

# Tenori-on Stage: YouTube As Performance Space

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## ABSTRACT

This paper reports findings from four related studies of the “Tenori-on” as it appears on YouTube in order to consider Web 2.0 as a performance space. A quantitative analysis of returns for “Tenori-on” attempts to model how posts achieve and maintain popularity. This analysis suggests sustained posting and engagement amongst users rather than initial product launch enthusiasm. A content analysis of the videos returned demonstrates a very different response to the launch of other technologies like the iPhone 3G. A grounded theory explores comments to the most viewed video returned which was a post by the artist Little Boots. A range of comments indicate virtual applause and suggest that YouTube has been appropriated here as a space for performance. Finally perspectives from critical theory are drawn on to consider the meanings of the Tenori-on in this user generated context and the ways users creatively resist the most obvious affordances of the device.

## Author Keywords

Tenori-on, YouTube, User Experience, Interaction Criticism, Critical Theory

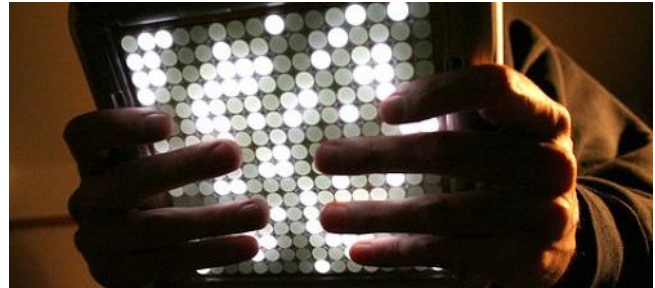
## ACM Classification Keywords

H5.m. Information interfaces and presentation (e.g., HCI): Miscellaneous.

## INTRODUCTION

The Tenori-on is a musical instrument designed by Toshio Iwai and Yamaha. It is part sequencer and part synthesizer with an interface made up of a grid of LED buttons which the user activates to make loops of sound (see figure 1). A line of lights pulses across the grid indicating bars of musical time. When one of the buttons on the grid is pressed it lights up and a note plays as the pulse passes over it. The user can create patterns of recurring notes to make loops that form single blocks. Up to sixteen blocks can be

created in different modes and users can play the device by flipping between blocks or performing other manipulations such as key transpositions.



**Figure 1: Tenori-on. Photo by Gabriel “Gab” Pinto. Creative Commons**

The designers were particularly concerned with the beauty of the light and sound, the ease of performance and the quality of the product as a whole [29]. There was an explicit aim to unite form and function in a digital instrument:

“In days gone by, a musical instrument had to have a beauty, of shape as well as of sound, and had to fit the player almost organically. Modern electronic instruments don't have this inevitable relationship between the shape, the sound, and the player. What I have done is to try to bring back these [...] elements and build them in to a true musical instrument for the digital age.” [29]

The Tenori-on was first made commercially available in Britain in 2008 to test the market before a wider global launch [36]. This study began as an attempt gauge responses to the instrument through the videos returned for a search on the term “Tenori-on” on YouTube. Although the returns offered numerous insights on the user experience of the device they also indicated how YouTube is being used as a performance space. When this study began the most viewed return was a video of Iwai himself demonstrating the device at a launch event. During the study it became a video posted by Little Boots. The returns for “Tenori-on” remain relatively dynamic as the next section will indicate.

## Modeling the Data

Results for the search term “Tenori-on” on 7<sup>th</sup> July, 2009 produced a typical outcome. The results page suggests that there are over 1,100 hits for this search term. However,

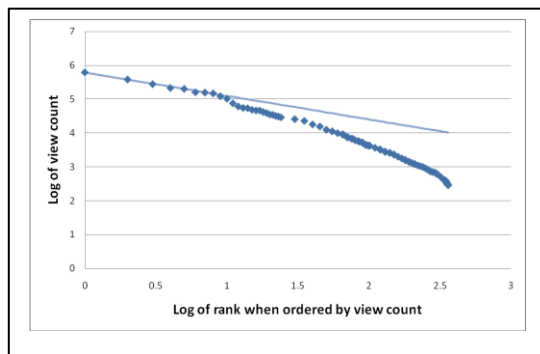
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when the results pages are trawled for the view counts, it becomes clear also that the results are no longer sorted by view count with view counts in the 360<sup>th</sup> to 380<sup>th</sup> videos varying wildly from several tens of thousand to zero. Thus we only model hits retrieved up to the 360<sup>th</sup> video.

When sorted by view count, it is clear that whilst the top few videos have view counts of several hundreds of thousands, this rapidly tails off but in such a way that there is still a “long tail” of viewed videos. There are several well understood long tail distributions that produce this shape, the two simplest and most common being the exponential distribution and the power law distribution.

The log-log plot of view count against the rank when ordered by view count is shown in Figure 5. Whilst the initial part of the plot is linear, it is clear that there is a tailing off from a straight line with a particular down turn just as the search results run out. This suggests that a power law distribution is a good starting point to consider view counts. Very similar results have been seen in searches over other terms such as “Shadow of the Colossus” [12] and “iPhone 3G” [8] where a rapid drop off or knee is more readily apparent.



**Figure 2. A log-log plot of view count against rank for the hits from search “Tenori-on” with best fit line for a power law.**

This shape of distribution in YouTube returns has been noted before by Cheng, Dale and Liu [14] also with a much more distinctive knee. The videos considered there were not the results of a particular search but rather obtained from a substantial trawl of all YouTube content. They propose, as others have, that the tail better fits a Weibull or Gamma distribution, each of which have a distinctive knee shape. Whilst this may be the case, this does not provide much insight into what processes drive viewing behavior. However starting with the power law distribution it is possible to consider possible processes that might lead to the observed view count distributions.

The power law distribution was first accounted for by Yule [41] and then simplified by Simon [33]. It corresponds to a steady state situation where the rate of increase in view counts is proportional to the number of view counts each video has already achieved. This can be generated by a step by step process where at each step two things can happen. First, there is a small probability that a new video is added

or secondly, an existing video is viewed in proportion to how much it has already been viewed. This latter behavior leads to the power law demonstrating a “rich get richer” process.

In many ways, this process makes a lot of sense in the YouTube context. People may search for videos across a wide range of criteria but generally they will view the more popular ones. Thus the rich videos do get richer. But also, popular topics are also likely to get more videos on that topic and hence there is a steady growth in the number of videos to be viewed.

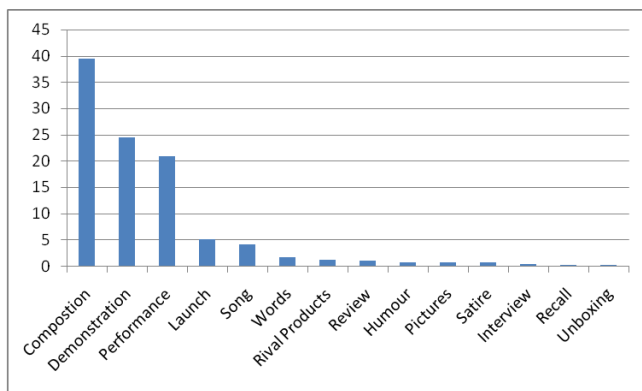
Why then is there not a proper power law distribution for view counts? One possibility is that though topics do grow, there is also a “shelf-life” to the topics and interest in adding videos to a topic falls away. Whilst popular videos continue to be viewed, there are diminishing returns in putting up a new video as the likelihood of getting viewed under the Yule-Simon process becomes vanishingly small. There is some evidence that YouTube viewing behavior follows a Yule-Simon process where the richer get richer but the uploaders get bored.

Evidence against this comes from what might be termed the degree of churn in YouTube videos. With a Yule-Simon process, there is little churn – once a video hits the top, it stays at the top. However, in many other power law situations there is a lot of churn [5] where the top 10 or top 100 ranked items vary enormously and that is exactly what is seen in YouTube. In a rich gets richer process, how do the richest ever get supplanted?

Although many topics such as iPhone 3G or Shadow of the Colossus could be expected to have a shelf life strictly related to the release date, the Tenori-on is an instrument which might have appeal beyond the initial novelty. Sorting returns by the date of the upload in the week beginning 14<sup>th</sup> September, 2009, there were 15 new videos. Sorting returns by the previous month showed that there had been 52 new uploads. This is comparable to the overall monthly average of 1,200 Tenori-on hits in the two years since its launch in Britain. This indicates a community of users continuing to keep a topic active and dynamic long after an initial launch. What then is this community doing?

## **CONTENT ANALYSIS OF THE FIVE HUNDRED MOST VIEWED RETURNS**

A content analysis [28] was performed on the first five hundred returns for the search “Tenori-on” sorted by most views on the 11<sup>th</sup> June 2009. Content analysis involves categorizing each video against pre-existing codes and counts the number of videos in each category. Figure 2 shows percentage returns for each of the categories.



**Figure 3: Content analysis on first 500 returns for “Tenori-on”.**

### Composition

The vast majority of returns featured people playing the device but there are distinctions to be made in terms of how they use it. Almost forty percent of the returns featured an original **composition**. Here users had composed pieces of music on the device and either set it to play a sequence of loops and blocks or directly manipulated the instrument to change blocks manually. Occasionally these Tenori-on compositions were accompanied by video effects or lightshows created with movie making software like iMovie. These were entirely instrumental pieces but often featured more than one instrument e.g. drum machines, synthesisers, compressors, effects units and other electronic instruments. Interestingly there was only one video featuring the Tenori-on and a non-electronic device; “Tenori-on meets sax” [27].

### Performance

The **performance** category often also featured original compositions but these were performed in public rather than filmed in a bedroom or studio. Some of these performances featured well known performers like Bjork using the device, these were a small minority however. Most of the performances were by DJs or musicians in small venues. Many of these videos were shot at launch events or conferences and some feature Toshio Iwai himself playing the device before an audience of academics. It is interesting to note that the reception of such videos changed over time. The early comments on Iwai’s performance are largely positive but later posts declare that he “sucks” and people should go and listen to “Little Boots”.

A small number of videos feature the device in a concert setting where it was not the primary focus. Musicians were playing a set and produced the instrument for one or two songs. Typically the performers apologized and joked about it. “*I have to activate the doomsday device, hold on one second... You’re all going to feel a stinging sensation and then you’re going to be blind*” [16]. At another concert the same artist tells the crowd “*You may have noticed a flashing device, it’s a Tenori-on, it’s a ...well, it’s a flashing device, I’m going to flash you with my device*”.

Coulter then attempts to play it and a long silence follows ended by audience laughter. In a post of the British singer Little Boots playing Glastonbury there is a similarly awkward silence as she picks up the device “*hang on...*” she says to laughter. After a technician arrives and fails to fix the connection she decides to play something else and turns to her synthesizer [23]. When Little Boots plays a keyboard the Tenori-on is sometimes placed on top of it and remains in shot as she sings. In band settings however it is raised up on a stand like a music stand. Its lights are lost in the stage lighting and it is not an integral part of the performance [26]. Similarly, a Bjork performance featuring the device begins with a close up of one of the backing musician holding it but it is mostly not visible in the wider stage shots [7].

### Songs

Although there are a great many videos featuring original compositions on the Tenori-on, they vary dramatically in quality as the comments below them readily illustrate. “Com4jai” like many others posted a video called “*my first tenori-on song*”. “Fewasdr” comments: “*I could play that better by randomly slapping my penis on it*” [18]. More kindly “utlewis” notes “*you suck at this, no offence*”. “Lionomega” asks “*yes but where is the song?*” (Ibid). The sub category of songs represents a wide variety of material and quality.

Little Boots is a singer and song writer who came to prominence partly through the popularity of her videos on YouTube and MySpace. Unlike the majority of posts featuring instrumental compositions Little Boots is among the minority of Tenori-on users on YouTube to post songs. Just 4% of the returns featured anyone singing a **song** with the device. However these posts were amongst the most popular returns of all. Of these the most popular, and indeed the most popular “Tenori-on” returns of any kind at the time of this analysis were the posts by Little Boots. The Little Boots songs featured innovative cover versions as well as original compositions. The videos are usually static shots of the singer sitting in a bedroom and playing either the Tenori-on alone or a combination of Tenori-on with other instruments e.g. piano and stylophone. These will be returned to in later sections.

### Words and Pictures

A small number of posts used the device primarily to create graphic displays of **words** like “Truth” or “Happy New Year”. Others used it to create simple **pictures** like an apple or animations of Egyptian hieroglyphic people dancing. A small percentage of the videos were demos of **rival products** such as iPhone apps with similar grid like interfaces and functionality (e.g. PakSound, Soundgrid, EasyBeats or Sequence). These offer similar grid-based interfaces but cost one or two dollars rather than several hundred. Other minority posts were videos on a possible **recall** of the device because of an electrical fault, there were also two **interviews** with Iwai.

## Review and demos

Although the device was played in **demonstrations** the focus was in showcasing different modes rather than composing music. Some of these featured musicians who had been given the device to play something on it for the purpose of promotion. One series of videos made by Yamaha specifically demos each mode of the device in a step by step guide.

There were remarkably few **reviews**, indeed only one in the first five hundred returns. This is extraordinary considering that returns for searches on other new devices like the Apple iPhone return such large quantities of reviews [8]. Devices like the iPhone and even individual apps like twitter clients receive detailed reviews which often focus on aspects of usability (ibid). Only one such review was returned for the Tenori-on and it was posted by a specialist technology webzine publication. It is possible then that the YouTubers who are posting are reading the device more as an expressive instrument rather than a piece of functional technology. Don Norman famously notes that nobody would expect a violin to be usable [30] perhaps this is also the case for electronic instruments like the Tenori-on.

## Satire

There were also remarkably few humorous or **satirical** posts. Of the few that were returned some might be considered fairly unsophisticated forms of **humour**, one simply features a Tenori-on spelling out in lights the word “cock”. But others were more subtle, one, for instance, was a clip from the IT crowd where IT support worker Roy is shown wearing headphones and enthusiastically nodding along to the Tenori-on he is playing. When another character walks in he puts it away without comment and the audience laughs at this clear demonstration of Roy’s essential geekiness. An even more direct satirical attack on the device comes in a demonstration of an “unplugged” Tenori-on. Kentaro Fukuchi’s video begins with a sign noting that the Tenori-on is very cool but also rather expensive [21]. It goes on to show him making an “unplugged” version consisting of four vinyl pipes and a piece of bubble wrap. Fukuchi then plays the instrument for our listening pleasure by popping the bubbles on the bubble wrap attacking not only the price of the device but the sound quality.

## Unboxing

Of the first five hundred videos only one featured a Tenori-on **unboxing**. Unboxing videos accounted for over twenty percent of the first hundred most viewed videos for a search on the iPhone [8]. Unboxing videos are a very interesting YouTube phenomenon, it has been claimed that they provide an empirical justification for theoretical constructs of user experience which emphasise the importance of anticipation (Ibid). Why then should there be so few unboxing videos for the Tenori-on? Were the users not excited about opening it? The Tenori-on packaging consists of a fairly rough cardboard box something like a take away

pizza box. The only graphic on it is a very simple line drawing of the device on the front. It is certainly not going to win the sort of awards that Apple’s packaging designers are accustomed to receiving. But perhaps the reason for the lack of unboxing videos is that the users were thinking of it primarily as an instrument rather than a new gadget.

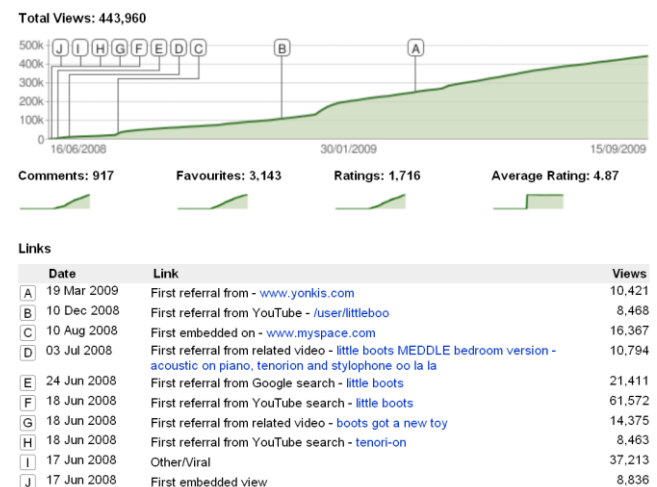
The overall shape of the data then is quite different to that of returns on searches like iPhone. There are very few reviews, there are almost no unboxing moments. The vast majority of posts are musical performances of one kind or another.

The next section will consider in more detail the most popular return at the time of writing: the Little Boots video “ready for the fun” [24].

## ANALYSING YOUTUBE’S NUMBERS

YouTube now provides audience demographics based on the information gathered from users with YouTube accounts who have logged on. According to the site statistics at the time of writing the “Ready for the fun” video was most popular with males from 35 to 44, followed by males aged between 45-54 and males aged between 25-34. It was viewed most often from Britain, where Little Boots is from and where the Tenori-on was first made commercially available. That the video should be most popular in Britain is perhaps no surprise, that the video should be so much more popular with men than women is perhaps less predictable. Other Little Boots videos, such as some of her performances at Glastonbury are most popular with 13-17 year old girls.

The timeline in Figure 4 also supplied in “statistics and data” section goes some way to explaining what is happening:



**Figure 4: YouTube “Statistics and Data” for little boots READY FOR THE FUN!!!.**

The letters in Figure 4 show the dates at which the video was embedded in sites like MySpace or referred from Google searches. It is likely that after being embedded in

the MySpace site other demographics than the middle aged males searching for “Tenori-on” would have viewed the video on YouTube although they may not have logged in as users.

YouTube claims that there are more or less equal numbers of males and females on their site [40]. There are several Tenori-on groups on Facebook and the most popular one has four hundred and ninety one members. Of these only around fifty are female. New technologies are often marketed specifically at males so it is possible that this explains the overwhelming gender bias in the audience for the most popular “Tenori-on” return.

### GROUNDING THEORY

On 28<sup>th</sup> July 2009, the most viewed return for the search “Tenori-on” was “little boots READY FOR THE FUN hotchip Tenori-on cover” with 399,627 views, 1,520 ratings with an average of five stars and 808 text comments [24]. The video is a single take performance of a song shot from a fixed camera. An attractive young woman in a black vest is sitting in a darkened room next to a keyboard with some cluttered shelves just visible behind her. She is lit by a strong light from screen left creating a chiaroscuro effect and also providing a strong visual platform for the white lights of the Tenori-on. In real time we see the artist setting a bass line in one block. She then creates another block with a synth pulse and another with a minimal drum pattern. Further blocks are added with synth pad sounds making up a chord sequence. Finally she adds a single voice triplet of lead notes. It is a virtuosic and clearly carefully rehearsed performance. There are almost no mistakes or mis-steps. Rather than begin the video with the Tenori-on part already created she performs its creation from scratch.

When the Tenori-on part is complete she begins singing and uses the transpose function to shift the entire sequence to create a different progression. By transposing the blocks and moving between them she creates a very complex and dynamic backing for her vocal which is showcased at one point by dropping the Tenori-on out altogether while she sings acapella. She ends the track by clearing each of the blocks until only one two note pattern remains. Finally she swirls her hand over the Tenori-on making a pattern and a random fall of notes.

A grounded theory analysis was performed on the comments for this video. Grounded theory begins with data, rather than pre-existing categories. Open codes are developed to summarise the data, these are then grouped together and linked in axial coding, the final stage of selective coding involves the selection of typical quotes to illustrate the “theory”. Theory here may refer merely to a broad description or set of categories rather than a fully worked predictive schema [13].

#### Praise

The vast majority of comments on the video were in praise of Little Boots, indeed, some negative comments had

clearly been removed although traces of flames wars about them still remained. Figure 5 shows the percentages of comments assigned to each code.

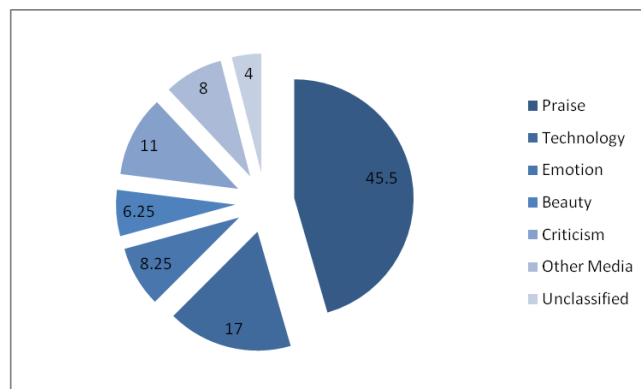


Figure 5: Comments on Little Boots video

The **praise** was most often a textual form of applause “*Bravooo*” “*A-MAZE-ING!!*” “*wow*”. These comments often contained onomatopoeic attempts to represent the sound of cheering “*yay!*”, “*Whoo!*”. These brief sound based responses indicate the ways in which the YouTube audience respond to the post as a performance. Just as they would clap at a live event they use text to applaud. These types of praise occasionally became direct address “*whoop whoop herd u on radio 4 womans hour !*” some followed praise with a question for the artist “*What do you call the sound effect at 4:31 ? Bare foot slapping on bedroom oak effect wood floors?*”. Although there are no responses from Little Boots there is a sense of direct communication with the artist in these posts. Some included requests for her to play their home town or recommendations of music or other technologies she might like. Many of these posts were general forms of approbation “*you rock!*” but others focussed on specifics such as her skill using the device, her voice, or her hair. Her hair was mentioned specifically in 12 posts, many more commented on her general beauty.

#### Beauty

Many of the comments regarding her **beauty** simply noted that she was a “*hot babe*” . Others commented on the combination of looks and talent “*what a babe. what a electronicmusician...*”. Two of the comments were explicitly sexual “*oh shit i snapped my boner!!*”. Many more were more emotional responses. “*Simply....I in love*” Some of these declarations of love were followed by optimistic requests like “*be my girlfriend*”. Or “*can you be my internet girlfriend*”. Other emotional responses included more direct accounts of how the video made them feel, for example “*sweet. made me feel good*” or “*goosebumps all over*”. Often comments related to “*sweetness*” and cuteness “*aww*”.

#### Technology

The comments that were not some form of praise for the artist’s looks or talent were often praise of the Tenori-on.

Seventeen percent of the comments specifically referenced the **technology**. Some of these were questions about what the device was often followed by explanations from other viewers. Some were comments about the innovative way in which Little Boots was using the Tenori-on by people apparently familiar with the device *"It must be in the choice of Tenori-On functions; key changes most important, the beepy-boopy Bounce mode probably least important."* This comment is interesting because it picks up on the innovative use of key change in the performance. Of the five hundred videos sampled very few make use of the key change button in this way and Little Boots is the only performer to use it to structure verse / chorus changes.

A number of comments specifically reference the other Tenori-on performances on the site *"You're the only one I have found so far who knows how to use the thing a write music with it. Everybody else seems like random noise."* One viewer noted that this was the best piece of advertising so far for the Tenori-on. Two viewers, however, posted jokes about it *"cool...pong is back!!!"* similarly *"I like how she sings and can play space invaders at the same time :)"* The slightly dismissive tone of these posts indicate a pleasure in "geeky" technology being used in this way *"it's nice to see a girl so into synth-pop geekery doing so well."* Part of the originality being enjoyed here is the innovative use of the instrument which is in marked contrast to the way it is usually used, even by its inventor.

### Criticism

Although abusive comments had been removed their traces remained in the flames sent by fans defending Little Boots against her detractors. *"I think we all feel sorry for you"* [the person who had been criticising Little Boots] *because you are obviously unhappy with life. Don't you know what pop music is about? Its about trends and styles and the latest thing so do yourself a favour an chill."* It seems that the removed comment had slated Little Boots as trivial or trendy. Some direct criticism remained however. Some of this criticism, like much of the comments on YouTube in general is homophobic and misogynistic *"she is actually like all other chicks, she went on x factor and didn't get through."* Other posts dismissed the video as a "gimic" or expressed resistance to coverage in other media announcing her as *"the next big thing."* Three of the posts expressed fears that the authenticity on display in the video would be swallowed by the music industry *"I will still like your art after you've been over exploited by the music Industry!"* Others contrasted this "amateur" performance with the artificiality of music industry products: *"I really like it. Is it now the trend to go against what the industry says."* One viewer on the other hand felt that she could be great with some help *"from the pros."*

The references to other media were primarily discussions of appearances by the artist either in concert or on television. A large number also referenced her debut CD "Hands" with promises that they would buy it. The "acoustic" and

*"intimate"* performance then functioned very well as a marketing device for the more fully produced commodity in production.

### Intimacy on YouTube: the limits of ratings

The seeming intimacy of the close up performance allows the users to feel engaged in an emotional dialogue with the artist. The intimacy of the setting was occasionally contrasted to other media *"Amazing. These solo versions on YouTube actually sound better than the mega-overproduced tracks on your EP. Your minimalist instrumentation lets us hear your great tunes and voice better, I think. Rock on girl"* The video appears somehow more authentic, it is described in another comment as *"acoustic"*, another writes *"Good on you for releasing wee home recorded vids like this, theres something very intimate about it, and that is never a bad thing"*. The setting and the performance are taken as modest and somehow genuine.

The star rating system offers a strictly numerical form of expression. It is interesting that the text boxes are used to emulate sound, noise and more intimate forms of expression such as the fan letter. The responses indicate that automated features such as rating are important but perhaps limited as forms of expression.

### FINDINGS SO FAR

Even if models could offer a compelling account of patterns of popularity (rich get richer plus decay over time) this would not tell us why one video rather than another is more popular. If it were simply the case that the rich got richer this still does not explain how they get rich in the first place. Clearly "Ready for the Fun" is returned for other searches, e.g. "Little Boots" and picks up more views and achieves a most viewed ranking. But this does not entirely explain how an artist and a technology can capture the public imagination in the way that Little Boots did. The next sections draw on critical theory to consider the meanings of the Tenori-on in the Little Boots video.

### CRITICAL THEORY

Critical theory is a field which encompasses many perspectives. It draws on literary studies, psychoanalysis, linguistics, cultural and media studies as well as philosophy [20]. As computing technology penetrates still deeper into everyday culture, perspectives from critical theory are increasingly relevant to studies of HCI [e.g. e.g. 1, 6, 19, 31, 32, 3, 8]. Critical theory is primarily concerned with interpretation and meaning. But critical "readings" are always open. There could never be a final reading of a poem, play, or any other cultural artifact. Nobody could plausibly claim to have finally discovered what Hamlet means. The meanings of cultural artefacts are never singular, they are always multiple. For this reason critical theory includes perspectives which are not only different from one another but sometimes completely opposed. Readings such as those by the cultural critic and philosopher Slavoj Zizek are "imagined hermeneutic

understandings” [44] or provocative interpretations and make no empirical claim. For example Zizek claims that British toilets combine both inspection (water) and fast disposal (flush) indicating inclinations towards empiricism and pragmatism. This is not to claim that this is what their toilet designers were aiming at nor is to claim that this is what most Britons think while they are on the loo. The following sections then are likewise interpretations which make no empirical claim but rather, supplement the more empirical studies which precede it.

### Tenori-on as Commodity Fetish

Perhaps the most obvious interpretation of the Tenori-on on YouTube is that it exemplifies perfectly commodity fetishism. When Marx first formulated the notion of commodity fetishism he was concerned to indicate the ways in which commodities are figured as mysterious or magical objects “endowed with special powers” [44 p. 300]. This can be seen in the YouTube responses where delight and wonder are mixed equally with speculation about how much the device costs. This wonder explains perhaps the impulse to post videos of the first composition: look at this magical and mysterious object which I own.

That our technologies are now as much about fashion as our clothes is such a commonplace that it is increasingly challenged, for example Charlie Brooker, “anyone who thinks their phone is an expression of their personality hasn’t got one” [11]. Indeed the adoption of a fetish is not about simple identification. Stonewashed jeans are supposedly associated with a working class lifestyle but they have always also been worn by the upper class. For Zizek it is in the gap between what something is supposed to represent and how it is actually appropriated where meaning is made; for this reason it is appropriate then that today’s most popular clothing stores are called “the gap” [42]. In order for us to adopt a technology there must also be a gap. As previously noted many of the videos featuring the Tenori-on in performance show the performers joking about the device and their own geekiness: “I know very well that this is ridiculous, nevertheless...”

However there were almost no unboxing videos in marked contrast to most other technology releases. This indicates perhaps that the device is either something more or something less than a commodity fetish.

### Tenori-on as MacGuffin

The comments on the Little Boots video indicate that the technology is not the only thing being admired and desired. Of equal if not much more interest is Little Boots herself. It is likely that the Little Boots videos are not as artless as they may appear. John Bowers has remarked that “unplugged” performances are in fact always plugged. If an acoustic performance is to be recorded and broadcast it must be miked up and amplified just as carefully as an electronic instrument would have to be (Bowers, personal communication). In each of the Little Boots posts the shot

is skillfully composed. The sound quality is particularly good and the mix of sound levels between voice and instrument has clearly been given serious attention. Although the bedroom setting suggests an artless or naïve performance Little Boots is clearly very conscious of the way she is presenting herself.



**Figure 6: Still from Little Boots MEDDLE bedroom version**

It is possible that she usually sits around in her bedroom wearing hot pants like the ones in Figure 6 but it is more likely that the performance is very thoughtfully staged.

It is also clear that these performances are far from spontaneous. They are not the improvised patterns submitted by the majority of Tenori-on users posting to YouTube. Rather they are carefully planned and rehearsed performances.

In other words the Tenori-on is far from the only reason this video is popular. In Lacanian terms the Tenori-on might be thought of as “object small a” [42]. This is a difficult Lacanian concept that Zizek illustrates with reference to the films of Alfred Hitchcock. Every Hitchcock film features a “MacGuffin” some plot element that motivates the characters. What the MacGuffin is does not matter, it serves merely to drive the characters forward, it might be a stolen microfilm, a plot by enemy spies, a lost love, a murderer – it could also be ambiguous [38].

The Tenori-on in Little Boots videos also functions in this way. It literally drives the video forward signalling both beginning and end, it provides a motivation for making and watching the video. Here is Little Boots playing this strange new instrument. The MacGuffin is a surplus of meaning, an excuse for self presentation.

The Little Boots videos are far from typical of most of the Tenori-on returns. They are not the improvised patterns submitted by the majority of Tenori-on users posting to YouTube. They are quite unlike the compositions where users create spontaneous, solely instrumental patterns by exploiting the most obvious affordances of the device. What then can be said about the particular use of the device

in the music rather than the video? The next section turns to another perspective suggested by critical theory: technological determinism.

### **Tenori-on and Technological Determinism**

The ease with which a complete beginner can create a pleasing sound with a Tenori-on was one of the features that were heavily promoted when the device was launched [36]. The affordances of the Tenori-on are towards patterns which even first time users create unwittingly as soon as they light up one of the buttons.

The resulting patterns of music that might appear intrinsically modern or at least twentieth century. The music of Philip Glass is intensely patterned and repetitive. Minor variations in patterns lead to very complex pieces but for the uninitiated listener they can sound unbearably repetitive if not mechanically looped. Similarly dance music is a form which in the last twenty years has made an art out of manipulating loops of sound. Again, to those who are not familiar with the genre much of it can sound alike: “Call that a beat, they had proper bass in my day.” Likewise, the music which accompanies video games is often deeply patterned. Of course the current generation of video games can play any form of music but early games had to generate their themes “in house” and with very limited computational resources. Early video games like *Sonic the Hedgehog* featured soundtracks composed and played entirely on computers. They were as patterned and repetitive as any avante garde piece or dance track.

Wikipedia offers a range of definitions of technological determinism, here is one; ‘The idea that technological development determines social change’ [39]. Although it is an extreme position it is hard to deny in every respect. The act of turning to Wikipedia for a definition rather than a book is evidence of the almost immediate impact of new technologies. But in a sense the Tenori-on provides a counter-example to technological determinism. The patterned music it produces existed long before it did. The patterns of music in Bach which could theoretically repeat ad infinitum were the dominant form signaling religious concerns with eternity. It was not until the Enlightenment that composers like Beethoven began to write linear music with identifiable beginnings and endings. Patterned music then is nothing new. In this sense the message preceded the medium.

And as Little Boots demonstrates, there is more than one way to adopt a new technology. Part of the pleasure of the “ready for the fun” video is the virtuosity of Little Boots’ performance and her mastery of the instrument. Little Boots’ use of the device to produce a recognizable song “ready for the fun” by the electro-pop band Hot Chip. Little Boots’ careful, controlled and skilful use of features like the transposition function illustrates the ways in which the most obvious affordances of the device can be creatively resisted. It is this creative resistance which, amongst other things, sets the video apart from the more general slew of patterned

instrumental compositions and perhaps explains some of its power and popularity.

### **TENORI-ON STAGE**

As with previous studies drawing on YouTube, the medium is as important as the context of the posts [8] The majority of posts featured users making music of one kind or another with the device. In this sense, these users appropriate YouTube as a venue for performance. While Iwai may have partially achieved his goal of making an instrument for the digital age, challenges remain in terms of providing a space for performance. As previously noted, when the device is used in a concert setting (e.g. 7, 26) it is lost in the space and stage lights. It is at its most arresting and beautiful in a small setting like a bedroom, or indeed a TV studio, with a close focus on the device.

In some ways YouTube is a better performance space for the Tenori-on than a concert hall. In the bedroom videos both device and performers can be seen and appreciated. Beyond texting crude substitutes for applause the audience can, to a degree interact. There are several Facebook groups for the Tenori-on, and its members exchange tips about the device.

It is not difficult to imagine a dedicated Tenori-on social networking site which would facilitate not only sharing recordings and videos but also perhaps collaborations. The ongoing uploads suggest a community of users who are interested in each others’ work as well as their own. Such a Tenori-onTube might also provide more imaginative ways for viewers to applaud than the basic YouTube textbox, e.g. sound or graphic presets. As jazz clubs provided a space to develop new forms of music for new instruments like the saxophone perhaps a dedicated site might help the development of a Charlie Parker for the Tenori-on.

Such a site might rank uploaded performances by views as with YouTube but it might also be interesting to allow users to categorise the submissions themselves. User-based categorization might be constructed as a content analysis where users could assign pre-existing categories (e.g. genre). More radically an open coding such as that practiced in grounded theory might allow for more creative and surprising patterns of user categorization to emerge.

### **DISCUSSION: ALL THE WEB’S A STAGE**

Many musicians are beginning to use YouTube as an intimate performance space with a range of instruments. In Reggie Watts’ video “I just want to” the artist uses only a microphone with a sampler and mixer to produce an entire song on the fly. He begins by recording samples of “beat box” vocal percussion and sung bass lines which he then loops and mixes with instantaneous recordings of backing vocals and live lead vocals. Watts creates every part of the song in a single take and performs the whole piece in real time [37]. The virtuosity is astonishing and would be lost outside this intimate YouTube “bedroom” staging. But YouTube is a stage for other kinds of digital performance.

Players of games like *Shadow of the Colossus* archive particular performances of game play [12]. And there is increasing attention to amateur multi-media such as machinima and mash ups [2] where YouTube and other host domains are performance spaces.

The British theatre director Peter Hall argued that all that is necessary for an act of theatre to occur is for someone to walk across an empty stage while someone else is watching [10]. It is clear that many, if not all, of the postings to YouTube are performances but the interface is seldom considered as a stage. The posts are also films yet film theory is seldom referenced in HCI. Zizek is perhaps the best known cultural critic and theorist of film alive today and yet his appearance in an article on YouTube may seem bewildering.

As HCI begins to concern itself with issues like aesthetics it is essential that the field engage with the arts and humanities [15]. As Jeffrey Bardzell has argued it is simply not the case that there are no definitions of what we mean by “aesthetics” as is sometimes claimed, there are standard textbooks on it. As Web 2.0 technologies are appropriated for creativity and performance, traditions of thought more readily associated with literary and cultural studies become increasingly relevant. There is then a growing recognition that researchers who ignore relevant work in the humanities and social science risk repeating previous work or revisiting previous philosophical dead ends [15, 9]

This paper combines very different forms of analysis from social science and the humanities. Of the various forms of analysis directed at the Tenori-on on YouTube in this paper the critical theory will appear most alien and disreputable to a traditional HCI audience. George Sokal famously hoaxed a journal of cultural studies into publishing errant pretentious nonsense [34]. Since then it has been easy to sneer at the humanities. But scientists should not forget how often their own journals are duped by charlatans [22]. There is a lot of bad critical theory which is easy to laugh at but then there is also a fair amount of bad science which can be equally amusing [22].

Critical theory is an umbrella term for a collection of sometimes mutually exclusive approaches to interpretation. The perspectives available within it are not methods but styles of thinking. The interpretations of the Tenori-on on YouTube here are examples of one perspective – psychoanalysis. They not suggested as definitive readings, there could be no such thing. There are a range of other perspectives (feminism, dramatism, performance theory) that would also be relevant. As interactive technology penetrates further into every aspect of our lives and culture the value of these different styles of thinking is becoming clear e.g. [4].

## CONCLUSION

This paper has reported findings from four related studies of the Tenori-on on YouTube. The quantitative analysis

demonstrated models of popularity based on the rich getting richer within a limited shelf life did not hold. Further regular uploads demonstrated a community of users that continue to be engaged with the device. The qualitative content analysis demonstrated that responses to the Tenori-on were quite different to those to gadgets like the iPhone indicating perhaps that the device is being taken seriously as a musical instrument. The grounded theory of the most popular return also indicated that the community found the device almost as compelling and beautiful as Iwai hoped. Finally perspectives from critical theory helped articulate the multiple meanings of the device as well as the notion of YouTube as performance space. YouTube offers unprecedented glimpses into the lives of users and the ways in which they adopt and adapt technology. Observation and description of these data are not enough, there must also be interpretation. Of course, in HCI there will always be base level questions of functionality, usability and acceptability but increasingly there is the further problem of meaning.

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