was augmented with a hologram of a living performer to an on-site audience, acceptance reduced to 46.4%/44.5%. Where a hologram of a deceased performer was deployed acceptance was 40.6%/40.1%. For a hologram of an entirely virtual artist acceptance was 43.8%/40%.

A human artist performing in an entirely virtual environment to an on-line audience received 41.3%/23.8% acceptance. An entirely virtual artist performing in a virtual environment to an on-line audience was identified as the least authentic live performance by respondents in both cohorts (23.8%/13.7% acceptance).

Audience Sizes

Being an on-site audience member in a crowd of 5,000 people was considered the most authentic live audience experience when watching an amplified performance, featuring vocals and some electric (analogue) instruments, augmented with ICT, at a music festival in cohort 1 (98.6% acceptance) and the second most in cohort 2 (96.3% acceptance). Being an on-site audience member in a crowd of 500 people was considered the most authentic live audience experience by cohort 2 (97.6% acceptance) and the second most in cohort 1 (97.3% acceptance). Furthermore, the largest capacity was marginally the least popular for both cohorts (measured by resistance) and had the lowest combined average acceptance for audience size (90.45%).

Kruskal–Wallis testing confirmed the null hypothesis that the distribution of responses for on-site audience sizes is the same across categories of both gender and engagement with the live music industry in both cohorts 1 and 2.

Audience Viewpoints

Being an on-site audience member predominantly watching the performers on stage during the performance represented an authentic live audience experience to the most respondents in both cohorts (99.9%/98.7% acceptance). Predominantly watching the video screen at the side of the stage during the performance was the most widely accepted ICT-enhanced viewpoint for on-site audiences (81.3%/67.6% acceptance). This viewpoint scored significantly higher than predominantly using a handheld device to watch/film the performance (51.3%/50.1% acceptance).

Watching live content of a performance utilizing AR technology represented the least authentic live audience experience on-site to respondents in both cohorts (35.1%/25% acceptance). Watching live content remotely utilizing VR technology was more popular in cohort 1 (45.1% acceptance) and less popular in cohort 2 (20.5% acceptance).

Watching a livestream of the performance at home with friends was the most widely accepted ICT enhanced viewpoint for remote audiences (48.8%/40% acceptance). Watching a livestream of the performance at home alone (36.3%/35.4% acceptance) was significantly lower, as was watching at cinema with strangers (38.9%/37% acceptance).

Testing confirmed the null hypothesis regarding distribution for audience viewpoints across categories of gender and engagement with the live music industry in cohorts 1 and 2.

Discussion of Findings

Liveness Scales

The willingness of respondents to engage with the pretest liveness scales, combined with the responses received from both iterations of primary research, strongly suggests that they can be further developed to reliably measure attendee perceptions of liveness at music festivals. The scales require

further iteration for several reasons. The use of a 7-point Likert scale proved problematic due to relatively small sample sizes being spread across seven potential responses. While the resultant collapsed scales clearly illustrated levels of overall "acceptance" and "resistance" (Nabih et al., 1997, p. 193), future iterations should consider a 5-point Likert scale that would code directly against degrees of active or passive "acceptance" and "resistance" and remove the need to collapse the scale. Five-point Likert scales are considered more reliable than those with 3 points in regard to scale development (Boateng et al., 2018).

Pretesting individual questions within the scales (Gehlbach & Brinkworth, 2011) was informative. Some verbal feedback from respondents (e.g., in comments on the artist fan group on Facebook) suggested that the questionnaire was "too academic" and therefore difficult to understand. This aligns with Churchill and Peter (1984), who stated that "shorter, simpler items are generally clearer and easier to respond to reliably" (p. 364). Simplification of language should be considered for future iterations. Both scales considering ICT-enhanced experiences have produced similar findings in regard to graded reductions in acceptance across a spectrum of ICT enhanced performances. Therefore, a focus on one, more holistic scale for ICT-enhanced experiences from a viewpoint perspective will be adopted moving forwards to simplify the process and focus on user experience. It is apparent that for some audiences, for example people who are deaf or disabled facing accessibility challenges, enhanced versions of the liveness scales may be required. A specific iteration linked to accessibility could be explored. Responses to the pilot of test liveness scales identified trends within and between iterations, which may potentially suggest broader tendencies in terms of audience perceptions of liveness. These would benefit from further exploration using a revised scale over several iterations, over time.

Overall, responses to the liveness scales support their further development with the intent to provide valuable insight into audience/potential audience perceptions of ICT-enhanced performances. To complete scale development (Boateng et al., 2018), test scales should be further reviewed by a panel of experts in relation to the findings herein to allow item reduction and extraction of factors. Following this, a final stage of scale evaluation (Boateng et al., 2018) can be carried out utilizing tests for dimensionality, reliability, and validity. Thereafter, significantly larger cohort sizes would be required, of at least 200 respondents, and/or a 10:1 minimum ratio between respondents and scale items (Boateng et al., 2018), to provide reliable results regarding potential for uptake, to inform new business models for music festivals. However, the responses to individual questions do provide some useful insights.

Performance Formats

Interestingly, acoustic performances without amplification were not considered to be the most authentic format of live performance, despite being arguably the least altered and therefore purest of form in relation to Phelan's "classic liveness" (Tsangaris, 2020, p. 200). Greater acceptance of acoustic and amplified performances may suggest that some form of electronic augmentation is required, at least in terms of a PA system and/or electrified instruments; however, once additional enhancements beyond those relating to amplification and lighting are included levels of acceptance are seen to deteriorate.

Compared to amplified performances, reduced rates of acceptance for commonly used ICT-enhanced formats, including pitch processing and prerecorded backing tracks, were observable. However, their relatively high rates of acceptance compared to other ICT-enhanced formats may suggest that passive acceptance is occurring "by stealth" through usage in event production over time. This may support claims of increasing use of ICT (Bossey, 2020) and suggests that further innovations including pitch processing in real time (J. Mulder, 2015) are viable in terms of audience acceptance.

DJ performances were generally less accepted than performances featuring live instruments and a clear gradation of response was evident regarding the two DJ options provided. The test scale did not allow for the subtle differences within DJ-based performances, the inclusion of DJs in other performance formats or reference specific ICT augmentations to the practice of DJ-ing. Furthermore, while DJs play recordings live and "perform

as artists leading crowds in a quasi-religious fashion" (Jaimangal-Jones, 2017, p. 234), this is only one metric of their authenticity. Overall, including DJ-based performances feels problematic, so future iterations of the liveness scales will be developed to either address the issues, remove DJ-based performances, or create a DJ-specific scale.

Significant reductions in acceptance for less commonly used ICT-enhanced formats, including networked performances, holograms, VR/AR, and entirely virtual artists were effectively identified by both relevant liveness scales. This provides both a "snapshot" of acceptance at a point in time among the respondents being sampled and a basis upon which to further develop and calibrate the liveness scales. These findings partially challenge claims that audiences at music festivals are susceptible to innovation (Hudson & Hudson, 2013) and that some audiences accept holograms as live music (Hughes, 2020). This may reflect the fact that respondents did not all have personal experience of the formats or communitas they can engender (Michaud, 2022).

Overall, the significant levels of resistance (Nabih et al., 1997) to ICT-enhanced formats appear to confirm that music festivals are in the early stages of the consumer innovation decision process. However, some audiences may require additional electronic augmentation to enable increased accessibility, which could be explored in future research.

Audience Sizes

The data showing that the smallest and inherently most intimate on-site capacity was not considered to offer the greatest sense of an authentic live experience seems to constrain Phelan's notion of "classic liveness" (Tsangaris, 2020, p. 200) in that if respondents want a close connection with the performer, they may not want one that is too cozy!

The perception that being an on-site audience member in a crowd of 50,000 people was a less authentic live audience experience than at the smaller capacities surveyed may suggest that perceptions of liveness may be reduced on a larger scale. This perception may also relate to social identities wherein perceived commercialization and increasingly corporate nature of larger festivals could mitigate against sense of authenticity. Given the importance of sense of authenticity to audience satisfaction (Girish & Ching-Fu, 2017), the finding may potentially have implications for future "arena" capacities within music festivals and/or the physical size of individual music festivals.

It is interesting that no significant variations were recorded in relation to individual respondent's engagement with the live music industry, when categorized, either by gender or by producer/selector or consumer of music (Askin & Mol, 2018). While this may align with the sense of communitas (Turner, 1969) experienced between audience members with varied motivations for attending music festivals, it does not conform with findings of gender disparities around group identification and self-esteem (Shepherd & Sigg, 2015).

While it is fascinating to contemplate the impact of physical capacity on perceptions of authenticity, which is broadly relevant to consideration of liveness for ICT-enhanced performances, future iterations of this research will remove the on-site audience capacity scale. Revised scales will focus solely on audience viewpoints, which are predominantly ICT enhanced.

Audience Viewpoints

In common with findings regarding format, higher rates of acceptance were observable for viewpoints that benefit from older, more commonly used ICT enhancements on-site, when compared to newer innovations. For example, watching video screens at the side of the stage, or (to a significantly lesser degree) a handheld device, were perceived as being significantly more acceptable than utilizing AR technology on-site (or remotely). This may indicate that while musical innovations have potential for rapid growth (Getz & Van Niekerk, 2019), adoption does not always transmit as quickly into live music.

Relatively high levels of acceptance for watching a live stream at home with friends may suggest that the value of communitas (Turner, 1969) extends to remote audiences and that watching remotely affords the opportunity of enhanced communitas among acquaintances that is practically less possible on-site, or at a cinema, where strangers will always be present.

The lack of any significant variations in relation to respondent's engagement with the live music industry suggests that while some industry gatekeepers were historically reluctant to engage with ICT-enhanced content (Bossey, 2019), gatekeeper perceptions of authenticity when experiencing such content are currently aligned with consumer perceptions.

The lack of significant differentiation in responses by gender regarding audience viewpoints contradicts suggestions that physical participation at music festivals is stronger among female attendees (Shuhua et al., 2023) and may support the latent potential for ICT-enhanced performances to increase inclusion and equality from a gender perspective. The successful use of the pilot scales in this research could support further development of an enhancement liveness scale that considers ICT-enhanced performances designed to improve accessibility for people who are deaf or disabled. No data were requested regarding music genre fandom, so social identity theory could not be tested in relation to in-group membership (Lonsdale & North, 2009), although a closed set of questions regarding music genre fandom could be added to a future iteration of this scale.

Authenticity/Liveness

The findings that amplified, on-site acoustic, or analogue performances were identified as the most authentic live performance across both cohorts manifest Phelan's (1993) view of "classic liveness" (p. 146). However, significant acceptance of livestreaming, video screens, and the use of handheld devices aligns with the work of Meyer-Dinkgräfe (2015), Tsangaris (2020), and Mallinder (2020), who suggested that audiences for music festivals who integrate ICT are developing their sense of "liveness."

Acceptance of the authenticity/liveness of most digitized formats was generally slightly higher among cohort 1 than cohort 2 although proportional changes varied. For example, the three measures of acceptance for on-site performances augmented with a hologram fell by an average of 2.06% between the two iterations. More significantly, acceptance of watching live content remotely utilizing VR technology was markedly lower in cohort 2 across both measures, with an average difference of 17.35%. While these reductions in acceptance over time may represent some form of COVID-19-related effect to reduce acceptance, there is no conclusive causational evidence, so further research would be required.

Conclusion

The perception of liveness is a significant factor relating to authentic music performances and one of a wider set of important factors that contribute towards an overall sense of authenticity in relation to broader music festival experiences. Understanding perceptions of liveness has potential to inform new business models, stimulating value for commercial music festivals.

The findings from three pretest liveness scales support the thesis that it may be possible to develop liveness scales to measure attendee/potential attendee perceptions of liveness at music festivals. Pretesting individual questions (Gehlbach & Brinkworth, 2011) successfully generated feedback about simplification of language and findings regarding the specificity of DJ performances. In the future, one individual liveness scale will be developed, based on audience viewpoint "at a live music performance on-site at a live music festival." For scale reliability, this 5-point Likert scale must contain at least 10 responses per survey item (Boateng et al., 2018) and/or 200+ responses. It could be coded directly against degrees of active or passive "acceptance" and "resistance" (Nabih et al., 1997, p. 193).

The scales require significant further development, expert review, and simplification to improve ease of use and reliability of responses, in alignment with Churchill and Peter (1984). Testing for dimensionality, reliability, and validity (Boateng et al., 2018) can then be carried out. Thereafter, investigating larger cohorts could facilitate further in-depth analysis of more specific applications. Specific scales linked to accessibility for people who are deaf or disabled could be developed. Revised scales will enable further investigation into potential trends identified in this research and could include questions regarding music genre fandom.

The research generated additional initial findings regarding perceptions of liveness between different performance formats at music festivals. Amplified acoustic and analogue electrified performances without ICT enhancement were considered the

most authentic formats, meaning acoustic performances without amplification were not considered to be the most authentic live performance. Acceptance declined for all ICT-enhanced formats.

Commonly used ICT-enhanced formats including pitch processing and prerecorded backing tracks obtained the highest relative levels of acceptance, which may suggest that passive acceptance is occurring through usage over time. Significant reductions in acceptance for less commonly used ICT-enhanced formats, including networked performances, holograms, VR/AR, and entirely virtual artists were identified, despite claims that Vocaloid performances create a shared sense of liveness and communitas (Michaud, 2022). Overall, music festivals appear to be in the early stages of the consumer innovation decision process (Nabih et al., 1997) in relation to most ICT-enhanced formats, potentially challenging claims that audiences at music festivals are susceptible to innovation (Hudson & Hudson, 2013).

The smallest scale audience size of 50 was less accepted as an authentic live experience than audience sizes between 500 and 5,000. The least authentic live audience experience was perceived as being an on-site audience member in a crowd of 50,000 people, suggesting that perceptions of liveness and possibly audience satisfaction may be reduced at a larger scale.

Predominantly watching the performers without any IT enhancement represented the most accepted authentic live audience experience on-site. The most accepted ICT enhancement on-site was watching the video screen at the side of the stage. Despite a significant drop between iterations, watching a live stream at home with friends obtained the highest combined acceptance for remote viewpoints. This may suggest that communitas (Turner, 1969, p. 94) extends to remote audiences.

Following Kruskal–Wallis testing, no significant differences in responses were observable by gender regarding audience viewpoints. This may support the latent potential for ICT-enhanced performances to increase inclusion at music festivals. Furthermore, no significant differences in responses were observable from individuals who work in, study, or attend events delivered by the live music industry regarding audience size. This may support the importance of communitas (Turner, 1969) across audience segments at music festivals. Acceptance of livestreaming, video screens, and the use of handheld devices aligns with the work of Meyer-Dinkgräfe (2015), Tsangaris (2020), Mallinder (2020), and Sanden (2019), implying audiences/potential audiences for music festivals are developing their sense of "liveness." This suggests further growth and innovation at music festivals is possible for these audience viewpoints.

Acceptance of ICT-enhanced formats generally fell slightly between cohort 1 and cohort 2, with acceptance of watching live content remotely utilizing VR technology being markedly lower in cohort 2. While this may represent a manifestation of a response to increased digitization caused by COVID-19, there is no conclusive causational evidence and further research would be required to draw any conclusions. Once completed, revised scales can potentially be used through repeated iterations to test whether changes in perceptions of liveness for different performance formats at music festivals might be identifiable over time, in response to claims that the nature of music festivals is fluid (Harsløf, 2020).

Implications of perceptions of "liveness" to the development of ICT-enhanced content for music festivals remain underresearched. To build on the findings described herein, case studies could focus on attendees' perceptions of "liveness" at individual festivals and/or attendees' perceptions of "liveness" while engaging with specific ICT enhancements at music festivals/events. Aligning findings to Rogers (2003) diffusion of innovation model could be explored. The extent to which augmentation may detract from authentic and liminal experiences for on-site attendees could be considered. Further research could address: the implications of ICT-enhanced content for music festivals that facilitates greater accessibility for people who are deaf or disabled on theories of liveness; and motivators for rejecting ICT enhanced content for live music performances.

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