Technology and Interactivity in Modern/Post-Modern Japanese Theatre

by

Diana Lily Draker
Bachelor of Fine Arts, University of Victoria, 2015

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Abstract

Multimedia technology in theatre is nothing new, but various companies in modern and post-modern Japan, such as Dumb Type, Hatsune Miku, and the robot theatre of Oriza Hirata and Hiroshi Ishiguro, have been experimenting with mediatized technology. This thesis hones in on these Japanese multimedia theatres. It studies the origins of mediatization in theatre, looking at the impact of the innovations made by Adolphe Appia. Furthermore, the growing impact of media technology can create a perception of 'Liveness' of these artificial actors. Liveness is a critically important concept, both on and off stage, affecting how one perceives the non-human and the type of relationships that are conveyed between the human and non-human actor, as well as the non-human actor and its human audience. This thesis covers the productions of "A One Woman Show" and a spoiler-heavy discussion on *Super Danganronpa 2 The Stage ~Sayonara Zetsubō Gakuen~* within the context of the impact of projections on stage. Robots and the uncanny valley are also reviewed, with the play *Sayonara* as the primary case study within this topic. Then the thesis analyzes the experimental human theatre of Dumb Type, focusing on their plays *S/N* and *pH*, as well Vocaloid concerts and the impact of these characters, especially Hatsune Miku, upon the fans. In the course of this analysis, reasons are suggested as to why these technological innovations have found particular success in Japan.

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Acknowledgements

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Finally, I would like to thank both Sega and Nintendo for their encouragement in my correspondence with them. While these companies were restricted from answering the technical questions I put to them, their responses were telling of the commercial and legal importance of their technologies.

Dedication

To everyone who has touched my life, and to those whom I have yet to meet. Thank you all from the bottom of my heart for all the encouragement that I have or will receive. Oh! And Ruby the dog. Can’t forget about her.

Chapter One: Introduction

From Dumb Type to the collaboration of Oriza Hirata and Hiroshi Ishiguro to Vocaloid concerts, various modern and post-modern Japanese performance arts have been using experimental technology. This thesis will seek to show how cutting-edge technology, with particular interest in digital media technology, is being adapted into Japanese theatre; I will also demonstrate how it creates a unique interactivity between the actor and audience. As such, this paper will primarily focus on theatre in twenty-first century Japan. The significance of the study is to understand why theatre in Japan has taken advantage of and applied digital media in innovative ways, both from the point of view of the performers and the audience.

In order to reach a compelling conclusion to this conjecture I have divided my thoughts into four main categories: mediatisation as a whole, projection technology in theatre, robot theatre, and specific Japanese theatrical groups who are working with digital media to enhance their performances. For the purpose of context, I will use this introduction to review important terms and concepts to which I will be referring throughout the course of this thesis.

One of the most important concepts is "Liveness", which is a key term in Philip Auslander's book *Liveness: Performance in a Mediatized Culture*: an academic study that will greatly serve my second chapter. Liveness is a term that I will use to address two different aspects: the idea of a live performance (Auslander 2) and the philosophical concept of artificial actors being "alive" (Parker-Starbuck 29). A strong defining feature of the concept of Liveness is the connection that can be formed between others, including, "the 'energy' that supposedly exists between performers and spectators in a live event, and the 'community' that live performance is often said to create among performers and spectators" (Auslander 2). I will go far more into detail about this terminology in the second chapter.

Moving forward, it is the nature of live performance art to be a temporary experience. Hence the next term I will cover is Temporality. When a character is on the stage, regardless of whether that actor is played by a human being or an object, the performance will only exist on the stage. Therefore, when the story is over, the human actor returns to being his or her own person rather than the character, but the inanimate actor returns to being an inanimate object (Jakovljević 2). I

will argue that even though the projected character exists for only around three hours at most, if an artificial being is able to make the audience connect with it, then it is "alive" for that duration of time (Turkle 26).

Branislav Jakovljević states that there are two main types of time passages: Concrete Time and Abstract Time.

> …'concrete time' is that kind of time that is inseparable from social and natural events such as holidays and seasonal labour, while 'abstract time' is a dimension of a commodity. As Moishe Postone puts it, in the former, the events 'do not occur within time, but structure and determine it', while the latter is 'uniform, continuous, homogenous, "empty" time … independent of events' (Jakovljević 4).

Jakovljević states that performance falls into Abstract Time; however, it makes itself look like it takes place in Concrete Time (4), as a play is a string of actions that interrupt the "normality" of the characters upon the stage (Ball 9). To clarify, Abstract Time is the time that takes place within the world of the play. As an example, if the story takes place over the duration of several days, then that would be defined as Abstract Time. Concrete Time is the flow of time happening in reality (Jakovljević 4). Once the intruding force leaves and a normal status is restored, whether it be the same situation that the characters were living before the events of the play or a new one as a result of the events, the human actors return to being themselves (Ball 21).

As a consequence of these factors related to temporality, it can be said that a theatrical performance is never the same twice. Consequently, there is the potential for improvised lines, for various reasons (Mitchell 73 – 74), such as if an actor forgets his or her line or if an unexpected occurrence happens on the stage. There are even competitions and whole companies that are based on the idea of improvised performance (e.g., *Canadian Improv Games* 2017). With current technology, it is a near impossibility for a pre-programmed actor to improvise (Baird 73), meaning that the live human actor must provide a perfect or near-perfect performance for every time the show is run in order to interact effectively with a non-human actor (Acaroglu 301).

Although I personally have directed two separate shows with pre-programmed actors and found them quite enjoyable to do, it does limit options for directing. With one of these shows the human actress and I could only really work on timing with the projection, and getting that

perfected left little rehearsal time for developing the characters and relationships. When I direct, especially with comedy plays, I like to play improvisation games with the cast to help them get a stronger understanding of their characters and to discover the comedic timing. Sometimes it would be as simple as performing a scene in a different genre. For example, one could play as a musical number within the scene in *The Goat or Who is Sylvia?* where Stevie learns that her husband has been cheating on her with a goat. A more complex improvisation exercise is having the cast play out what they believe happened before the story (Mitchell 173) and the after effects. "Improvisation [exercises] will build strong pictures of the past in the actors' minds, and these pictures will help them play the present action more accurately" (Mitchell 163). In both examples, especially in the latter, I imagine it would be difficult (if not impossible) for a robot or projection to participate in these exercises.

As the pre-programmed actor is a character in and of itself, it does not need to go through rehearsal exercises to get into character; however, it naturally can only create the illusion of forming a relationship with the human cast members, as while it exists off stage, it does not have a true personality, dreams, goals, etc. (Acaroglu 301).

The concepts of Authenticity and Fictionality clearly travel hand-in-hand with the preceding concepts. This is because they both question the reality of the world that is being depicted on the stage. In fact, it can be argued that theatre has become a "laboratory where the fundamental relationship between reality and fictionality is explored" (Epner 291). In this case, the very existence of artificial performers on the stage is what is being brought into question as they are both real and fake at the same time (Turkle 26). By this, I mean that they are really on the stage; however, they are without a doubt fictional because they cease to exist in a way after the show finishes (Collins 36) because they lose the emotions that existed only in their characters' dialogue (Jakovljević 4).

> Historically, the word 'authentic' has been used describing texts or knowledge based on initial sources and therefore reliable - the opposite being 'fake,' 'imitation,' or 'copy.' In a wider sense, 'authenticity' means genuineness, realness, as opposed to such notions as 'illusion,' 'fiction,' and 'pretending.' (Epner 291).

While human actors pretend to be someone they are not, an artificial actor is programmed to pretend that it is indeed real (Turkle 6). To add to the authenticity of a fictional performance, human actors can and are encouraged to draw from their own life experiences to connect to the character that they are portraying (Epner 296). It has been said that the key point for "making a fictional story authentic" is how successful the actors are at making the audience believe what they are seeing (298). However, when it comes to an artificial actor, projected or robotic, said actor is a reflection of the human cast and audience (Sone 346). Hence, not only do the performers need to convince the audience that the story they are witnessing is really happening, but also that these synthetic actors are really alive (Acaroglu 300).

The creation of the relationships among cast members (and crew members) is essential for making the production a success (Mitchell 127); however, as I previously mentioned, artificial actors can only form the illusion of a true relationship. Thus, the crucial job of a director in this type of theatre is helping the actors find a way to present an authentic relationship between themselves and the non-living being (Acaroglu 301); as family relationships are the most familiar to the average theatre goer and cast member, it is said that drawing upon the knowledge of one's own family experience can create a stronger connection between the cast members, including artificial ones (Ball 85).

This audience and actor relationship is a crucial one for my thesis and involves two more concepts: Immediacy and Intimacy. In the context of this thesis, Immediacy is bringing someone into the direct involvement with a project, often creating urgency and/or excitement in the participant(s); this naturally goes hand-in-hand with the term Intimacy.

When it comes to theatre, the term immediacy describes not only a production that closely involves the audience but also a production that brings in outer sources. By outer sources, I mean to say that such a theatrical production involves other art forms, such as video for example (Machon 22). "All elements of theatre are in the mix, establishing a multidimensional medium in which the participant is submerged, blurring spaces and roles" (Machon 27). This creates an atmosphere that (hopefully) supports the script and playwright's vision (Ball 86), hence a better overall experience for the audience.

However, there is the argument that the inclusion of media within theatre makes it cease to be live theatre (Auslander 31). Naturally, the recorded media is not technically alive or performing live, as it was shot or programmed some time before the performance, as was the case when I directed a show that had an animated performer. This argument may be partly out-dated because with current technology one can have a live video feed on the stage. In regards to an animated character, during a trip to Disney World, I had an actual conversation with an animated version of Crush from *Finding Nemo* due to a hidden actor who had access to a wide array of pre-animated assets with which to manipulate Crush's movements live (Porges 2010); furthermore, this technique was also used for Nintendo's Christmas Mario surprise in December of 2015 ("Holiday Surprises from Mario"). Also, regarding physical actors recorded on video, Katie Mitchell explains that when she directed *The Waves* she had the video that was being displayed on stage be secretly recorded live beneath the stage (Mitchell 90). Not to mention Let's Players who make a career of recording and broadcasting their video game shows live online on such websites as YouTube or Twitch (Good 2017). Auslander holds that this sense of Liveness results from the interaction of the actors and the audience due to "the 'energy' that supposedly exists between the human performers and spectators in a live event…" (Auslander 2). That relationship is less clear in the case of the holographic Hatsune Miku because it is difficult to argue that she actually has agency in the same sense as do the human actors. However, the high energy from the audience that occurs during these live concerts, arguably is an indication of the audience connecting with the Vocaloids on the stage for the duration of the concert, despite knowing that the singers are not really alive (Greenwood 10). This connection is to the point where there will be cries for an encore from the audience; for example in the 2013 Kansai concert, Hatsune Miku was called back to do two different encores.

Whether the audience members realize it, when they go to enjoy a theatrical production they are participants as well: "the individual audience member influences the shape of the 'show…'" (Machon 28). Hence, a director's job is, for lack of a better word, to manipulate the audience (Ball 71), with both the visuals and sounds, in order to obtain those expected reactions (Gillette 342 – 344), creating a spectacle that is of high quality and generally provides the audience with the same (hopefully positive) experience for the course of its run (Mitchell 213). The audience reactions have the power to affect how the actors upon the stage perform (112), thus showing how important the director's job is in creating an atmosphere that feels like there is a certain

connection between the audience and the actors. This sometimes involves creating an 'immersive theatrical performance' (Machon 36).

Speaking of actors, the term brings to mind the Actor-Network Theory (also known as ANT) which proposes that non-humans, including "things," can function in a network without the need for a human actor (Latour 373), a viewpoint that "does not conform to the ontological separations of society, nature, and religion" (Jensen 87). Eliminating this divide and bringing humans and non-humans to the same level creates the basis for mediated theatre, as the humans must act with their non-human partner.

> ANT tries to bridge the gap between a socio-technical divide by denying the existence of purely social or technical relations. In doing so it takes a very radical stand and assumes that each entity (such as technologies, organisation) are actors and therefore have the potential to transform and mediate social relationships (Tatnall 22).

The importance of the Actor-Network Theory, specifically with regard to my thesis, is how it supports the perception of fabricated actors as being "real."

However, despite this potential inclusion of all living creatures and non-living things in the same or similar categories, there are those who believe the balance between the two is not equal. Rather than the hierarchy of where humans are placed higher than objects (Sone 343), there are people like Michel Schreiber who argue that this theory forces the objects to the top, hence being more important than the living creatures who are included in the same networks. The argument is that it negates some aspects of humanity in order to bring humans to the same level as the objects that are within the same network (Spoehrer 267). This criticism attacks the suggestion that regardless of anatomy (or lack-thereof) everyone/everything has an equal amount of agency that they can assert (Spoehrer 4). Needless to say, as the quote demonstrates, there are valid ethical arguments against ANT.

Nevertheless, given the existence of artificial acting partners (Mitchell 90) the concept that even the inanimate have a sense of agency, can help one, whether audience or actor, develop a connection with that artificial actor. As forming connections is a key part of acting, such as being able to trust in one's partner (161), this mindset when rehearsing may help an actor in creating

believable interactions with an artificial partner, regardless of the level of significance the two characters have with each other in the context of the script.

In support of my thesis chapter on robot theatre, the final term that I will cover in this introduction is the concept of the Uncanny Valley. Although this is mostly applied to physical structures, such as robotics or puppetry, it is also applied to animated creations. If something does not look human at all then it is perceived normally; however, generally if said creation looks "too human" then it is perceived poorly and consequently rejected (Hamilton 62).

> It seems that when something is, say, 50 percent human,
> our brains focus on the similarities and we embrace it.
> When it's 95 percent human, we focus on the differences,
> and the unresolved conflict we feel – is that human or
> not-human? – creeps us out. (Hamilton 62)

Hiroshi Ishiguro's humanoid robots often fall into the Uncanny Valley (A. Wright 12). Hence most people are disturbed by these androids (Lin 8).

All of the concepts discussed to this point will be put to use in my thesis. In my second chapter, I will be looking at essentially the development of mediatisation in theatre. The two largest topics I will cover there are Adolphe Appia, who was a pioneering figure for theatrical staging, specifically, set and lights, who unknowingly paved the way for the future use of mediatisation in theatre (Wiens 26), and Philip Auslander's *Liveness: Performance in a Mediatized Culture*, including points such as the impact of media on theatre and audiences' expectations of performing arts.

Following that, in the third chapter, I will discuss theatre which primarily relies on projections. I will be looking at the technological components that are so employed, and the theatrical results that come from it. This includes looking at artists like Kris Verdonck, Simon McBurney, and Timothy Bird. I will also reference a play that I worked on in the past, called "A One Woman Show," to demonstrate audience response to the use of an animated actor on the stage. Furthermore, I will be looking at the stage adaptation of *Danganronpa 2: Goodbye Despair* because of how the show takes advantage of two distinct video techniques in its final act.

In my fourth chapter, having addressed the intangible actors, I will look at their physical counterparts: robots and androids. As in the previous chapter, I will look at the technology in

addition to how it has been implemented in theatre. Within this chapter I will address the role of the body in theatre, taking particular interest in Jennifer Parker-Starbuck's *Cyborg Theatre: Corporal/Technological Intersections in Multimedia Performance*, as well as the acting required to work with robots. Thus, I will focus on the production of the play *Sayonara* created by Oriza Hirata and Hiroshi Ishiguro.

Finally, my fifth chapter will look specifically at mediatisation in Japanese theatre. There, I will cover two different types of theatre: experimentation and adaptation. On the experimental side, my primary focus will be the theatrical group Dumb Type because it not only urged performance to cross disciplines, but also to combine different artistic styles (Cooper 1990). Then on the adaptation side, I will be looking at Hatsune Miku and her Vocaloid friends who are virtual pop stars (Rugnetta 2012). They originated from a sound synthesizer program; however, their concerts are based on the *Hatsune Miku* video game franchise, as their dance routines and songs come from those games ("My Vocaloid"), to the point where at the top of a concert Hatsune Miku has been heard saying "SEGA" (VocaloidLiveConcert 2012). Additionally, I will look at the pop group named the Squid Sisters, who are similar to the Vocaloid characters, and who originated from the 2015 game *Splatoon*.

This understanding of the general structure of my thesis and the terms referenced within it, forms the context for my analysis of how and why current technology, particularly digital media technology, is being adapted into Japanese theatre, as well as how it creates an interactivity between the actor and audience. It is my hope that this analysis will assist future artists and researchers also interested in the topic.

Chapter Two: Development of Mediatisation

When it comes to special effects, it is common to automatically think of grand spectacles such as Broadway musicals because of the exuberance demonstrated by some shows through their technological adaptations (Auslander 31). However, despite the grandness of today's spectacles, special effects have existed since the origins of theatre in ancient Greece, albeit with machinery rather than computer graphics. The purpose of special effects, in addition to spectacle, is to support the actors in conveying the message of the script (Mitchell 77). Effects such as flying were executed with a crane, a spectacle that still awes audiences to this day (Wilson 46 – 47). With regard to the digitized effects that I will be looking at, it is arguable that their origins can be traced to the innovation of stage lighting by Adolphe Appia.

To explore the concept of Liveness more deeply, it is instructive to consider the impact of this pioneering work of Adolphe Appia: the man who is said to have paved the way for the modern inclusion of multimedia technology in theatre (Wiens 26). Appia was an architect and innovator on the modern Western proscenium stage, and his philosophy treated the actors as an extension of the set.

> Although in the scenarios [of "The Ring"] much space was devoted to settings and scenic effects, Appia never forgot the performer. In prescribing positions and movements he frequently had one or another character placed in profile and thus, in relation to his particular light plot, in silhouette. Such a position was rarely seen, if at all, in operatic productions of his time. (Volbach 49 – 50)

Viewing the actors as a part of the stage design has implications for the perception of the audience regarding the liveness of the actors/characters, and this was an important factor in the interactions between the actors and the stage technology designed by Appia (Wiens 26). Actors being considered as part of the set, was an idea that did not come about until Appia's time and implied that movement on stage was vital. Prior to Appia's innovations, "acting in almost every leading theatre consisted very largely of reading lines; the action that accompanied them was as much a matter of traditional routine…" (Simonson 280 – 281). It should also be noted that Appia's innovations in set design could be seen as an inevitable evolution of theatrical design. As Appia himself says, one of the biggest obstacles he faced in set design was the limited space

of the theatre wings. This is because the small size of them proved difficult in storing the three-dimensional set pieces (Appia 195). This thinking was part of an evolution. As it became necessary for theatre stages to increase in size, it became more pressing to move away from painted sets and move towards "realistic 3D sets" an idea that came as early as 1760 (Simonson 266).

In Appia's mind, theatre was not a collaborative art form made for the audience; rather it was the assemblage of various technologies brought together to communicate to the audience the vision of one artist (Appia 11 – 12). Considering this description, it can be assumed he was referring to the production's director, since it is the role of the director to provide the feedback that pushes the production towards the director's interpretation of the script (Mitchell 127 – 128). His innovations with the proscenium stage and his attitude toward actors and their relationship to the stage make him integral to my thesis of modern Japanese theatrical technology and interaction.

As a designer, Appia entered theatre in the 1890s (Beacham, 1987, 20) and rejected "the 'visual fraud' of the perspective illusion of the scenic stage with its painted decoration" (Wiens 28). By this I mean to say that Appia was not a fan to say the least of the way scenery was being created for the stage and wanted to create a 3D acting space, one that was "living" and "fluid" (28). As the sets before Appia's innovation were merely painted backdrops, Appia's vision was to create three-dimensional levels, an interactive set where the actors could play without the fear of "stepping out of the scene" (Wilson 321). Previous to this innovation, the risk of painted sets was that the actor could accidentally move from one location in the play to another simply by walking in front of a different part of the backdrop - thus breaking the illusion of reality, and making it more difficult to suspend one's disbelief (Simonson 263 - 264). During the Renaissance era, "Most [European] continental theatres used Italianate wing-and-shutter settings, painted in perspective, and shifted scenery by Torelli's pole-and-chariot system" (Wilson 275). One of Appia's innovations for the stage involved rejecting the painted setting (Wiens 28) and creating platforms and levels.

In contrast to the practices of the Renaissance Era, Appia's innovations permitted free movement of the actors as they first developed their blocking and level positions because they were no longer confined by the sets (Wilson 352). Subsequently, the director of the play would

modify those initial blocking instincts made by the actor(s) according to the director's vision of the play. Appia's scenic design philosophy persists to the present day as it helps actors "transmit" to the audience the concepts and ideals of the script. Although Appia was not truly interested in realism within his design, his approach portrays the time and place naturally (Mitchell 77), it supports the actors in conveying the ideas of the script by affecting their character biographies (83). The set's assistance to the actor's individual interpretation of his or her character comes from a physical stand point rather than a mental one – providing ideas for how the character would move in certain spaces and/or how he or she would interact with certain aspects of the environment (Wiens 26). For example, if a book shelf is present, one character could take books out and skim through them, whereas another character could actively avoid the book shelf.

The big technical innovation that was introduced to the stage during Adolphe Appia's time was electric lighting. It was this new technology that allowed Appia to create a form of theatre that rejected the "2D" (Wiens 26), because the controllable electric lighting created a "3D" actor (Beacham, 1993, 114), since the lighting control would not cast an unnatural shadow upon the painted backdrop; moreover, lighting allows the audience to see the depth of the cast and furniture on stage (Gillette 340 – 341). Naturally, with the innovation of lights and lighting design, the painted sets would eventually have to be disposed of due to the shadows that were projected onto the backdrop – shadows that could now be controlled because of those lights (Gillette 344). As Gillette pointed out, "The direction [from] which light strikes an object has a different effect on our perception of said object" (Gillette 343). Certain angles could make someone or something look like a power for good, whereas a different angle could make that same someone or something look like a monster (343); Appia's invention of lighting design is what creates such a power over perception feasible (Wiens 30). As light gives visual dimensions to the humans and items on stage, it is invaluable to the expression of the space, especially in the service of the actor (Beacham, 1993, 114). Although lighting design is commonplace today, at the time it was a novel idea. One could therefore assume that the digital media in theatre will also someday become commonplace (Wiens 37).

Adolphe Appia considered lighting to be "the supreme scene-painter" (Simonson 360); despite the nonexistence of lighting design in the past, it has become an essential part of theatre (Mitchell 84 – 85). As Beacham claims "light can express only what belongs to 'the inner

essence' of all vision. The two elements have an analogous existence" (Beacham, 1993, 51). Light not only provides the visibility of the cast on stage, but it also subliminally affects how the audience reacts to the situation on the stage: light sets the mood of the piece (Mitchell 84) and is now as much of an "actor" as the actor him/herself. The mood created by these lighting effects is what is being referenced by Beacham as "the inner essence," because lighting helps the director (and to some extent the cast) convey to the audience the reaction they should have to any particular scene (Beacham, 1993, 114). The actor's indirect natural interaction with light plays a large role in how a lighting designer can lay out a lighting plot, as the actor (as well as the set pieces) casts shadows. Thus the lighting designer must create a plot for the actor (Gillette 342). Furthermore, the lighting designer attends rehearsals and necessarily maintains contact with the other designers in order to see the sets and their potential shadows, as well as the movements of the actors; this allows the lighting designer to know where lighting will be needed to make these elements visible, and to determine the fabrics from which the costumes are made to ascertain how the fabric will absorb or reflect the light. It is for that reason that the lighting design comes last in the design process of behind-the-scenes labor (Mitchell 85). Breaking the "illusion of an illusion" (as Beacham puts it) meant making the painted backdrops obsolete.

In Adolphe Appia's view, there were two major elements that were needed to produce (Beacham, 1993, 47) the "living space for living beings" (Wiens 28): "the 'terrain' set aside for the actor, and the complex lighting apparatus" (Beacham, 1993, 47). He was also greatly influenced by his love of music – specifically opera (Volbach 25), and his idolization of Richard Wagner. Beacham claims that "Appia as a young man was enthralled by Wagner's works, and obsessed by the challenge they offered conventional stagecraft" (Beacham, 1987, 8). By following these ideals in set design, Appia rejected the traditional flat stage and painted canvas flats (Beacham, 1993, 47), because the painted backdrops were merely an "illusion of an illusion" due to the presence of the actor on stage (59). By creating a 3D environment for the actor to live in, Appia "freed" the actors' bodies, allowing them to explore the stage more freely (119 – 122). By taking the dimensions of the human body into account, the set designer could create an environment that allowed the actor to wander about without the worry of touching the canvas or accidently stepping outside of the painted set in which their scene takes place (Simonson 272). The impact on modern theatre has been profound to the extent that it is the current recommended practice for design and directing to make the set an 'obstacle course' for the actors (Mitchell 78).

In this context, an ‘obstacle course’ is a directing term that regards the set design. An obstacle course set provides many physical levels for the cast to play on or objects to maneuver around, thus providing a space that allows freedom of level and movement for both the director and cast members (Mitchell 79). Appia used the term “indication” to describe actors who were able to express pure emotion and expression by working together with the scenic environment (Beacham, 1993, 110). This idea conveys a demonstration of the freedom that actors had gained from not being constrained to a “2D” set where they had to emote mostly through voice with limited room for expression through body language and walking patterns (Simonson 280 – 281). Appia’s innovations resulted in a more natural performance that added to the realism of the overall production. Since the time of Appia’s innovations creating a “living theatre,” many (if not all) of his ideals have become commonplace for the stage (Wiens 28). As Simonson said, “Stage pictures were to be freed from the necessity of reproducing backgrounds of action…” (Simonson 351). Furthermore, it is argued that freeing the actors on stage from these scenic restraints allowed them to not only become more expressive physically, but also internally (351). Rather than focussing part of their attention on the backdrop in order to avoid wandering into the scenery, the actors could instead place all of their focus on the emotions of the scene and on their scene partner (Wilson 321).

Birgit Wiens believes that modern theatre that uses unique lighting designs and projections no matter how experimental, shows references to Appia’s work, consciously or otherwise. Her primary example is Hotel Pro Forma’s *Operation: Orfeo* from 1993, where the projections were used in such a way as to provide the illusion that the entire stage was merely a computer screen (31). The “living” projections are similar in this sense to Appia’s “living” lights (and acting space) (35).

Regardless of which “living” projections are added to a theatrical production, the key factor in the efficacy of the effects is not simply the actors, but the audience interpreting the production before them.

> To summarize: the mise en scène is nothing in itself. The spectator creates it, and in the process inspires and determines theatrical production. Therefore, to deal with staging means to observe this aspect of ourselves, and attempt to find, in our heart, the origin of our taste for dramatic art and the appropriate form to bring this art into harmony with our basic heritage

> and the particular genius of our race (Beacham, 1993, 146).

As this philosophical quote shows, it is the audience that "creates" the magic of the "living art" (Wiens 35). Wiens and Beacham agree that, for Appia, the key variable was the audience: Appia's goal was "to abolish the barriers between the spectator and performer" (Beacham, 1993, 110). Appia himself explains that there are two key factors for staying in control of one's theatrical production: the director must impose his/her vision of the script onto the stage and must meet the demands of the audience (Appia 10). However, he does go on to say that meeting the second requirement (the audience's expectations from the script) does result in some loss of control over the production (11). Furthermore, it can be argued that modern theatrical practices are intended to create a bridge between audience and actor by creating illusions, in other words with digital media (Wiens 36).

Important aspects of that media are discussed in *Liveness: Performance in a Mediatized Culture* by Philip Auslander. This is an academic book about technology as it regards the humanistic aspects or the "life" of a technological "being," regardless of whether that technology is software or hardware. The discussion starts with the use of video in theatre.

Video has been used in theatre since the 1980s, yet is still considered to be a new concept (Mitchell 90), possibly due in part to the constant evolution of technology.

> There are as many ways of integrating video into theatre as there are shows that use it but, crudely speaking, it has two broad functions: To support the set design in communicating the world and ideas of the play. For example, using recorded footage of clouds in the sky moving across a white cyclorama. To act as a live participant in the performance, with almost equal status to an actor. For example, video footage of a person – recorded or live – may literally replace one of the actors. (Mitchell 90)

It is difficult to argue that the former of these applications produces an image that possesses its own identity; however, the introduction of an actual electronic actor can certainly result in the character being seen as "alive" by some. The inclusion of an actual electronic actor also forces both those involved in the production and the viewers to rethink traditional theatrical techniques

in the wake of the new technology (Sack 380). The observation and perception of the individuals in the audience, are what determine the life and identity of an electronic being (Miiverse 2016).

> It is the audience, I hope - it was the audience all along - playing" the actor's body into psychic depth, "playing" the melody of a machine into meaning. The interiority of actors has always been produced this way: as a collaboration among performers, audiences, and things, by a collusion of techniques and technologies. The telegraph and the telephone, the radio and the robot, the polygraph and the Rorschach blot - these technologies and others all queer the boundaries of the self. They don't just allow the self to seep out in new ways; they also worm their way into the self, slowly altering the mechanics of expression, gradually changing the tectonics of the human interior. (Sack 383)

As an example, a play I once directed called "A One Woman Show" involved an animated character. It is a simple story: A girl named Sasha is trying to audition for a play; however, she is constantly interrupted by her toon friend, a chameleon named Chuckie. Being a toon, he was animated and projected for the play. There was a talk-back session afterwards. Naturally, a chair was brought out for the actress playing Sasha; however, the primary critic felt it was necessary to bring out a chair for Chuckie. To emphasize this point, this show was kept highly secret with only the director and actress knowing about the chameleon's existence. Consequently, bringing out a chair for the chameleon was not planned for the talk-back. As Turkle posited, "We are at the point of seeing digital objects as both creatures and machines" (Turkle 46). In this sense, Chuckie's impact was illustrated by the request of the instructor, Peter McGuire, that Chuckie receive his own chair: he was interpreted as being "alive." However, I believe it should be noted that it is fair to argue that the chair could have been brought out for fun rather than as a serious gesture.

It is thought that the relationships developed between the audience and performers in theatre are similar to the relationships developed in television performances (Auslander 18). This idea could possibly spring from the way in which television productions used to be broadcast live (12); furthermore, for modern day television shows that are filmed before a live audience, it is often the case that the set is built like a proscenium stage, as was my personal experience when I participated in such an audience for Disney's *Pair of Kings*. However, television eventually transitioned to become more like cinema than theatre: "To Murray Boeln, the author of the

postwar boon entitled “Fundamentals of Television,” immediacy was no longer clearly fundamental to the [televised] medium” (Auslander 21). This would mean that television does not have “the audience at the heart of the work…” (Machon 22), thereby depriving the audience of a chance to “shape” the production (28).

Despite this, cinema and television have a strong impact on modern-day theatre. This is because, in order to survive in today’s world, theatre has come to a point where it must replicate film (Auslander 23 – 24). Auslander relates how “audiences now expect live performances to resemble mediatized ones” (25), to the extent where performer Willem Dafoe believes that film acting and theatrical acting are virtually identical (29), and it is not unheard of for actors to appear in both mediums (30). I believe I should note that through my experience of acting in both genres, I have found that the skills and methods required are quite different. For example, an actor may be forced into an unnatural position for film acting since it looks better on camera. Nevertheless, possibly resulting from the milieu of my generation, I embrace theatre that incorporates modern media while at the same time enjoying regular theatre without media influences. In fact, there is an expectation that mainstream entertainment will appeal to that reality.

> The experience of the audience present at a live musical event that has been designed for repetition is “to be totally reduced to the role of an extra in the record or film [or, in this case, television show] that finances it,” to become part of a simulated, commodified audience (Auslander 108).

Even so, incorporating technology into theatre creates another level of immediacy: “where technologies were involved these fused the human and the technical to foreground embodied presence, thus reaffirming, rather than alienating, corporeality” (Machon 39). I believe Josephine Machon is asserting here that new relationships can be forged between actor and audience by taking advantage of the many possibilities that said technology can have on the stage.

It has been noted that Auslander’s work brings up the point that live and pre-recorded performances are “symbiotic creatures” (Herrera 154). In this sense, digital media (among other technological devices) in theatre, in some cases blurs and questions the aforementioned definition of what is live. The blurring of lines does bring into question why recorded television and film are not considered live. Although the presentation may not be “live,” it is the perceived

experience that makes the recorded medium feel "live" (12 – 13). On the other hand, a fair argument against this position relates to the concepts of "tangibility" and "improvisation." That is to say, in live theatre, if an audience member chooses, he or she could, in reality, run onto the stage and physically touch the actors, the set, the props, etc. While this type of audience interaction is considered rude and looked down upon in the current age, it is possible in theatre and impossible in film.

> Both live performance and the performance of mediatization are predicated on disappearance: the televisual image is produced by an on-going process in which scan lines replace one another, and it is always absent in the present; the use of recordings causes them to degenerate. In a very literal sense, televisual and other technical reproductions, like live performances, become themselves through disappearance. (Auslander 45).

Here, then, is the key difference in the identity of a theatrical production: the script may not disappear, but the production will. Although difficult in a theatrical setting with a pre-recorded partner, it is possible to improvise certain lines and movements should the actor forget them making the production different each time. Yet in a pre-recorded production the presentation is the same every time it is watched by the audience. Early films were transitional in this regard.

Early film techniques and acting were reminiscent of the live stage (Auslander 11), and now the film medium is ironically being reintegrated back into theatre. Auslander argues that with television, the individual episodes are reminiscent of the individual acts of a theatrical production (22). "Unlike film, but like theatre, a television broadcast is characterized as a performance in the present" (Auslander 15). This quote shows the position live performance has in current culture because of the ease with which it can be paralleled with digital media (Herrera 653), as well as the ease with which that media can be integrated back into theatre.

Such integration is one of the methods theatres may use to stay alive by adapting other media, such as film or television, to the live stage (Auslander 33). Speaking for myself, I can certainly say that if I were to direct an animated film or series, then one of my biggest dreams for that project would be to have a different company want to make a stage adaptation. Regardless, it is said that there is a type of disconnect that is born from adaptation (Auslander 35). To my understanding, this results from the disjunction between the original source material, with which

the audience may already be familiar, and the staged reproduction. The stage version could be jarring because, by definition it would have to be different from the original in some way. However, another critique by Auslander regards the way in which performances that use video material attempt to make said material appear "natural" supposedly by playing on the nostalgia of the viewer (38) and thus lending credence to the idea that theatre is becoming dependent on media technology (40).

Although technology is becoming more apparent in all forms of performance, I disagree with Auslander concerning the idea that theatre is "losing itself" to technology. I personally think it is a necessary path that theatre must trek: not to stay alive but because it offers more creative options when crafting the performance. As an example, in my previously described production, "A One Woman Show," I specifically wanted to create a theatrical experience that could not have been achieved without the help of modern media technology.

Auslander argues in his book that one reason for pre-recorded media "returning" to the theatrical stage is not purely because of a "symbiotic" relationship between the live and the pre-recorded, but because technology has become so integral to a person's daily life that it is almost always present in one's thoughts, even if they do not have a device on them at the time (Turkle 156).

In Auslander's view, another element in making theatre a "live" experience is what he calls the building of a community (Auslander 57). According to Herrera, Auslander says that community creates authenticity, and that "authenticity" is the key element that creates a live performance, whether it is theatre or a concert (Herrera 654). In contradiction:

> [Noel] Carroll argues that performances of live theatre differ from those of films by saying that whereas the performance of a film is generated directly from a template (a print of the film), a theatrical performance is generated from an interpretation of the play text. (Auslander 48).

Auslander points out, however, that Carroll's view is simply a bias and not a strongly argued observation (Auslander 49). In my experience of acting in film projects and voice-over productions versus directing stage plays, text interpretations certainly determine aspects of the film production; however, text interpretations are addressed differently in stage plays. As with

pre-recorded film, the director's interpretation determines angles and zoom of the camera, in addition to most of the choices a director would need to make based on the text for a stage play. Overall, from an artistic stand point rather than a technical one, film, voice-over, and stage directors all understand scripts in different ways. For the latter, the director's interpretation also leads into whether it is necessary to include pre-rerecorded material in the play and whether it will add to or detract from the script.

Regarding this matter, something as simple as sound design as being a form of encouraging audiences to see the performance as a film rather than its own entity; although to be fair, this is specifically noted as digital sound in a musical (Auslander 31), implying the use of lip-syncing. In this sense, poor lip-synching can destroy the authenticity of the liveness of a production due to the obviousness of the technical-to-performer error (Herrera 154).

Brian Eugenio Herrera notes in his review of Auslander's book that there is an added chapter in the updated version that was not in the original: the chapter about rock music (Herrera 154). In this chapter Auslander notes that there are people who believe that live performance and pre-recorded material are two different "creatures" (Auslander 82). In Auslander's chapter on "rock authenticity," he writes not just about the different performance media but also the effect the audience itself has on the performance. In this sense, it is ultimately how the audience reacts to the performance that determines whether it should be determined to be a live performance. For example, when comparing film to pre-recorded material on the stage, the reactions and behaviour of the audience determine the consciousness of the electronic character (Auslander 108), and the legal definition of live performance should be altered to reflect the newer technologies (106). One could go even further by suggesting that, rather than focusing on the audience in general, the reaction of the individual could also determine whether the pre-recorded performance is live or not.

Furthermore, the inclusion of multimedia in theatre raises the issue of temporality, as stated above, because no theatre production is the exact same two nights in a row; there are always differences no matter how small and unnoticeable by the audience (though sometimes these differences could be extremely obvious). One example comes from the very existence of the understudy. In a production of *Rookery Nook* the director had to play the understudy for two consecutive nights when the lead actor was in the hospital for alcohol poisoning. When the

director was in the play, there were points where he would stop and ask the cast where they were in the script, an experience that the audience could only have for two nights (Kinghorn 2011). In fact, it is not uncommon for moments in the play to change or be adjusted after the public preview night (Mitchell 213).

> These early performances gives [the director] the opportunity to test-run the work in front of an audience and their response allows [the director] to measure the accuracy of [his or her] directing choices. (Mitchell 213)

During this period, the director must pay special attention to the audience in order to discern what moments need to be changed (Mitchell 213). The point of the play changing in a (normally) miniscule way from night to night highlights the concept of temporality in theatre. These changes are also created partly from the audience of each individual night.

Furthermore, Auslander says that the contemporary audience expects a live production to be nearly identical to a televised production, to the point where reactions from the audience are not truly "authentic" and are almost "manufactured." He goes on to say that "audience reactions at live performances are so programmed as to seem canned…" (Auslander 25). It is the directors' job to "manufacture" these responses in their audiences.

> …the accumulation of reactions helps the audience to emotionally experience, not merely understand. The simultaneous communication of both understanding and emotional experience is the domain of art. (Ball 71)

Despite the attempts that a director may undertake to manipulate the audience into feeling and reacting in a certain way, I disagree that an audience's reaction is predictable. One example is during a performance at the University of Victoria's Phoenix Theatre. A water vendor was selling his product to the characters on stage, but his travel route included entering the stage through the aisles, and someone from the audience decided to actually buy some water from the actor (Alexandrowicz 2012). In order to envision the production and the desired audience reaction, the director must analyze the script (Mitchell 15), in some cases as long as a year in advance, in order to fully understand its requirements. This does not simply include the lines on the page, but also the playwright him/herself, recurring themes within the playwright's previous work and the playwright's personal background almost always give deeper meaning to certain

areas of the work (Ball 81). Nevertheless, by keeping Auslander's views of audience reaction in mind, the ideal of paying attention to these factors may be something that (even unconsciously) enters into the minds of those working on the production so that they can "manufacture" the reactions that they want from the viewing public consecutively for each showing over the course of the production's run without fail.

The reason for this immediacy is that on an occasion when the mass of the audience does not react in the way the cast expected, that reaction can disconcert the cast causing their acting to take a negative turn (Willes 2013); in this sense, the audience is constantly involved with the temporality of a specific production's performance.

In terms of audience interaction, the method of visual communication with the audience is one of the most important if not the most important aspects of communicating the script. Images that refer directly to the title or repeating images are powerful in a theatrical production (Ball 73 – 74). In terms of the inclusion of multimedia technology within theatre, the image can be used to enhance a scene (Mitchell 90), or abstract it (Parker-Starbuck 100).

In Auslander's final chapter, "Legally Live: Law, performance, memory," he talks especially about the legal definition of "Liveness" (albeit indirectly). In this regard, he argues that a courtroom can be considered to be a type of live theatrical performance (Auslander 114), and interestingly it is not uncommon for students from the University of Victoria's Theatre Department to become lawyers. I personally know two people who are interested in going into that field, one from the directing speciality and the other from the acting speciality.

Furthermore, Auslander points out that the law itself may have a difficult time keeping pace with technology's impact on what constitutes a performance (Auslander 106):

> Comparably productive is his incisive analysis of the challenges to intellectual-property law posed by the increasing ubiquity of "synthespians," a compositional practice wherein "digital information is derived from a performer to create performances . . ." (Herrera 654).

In fact Auslander notes that copyright laws regarding live performance are inevitably going to change because of the inclusion of multimedia technology (Auslander 106).

As Auslander observes, the present youth generation, in general, does not care about the "liveness of their idols" (110), likely because what they experience is "alive enough" to be recognized as "live" performers (Turkle 3 – 4). A significant part of theatre is the audience's individual experience that shapes it (Machon 28); thus an individual's experience determines the liveness of the production and of the actors/characters upon the stage (43). This observation suggests that, perhaps regardless of media usage in theatre, the director cannot fully control the impression of the individual when deciding who/what is "alive" and who/what is not.

In summary of Appia's contributions to theatre history: by creating a stage that included the actors in the vision, considering them to be extensions of the set, Appia set new standards for stage production. His actions freed the actors on stage from the confines of painted backgrounds and thrust them into an "obstacle course" (a furnished set with levels instead of a painted backdrop for a set). His experimental innovations with light opened the door for present day experiments and innovations with digital media on the stage. The last of these points is actually somewhat ironic because Appia was against the use of media in drama believing that it causes an imbalance in the "harmonious relationship between feeling and form" (Appia 10). One could argue that a weakness of having digital media on stage especially if it is being used as scenery is that it has the potential to become another (more modern) version of the rejected painted backdrops (Bird 2016).

With Appia laying the ground work for this future, and the understanding of it from Auslander's point of view, I believe it is time to move towards that future. That future involves the innovations in which projections and video media are combined with theatre to make a unique live experience (Machon 58). Just as this thesis asserts, if a director takes proper advantage of this technology, then he/she can create a compelling experimental theatrical experience (Parker-Starbuck 51) and/or "reinvent" the immersive experience and relationship between the audience and actor (Machon 27). My next chapter will explore projection technology and its use on the theatrical stage.

Chapter Three: Projected Actors in Live Theatre

In this chapter, I will discuss the technologies that go into creating multimedia theatrical experiences by examining some of their inherent capabilities and through case study. More important than the technology itself, however, is the nature of one's interaction with, and perception of such technology. For example, how can the script and/or director use technology to elicit one's imagination and emotions within the context of the cultural expectations of the audience? This latter question is essential to my thesis and will be touched upon later in this chapter as I review the application of these technologies by three directors and in two case studies.

First it is necessary to specifically define what the technology is composed of, such as projection types and lighting techniques, and to explore the limits of newer technologies, such as virtual reality, as they are applied to theatre. I will begin with projections.

To describe this technology's general application: "[Projections] can provide the stage with seemingly unlimited depth or create an aura of realism as one image dissolves into another" (Gillette 426). In the West, projection technology in theatre is something that has existed as far back as the 17th century, with the first recorded example being the simple projection of the devil in a Christian play (Barbour 2011). When it comes to lensed projectors, there are three major types: the Scenic Projector, Slide Projector, and the Digital Projector (Gillette 430). Naturally the most important of these projectors for this thesis is the Digital Projector. According to both *PC Magazine* and *Best Reviews*, the most trustworthy digital projectors are the ones made by Epson (Hoffman 2016), and the supposed "best of the best" is the Epson 5030UB ("Top Home Theatre Projectors").

The operating manual for the Epson 5030UB emphasises the need to place the projector squarely in front of or behind a screen for the best image ("PowerLite® Home Cinema" 25). If the projector is placed behind the screen, then it is necessary to use a Dilad Screen, a type of projection screen that somewhat resembles a mesh that produces clear images from the hidden projector behind it ("Dilad Screen"). As my fifth chapter will be covering Vocaloid and their concerts that are made by SEGA, based on the songs that appear in the *Hatsune Miku* video

game series (VocaloidLiveConcert 2012), I contacted them regarding the technology involved; however, Sega declined to provide me with specifics on the technology used in the Vocaloid concerts. For production of such a virtual concert, or for Nintendo's Squid Sisters, I would imagine that the placement of the projector would be behind the viewing screen. Based on various online forums (including sites such as *Quora* and *PCSX2*), that demonstrate consistent answers, the rear projection method is not only valid but has also been replicated by some fans using mosquito netting instead of a proper projection screen (RandomMikuFan 2013).

It should be noted that when a director decides to use such video technology in a production, the associated lighting designer must be made aware ahead of time because it is "very hard for the lighting designer to add any other lights to illuminate the theatrical action beneath the screen without them interfering with the lighting for some of the film shots" (Mitchell 91). Despite lighting design being one of the final elements to be integrated in a theatrical production, when video production is involved, the designer must be careful to not wash out the projections with lights - reducing the effects of the ambient light - by meticulously planning movement patterns so that the actor is still visible, as well as the projection (Gillette 437).

As a note of interest, the Epson 5030UB not only supports 3D viewing, but also provides the glasses for it ("PowerLite® Home Cinema" 10). These glasses run on a battery that needs to be charged by being directly plugged into the projector. That direct connection, as well as the visual sample provided by the manual (42 - 43), may lead to the misinterpretation that the projector supports Virtual Reality (VR) technology, an interactive computer experience which manipulates the user's sensory feedback (Mihelj 1).

Although regular 3D viewing is neither needed nor used in theatrical productions, the concept and practice of VR technology may contribute towards conditioning audiences to hold a positive view of multimedia technology in general and lead to expectations of multimedia use in live performance. The immersion of a video game "is achieved via audio, video, and haptic means, which influences embodied sensations, establishing a perceived inclusion in an environment" (Machon 60). Consequently, those who can afford and enjoy such advanced VR technology, may be more likely to seek the same type of immersion in theatre; if so, this desire could underlie a market pressure to bring multimedia theatre to the forefront (60 – 61).

Morton Heilig created VR in 1957 with the *Sensorama*, a machine that created a virtual bicycle riding experience. His dream vision of VR was to be able to fully interact with the objects created: "A chair displayed in such a room would be good enough to sit in. Handcuffs displayed in such a room would be confining, and a bullet displayed in such a room would be fatal" (Mihelj 5). Although the latter example is a bit morbid, being able to touch virtual objects is now possible. Even so, it is the hardest aspect of virtual reality to program (164); thus, it is often excluded (or in some cases, there are programmers who do not know it is possible to program virtual touch). Furthermore, the complex programming may not always produce the desired impact, as some consumers may feel that touching a virtual object is odder and more distracting than simply "wandering" around a fantastical virtual world (Rheingold 313). The idea of "touching a virtual object or being" brings a new level of interaction and sense of life to a virtual partner. However, to be fair, at this point in time it is not yet practical to include VR technology in theatre.

There are some VR games that allow the player to live with a virtual being. Some players may treat this virtual being as a husband or wife. For example, one could use the "Oculus Rift [VR] headset to let one 'live' with or sleep alongside [the fictional Hatsune] Miku" (Litchty 105). Hence, adding the concept of touch to this game could further blur the fictional reality of being "married" to Hatsune Miku. Although this game is not likely to reach many people as it is a fan-made game for an expensive system (105), even without the capacity of touch, the experience may condition the user to perceive liveness during a Hatsune Miku concert.

Furthermore, graphics technology has reached the point where sometimes it is difficult to distinguish the difference between a live human and an animated one (Perini 2016). Hence, the more lifelike the technology becomes, the harder it will be to distinguish the difference between reality and unreality. It has also been suggested that due to the immersion of a human user's experience in VR, theatre could adopt digital technology, such as projectors, in order to produce a similar level of immersion with the audience members (Machon 59). One advantage of including emotion-inducing artificial actors is that it brings together "the human and the technical to foreground embodied presence, thus reaffirming, rather than alienating, corporeality" (39).

The next point I would like to review is audience experience with 4D technology. 4D films are mostly found at amusement parks, likely because of their similarity to VR technology. Entertainment using 4D technology takes advantage of physical effects and sensory manipulation, using scents, vibrating chairs, wind jets, etc., in support of a 3D film playing on the screen (Lee 2300). 4D film is a type of technology that walks on both sides of "the line" based on the definition of live performance, which is a performance happening in real time in the physical presence of an audience (Commonwealth Consolidated Acts). In "films" such as the Japanese *Pokémon 4D: Pikachu's Ocean Adventure* (Yuyama 2006) or Disney's *It's Tough to be a Bug* (Bailey 1998), the auditorium moves and the audience is given 3D glasses, causing the film to come to life and feel like a live performance (Parker-Starbuck 141). In Disney's *It's Tough to be a Bug*, for example, the way that the presentation was filmed makes it appear as though there are puppets on a stage (an effect that is enhanced by the 3D glasses) and at the end of the presentation, air jets are fired off the seats in the auditorium to make the audience feel as though there are actual bugs crawling around beneath them (Bailey 1998). All of this manipulation creates the illusion that what is being viewed is not film but live theatre. Jennifer Parker-Starbuck notes that a key element of this type of performance is the audience: "the audience experiences a shifting sense of perception; the audiences are indeed an integral component of the design" (Parker-Starbuck 141).

Another type of 4D film is interactive, such as Disney's *Turtle Talk with Crush* ("Turtle Talk") or Nintendo's *Holiday Surprises with Mario* ("Holiday Surprises"). In these productions, there is an actor hidden away, out of sight of the audience. The actor uses pre-animated assets in order to operate Crush's movements live (Porges 2010), thus being able to interact intimately with individual members of the audience (Jung 415): the performance is different every time, as it is in theatre but not film. As an example, during my experience watching *Turtle Talk with Crush* there was an audience member who answered Crush's question about their favourite food with "turtle soup," at which point, the animated character Crush responded by calling security. As the audience member was not scripted in the show, the consecutive viewings lacked the "turtle soup" moment ("Turtle Talk").

Clearly all of the technologies described in this section attempt to encourage audience perception of liveness in an artificial character, so that the audience feels a connection to that

character. That perception will also be affected by the degree to which human actors on the stage seem to interact with that character in a way that suggests the technological character is real.

Building the relationship between those technological characters and human actors is essential for the success of a performance. It is easier for the human actors to create believable, emotional relationships with each other because they can more easily relate to their fellow human cast members (Acaroglu 300 - 301). It should be noted that many theorists disagree on how to define "emotions" (Trappl 213). However, emotions have a function as a survival mechanism and can determine individual decisions (12); it has been proven that producing emotions is a prerequisite for making rational decisions (3). Nevertheless, there are toys and games, such as the creatures in *Tamagotchi* or Sims in *The Sims 4*, that seem to express emotions; however, said emotions are technically artificial - programmed so the users perceive an illusion of life (Turkle 30).

For the sake of context, *The Sims* franchise is, as the name implies, a collection of simulation games. It was created by Maxis and Electronic Arts (EA). Rather than escape reality by fighting "bad guys" like other games, *The Sims* allows the player to control the reality of the in-game human-like Sims. This includes time and money management. Furthermore, with the exception of the first entry in the franchise, players could fully customize how their Sims look, both in physical features and clothing, as well as their Sims' personality traits. Unlike defeating a "final boss," the end goal is simply to help the Sims in living a long and happy life through having them work at their dream job and raise a family, among other needs (James 2017).

A new program called Smart Sim was added to *The Sims 4* to make the Sims more life-like. "Sims could now express and feel emotions based on events that were happening around them, objects, and of course, interactions with other Sims" (James 2017). However, these emotions are not fully realistic as having a Sim being too emotional can lead to their death, with the exception of depression due to that being "too dark" and potentially dangerous for players of this light-hearted franchise (Schwartz 2017).

On the other hand, Tamagotchi is an interactive toy rather than an interactive video game. The Tamagotchi were made by Bandai and debuted in 1996 in Japan (Mystic Forretress 2004), and 1997 in North America (Turkle 30). This popular toy also spawned a spin-off toy series directed specifically to boys called Digital Monsters, or Digimon for short (Mystic Forretress 2004).

While both Tamagotchi and Digimon branched out into multimedia with anime, film, and video games (Mystic Forretress 2004), *Digimon* has had more consistent longevity with constant spin-off sequel anime, currently being in its eighth instalment (Anime News Network 2016).

In both cases, the creature starts from an egg which hatches in about five minutes. It is then the owner's job to take care of the creature and try to keep it alive for as long as possible. One day in real life is one year for the Tamagotchi. They can live for up to twenty-three years, or longer if the owner is lucky and has been taking good care for them, before dying of old age (Mystic Forretress 2004). The Tamagotchi are always on and thus need constant care (Turkle 30), especially in the baby and child phases; however, after six to eight days it will enter the adult phase and no longer need to be supervised every moment (Mystic Forretress 2004). Despite the short life span of a Tamagotchi, owners, especially children, get attached to them. Those owners may mourn their Tamagotchi and bury them on an online graveyard when they die (Turkle 34). Hence although these toys are obviously not alive, they are "alive enough" to prove a public sense of liveness.

However, a natural obstacle to developing such relationships is a lack of genuine emotions that are drawn upon from past experiences (Turkle 6). One example comes from the AIBO robotic dog. AIBO is meant to be a companion robot and act like a real dog, including physical gestures and training (53). It was also recently revealed that Sony is going to be releasing a new model of AIBO after being discontinued for more than a decade, which Sony claims can make real emotional bonds with its owners, thus being even more like a real dog than before. The reason for this strong claim is that the new learning intelligence program will allow it to adapt to its environment, learn what behavior makes their owner happy, and act accordingly (Byford 2017). In response to the commercial availability of the original AIBO, Sherry Turkle organized various focus groups where she would send AIBO robots home with the participating families who were expected to keep a diary about living with the robot (Turkle 56). One child in the focus group stated that he talked to his hamster instead of the robotic toy because, while AIBO could apparently verbalize feelings, the hamster was a living creature; therefore, the child perceived it as actually having feelings. (58).

Other children had the opposite reaction, such as a young girl who thought her Tamagotchi had feelings and memories to such an extent that when her Tamagotchi died, the girl did not want to

start a new game. If she were to get a new Tamagotchi creature, she insisted that it be raised from a different egg (33).

As Turkle asks, "If a robot makes you love, is it alive?" (Turkle 26). The same could, of course, be applied to artificial acting partners. During the time it spends upon the stage, the artificial actor gains a "temporary life" (Machon 44) because it appears to have emotions just as any human would while participating in the circumstances of the play's world (Turkle 28).Actors need to build their characters' relationships with each other, so that the interactions between the characters will be believable. Sometimes, actors will neglect relationships with characters they do not interact with as much, resulting in a performance that is less believable in the eyes of the audience. It is much more difficult for the human cast to relate to and create a true emotional relationship with a figure that some may see as a glorified prop. Without that relationship, the perception of liveness suffers. The director's role in this situation is to assist in creating a meaningful relationship between the cast members and the artificial actor. It is the interactions of these acting factions that can "breathe life" into the artificial cast member(s) (Acaroglu 300 – 301).

Another relevant step in the progress of technology is artificial intelligence, which attempts to replicate human interactions. However, at best, artificial intelligence can produce only the appearance of emotions (Trappl 218). According to Rosalind W. Picard, there are also other factors in the perception of genuine emotion: body language, emotional experiences, and levels of emotion (217). Personally I would argue that for an artificial actor to display the appearance of emotions, it must also be able to mimic appropriate body language. For some of the technology in question, making that mimicry successful is time consuming and difficult (Acaroglu 303).

However, animating such body language is a non-issue for projected acting agents (Hanke 38). As an extreme example, one can look to the Sims of *The Sims* franchise because, unlike the characters that would be seen on the stage or a more story-oriented game, Sims do not have a "set-in-stone" story or personality written for them. The body language in their animations does portray the illusion of emotion (Prügl 240), especially in *The Sims 4* where emotions are a key mechanic ("The Sims 4"). During interactions with other Sims, characters may stomp their feet in anger or touch another's shoulder when offering congratulations (Prügl 240). However, in a

live theatrical setting, body language becomes much more difficult for the artificial actor due to the current state of technology, thus making voice-over a key element in these types of theatrical productions (Acaroglu 303).

Voice acting, or voice-over as many in that industry would prefer, is as the name implies: acting while solely relying on one's voice to convey the emotions of the script (Moore 2013). Almost all voice-over is done in a pre-recorded format, as opposed to using a live actor backstage voicing in real time. This pre-recorded format is also the most common approach used in theatrical settings. The technical element in this kind of production becomes similar to voice-over in the animation world (Acaroglu 302 – 303). When conveying emotions to the audience on behalf of the artificial actor, it is often taught in voice-over that, unlike in theatre and film, it is appropriate to over-act due to limitations on the ways in which the artificial actor can appear to emote (Moore 2013). It should be noted that, even in voice-over, the unseen actor is likely to be making very expressive, yet unseen, body movements, to the point where it is not uncommon for an actor to exit the recording booth sweating. This physical activity is to mimic an action similar to that of the artificial character in order to produce the voice inflection and energy that the scene requires (Tozer 2017). Often times in voice-over, an actor will either be in the sound booth all alone or with a very small group; it is rather rare for the entire cast to be present at the same time (Moore 2013). In Automated Dialogue Replacement acting, also known as dubbing, it will always be just a single actor in the booth because it is much more technical than other voice-over scenarios (Tozer 2017). In relation to acting with an artificial partner on stage, an actor can sometimes feel alone, because the artificial acting partner does not possess the ability to react - as I learned when directing "A One Woman Show." Depending on the individual, the feeling of isolation that arises despite the "presence" of another actor, albeit non-human, could either be attributed to a director who failed in creating a bond between the human and non-human cast (Mitchell 161) or to the individual's personal view of the non-human's liveness. Clark Elliott notes that "We, as users, provide all of the 'juice' that makes this relationship [with artificial creatures] work" (Trappl 246).

Nevertheless, performing with such an artificial actor, pre-recorded or otherwise, has been equated to acting with a person wearing a mask. Theatre actress Bryerly Long describes the experience, claiming that "You could say that it's limiting, but actually it's very expressive

within a certain range of elements that are shown to the audience" (Acaroglu 301). However, the interactions with the artificial actor (or the mask) are based upon the real emotional presentation of the human actor behind the scenes. Whether it is a case of live actors hiding backstage using motion-capture technology (300) or a pre-recorded voice-over, the emotions that the human actor conveys through the non-human actor adds depth to the emotional performance. This is naturally due to the fact that the human's emotions are more genuine than those of an artificial intelligence, thus bringing life to the otherwise inanimate actor (Bryson 2017). Furthermore, even as technology develops to a point where artificial intelligence can sense true emotion, it will nevertheless be different from an organism, due to the fundamental difference in their body structures. "In this sense machine feelings cannot duplicate human feelings" (Trappl 224). Some people claim that they will be able to program a consciousness into an artificial intelligence (225), but based on a general argument of what defines emotions (213), the "quality" of said emotions would pale in comparison to those of a human (225). An important missing element is experience, preventing the artificial intelligence from feeling "pure emotions" such as love (Turkle 6 - 7)

Having similar past experiences allows one to place oneself in another person's shoes, thereby creating an emotional connection with whomever he or she is interacting (Turkle 6). Even with artificial intelligence, drawing upon past experiences to obtain emotional responses is virtually impossible for artificial actors at this point in time; however, they can "fake" that they have "lived" through several past experiences (Turkle 35). A sense of shared experience can lead to emotional attachment. For example, due to the time spent with toys that involve life-mimicking technology and the "raising" of such toys, children have been known to mourn the "death" of their toys to the extent that some have buried them (33). While this phenomenon is not uncommon in other places, Japan in particular has formal and widespread practices involving ceremonies, such as *ningyō kuyō*, for the funerals of inanimate objects (Chapman 2013).

Different levels of emotion vary depending on the situation at hand. Picard uses fear as an example, stating that if one were to instinctually jump at the sight of something like a snake, then that would be "an instance of the fast subconscious fear-generation mechanism" (Trappl 221). However, the fear instilled by the thought of an escaped murderer is an emotional response that is the result of a "form of a learned fear response" (222). In contrast, although there are attempts

to program a learning artificial intelligence (Dietterich 43), it would likely be impossible to program the instinctual emotions, as these artificial partners, by nature, do not possess a natural instinct to begin with (Turkle 3 - 4).

In this sense, the connections that are created between the human cast and artificial actor are a type of performance in themselves (6). Although this is true in a technical sense, at the same time, there are several people who refer to their machines as if they were alive. "We are at the point of seeing digital objects as both creatures and machines" (46). The distinction made here is between actual liveness and the perception of liveness. This is important to theatre because it illuminates the complicated relationship that an actor must form with an artificial acting partner (5 – 7). Depending on the individual, suspending disbelief to create an emotional relationship between man and machine could either be quite easy or nearly impossible (Trappl 337), as there are those who are ecstatic about the concept of forming an emotional relationship with an artificial intelligence (Litchty 105) and those who are disgusted by the concept (Turkle 6). The innocence and wonder of child actors, in particular, allow them to form "true" relationships with artificial actors (Trappl 337). Ironically, in a theatrical setting due to the highly technical aspects of having an artificial actor upon the stage - especially a pre-recorded one - using a child actor with less skill is highly impractical (Acaroglu 299 - 300).

It should also be noted that technology is ever evolving, including that related to the learning parameters of artificial intelligence. Although incapable of developing genuine emotions at this time, artificial intelligences are now able to learn through experience (Rose 2016). This capacity has increased to the point where even video game characters can be programmed to learn through experience, like the main antagonist in *Hello Neighbor* ("Hello Neighbor" 2017). As previously established, experience is an important aspect in creating emotion and meaningful relationships with others (Turkle 35). Additionally, while advanced learning programs have not demonstrated true emotions, and artificial emotions may or may not be possible to program in the future (Trappl 225) they should not be seen as "lesser" emotions (Bryson 2017) - at least in the theatrical setting.

Moreover, artificial intelligence is advancing to the point where, in 2010, the Engineering and Physical Sciences Research Council declared in their "Principals of Robotics" that an artificial

intelligence's "illusion of emotion should not be used to exploit vulnerable users" (Bryson 2017); however, such an illusion would be ideal for a theatrical setting.

Should the design of artificial intelligence reach the point where a projected character no longer needs to be pre-recorded or have an actor hidden behind the scenes in order to be live, then there would be a number of impacts on theatre. For one, the director would treat the artificial actor in the same manner as a human one, directing that character in real time rather than focusing on timing the interactions with the human actors. Such an intelligent design would create a less technical acting environment and limit the human actor's responsibility to create the illusion that the artificial actor is actually reacting and being emotional (Acaroglu 300 – 301). The director could place all of his or her focus on ensuring that a relationship of some sort is created between all cast members (Mitchell 161). Another impact of such an advance in artificial intelligence would be to enhance the perception of the projected actor's liveness (Turkle 31). That impact would be enhanced by the audience's exposure to similar impacts in other parts of their lives via home objects that would seem as though they had genuine emotions, such as electronic games and toys (10 - 11). The more people spend a majority of their time immersed online in any function, such as Facebook or online video games (157 - 157), the more accepted such artificial beings could become, perhaps to the point that their presence would come to be expected in theatre (Machon 72). The very anticipation of an artificial actor with advanced programming may produce an emotional response in the audience that is greater than what is already possible, thanks to the human actor on stage (Acaroglu 302 - 303). This anticipation and stronger emotional reaction in audience members would reaffirm the liveness of the artificial members of the cast (Machon 39).

Of course, the creation of "live" artificial actors is not the only way one can use projections experimentally in a theatrical setting. One can use it for sets, which ironically has the potential to create what Adolphe Appia, the man who unwittingly paved the way for mediatisation in theatre (Wiens 26), detested: set scenarios in which the actor's movement is limited, just as though they were in front of a painted background (28). Despite this potential weakness in this type of theatre, people such as Timothy Bird, Kris Verdonck, and Simon McBurney have continued to move forward with this media in theatre. I will now discuss the work of these three artists to illustrate examples of the use of these technologies in theatre.

Tony nominee Timothy Bird (Bird 2013) is an example of someone who has used such techniques, as he sees scenery as being a stage performer alongside the physical actors (Bird 2016). In a way, this resembles the attitude of Adolph Appia who saw actors as an extension of the set (Volbach 49 – 50). Bird, as a designer, director, scenic designer, and projectionist, brings digital media to the forefront in theatre (Bird 2013) with his company, Knifedge (Timothy Bird Studio) – taking advantage of video technology to create a new type of "living set" rather than a digital acting partner (Finney 2016). In fact, as implied above, Bird does not create speaking digital actors: rather images are projected to enhance the experience by "tell[ing] their own story" (Bird 2016). Now, according to an interview with Timothy Bird, using projections in theatre creates the feeling of a 3D movie production without the need for 3D glasses (Shaw 2012), a novelty in the use of projections, to be sure. However, "Some people in the theatre industry don't take kindly to the innovations that Mr. Bird and his team at Knifedge are introducing to the stage." The specific complaint is that the inclusion of a video designer's work distracts the audience and takes away from the overall production (Shaw 2012). Moreover it should be noted that Bird is taking credit for "introducing" technology and theatrical techniques where the stage itself becomes a character in the show (Rich 2012), even though such techniques were and are already in use in Japan by companies like Dumb Type, as far back as 1984 (Hood 7).

A reason presented for the negative responses to Bird's techniques is that it is disturbing to see the hierarchy of man verses machine disrupted by having man and machine as equals (Van Baarle 55), especially when one considers how Bird's techniques are used to enhance the scenic design rather than create an actor who can verbally respond to the live humans upon the stage. Nevertheless, since Bird sees his sets as being stage performers themselves (Bird 2016), it naturally must place both actor and set within the same Actor Network (Latour 373). If the stage and stage performer are in the same network, they can not only form a social relationship (Tatnall 22) but also display equal potential for displaying their own agency (Spoehrer 4). In certain movement pieces, especially experimental movement pieces, there is undoubtedly a type of relationship between the stage and performer because of the way in which the performers' full body "communicates" with the performance area. By this, I mean to assert that, by having full awareness of their surroundings and depending on how the performer interacts/takes advantage of them, the audience can feel as though the stage is truly as much of a performer as the human(s) upon it (Hood 19). While I am fully supportive of the philosophical viewpoint of

artificial characters containing some version of agency and life-likeness, even I have trouble justifying a theatrical stage having its own agency.

Moving forward, in my correspondence with Kris Verdonck's office, I was given access to various resources, including essays and a link to a recent interview with HowlRound. Verdonck also wanted me to specifically state that he highly values education (Roggen 2016). Verdonck is a director who studied theatre, architecture, and the visual arts ("Kris Verdonck" 2016), and considers man and machine to be on the same social hierarchal level (HowlRound 2016). "Verdonck's work deals with the complex relationship between human and technology - 'the machine' - that characterizes our time" (Van Baarle 54). He uses lights and projections, among other special effects, to "break down" the established elements of theatrical presentations. By framing the theatrical space, Verdonck explores the idea of theatre involving technology as being a space "that combines physical properties and metaphorical aspects… to recuperate an almost classical and formal idea of theatre" (Eckersall 68). In other words, Peter Eckersall is saying that Verdonck employs innovative theatrical technological feats, while at the same time evoking the feeling of a traditional stage play. Verdonck's works are "object-based," presenting the object as the main actor - something that causes some to compare him with the Italian Futurists (72); his instructions are to "listen to what the bloody machine wants" when working with machines (HowlRound 2016). However, the Futurist movement in theatre actively rejected the formats of the past and believed "that audiences should be confronted and antagonized, and they argued against the separation of performers and audience" (Wilson 373 - 374). There is a distinct "undialectical, antithetical pair, along the lines of closure (bad)/aperture (good)" that is a key element to the themes of Futurists drama (Gordon 350). One of the most important aspects of the Italian Futurist movement parallels Verdonck's approach: the use of technology in experimental ways (353). Regardless, I would argue that Verdonck does not purposefully antagonize audiences like some of the Italian Futurists; however, I do acknowledge his rejection of conventional theatrics (Van Baarle 56) and the participation of the audience in his works (Eckersall 70 - 71). One way that Verdonck continues to innovate his approach to theatre is to present the unexpected to his audience. The idea of his current production is to intentionally put the audience to sleep. To this end, he (presumably) joked about giving out pillows to the audience as they enter the theatre (HowlRound 2016).

The article "Virtual Dramaturgy: Finding Liberty in the Virtual Machine," which was co-authored by Verdonck, states that this approach to theatre questions one's "perception of reality," as it may make the viewer question what is required to have a "reality" (Van Baarle 60). The distortion of reality by including projections in theatrical production is an experience that has the potential to break the illusion of theatre. By this, I mean that a traditional theatre production has a story that is easy to invest in and promotes the suspension of one's disbelief; however, the theatrical experience with Verdonck's technique may force an awareness that the audience is in a theatre, compelling the audience to undergo a more avant-garde experience that may be uncomfortable for some. On the other hand these projections can simply be used to enhance a theatrical illusion (Mitchell 90).

The idea of a distortion of reality is not limited to projections, as it wholly relies on the audience's reception of the piece. In one of Kris Verdonck's works, he created a scenario in which he could manipulate the audience into questioning the suspension of disbelief by secretly placing an actor in the audience. At one point this actor shouted "This isn't real; there's no water in that tank," thus causing the surrounding audience to look around in confusion (HowlRound 2016); however, whether this was a reaction to the man's comment or at his "lack of theatre etiquette" is unknown. The inclusion of this hidden actor heightened the individual audience members' awareness of the surrounding people, thus challenging the suspension of disbelief (Machon 63). The audience became a character of the fictional theatrical world (HowlRound 2016). In a way, this directorial approach attempts to force people into thinking about the themes of the play rather than simply losing themselves in the story (Wilson 406).

The third individual talent I wish to address in this chapter is Simon McBurney. McBurney is considered to be one of the most powerful people in British culture, ranked 31st in an article by Telegraph, taking a "jack-of-all-trades" role in the world of theatre; this includes acting, writing, directing, and serving as the artistic director for Theatre Complicite ("Simon McBurney" 2014). In a review of McBurney's *The Master and Margarita*, his style is described as "judiciously combin[ing] technical wizardry with simpler effects drawing on actors' skills and optical illusion" (Young 573). McBurney used projections to highlight and emphasize particular moments of the script, but at the same time, he used them in such a way that the images worked with the actors rather than upstaging them (572 – 573).

It seems as though McBurney's use of projections results in a "hit-or-a-miss" experience for the audience. Where one critic states that his use of projections correctly highlighted key issues in the script (Young 572), others argue that they take away from the play's message, doing it an injustice and ultimately creating a negative experience (Sorgenfrei 289). In critique of McBurney's work, and his theatrical technique(s) in general, there are some who view it as a "gaudy spectacle" that detracts from the overall performance and enjoyment of the piece (286). Although the interpretation of a play is up to the individual audience member, the critique is nonetheless fair: for some performances and/or theatre architecture, adding special effects can destroy the production of the play, especially if it is not done correctly.

One example comes from the University of Victoria Phoenix Theatre's 2012 production of *Eurydice*. The play was being performed in the Phoenix's thrust theatre, and the director wanted to convey flashback sequences through the use of projections. However, because it was in a type of theatre where the audience encircles nearly the entire stage, using conventional means to project the images would be difficult. The director "solved" this problem by using a weather balloon onto which he projected the images, so that (in his assessment) the audience would be able to see the images no matter where they sat. This idea did not work in practice. Despite his good intentions, the projections could only be seen in select seats without an odd distortion. Therefore the projections took away from the play, resulting in a jarring experience for the audience - and an expensive experience for the scenic carpenters because the weather balloon kept popping and new ones had to be ordered and built for the remaining run of the show (Pufahl 2012). Consequently, one could argue the method used and type of stage were the reason why the multi-media diminished the overall experience. However, there are alternative ways to produce projections for a round theatre - especially should the production have a bigger budget. As an example, the 2011 production of *Shibahama* by FaiFai took advantage of every wall, using them to project an environment ("Shibahama"). Similarly, one could have a projected character travel along the walls surrounding the audience, mimicking the way in which actors may sometimes walk through the aisles of the audience.

In my correspondence with Simon McBurney's office, I was given information about McBurney's creative process, specifically in relation to his latest production *The Encounter*, which debuted at the Edinburgh International Festival in 2015. This play has been in the works

for twenty years and is based on a book called *Amazon Beaming* by Petru Popescu. The book is itself based on the true story of Loren McIntyre, who made contact with the Matoruna tribe in Brazil in 1969 (Soloski 2016). McBurney travelled to Brazil to do research for this play. In Brazil he created relationships with locals, such as the filmmaker Takuma Kuikuro and the magazine editor Jess Worth (Claire 2016). For the English adaptation of the Japanese piece *Shun-Kin*, McBurney worked with local composer Toshi Hosokawa (Sorgenfrei 286). Thus, it has been demonstrated that McBurney has great respect for source material and background, going to great lengths to ensure his stage adaptations are faithful to their origins.

McBurney uses multimedia to provide the best possible experience the text and source material can offer. In an interview about *The Encounter* McBurney expressed how he was worried that his idea of giving the audience members headphones would be seen as a gimmick. However, it is impossible to just write it off as a gimmick because "it is essential to the experience of the piece" (Shenton 2016). Ultimately, rather than create a distance between the audience and performer it draws the audience in more intimately (Brantley 2016). McBurney stresses that technology is merely a tool, one that art can use and subvert (Shenton 2016). His process, therefore, demonstrates how multimedia technology can be used to solidify adaptations of their source materials.

Finally, I will discuss the application of these multimedia technologies in two example plays: "A One Woman Show," which I directed, and *Super Danganronpa 2 The Stage ~Sayonara Zetsubō Gakuen~* which was directed by Fumiya Matsuzaki. I specifically chose these two because they both involve live actors interacting with projected characters; the former is animated whereas the latter is a full-bodied human.

As I referenced briefly in my previous chapter, "A One Woman Show" was a play that I directed in 2014 for my directing course in the University of Victoria's Theatre Department. It is about a girl named Sasha trying to audition for a role in a fictional play called "Jade." However, the audition space just happened to be on the windowsill of an animated chameleon friend of hers named Chuckie (see fig. 1). Chuckie is constantly interrupting Sasha's audition until she gets fed up and goes backstage to murder the toon. Although Sasha is successful in her plan, because Chuckie is a cartoon character, he is able to get right back up again and cut Sasha's audition short.

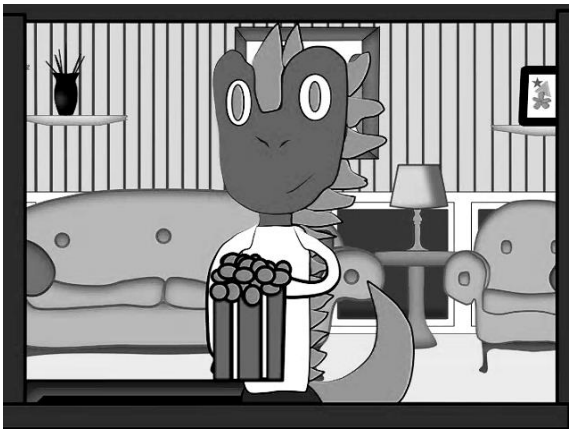

Fig. 1. Chuckie the Chameleon (Diana Draker, *A One Woman Show*)

Due to the novelty of the technology in modern theatre, having the projections serve the actor is rather difficult. In my experience with directing "A One Woman Show" the projected toon character could have easily stolen the show from the actress if she had not been strong enough to hold her own against him.

Shows of this nature become a very technical type of performance. In my experience directing the play, quite a lot of the rehearsal time was spent perfecting the timing of the lines in response to the pre-recorded animated chameleon. In such a production, the actor must have perfect timing, or else the artificial partner could get ahead of him/her and lose the audience, or the artificial partner could fall too far behind and leave unnatural pauses between lines (Acaroglu 300 – 301).

The establishment of a relationship between the actress and toon relied primarily on working with the actress to determine the backstory of the two characters. I believe that this process, in which a past relationship between the human character and artificial character was created, contributed to promoting a realistic current relationship between them. The existence of a "past life" for the artificial character can make it seem more alive than it actually is (Turkle 33), making it more "real" and, thus, easier to form a relationship with (31). This past life was developed only during rehearsals and was not referenced during the actual production in front of an audience, because its actual intent was to create a relationship between the human and artificial actors so that their on stage performance would be more compelling.

This process can be compared to voice-over where a recording session can sometimes feel like a cold read, as actors are likely to get their scripts either the night before or when they walk into

the studio (Moore 2013). To clarify, a cold read is a type of audition where the actor walks in to read an audition script with which they are unfamiliar. In such circumstances, one of the best tools a voice-over artist can use when preparing for a recording session is to prepare a "moment before" (Tozer 2017). The "moment before" is an acting term that refers to an imaginary, yet plausible, situation the characters could have found themselves in before the main actions of the play (Mitchell 12). Just as I had the actress playing Sasha do in "A One Woman Show," voice-over artists use this tool to help figure out their relationship with the other characters (Tozer 2017). That relationship in turn promotes the perception of liveness during an actual performance.

This play was also unique in its interaction with the audience. From the beginning, it was written specifically to include the audience's presence without directly interacting with them. This is the reason why Sasha was doing an audition: the play was originally put on specifically for a group of directors, and so the audience became intrinsic characters within the play. Consequently, this temporarily made the cartoon chameleon a part of their world as well. This immersive experience was the result of the multimedia technology used in the play. Also, this experience may have led some audience members to consider the role of the body "in our everyday interaction in these technocultural times," because the character lacks a tangible physical form and could challenge the idea of the body (Machon 36). The fact that the course instructor offered a chair to Chuckie during the talk-back session shows how Chuckie's liveness resonated with the audience (43), as he was "alive enough" to be offered a chair to sit on.

Although Chuckie lacked the physical form necessary to take the chair, there are projected acting partners that could have done so, for example pre-recorded film humans projected upon the stage, such as those of the second play which I will reference: the 2015 production of *Super Danganronpa 2 The Stage ~Sayonara Zetsubō Gakuen~* at the Zepp Blue Theatre in Tokyo. This play was an adaptation of the 2014 game *Danganronpa 2: Goodbye Despair*, and it also used multimedia in an innovative way. The adaptation featured a projected acting partner; however, rather than being a non-human, this character was a physical human whose image was being projected (Matsuzaki 2015).

The projection was that of Sayaka Kanda performing as Junko Enoshima. In this production, the actor Kanda did not appear physically at any point on the stage (Matsuzaki 2015). Rather, Kanda's entire performance was pre-recorded. At times, the recording was displayed on a TV

that was on the back wall of the set. By taking advantage of the projection technology, there were times when Junko would be projected onto the entire back wall (see fig. 2) rather than simply the video screen, physically using the technology to reveal her overwhelming power to the audience and cast on stage (Matsuzaki 2015).

Fig. 2. Junko Projected Onto the Entire Wall (Nekobako, *[Review] Super Danganronpa 2 The Stage ~Sayonara Zetsubō Gakuen~*)

In both *Super Danganronpa 2 The Stage ~Sayonara Zetsubō Gakuen~* and its source material, sixteen students from Hope's Peak Academy were sent to a deserted island to play a killing game in which the classmates tried to kill each other and survive the game, and takes place over the course of the Abstract Time of at least 18 days. The game was orchestrated by an AI version of Junko Enoshima. As this story was a sequel, there had been a previous killing game, which Junko had organized as well. However, in the previous game, the real Junko Enoshima had been killed by the surviving students. Thus, the AI version of Junko Enoshima trapped the minds of the sixteen new participants so that they could kill each other on a deserted island in a virtual world. Once those sixteen students were killed, AI Junko intended to take over their lifeless bodies in the real world, not only resurrecting herself, but also creating an entire army of Junko. Despite the near success of Junko's evil scheme, the five surviving students were able to delete her from existence and escape to the real world (Matsuzaki 2015).

Projection technology was used strategically in this play to underscore the nature of Junko. That is, I believe that a major factor in the decision to have Kanda's performance be a projected one rather than a physical one was to stylistically express how this Junko was no longer a physical being (Matsuzaki 2015). Further, the unique interactions in this case "creates a space for reinvigorating human interaction and exchange, however 'fictionalised' the encounter might be"

(Machon 72). By this, I mean that due to the fact that Kanda quite literally takes up most of the acting space at points in the production, the human interaction between the cast and the audience takes on a new dimension: Junko Enoshima's size dwarfs not just the surviving students, but the audience as well (Matsuzaki 2015). I can personally attest that between watching the play and playing the game, the size and intimidation of AI Junko was more powerful in the play than in the source material.

However, I feel that there is an untapped potential for the use of projections in this play. The *Danganronpa* series is best known for sending killers to different locations for extravagant executions, such as being hit by a stampede or riding on top of a giant, arm-like rocket into space (Kodaka 2014). Granted, in a theatrical setting, pulling off some of the executions with the actors would be difficult to near impossible; however, there was a television mounted on the back wall (Matsuzaki 2015). Similar to how Kanda's performance was sometimes seen through that television screen, it could have been used to display adaptations of the original executions in order to be more faithful to the source material, although I will admit that might have been difficult to do, depending on the play's budget. I also grant that the television was put to effective use, announcing the deaths of the participants, like in the game. In fact, one could argue that the announcements were an acting partner, because they were made by AI Junko's avatar, also known as Monokuma, the evil teddy bear (Matsuzaki 2015). Nevertheless, the fact that there was untapped potential for using media technology to support the setting and world building remains (Mitchell 90).

To summarize this chapter, the impact of multimedia on the perception of liveness in theatre, is more significant than the technology itself. The technology is not perfect in this regard. Projection technology is quite difficult to work with in theatre because of the issue of lighting (Mitchell 91). Some people, such as Josephine Machon, suggest that theatre could become immersive by taking a cue from virtual reality technology (Machon 59). Similarly, 4D films, although (as the name suggests) not technically live theatre, offer life-like interaction with the audience (Parker-Starbuck 141).

In this regard, a demonstration of an apparent emotional relationship with the human cast is critical to the audience's perception of the liveness of artificial characters. In establishing relationships with an artificial intelligence or a pre-recorded acting partner, there can be a

number of difficult hurdles, depending on the actor's perception of the liveness of their partner (Turkle 30). Nevertheless, a relationship must be made or else the production will fail (Mitchell 161). Creating such a relationship is, in its own way, a performance in and of itself (Turkle 6). It is the director's job to ensure that some kind of relationship will bud between the human and non-human actor, giving the non-human a temporary "sense of life" upon the stage (Acaroglu 300 – 301). Of course when an artificial being on stage is being voiced by a live human actor hiding back stage, relating to said character becomes much easier because a certain degree of spontaneity is possible. (Acaroglu 300) Thus, the question of genuine emotions versus artificial emotions emerges, and it should be noted that theorists argue over the definition of what it means to have emotion (Trappl 213).

Some audience members may be pre-conditioned to perceive emotions and liveness in an artificial actor, through experience with toys and games that give the illusion of being alive with genuine emotions through their behaviour and sounds (Turkle 26). In addition to an emotional appearance, other factors that contribute to the perception of genuine emotions are body language, emotional experiences and levels of emotion (Trappl 217). Personally, I would argue that body language and an emotional appearance are similar, if not the same. Nevertheless, body language can be difficult to replicate in artificial actors, including well-animated projected ones (Acaroglu 303).

In these cases, voice-over skills become a key factor of success in this type of theatre (Acaroglu 303). Similar to a theatre actor feeling alone on stage with an acting partner who does not have genuine emotions, a voice-over artist likely will be recording in the sound booth alone (Moore 2013). An exercise that helps in establishing a relationship between cast members who may not be present physically, is establishing a backstory and history between the characters prior to the events in the script (Tozer 2017), as past experiences are an important aspect of emotional relationships (Turkle 6). Technology is unlikely to bridge this gap in the near future. While technology is evolving and artificial intelligence programs are learning through experience (Rose 2016), it is not known when or if, it will be possible to program a consciousness into a machine. Should that time arise, the quality of the emotions displayed would still be programmed to some extent (Trappl 225).

Creators have nevertheless applied multimedia technology in interesting ways. Timothy Bird sees the cast as an extension of the set; hence he uses projections to create a "living set" for them to play in and with (Finney 2016). Kris Verdonck uses media to explore the relationship that people have with technology (Van Baarle 54) and uses it to frame the set (Eckersall 68) for his object-based theatre (72). Simon McBurney uses media technology to better convey the foreign material that he works with (Young 572 - 573), and is able to do it in a seamless way where it feels as though it would be impossible to put on the production without said technology (Brantley 2016).

Two plays are presented as case studies of the application of multimedia technology to theatre, one which I have directed and one from Japan. Both make evident how projected acting partners can be used to include the audience as part of the play. In my play, "A One Woman Show," the script was specifically tailored to the anticipated audience, and a living presence of the animated actor was perceived strongly enough by the audience that he received an invitation to sit in on the talk-back portion of the performance. *Super Danganronpa 2 The Stage ~Sayonara Zetsubō Gakuen~* used projection technology even though the human actress could have made a physical appearance. In this case, projection was used, in part, to be faithful to the source material and to overwhelm the audience with the character's power upon the stage (Matsuzaki 2015).

Lastly, the relationships that one forges with projected acting partners determine how alive and "genuine" the artificial actor's emotions are perceived to be. Although difficult to work with in an acting environment, the display of such apparent emotional relationships can immerse an audience. Even when the projections are used as set pieces, they still can have a life of their own, as evidenced by the creators referenced above.

Projected acting partners are not the only type of artificial actor. Robots are also made use of in theatrical productions and the next chapter will be dedicated to them and their place in theatre.

Chapter Four: Robot Actors in Live Theatre

In this chapter, I will briefly describe the basics of robot technology before focussing on the implementation of that technology in theatre. The latter focus will address the perception of the liveness of robot actors by showing that this technology largely (but not entirely) fails to meet the expectations of the role of the body and movement in theatre. Additionally, I will comment upon the ways in which direct interaction of both the human actors and the audience with the robot impacts the perception of the robot's liveness. This chapter will conclude with an analysis of the play *Sayonara*, which was staged using an android, and suggest reasons why robot theatre is more advanced in Japan than elsewhere.

The definition of what constitutes a robot should be addressed to avoid confusion in this paper, especially since the terms are used in everyday language without much thought for their specific characteristics. Robots are machines that are designed to automatically assist humans by performing "a specific task more efficiently than a human" (Pruthi 598). The term was first used in Karel Čapek's 1921 play *R.U.R. Rossum's Universal Robots*; however, it was coined by the playwright's brother Josef. He suggested this name because it comes from the Slavonic word "rabota" which means "servitude." In comparison, Karel Čapek's original term was "dělňas" which came from the Czech word "dělat" meaning "to work" (598). Robots are divided into two categories in the field of robotics: Professional and Personal (600). For example, some theorists hold that Professional Robots are generally designed for military (600) or medical uses (Rose 2016). In contradistinction, Personal Robots are "for personal or domestic use [and] include those used as toys, for hobbies and generally for entertainment and leisure, as well as those used for domestic applications such as vacuum cleaning [and] lawn mowing" (Pruthi 600). At this point in time, robots in theatre should be classed as Professional Robots because they are used less for entertainment than for technical and psychological research regarding various aspects of human-robot interactions, including efforts to develop androids with "human-like behavior" (Acaroglu 294). As a research platform, robot theatre allows researchers to "rediscover the original meaning of the concept of 'being together' and empathy" (Paré 130). Furthermore, in theatre, there is an aspect of researching neurosciences to have robots perform actions that appear to be natural and not thought-out beforehand, like when one fidgets for example (131).

The importance of this research is of course to be able to integrate the types of robots that are used in theatrical performance into everyday human society (Lin 10).

For the purposes of this paper, I will use the term "robot" in the broadest sense of classification, and all the other terms can be viewed as subsets. Some of those subsets are not relevant to my thesis and will not be addressed, including Industrial Robots (automated machines used to manufacture goods in factories), Medical Robots (used in surgery), and Military and Para-Military Robots (such as are used for bomb disposal). The subsets of robots addressed in this paper are those used in theatre, and they include Animatronics (programmed machines designed to mimic living things), Autonomatronics (Animatronics which can autonomously interact with an audience), programmed free moving machines (which can take many physical forms) and androids (which are meant to specifically mimic human beings in appearance and behaviour).

For many people, the first type of robotic performer they come across is that of Animatronics, a term coined in 1961 by Walt Disney (Földesi 2015). In the West, designs for animatronics have existed since the thirteenth century (Ackerman 41); however, the first Animatronic reportedly to be actually built in the West was a mechanical lion by Leonardo da Vinci, based on his own design (Bedini 31).

Presently, a new type of Animatronics, also designed by the Disney Company, is called Autonomatronics. Advances in programming and engineering allow this new design to "interact" with the audience (Goswick 2015).

> These robotic characters use cameras and sensors to "see" their audience and react appropriately. If you're enjoying the show, the character can see your smile and laughter. If you're uninterested, it notices that as well. It can then decide what to do based on your reaction - completely on its own with no human controlling it. (Goswick 2015)

The fact that these Autonomatronics can react to the audience demonstrates the steps being taken to create liveness in robotics in theatre. Although these Autonomatronics are not in use at any Disney theme park (Goswick 2015), they were displayed at Disney's yearly convention, D23, in 2009 (Hoque 2009). Due to the large gap between Adam Goswick's 2015 article and the original Autonomatronics reveal date, one can assume, that despite the development of a working prototype by Disney's inventors and engineers, the technology is still too complicated to be

implemented at the moment in Disney theme parks. Further, while Autonomatronics is an advanced variation of Animatronics, the Autonomatronics are similarly unable to move from their original location. Specifically, they are tethered by motors and processors in the ground and it is impossible for them to walk around the stage like a robot actor could potentially do (Sirinterlikci 30; 35). Nevertheless, it should be noted that there are currently some robots that use too much electricity to be powered by a battery for extended periods of time; hence, they must be connected to a constant power source, preventing any mobility that they could have had. Furthermore, for the robotic actors who can move around, their walk cycle and limitations are all preprogrammed. There are sensors that are placed on the perimeter of the stage, which help the operator backstage control said movements (Spedalieri 139).

More recent robots were developed, in part, to address this mobility aspect of behaviour. Of course, that development in turn has the potential to raise audience expectations regarding the sophistication of the robot actor in general. Of particular note is the interplay between these expectations and the role of the body in theatrical productions, particularly regarding the cyborg implementation of the robotic form. The cyborg, part human and part machine, is similar in concept to multimedia theatre, which incorporates inorganic technological elements into the more organic framework of traditional theatre. (Parker-Starbuck 37).

The more a robot looks and behaves like a human being, the more alive it seems (at least to the point that it becomes uncanny) and the more some may question the degree of difference between people and robots. Sue-Ellen Case suggests in her study of science and theatre, that the inclusion of robots in theatre is equivalent to the “reimagining of DNA.” She believes that it leads to blurring the difference between robots and human beings (Parker-Starbuck 37). Morrison expresses this idea by suggesting that the “cyborg’s DNA” is forced into the limelight when the artificial actor is put onstage (Morrison 429). Parker-Starbuck goes further to suggest that the technology of cyborgs creates the potential for a type of being that has no gender and no race; they can be everything and yet nothing, for better or for worse (Parker-Starbuck 35). In effect, the question becomes, “What constitutes a human being?” Is a human being with medical implants still human? What if the implants are enhancements in the brain? Perhaps the more the differences are blurred, the more willing audiences and human actors will be to perceive liveness in the robot actor.

In my introductory chapter, when considering the impact of the body on the perception of liveness, I made reference to the uncanny valley. The Uncanny Valley effect was introduced in 1970 by roboticist Masahiro Mori. He explained that when something is roughly 50% human-like, our brains focus on the human similarities and find the object appealing; however; when an entity appears to be roughly 95% human, the observers feel uneasy because the differences between what is expected and what is seen is unsettling. Fear is also a contributing factor to this feeling. Fear is hard-coded into one's DNA, as fear is what kept ancient humans alive by avoiding life-threatening danger. However, when one comes across an uncanny object it seems normal, but also not so normal. "So our brains don't know what to do. Some parts respond with fear while other parts don't, and they don't know why" (Stevens 2013). The ambiguity of whether there is danger or not makes the brain register the object as uncanny (Stevens 2013), a phenomenon that is a common pitfall for roboticists (Hamilton 61). Of particular interest for robotics, it is not just the appearance that can seem uncanny: when the robot's movements are perceived as unnatural, said robot falls further into the realm of the uncanny (Saygin 414 – 415).

It is rare in multimedia projections for a designer and filmmaker to create an uncanny image, as one could record a live human (Matsuzaki 2015) or animate an actor beforehand, and animation technology has reached a very high fidelity and resolution (Perini 2016). Conversely, physical robotic design is still in an experimental stage. In a survey done in 2013, conducted after the viewing of an undisclosed performance of a humanoid robot, less than half of the almost 250 respondents had positive reviews about the robot's movements and appearance, although two-thirds of the audience enjoyed the inclusion of the robot partner (Lin 8). Dramaturges that include robots could take the approach of purposefully making a non-human design, hence making the acting partner less uncanny. This approach is contrary to the intent of the development of androids where the focus is to make the robot as human as possible in terms of physical appearance and movement.

This discussion does not rely solely on subjective survey results: quantitative data has also been collected. An experiment was conducted where participants were subjected to FMRI (functional magnetic resonance imaging) while watching three videos on repeat: one of a robot, one of a human-like android, and one of the human upon whom the android was based. The FMRI measurements showed that brain activity was approximately the same when watching the

robot and human videos, but that it increased significantly when watching the android video (Saygin 418). Roboticist Hiroshi Ishiguro explained that when first encountering a human-like android, people initially tend to perceive it as being human. However, upon realizing that it is in fact an android, the idea that it could be human becomes one that is difficult to accept (Paré 134) and the FMRI records the brain activity trying to reconcile differing views. In regard to the experiment, the robotic movement is what cemented the idea that the android was not human and heightened the uncanny aspect of the android (Saygin 420). The perception of liveness, therefore, erodes.

Furthermore, the literal fusion of the human body with technology has been equated to the creation of a zombie, because the parts being modified by technology are those which have ceased to function normally, similar to how the parts of a corpse have ceased to function entirely (Parker-Starbuck 57). In like fashion, one way to describe the impact of a robot in theatre is by comparing it to a "hall of mirrors" (102). As a humanoid android is typically based on a real person, it serves as a mirror to the human (Paré 135). However, the robot is not a perfect copy, and is like the "distorted image" of a funhouse mirror, thus resulting in the uncanny (Hamilton 63). The twisted image compared to the actual body is like the robot compared to the person it imitates: it seems both alike and different at the same time. Furthermore, a hall of mirrors also suggests an infinite regression of reflections with diminishing liveness to each. This is equivalent to how a human actor brings the robot actor to life in that the robot's acting is a reflection of the human's acting (Acaroglu 301). In this sense, a robot's acting (in some cases existence) can be seen as inferior to a human's, supported by the debate I started on Miiverse, where users such as "aizakku x" and "Aty" believe in the "humanness" of an artificial performer, yet users such as "Ugly Wolf," "Richard" and "Samuel" argue that only biological humans can be "human." Hence, an artificial being's performance is a reflection of both the interaction with human actors and the perception of the audience (Miiverse 2016). Significant to this perception is the common view in Western entertainment regarding the separation between living beings on stage and objects. "According to drama theorist Stanton B. Garner, there was a clear hierarchy between the human subject and theatrical objects…" (Sone 343). With an artificial performer, it is up to the audience to project a personality upon it (Miiverse 2016), since the artificial actor cannot.

In contrast to the question of robot-as-human, one of the themes brought up in the 2008 robot play *I, Worker* is the question of how humans can be robotic despite being biologically human. *I, Worker* itself is about a day in the life of the Mayama family, including their robot servants. In the same way that a robot can only do its programmed job, a human can be devoted to work out of a sense of diversion or because of financial need. Either way "the audience [is made] to consider if making work one's primary reason to exist effectively turns humans into machines…" (Spedalieri 139). Hence one could philosophically argue that if humans can be like machines, then the reverse must also be true (Van Baarle 55). Furthermore, the robot named Takeo recognizes that he was programmed just to work but does not want to, and this sentiment is paralleled to the human Yūji who acts the same way. His wife, Ikue, quotes her parents saying that "people should be working" (Hirata, "I, Worker" 2010). However, a programmed robot is currently capable at most of inducing humans to feel emotion and cannot actually possess emotion of its own (Turkle 26).

This blurring of robot-as-human and human-as-robot impacts the perception of liveness of robots in theatre. Parker-Starbuck suggests that "technologies have become our bodies," both literally, such as through pacemakers, and metaphorically, through the "viewing positions of mediatised society" (Parker-Starbuck 10). In some cases, there are people who question what is so special about being a human, such as the children in Sherry Turkle's focus group that I spoke of in the previous chapter (Turkle 30). However, it has been said that focusing on the appearance of the robot is not what makes the robot "human," and that this focus has been a pit fall for many robotics scientists (Acaroglu 294).

So in some ways, liveness may be more convincing in theatre when the robotic actors do not appear to be human. For example, while I was in Japan watching robot demonstrations, which included Asimo, the host asked the children what they thought of a centipede-like robot. One child shouted very loudly that it was a *kaijū* or monster, thereby suggesting some degree of perception of liveness in that robot. (It should be noted that there is in fact a centipede *yōkai* called the Ōmukade ("Ōmukade" 2017), and the child could have been referring to that.) As a note, the franchise *Yo-Kai! Watch*, which originally spawned from a game developed by Level-5 and published by Nintendo, portrays these *yōkai* spirits for those who are unfamiliar (Deschamps 2018). This observation suggests to me that the hurdle for human-like robots in theatre is far

higher than for projected actors, due to the potentially increased level of uncanniness, as opposed to non-humanoid robots. Furthermore, using technology as a form of costuming can also create an unforeseen negative response toward the human actor so costumed. Costuming supplemented the technology of robotics and played a significant role in the play *Long Distance Love*, specifically the dichotomy of the costume/casting choices. As a note, *Long Distance Love* is a play about a long distance relationship where the characters are united through technology. Child characters were portrayed by adults, and although this is not uncommon, there are those who saw these "little girls" as "mutants" (Parker-Starbuck 80). This was further exemplified by having the bodies "modified" by technology putting their bodies in a further liminal state for the duration of the play (81). The technology in this production was being used as a kind of language, and in that role, it increased the mediatisation of the performance and enhanced the relationship that the audience was having with the production (81 – 82).

This theme of body appearance, body movement, and the uncanny valley, has also been approached in a number of ways by other academics. James R. Hamilton, for example, holds that the physical artificial body of a robot and the non-physical body of a projected actor can evoke different emotions in the cast and audience: anything from discomfort to fascination. Although both robotics and animation can result in the uncanny (Hamilton 61), a robot's presence can be even more disturbing to some, as "too much perceived similarity between social robots and humans triggers concerns because [the] similarity blurs the boundaries between humans and machines and this is perceived as damaging humans, as a group, and as altering the human identity" (Ferrari 288). Hiroshi Ishiguro claims that, at least in Japan, seeing a robot on stage is similar to seeing someone of a different ethnicity because both are a rarity upon the stage. In the case of the former, due to the space between the audience and the stage, it can be quite difficult to distinguish the real human from a humanoid android. "We expect that human actors and actresses will perform in theatre, but that is not the definition of theatre. We can use anything in theatre. Obviously, the android can represent different aspects of humans" (Acaroglu 295). Indeed, at first glance, there are many who may mistake an android for a human (Paré 134), which would cause any robotic movement to be jarring to the individual (Saygin 414). Frankenstein's monster serves as another example of how people fear, yet are fascinated by, the advancements in technology (Parker-Starbuck 197). Parker-Starbuck also suggests that an android's body brings up the question of human cloning (5). As applied to theatre, perceiving a

robotic acting partner as a monster or "cloned" replacement could aggravate the difficulty that some have in developing a relationship with the machine, thereby limiting the perception of liveness.

In this sense, having a robotic actor in a theatrical production can make some uncomfortable by making them hyper aware of their physical identity. This can be seen in the play *Joe*. The story of *Joe* follows the title character through different stages of his life (Parker-Starbuck 54).

> Maxwell's robot Joe creates an uneasy laughter because as we sit there in the theatre, aware of our own fleshy bodies, we hesitate to accept robotic subjects as our replacement - the robot takes the abject aging body to another level, removing flesh altogether. Although the robot does not literally merge or interact with the other live bodies of the piece…it becomes the ultimate abject body - rejected as a material possibility by (the greater part of) the audience. However, it also serves as a dramaturgical function - it is thematically the projection of the next age of (this) man and therefore seems to point not only to questions about bodies as they age, but also to questions about future bodies. (Parker-Starbuck 55 – 56)

Elise Morrison suggests yet another metaphor to explain the importance of the body in relation to robotic actors. To her, the presence of a robot actor is similar to having a disabled body upon the stage; however, because of the use of technology, that disability is trivialized and essentially moot (Morrison 429). This point is significant because a robot's movements can create or add to an uncanny effect (Saygin 414 - 415), and if the body is perceived as being disabled, then the expectations and predictions of movement will be affected (Morrison 429). Both the cast and director must fully understand and predict how the robotic character would move in order to properly block stage movements, just as is true for human actors, and thereby contribute towards a sense of liveness. For example, an elder would not move the same way that a child would (Mitchell 179).

Future developments in the fluidity of robotic body movements may lead to significant changes in how their liveness is perceived during a theatrical performance. The key to these developments is programming not just the movements themselves, but also the autonomous reactions of the robot to its environment and its ability to learn (Saygin 414). While an entirely autonomous robot is not fully possible at the moment due to the nature of programmed reactions, a robot can check its database to select the most appropriate reaction based on the circumstances,

such as Disney's Autonomatronics (Goswick 2015). Developments are currently underway to produce learning robots that can perform a variety of actions without those movements being pre-programmed (Saygin 414). As technology improves, so does a robot's learning capabilities, with programmers and roboticists creating robots that can potentially understand and take commands in various languages (Stacey 2017). Should this concept be fully realized then it could potentially be possible for a director to actually give oral instructions to a robot actor, and depending on the sophistication of the programming, said artificial actor may be able to improvise with the human actors should something go awry in the production; however, the latter is far less likely to be realized in the foreseeable future. Technology pertaining to creating such an actor has been in development since 1984 (Baird 74).

An interesting facet of these body-related developments is the ability of a robot to visually recognize individual people. In this process, the robot is shown photos of a person and maps the face to a wire-frame, allowing it to analyze the image by individual pixels; the robot then draws an accurate, although simplified drawing of the human, proving that it can recognize the individual. Because the image is simplified, the robot can recognize the person faster and is therefore "excellent for stage performance under real-time constraints" (Lin 5). The faster the robot can recognize its human partner the faster it will be able to understand and "react" to the stage performance (5), thereby enhancing the perception of liveness.

Of course, such socially sophisticated robots are being developed primarily for application in other areas of everyday life. However, integration of that technology into daily life could influence audience expectations of viewing robotic actors within the theatrical environment (Machon 60) and pre-condition audiences to perceive liveness in the robotic actors. Whether the audience is anticipating an artificial actor to be "alive" or to be merely a sophisticated prop (or set piece in the case of a projection) will also be influenced by how such objects have been portrayed on the stage in the past (Sone 343).

The execution of how a robot or projection is used should be a determining factor. Maria Shchelokova uses a modern take on Shakespeare's *Hamlet* as an example of this. In this rendition, by using projection technology the dramaturge is able to create a "virtual doppelgänger" that visually torments the title character and allows the audience to see not only Hamlet's internal struggle but also visual characters that help in his decent into madness (Shchelokova 48 -

49). Shchelokova states that while technically projections are set pieces, they are also something more: they create characters with whom the human actors are able to perform in, "tough psychological interaction with [a] digital doppelgänger" (49). The same observation could apply to robots compared to props. While props are handled as items and never addressed as though they have some type of self-awareness, robots can have an artificial intelligence. Although it is presently somewhat crude, said artificial intelligence provides a significant difference and impacts how the actor would interact with the robot compared to a traditional prop (50).

While the limitations of a robot's body and movement affect the audience's perception of the liveness of the robot, the way in which the human actor interacts with the robot is also critically important. This concern has a long history which predates such technology. Stage robots in Japan are "descendants" or "in the lineage of puppets (*bunrakuningyo*), automatons (*karakuri-ningyo*) and hyper-realistic Japanese *gofun* dolls (*iki-ningyo*)" (Paré 129). One could also think of the robot's operator back stage as the puppeteer controlling the android puppet (Spedalieri 139). Considering the idea of "robot as puppet" brings to mind how such a theatrical production can connect "a vast variety of contemporary and ancient performance practices" (D'Cruz 280). Even puppets as artificial actors are both object and subject, and the resulting psychological tension produces something of an uncanny feeling (Hamilton 63).

Yet, an uncanny feeling is far more likely in the case of humanoid robots, where it is harder to distinguish the human from the android, as opposed to puppets, since it is quite obvious which is the puppet and which is the human (Acaroglu 298). This point is significant because an element in the audience's perception of the liveness of the artificial actor, is the interaction that entity has with on-stage human actors. A puppeteer controls the movements of the puppet, whereas the human actor's movements must be blocked to suggest a relationship with the robotic actor. For the audience to suspend disbelief and accept the liveness of the robot, it must seem that the human actor is truly reacting to the artificial actor. Ultimately, then, even the human actor must subscribe to, or at least appear to subscribe to, the liveness of the robot. That task is not straightforward (301). The degree of difficulty faced by the human actor in this task reflects not only the actor's skills but also the sophistication of the robot's programming, which in turn impacts on the human actor's reactions.

In this regard, an experiment involving adults conducted by Freedom Baird tested the individual's ethical judgement and instinct when it came to objects as subjects, specifically with the Furby toy, which is programmed, to some degree, to react verbally and physically to its environment. Significantly, the participants in the study were all adults and were told going in that the Furby is simply a robotic toy and does not possess any biological qualities of liveness. Participants were asked to hold a gerbil, Barbie doll, and Furby upside down. While no one was willing to hold the gerbil upside down, everyone was willing to do so to the Barbie doll. However, after about 30 seconds of holding the Furby upside down, the toy started to cry and express its fear, saying "Me scared." At that point, most of the participants immediately flipped their Furby back over out of guilt, an act that even the participants were surprised that they performed, as they knew that Furby did not have a true life (Turkle 44 - 46). Furthermore, there are therapeutic social robots that "connect" with their owners, and in some cases the owners feel more comfortable with their robotic buddy than with other humans (University of Portsmouth 2017). However these examples are of Personal Robots as opposed to the Professional Robots used as actors. They interact directly with the user, whereas the robotic actor is observed from a distance interacting with a third party. This distance is both physical and emotional, and thereby affords the audience greater time to be more critical of the liveness of the robot actor.

As robotic actors become increasingly sophisticated, their communication with the audience can become more direct and more similar to the above-noted Furby experience. Specifically, robots as stage comedians speak directly to the audience. This kind of performance creates, "a new form of communication and interaction between human beings and robots" (Lin 1), to the extent that there are even comedy performance competitions exclusive to robots; in Japan, these competitions take the form of a variety show (Sone 342). More recently, a stand-up comedian robot named Data has been created (Knight 2010). Like Disney's Autonomatronics, Data is able to scan the audience reactions in order to determine what jokes work and which ones do not. The robot explains that his programmer created him as a way to drive innovation in the field of social robotics with the hopes that robots like Data will become everyday human companions in the future (Bans 2013).

It has been argued that these variety shows, specifically the *Bacarobo* comic variety shows, are a special case of Japanese theatre in that the main subjects of viewing are not the artificial actors

but the attending audience (Sone 344). In fact, Hiroshi Ishiguro argues that the spectator is an accomplice in the play. As a result, the audience can find it difficult to see the robots as soulless androids, and instead give them 'human life' during the duration of the production (Paré 133). In some ways, this attribution of liveness parallels the reaction of people to the sounds of the Furby's distress in the experiment cited above as they were also personally involved with the robotic entity. However, unlike relationships between people, when the show's run is over, the audience's relationship with the artificial actors ceases to exist (Paavolainen 116). (That is, of course, unless the show's run is extended, toured, or revived with the original cast). At this point in time, technology is not advanced enough to create and maintain lasting friendships between robots and human beings (Mihelj 9). This fact underlines how crucial and difficult it is for the director to assist the human actor in bringing the artificial partner to life for the audience.

In spite of the advancements in robotics discussed above, it remains the human stage actor's job to provide the emotional appeal of the robot, as the robot cannot truly "feel" said emotions (Paré 131). Bryerly Long, the human actress who performs alongside the android Geminoid F in *Sayonara*, states that her job was to express enough emotion that the audience felt as if the artificial partner was also emoting (Acaroglu 301).

> While sympathy binds men together, empathy here concerns the relationship of a subject (the man) to an object (the robot) with different levels of human presence in its aspect, movements and behaviors (Paré 130).

In this sense, the artificial acting partner is a blank slate for the audience to project a personality onto (Sone 347) - within, of course, the structure of the script. Audience members projecting themselves onto fictional characters that relate to their own persona or situation is nothing new; however, the act of placing this blank slate onto the stage is parallel to the act of placing a silent protagonist into a fantasy; it is easier for the audience to project themselves onto such a character (Player 22), theoretically making the events in the production stronger for the individual. In a sense, the human actor becomes subservient to the robotic actor in order to demonstrate liveness in the robot.

The last element I will discuss regarding the challenges of acting with robots in theatre has less to do with plays and more to do with purposely designed experimentation regarding the

interaction of human and robotic entities. For robotic scientists, theatre is an important platform for the development of robotic technology (Paré 130). This can be attributed to the technical side of robot theatre, which is focused on researching and deepening human-robot interactions (Lin 10).

The theatre space is a safe place for robotic scientists to "experiment with engineering challenges and many aspects of social interaction" (Paré 130). The draw is to study human behavior, the results of which could be applied to improve the 'human aspect' of a humanoid robot (Acaroglu 294). As the robot can neither feel nor express emotions, "we need to study different kinds of behaviors to have an idea of what kind of psychological behaviors we should implement into our robots" (Paré 131). Furthermore, Ishiguro expressed that the purpose of creating human androids is that "by making a copy of a human…we can understand humans" (D'Cruz 274). Although, at this time, it is only realistic for a robot to play the role of a robot, directors like Oriza Hirata have expressed an interest in casting a robot in the role of a human (Acaroglu 294). As artificial intelligence becomes more and more advanced, it is possible that in the future there will be a type of casting that is similar to today's colour-blind casting: lifeform-blind casting (Spedalieri 140).

The intent is that, by observing human behaviour, a roboticist will be able to replicate the acquired learning that humans naturally have, thus giving the robot a history to draw from (Acaroglu 294 – 295). This history, especially a shared or similar history, is what allows humans to feel emotions and express empathy in relation to others (Turkle 6). Even though the creation of a sentient robot is an impossibility at the present time (9), people have "a different kind of relationship to the robot" (Sone 347). Ishiguro expresses the need for have "a new category" to express the relationship he has with his robots (Acaroglu 296).

While the idea of studying human behaviour to make a more sociable robot makes sense in principle, engineering the appearance of a wide range of human behaviour is beyond the current capacity of programming. Since it is not possible to create a robot that can do almost everything, roboticists "always need to choose a situation or a task challenge for each situation" that the robot will tackle (Paré 134). Indeed, although there are those who will openly form relationships with these robots and revel in their version of liveness (Turkle 9), for many roboticists, the idea of making robots appear more human, is not to create an actual sentient creature (Paré 132). But

by giving a robot a "friendly human appearance," at least people are able to feel more comfortable around it (133). Presently, this design choice is likely to fall into the realm of the uncanny (Saygin 418), but cute, non-humanoid robots are able to produce a feeling of ease (University of Portsmouth 2017). Regardless, robots themselves, especially in the case of humanoid robots, are mirrors for the creators, even if said robot does not look like them (Acaroglu 296).

I will now consider the 2011 Japanese play *Sayonara*, written and directed by Oriza Hirata, as one example of the implementation of the concepts developed in this chapter regarding the use of robots in theatre. *Sayonara* is a play that has the actual android Geminoid F (see fig. 3) playing the role of an android (Spedalieri 138). The relatively simple and depressing plot of this play is that a dying woman is given an android in her last few days to read poetry to her and to ease her pain (Hirata, "Sayonara" 23 – 27). In the play, after the woman dies, the android is taken away, reciting one last poem (Spedalieri 139). The run of the play is approximately 30 minutes and although it is short, there are many technical details to which the on-stage human actors and both the pre-production and production crews must attend (Acaroglu 298). This play was influential enough to garner a sequel and full-length feature film, starring the same human and robot cast as in the play, in addition to new cast members (Collin 2015), which is to be expected when a 30-minute play is expanded into a 112-minute movie. Furthermore, the movie takes a lot of inspiration from the aforementioned sequel.

Fig. 3 Geminoid F and Bryerly Long (Origin, *"Android-Human Theater "Sayonara"(Good-bye)*)

Similar to an Animatronic, the android had limited mobility because she was bolted to her seat by a metal rod (D'Cruz 273) and therefore remained immobile, with the exception of making hand gestures and being carried off the stage (Spedalieri 139) As should be anticipated in light of the analysis in the preceding sections of this chapter, there are differing views regarding whether this play was successful in blurring the "boundaries of humanity" between the cast members or whether it explicitly divided the human actors from the android actor (D'Cruz 278).

Looking at *Sayonara* as a theatrical play rather than a research exercise garners mixed reactions. There are those who adore Geminoid F's performance, praising it as better than that of the human actor, Bryerly Long (D'Cruz 272). That judgement is quite ironic considering that Long voice-acted Geminoid F as well (Acaroglu 302). There are others who recognize the importance of the inclusion of robots for scientific research yet still dislike it, finding it to be uncanny (D'Cruz 274 – 275), or "stiff" due to the lack of movement (281) and its subject matter depressing (Collin 2015).

Yet, in the context of the plot and the caretaker role of the android, the perception of liveness of the android strengthens thanks to its apparent emotional reaction to the woman's death. The audience has to contend with, "the woman's death and the android's malfunctioning, invoking feelings of empathy and pity for the lonely, companion-less android" (Spedalieri 139). The malfunctioning of the android is equivalent to pain in a body. This point may also suggest that the robot need not be in human form to elicit emotions as was demonstrated earlier in this chapter in the Furby experiment: the Furby was recognizably not human, but still elicited an emotional response when it expressed fear.

The android's own death is also significant to its liveness in another way because if it can die, then perhaps it had been alive. The equivalent of death comes from the fact that when a robot malfunctions, it is shut off and its memories are reset. While not physically being discarded, a robot's memories being reset has been equated to it no longer being the same robot (Turkle 36; 40 – 41). When people kill an insect, and feel no guilt, the lack of remorse or emotional connection makes the insect appear less alive in the first place; however, the idea that one can empathise with a robot and feel sad when it is "dead" makes that robot seem more alive (61), something that Oriza Hirata and Bryerly Long are able to make the audience feel quite strongly (D'Cruz 277).

At this point, the question arises as to why robots seem to be so readily accepted in modern Japanese theatre such as in *Sayonara*. Right now, "The robotics industry is arguably more important and more enthusiastically embraced in Japan than anywhere else in the world" (Robertson 572). A subtle factor noted by Steve Wright in this regard is that in Japanese culture, when receiving service from someone, the natural reaction is to express a degree of regret for inconveniencing the server, rather than giving thanks. That expression of regret is not required for a robot, thereby relieving the human being from any sense of resentment (S. Wright 2013). Furthermore, in Japan for decades there have been many different kinds of vending machines that are not limited to food items, such as batteries, books, or umbrellas (Ashcraft 2016).

Also of cultural significance is the impact of popular manga where robots have played important roles. *Astro Boy* for example fostered a family-friendly image of robots, and many cite the character of Astro Boy as being the inspiration for going into robotic studies in the first place (Robertson 583). As a note, the iconic *Astro Boy* series was originally created by Osamu Tezuka and debuted in 1952. The title character is a friendly robot who helps in solving situations involving both humans and robots, and will possibly even be serving as an ambassador for the Tokyo 2020 Summer Olympics (Anderson 2017). In Japanese popular culture, robots have dominated the market since the 1950s (Robertson 574).

Another important element in the acceptance of robots in Japanese theatre is the demographic realities of Japan. First, the Japanese are aware that their aging population cannot be cared for adequately by the fewer numbers of young people and have been developing robots for decades with the view of having them care for the elderly (Robertson 578). Ultimately, in general, the average Japanese citizen prefers being with a robot companion or caretaker (572). It is possible that this is spurred on by negative stereotypes of Western caretakers, such as being rude or ignorant of the accepted and expected respectable behavior in the Japanese culture. Although these feelings are obviously not universal across all of Japan, they do exist and there are even some companies that refuse service to foreigners under the belief that the foreigners will not behave appropriately (Kikuchi 2017).

The second impact of demographics in Japan has to do with the shortage of labour. In this context, automation has come to supplement the human labour force, rather than replace it, and it is therefore not perceived negatively by the human workers. Robots are a useful tool rather than

a threat to their livelihood. Reliance on automation is so central to the economy of Japan that the government is supporting the development of robotics and hopes that "the robot market [will] reach $21 billion by 2020" (Saiidi 2017). Consequently, robots have become an integral part of everyday thinking in Japan.

In conclusion, robots as artificial actors are currently an experimental form of theatre that has not been widely implemented. While robot actors should offer the advantage of being three-dimensional, they also share some of the constraints of projected actors, such as an inability to improvise on stage (Acaroglu 300 – 301), thereby limiting the perception of liveness (D'Cruz 281). Further, robots pose additional challenges to the perception of liveness through limitations in the perceived fluidity of motion, the need for a reliable on-stage power source and complications of blocking the movements of live actors on stage (Spedalieri 139).

In Asian theatre, robots can trace their origins to puppetry (Paré 129), with their operators serving as modern-day puppeteers (Spedalieri 139), but the term for robot is actually rooted in Western theatre, coming from Karel Čapek's *R.U.R. Rossum's Universal Robots*. Although the first entertainment robots were the Animatronics (Ackerman 41), these are quite different than the ones used in theatre. This is because in theatre, robots are included not purely for entertainment purposes, but also to study human behavior in order to assist with the growth of the robot's artificial intelligence (Paré 131).

The inclusion of robotic actors in theatre can produce mixed reactions from audiences. While some can only see the robots, especially humanoid robots, as uncanny and unwanted (D'Cruz 274 – 275), there are others who embrace the technological actor upon the stage (272). Such reactions can be identified physically by FMRI; in attempting to distinguish a human from an android (Acaroglu 298), the brain becomes much more active as it tries to figure out what is being shown (Saygin 418).

When a robot is placed in the spotlight, the role of the body becomes a relevant question to many (Parker-Starbuck 55 – 56), something that does not concern projected actors, as they do not have bodies to begin with. Audience members can become hyper aware of their own physical bodies (55 – 56) and question their own physical identity by comparing it with the robot's (Turkle 30). Furthermore, humans themselves are becoming robotic, literally, through the

introduction of objects such as pacemakers; psychologically, due to the constant and casual intake of mediatised society (Parker-Starbuck 10); and behaviourally, such as through wholesale dedication to work (Spedalieri 139). One could then say that the inclusion of robots in theatre can either blur the "boundaries of humanity" or make explicit the differences between human beings and robots based on the individual's point of view (D'Cruz 278).

In this regard, it is the director's job to help the human cast bring the robot to life (Acaroglu 301). Naturally, this is because the robot cannot truly express emotions (Paré 131). Furthermore, improvisation is currently an impossibility, so acting with robots requires perfect timing similarly to acting with a projection (Acaroglu 300 – 301); however, unlike with projections, strides are being made to create a reactive robot. Should this research prove fruitful then directors would actually be able to direct the artificial actor, and the human cast would be able to create more organic performances (Baird 74). As should be noted in the sample play, *Sayonara*, part of the mixed reception was due to the stiff performance of the android (D'Cruz 281). This likely can be attributed to the limitations of robotics resulting in uncanny movements (Saygin 420). Nevertheless, the relationship the android has with the woman character in *Sayonara* humanizes Geminoid F to an extent. At the end of the play, the audience is likely to empathize with the android (Spedalieri 139), with some even finding it easier to relate to her than to the human actress, Bryerly Long (D'Cruz 275 – 276).

In my previous chapter, I briefly mentioned how there are funerals in Japan for one's objects due spiritual beliefs (Chapman 2013) and this would likely hold true for robotic actors as well, and there are additional factors regarding the acceptance of robots in Japanese theatre. For example, Ishiguro suggests that at least in Japan, due to the smaller number of actors of other ethnicities, the novelty of having an artificial actor on the stage is the equivalent of having an actor of a different ethnicity on stage (Acaroglu 295). Furthermore, Bryerly Long herself is a foreigner. She met Hirata early on after moving to Japan, and while Hirata had directed foreigners before, Long was the first Westerner to join his theatre company (Long 2017). It is then likely that early on it was decided that a foreigner should be cast in *Sayonara* to aesthetically create a unique and foreign feel to this already fascinating production. While Long did not take part in the production side of the play it is possible that she indirectly inspired some parts of it, such as taking advantage of how she is fluent in not just English and Japanese, but

French and German as well. She also had a hand in the script writing for the film adaptation (Fred Film Radio 2017).

In the following chapter I will be looking at specific artistic groups in Japan that take advantage of such mediatised technology in theatre, taking them in new directions, and the effect this has on the viewing audience.

Chapter Five: Dumb Type and Vocaloid

In this chapter I will address specific groups of interest in Japan: Dumb Type and Vocaloid concerts. My interest in these two groups centers on the use media technology in their presentation. Dumb Type is a group that takes advantage of projection technology in their experimental dance theatre. Although the live human performers are interesting in their own right, the main draw is the scenery. These sets have been described as being futuristic due to how they use the technology to seemingly come to life. Vocaloid on the other hand focuses on projections that imitate life. Hatsune Miku is the most well-known of these singers; they are animated characters who hold their own concerts in which they themselves appear on the stage rather than being represented by a costumed actor. During these concerts the only humans on the stage are those of their back-up band. These two theatre groups display the liveness of their projections in unique ways: whereas the Vocaloid singers are quite obvious, as they are characters in and of themselves, Dumb Type's projections are a part of the set and, in a way, give life to the set itself.

I will begin with an overview of Dumb Type, followed by an analysis of specific productions. This theatre company was formed in response to the constraints placed on the founding members while they were in school. Hood relates how the company was "Created by frustrated art students who were not allowed to work outside their disciplines, the original members of the collective came from diverse backgrounds" (Hood 7). Dumb Type not only proposed the crossing of disciplines, but also the combining of different art styles. The members of the company considered themselves to be "part-time artists," and they had jobs in addition to serving as contributing artists (Dumb Type 59). The group was named Dumb Type because "[they] didn't want to use any dialogue in [their] performance" (Cooper 1990).

At the center of Dumb Type's creation was Furuhashi Teiji, the artistic director at that time. Furuhashi Teiji began his artistic pursuits with painting in deference to his father's wishes. However, Furuhashi was more interested in music, crediting his brother's rock band for driving that interest (Cooper 1990). Furuhashi said when he was in junior high school, he became a drummer in a band, which developed his sense of rhythm; this in turn played a significant role in the complex rhythms of his choreography in Dumb Type (Dumb Type 121). He also studied film

in university (Cooper 1990). Given his exposure to a wide array of art disciplines, it is not surprising that he would be the artistic director of Dumb Type.

In terms of the usage of digital media in Japanese theatre, Dumb Type can be credited as "the first of its kind" (Cooper 1990), as digital media in contemporary art was generally rejected in Japan during that time (Dumb Type 53). In fact, it was so new that Dumb Type had to produce its creative multimedia work primarily overseas. That was the case until the group founded the Yamaguchi Center for Arts and Media which is a facility for multimedia artists in Japan ("Artist Interview: The World of" 8 - 9). In terms of venues, in addition to traditional theatre stages, Dumb Type has performed in a variety of places, such as art galleries and museums, but the group requires that the venue play the role that was required by the production. In fact, the company has gone so far as to renovate the venue to suit its specific needs (Gendrich 2000). A decision such as this likely drew upon the unique educational background in architecture of one of the founding members (Hood 7), a skill that was also likely utilized in designing sets. It should be noted that although the said venues may have been best for the performance, they may not have been the best for the performers.

Another founding belief of Dumb Type was the absence of an arbitrary hierarchy; everyone in the company, regardless of their core discipline, could come together in the creative process and brainstorm pitched ideas ("Artist Interview: Exposing His Own Body" 4). As a result, the company "does not rely on the personality or charisma of a solo performer" (Gendrich 2000). To this extent, every person involved in an individual production was paid the exact same amount as every other member (Dumb Type 125).

Dumb Type's incorporation of digital media and other "techno-toys" was intended to "kill the illusion of art" (Dumb Type 127). This notion is reflective of Adolphe Appia's desire to break the "illusion of an illusion" (Beacham, 1993, 59). Dumb Type's intention to break the illusion of art is reflected in its choice of performance themes that addressed issues that were normally avoided (Cooper 1990). A further parallel between Dumb Type and Appia is the irony of their positions on multimedia. Adolphe Appia is said to have been a key person in terms of multimedia's eventual inclusion into theatre (Wiens 26), even though he opposed the idea (Appia 10). Similarly, Dumb Type was formed in response to the frustrated artists' dislike of commercial art and theatre (Dumb Type 123), and yet their own success in using multimedia

encouraged other companies to do the same. The members of Dumb Type felt that they were now engaged in that which they were rebelling against (Dumb Type 55). Even though they continued presenting experimental theatre, using said media technology in new and interesting ways, it does not change the fact that they were no longer the only ones performing this way.

The way in which Dumb Type integrates multimedia into its performances is rooted in the darker messages of its themes (Hood 8). Theses darker messages are typically political in nature, in contrast to the "light-hearted" material that is most often performed in commercial theatre. Rather than a romantic treatment of daily life, "Dumb Type's evocation of daily life instead took place within a regimented, high-tech environment" (Neave 85). The technologies are optimized in a way that enhances the experience of the dance theatre. In my communications with Yoko Takatani of Dumb Type, I was told that when integrating technology into a performance, they "carefully consider if that technology is indispensable to the performance [they] wish to carry out, or if that technology is the most appropriate one to the expression [of the work]" (Takatani 2016). Thus, the multimedia technology becomes an art form in and of itself (Gendrich 2000). It is important to understand that the technology is not intended to serve as spectacle, although it has led some to comment that it looks futuristic. Rather, the themes are rooted in the present, and the technology is integral to the presentation of the theme. Furthermore, the production items used by Dumb Type could be bought off the shelf, confirming that the production is taking place in the present (Dumb Type 57).

Dumb Type's debut multimedia theatre production was *036-Pleasure Life* in 1987. According to Dumb Type lighting designer Takayuki Fujimoto, *036-Pleasure Life* was largely made possible thanks to Sony's newly released Sony Profeel. This apparatus made it possible for images to be displayed in real-time while being filmed via a VHS camera. Although live streaming is rather common today, it was a novelty at the time. Notably, "Dumb Type kept pace closely with the technological advances of the times in creating new modes of expression" ("Artist Interview: The World of" 2). As a recent example, at the 2016 - 2017 Dumb Type exhibit at the Museum of Modern Art in New York, there was a short presentation of Furuhashi's personal 1994 production *Lovers* in VR ("Teiji Furuhashi: Lovers" 2016).

pH is another early example of a Dumb Type play and debuted in 1990 in Kyoto. This play demonstrates the application of multimedia (see fig. 4). As Furuhashi describes it, "*pH* dealt

directly with the relationship between technology and human beings" (Dumb Type 123). The title is a reference to chemistry (Borggreen 80). In chemistry pH is a measurement of "the hydrogen ion concentration of a solution," essentially a measurement of the degree of acidity of a substance. The theme of the play is the relationship between man and electronic technology (Dumb Type 123). Hence, the title of the play signifies the potential for technology to have varying levels of danger attached. I should note that Furuhashi contradicts this statement in a different interview, claiming that *pH* does not have a theme because it is about contemporary life, which does not have a theme (61). While *pH* had an overall plot, it was divided into thirteen phases that told different stories related to the overall theme. The simplest way to demonstrate this relationship is to relate that the play was essentially bookended by a man crawling on the floor in his underwear, and the explanation for that appearance comes shortly before the end.

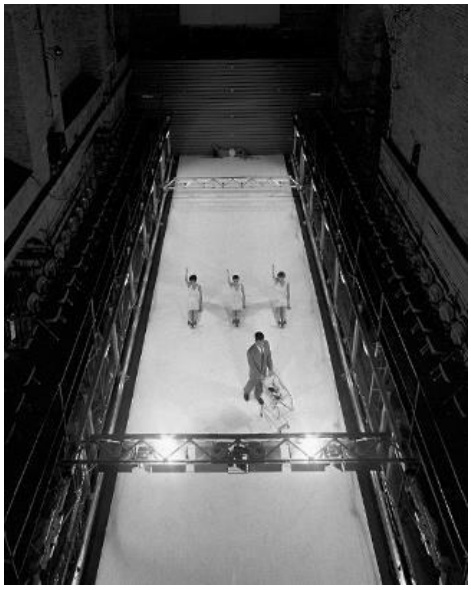

Fig. 4. Dumb Type's pH Stage (Dumb Type, *Dumb Type Works*)

pH reflects the belief of Furuhashi and the other founders of Dumb Type that most theatre groups portrayed too much information through their words. The members of Dumb Type believed the same information could be conveyed in a deeper manner through action alone (Dumb Type 55). The name Dumb Type also refers to a specific societal problem in which people may learn and/or share a large amount of information that ultimately results in nothing (Neave 85). However, that does not mean that there are no words in their plays. When Dumb Type does use words it is through projected English text, usually with broken grammar. For example, in Phase 6 of *pH*, there is a section that resembles a fashion show, and the words "the

very latest," "new and improved," and "like never before" are projected onto the floor. On their own, these words can easily be interpreted as referring the faux fashion show, and that could very well be the intention behind them. However, when coupled with the projected words from Phase 9, they gain a deeper meaning. The words that are projected during Phase 9 are "Player 2 Start," "Ok," "New World Border," "New World Order," "World Order," "World Boarder," "New Game," "Game Over," and "World Over."

Given Dumb Type's interest in public issues, it is instructive to speculate whether the political environment surrounding the play is reflected in these words projected on the stage. For example, a year before *pH* debuted, the most significant political event was the death of Emperor Shōwa, and the rise of Emperor Akihito and it is possible that the written words of *pH* refer to these events (Chira 1989). As Emperor Akihito is the second emperor since the end of World War II, it is possible that the phrase "Player 2" refers to him. There were also a number of different Prime Ministers of Japan in the 1980s, such as Yasuhiro Nakasone and Noboru Takeshita. Hence, it would make equal sense that these words are reflective of the various Prime Ministers. This interpretation does not come from the words alone, but is also supported by Dumb Type's philosophy. Dumb Type likes to create performances around ideas that the Japanese society prefers to ignore or avoid (Cooper 1990). For example, Yoko Takatani stated that she wished she could speak with Furuhashi about the current political state of the world (Takatani 2016). Furthermore, the group's political viewpoints and critiques are presented subtly and not directly stated or explained (Jansen 43). In this way, politics could be brought up in a production revolving around the relationship between humans and technology.

Coincidently, a change in the political environment was happening overseas at the same time: in the United States of America, it was the end of Ronald Reagan's term as President and the beginning of that of George H.W. Bush. Thus, the projected words could mean that it was not just the local "world order" getting a "new game" but other places in the world as well.

There is another interpretation that more closely addresses the theme of humans and technology, one that is rooted in a fear of technology. The phrases "the very latest," "new and improved," and "never like before" could refer to the latest iteration of ever-evolving technology. In that case, the phrases about a new world order could be about a new world that is ruled by machinery.

The use of English in these projections is purposeful and strategic and is meant to alienate the audience from their production (Gendrich 2000). Japanese audiences find that the use of English "always makes it alien," yet the Japanese performers provide a sense of familiarity. These very feelings of "alien" and "familiar" could be experienced by English audiences for opposite reasons (Gendrich 2000). Nevertheless, the company accepts direct criticism after every showing and is available to speak with every individual (Takatani 2016).

Additionally, Dumb Type uses elements such as light to experiment with their effects upon the human body (Gendrich 2000). In Bridget Cooper's interview with Furuhashi, the latter spoke of its application in *pH*. He explained that the lights and projections in that show were adjusted and programmed in such a way that the actor would not even realize that they were there; however, the actor was still affected by the multimedia technology unconsciously, something that he believes media does to society on a day-to-day basis (Cooper 1990).

In regard to sound design, Dumb Type is well known for providing a "sophisticated soundtrack" as background music, which is crafted to be, "a further sensory channel to communicate messages and concepts" (Neave 93). However, there are occasions when Dumb Type will purposely drown out said music. Dumb Type performer Takao Kawaguchi has expressed an interest in using electronic noises in a way that would stimulate his senses to the point where his body could fall to the ground due to dizziness ("Artist Interview: Exposing His Own Body" 7).

As Dumb Type is a dance theatre company, the movement of the body is of central concern. In this regard, disco dancing was an important influence on Furuhashi, and by extension, Dumb Type (Dumb Type 127). Dumb Type's combination of multimedia technology with that dance style influence naturally affects those movements, such as in *pH* (Mezur, "Fleeting Moments" 195 - 196). The movements choreographed with multimedia technology, such as projection and lighting, "transforms" their bodies (200).

In *pH* imagery is repeated, and if an image is repeated multiple times then it must be with intention and have significance (Ball 70). There are two repeated images that I would like to highlight, the first revolving around consumerism and the second revolving around tennis.

From projected bar codes to an actor wandering with a shopping cart, there are many different examples of consumerist imagery. At one point several women are lying down on a pitch-black

stage. A single thin red light passes over them and flashes into a bar code, implying that it just scanned them as objects to be sold or items to be copied. At another point, the stage once again is darkened while a bar's bright white light emits a loud hum, similar to a copier. This projection parallels the theme of repeated imagery due to how it implies these women could be copied. Gunhild Borggreen suggests that this imagery of a copier scanning the subjects brings to mind the issue of surveillance technology and visuality (Borggreen 79). Her interpretation is supported by a later scene of the play in which a man is being interviewed by an actor who appears to be a customs officer. There are also moments when the same female actors display erratic yet stiff movements, as if they were malfunctioning machines. In these cases Sara Jansen argues that the performers are acting as both humans and non-humans (Jansen 22). I do not believe that this imagery is trying to objectify women, but rather signifies that one's environment dictates the behavior of the individual: in this case, an environment of technology and consumerism.

Another repeated image in *pH* is that of tennis balls, which are thrown onto the stage eight times. The parallel between the play and the symbolism of tennis balls is too similar in my opinion to be mere coincidence.

The tennis balls are less predictable with a more organic movement than the two bars that run across the stage on set intervals. In the play, the tennis balls were either dropped or rolled onto the stage, and like the bar, the tennis balls assault the performers on stage. At the top of the production when a tennis ball is first dropped onto the stage, the three women who are lying there roll away from it, only to return to their original positions a moment later. However, at the very end, one last tennis ball is thrown at the women but, this time, they do not roll away from it.

Tennis forces the player to make a quick decision and "to accept the responsibility for the consequences every time [they] hit a ball" (Cullinane 2015). This quote supports an interpretation that involves multitasking and stretching oneself too thinly. For example, balls can be used in juggling, and just like juggling multiple responsibilities, the more balls that are thrown at the juggler the more difficult the trick becomes. The multiple phases in the play could represent some of the responsibilities that the performers have in the production. The fact that the women roll away from the tennis ball at the beginning can be interpreted as the women rolling away from their responsibilities and difficulties that come with them. However, at the end they do not dodge the ball, meaning that they are willing to face the responsibilities and hardships in

front of them (Klein 2013). Alternatively, it could be a reflection of the typical working environment in Japan. The environment is quite intensive with long working hours. The stress can and has led to several Japanese workers literally working themselves to death (Lane 2017).

The stage on which these actions take place is not a passive one, and technology is used to make it appear to have agency, thus forcing the actors themselves to become reactive components. A key example is the swinging bars alluded to earlier. On that stage there were two metal beams, one of which was only about two feet off the stage. The second beam was approximately seven feet off the stage and held multiple projectors. Both metal beams moved back and forth over the stage in a rhythmic motion (Mezur, "Fleeting Moments" 193).

Due to the presence of the low-running bar (see fig. 5), the movements of the performers were limited. To avoid being injured, the performers had to lie down or jump over the bar at certain set intervals. In fact, the stage setup for the production of *pH* was "potentially deadly" (Mezur, "Fleeting Moments" 193). Furuhashi endangered the performers in this way in order to represent that Japanese society was dangerously similar to a machine. Although the performers rehearsed and knew what they were doing, "on some level, [they were] playing in the narrow margin between life and death" (Mezur, "Fleeting Moments" 195). Audience members may have perceived genuine terror upon these performers' faces (196). Katherine Mezur further posits that the act of performers placing themselves in these dangerous situations was meant as a metaphor for media terror. She believes that these acts of bringing the body and media together in a dangerous situation, represented an act of terror (Mezur, "Dumb Type Women" 66).

Fig. 5. pH Actors Avoiding the Lower Bar (Dumb Type, *Dumb Type Works*)

Of course, the bars dictated the pacing of the performance. In addition to dodging the lower bar at certain intervals, the performers had to walk in front of it at other times, as if it were pushing them along, or act at the far ends of the stage out of the bar's path. One could argue that this low-running bar functioned in the same way as an artificial actor because of how the performers had

to give a near-perfect performance to avoid injury and move at the bar's own pace. This in turn makes the stage itself into a character of the show, thus displaying an arbitrary sense of liveness.

In addition, the audience was set above the stage rather than in front or around it (Dumb Type 61). This aerial vantage point gave an individual audience member full view of the stage. Although the audience would be aware that the stage itself is obviously not technically a character, the intention of the viewing angle may be to subconsciously affect the emotions of the audience during certain scenes (Ball 71).

As a character, the closest the set can get to providing dialogue is through the words that are projected upon it. Furthermore, it obviously cannot even approach the expression of emotions; however, this coincides with a quote from Furuhashi Teiji, in which he stated that one of the reasons for using technology in theatre is to replace "emotion" with "motion" (Borggreen 90). This is also somewhat supported by David Ball's description of character. He claims that characters are revealed through their actions and that their personalities are determined through those actions (Ball 60). Thus, from this point of view, the bar acts as an antagonistic character: not only does it constantly threaten the performers it also "acts out" with violence. For example, it knocks over folding chairs that are placed upon the stage.

Dumb Type uses technology to illuminate that which most avoid, including aspects of technology itself as demonstrated in the later play, *S/N*, which debuted in 1992 in Adelaide, Australia.

> It is therefore not surprising that the performance *S/N* evolved over several years. The term S/N is a reference to signal to noise, a telecommunications term often used to express the quality of electronically transmitted information. As Furuhashi commented, "on records there is lots of noise, but on CDs there is no noise. Everything is moving towards cutting noise-how to digitalise everything, how to signalise anything. That kind of "cutting noise" seemed to me like cutting everything people don't want to see" (Neave 91).

Therefore *S/N* stands as another example of both their innovation as well as highlighting one of their founding beliefs of not avoiding issues that normally went unspoken by the public (Cooper 1990). The play debuted when Mac computers had advanced to a point where the group could

make their own computer graphics ("Artist Interview: The World of" 2). Due to the circumstances surrounding *S/N*'s theme and Furuhashi's death in 1995, one could easily argue that it was the last production in which he had direct involvement. Nevertheless, *S/N* is very much rooted in the circumstances of Furuhashi's medical condition, as his diagnosis of HIV determined the play's central theme ("Artist Interview: The World of" 3). That theme was quite rare, if not unheard of, in Japanese theatre at the time (Gendrich 2000).

Furuhashi stated that *S/N* was emotionally difficult for him because to some degree, it felt like an autobiography. Consequently, he could not do this play without including the experience of AIDS (Dumb Type 111). *S/N* was a major factor in Furuhashi's decision to disclose that he was HIV-positive because he did not want the audience to question whether the theme of the performance was fact or fiction (109). Furuhashi stated that his personal mission was to put AIDS in a visual medium that countered the stereotypes presented in art (111). Despite this, a journalist, much to Furuhashi's chagrin, asked after a performance "Do you know someone who has AIDS or who is homosexual?" (111). Nevertheless, Furuhashi saw the performance as a metaphor about "the complexity of the times we live in" (113), and an important goal for *S/N* was to blur the boundaries of art and real life (109).

Multimedia was used extensively in this production. For example, several words, phrases and images were projected on the stage screen, some of them numerous times. Those most frequently repeated were, "Conspiracy of silence," "Conspiracy of science," "I dream my gender will disappear," "I dream my nationality will disappear," "I dream my blood will disappear," and "I dream my right will disappear." The words "Signal" and "Noise" (*S/N*) also occasionally scrolled across the onstage screen (Epidemic Video 2012). These words and phrases were likely chosen in order to emphasize the feelings and problems that homosexuals and those inflicted with AIDS were forced to deal with (Dumb Type 109). Additionally, close-up chest images were projected upon the stage. The camera was filtered giving the impression of a medical environment and therefore the images suggested vulnerability and preparation of disease analysis. The images overlap, blurring gender assumptions (Mezur, "Fleeting Moments" 201 – 202). Through theatre, Furuhashi conceived of a world where there are no longer definitions for concepts like gender, race, or nationality (Neave 92). This is especially apparent in *S/N* where related phrases are constantly projected as text (Epidemic Video 2012), and the chests that are projected fuse

together, causing confusion as to which chest belongs to which gender (Mezur, "Fleeting Moments" 202). People who were homosexual or HIV positive, as well as other social outcasts, may feel alienated because they are different from the majority. Furthermore, especially during the era in which *S/N* was conceived and performed, there was a general negative view of such subgroups (Alessi 512). Some people saw those characteristics as contributing a person's "primary identity," even if the individual in question did not share that view (Dumb Type 109).

S/N was a controversial play, not only for the themes but also the visual presentation. It is nearly impossible to create an unbiased review, as "*S/N* reveals your feelings about so many intimate issues. The reviews were uncharacteristically personal" (Dumb Type 113). One of the controversial points was nudity in the play (115); however, the occasional use of flashing lights resulted in the performers themselves being silhouetted (Epidemic Video 2012). The most controversial aspect was the casting of a woman named Bubu, who performed the rare spoken monologue in the play (Mezur, "Fleeting Moments" 201). She played the role of a prostitute and she was one in real life as well. On the stage she performed a sexual act that Furuhashi described as being "like a magic show." The basic trick of pulling a string of flags from a sleeve could be seen in a commercial magic show. However, in the play, the flags were extracted from her vagina (Dumb Type 115). During this performance, a woman performing a monologue live backstage was recorded through a fisheye lens. Her performance was projected onstage as a talking floating head as she delivered her important testimony (Mezur, "Fleeting Moments" 201). While this projection may appear to be spectacle, the apparition reflects the social reality of AIDS. Fisheye lenses create an effect that looks somewhat like a bubble. Now due to strict cultural values about the subject, several people go into a social withdraw (Lunsing 98 - 99). The idea of feeling as though the only place where someone in such circumstances feels is alone at home could be represented by the floating head trapped in the bubble.

The theme of death continued in Dumb Type's *OR*, which debuted in 1997 in Maubeuge, France. Furuhashi contributed to the themes of life and death in the early stages of its development; this was not because of his own imminent death, but rather the death of his mother. He came to question if or how the medical machines could have saved her. Her death also led him to contemplate the distinguishing factors regarding the border between life and death (Gendrich 2000). Katherine Mezur refers to this production to argue that the way in which Dumb

Type utilizes light makes the performers "magicians of light." They can have complete control over it and can disappear and reappear with the light and projections. She specifically cites both Dumb Type's *OR* and *Memorandum* as instances in which the performers had complete dominance over the video and lighting technology (Mezur, "Fleeting Moments" 200). For example, in *OR*, the lights flashed at a dangerously fast speed, to a point where the audience experienced the limitations of what their eyes could discern ("Artist Interview: The World of" 4). By the description, it appears as though the speed may be that which is used in Electroencephalography (EEG) scans to test for epilepsy (Poinier 2015), and although there was a warning about loud noises, I have not found any evidence for a flashing lights warning (Gendrich 2000).

This experimentation is not limited to the performers, but also affects the audiences. As an example, sound in Dumb Type productions can act as a "bridge" between the audience and the stage. In the play *OR*, Dumb Type plays "with pitch and volume, [and] the audience physically feels the sound waves move through the performance space and their bodies" (Gendrich 2000).

The potential for misinterpreting what is integral as mere spectacle, can be demonstrated in Dumb Type's 1999 production *Memorandum*, which debuted in Maubeuge, France. There are a number of dance sequences that depict a theme of memory and how it is affected by technology. In this performance, the projections appeared to be alive, almost becoming live actors on the stage, despite not truly having agency of their own: "the mediation of the video technology makes visible the relationship between the performers and the story" (Hood 11). For example, near the beginning of Dumb Type's *Memorandum*, the dancers were presented in stop-motion animation. Namely, the way and speed of the light flickering on and off again created the illusion that the dancers were stop-motion characters. In other performances Dumb Type has used technology and mechanical body movements to present a political issue, rather than for reasons of spectacle (Neave 92). The biggest example of this comes from the previously mentioned *S/N*, where both the mediatized and organic visuals would "shatter the conspiracy of silence" regarding homosexuality and AIDS that was ignored by the popular Japanese media (Jansen 28). The illusion of live humans in stop-motion can also be seen in *pH* (Mezur, "Fleeting Moments" 192) and *S/N* (Epidemic Video 2012).

Dumb Type uses projection technology in other ways as well, such as within a scene in *Memorandum* involving a man rummaging around his house. There are four video views of his house on four different screens; each video begins at a slightly different time, but the story being enacted on stage is presented in real time. Such intricate coordination doubtless required a lot of rehearsal time. However, the events in the videos are slightly different from what takes place on stage. This incongruity cultivates dissonance in the audience, making them interact with the technology on stage psychologically.

> The live bear has been knocked cold by the man. Did we remember wrong? Didn't the bear knock the man out? Suddenly our own memory of the event is questioned and we, as the audience, are implicated in the documentation of the event. Which version is true? (Hood 14).

This sequence also furthers the conception of temporality. In this scene memory is highlighted as being temporary and can be misinterpreted and/or misremembered when conveying the story or pondering back to it. While the video itself will last potentially forever, the precise choreography will not likely be precisely repeated in live performance, and the performer's own body may not remember the correct timing of the movements.

Unfortunately, Furuhashi Teiji died at the age of 35 from AIDS, and even those who are currently in Dumb Type cannot say what their company's future would have been like if Furuhashi were still alive (Takatani 2016). His diagnosis had come during the development of the collaboration between Dumb Type and Denmark's Hotel Pro Forma, and it was this revelation that inspired the theme for the play *S/N* (Neave 85). These are the types of themes for which Dumb Type was known (85). Nevertheless, despite Dumb Type's aversion to a determined hierarchy, Furuhashi's leadership was crucial. When he passed, it was rumored that Dumb Type would be breaking up. Even though Furuhashi was no longer among them, the group was driven to keep his memory and spirit alive (Gendrich 2000), and they were determined to continue to work together ("Artist Interview: Exposing His Own Body" 4). Nevertheless, although the group still exists, they have not performed since their 2009 production of *Voyage* in Cannes, France (Takatani 2016). This development strongly suggests that despite the lack of hierarchy, Furuhashi was the team's leader and without him it was perhaps far too difficult to continue. While Dumb Type's performance art remains unique to them, the general idea of

incorporating digital media into Japanese theatre has become commercial (Dumb Type 55). It cannot be known what Furuhashi would think of this development. He had said that "Those commercial things, the show business idea, are the enemy for [Dumb Type]. We want to break it. That's why we're doing this" (59). Yet, as other companies incorporate multimedia into their own Japanese theatre productions, albeit not in the same experimental way as Dumb Type, the company "no longer [has] anything to fight against" (55). This development may also be a contributing factor regarding the company's decision to no longer perform.

One example of the commercial application of multimedia is a character created entirely through technology, the fictional performer Hatsune Miku.

Fig. 6. Vocaloid Hatsune Miku Software (Japan in a Box, *Computer Vocal Software Vocaloid 2 HATSUNE MIKU*)

This character was born out of the evolution of voice synthesizing software called *Vocaloid*, developed by Crypton Future Media (see fig. 6); she is the third and most well-known character created for the line. She is often "hailed as an icon of [the] participatory culture" (Greenwood 10), even when rival companies try to create *Vocaloid*-like merchandise coupled with their own virtual idols, Hatsune Miku's popularity goes largely unchallenged (Le 5); for example, in 2011 Hatsune Miku appeared as a spokesperson for the Toyota car line. *Vocaloid* was originally meant to be a program used to assist professional musicians, especially small unknown composers, who would effectively have at least a virtual singer to showcase their songs (Hamasaki 223). This is further exemplified by how it used notes recorded from professional singers. However, Miku was special because she was recorded by a professional voice actress rather than a singer. According to one article, "As a Character Vocal, Miku was not designed to sound professional. Instead, she sounded like she came from an anime, and as a result, immediately gained much attention" ("My Vocaloid"). The evolution began with the original two Vocaloid characters,

Meiko and Kaito. Their sound quality was meant to mimic a human's, and in order to market the *Vocaloid* software, they were designed to look like humans. This design choice would ultimately be fruitful in terms of sales and was thus carried over to subsequent *Vocaloid* software, which had a different sound quality from the original two (Le 3). Although many regard Miku as a character in her own right, she and the other Vocaloid characters are essentially musical instruments. Like musical instruments, use of the *Vocaloid* system involves a steep learning curve and it also requires a technique akin to tuning in order to make the music sound natural (Hamasaki 223).

The software allowed anyone to produce music for Miku and her fellow Vocaloid characters, and the original community-made content was often uploaded to video-sharing websites like Nico Nico Douga, which improved her popularity (Greenwood 10). Furthermore, this software is quite a convenience for fledgling composers. Young songwriters who may not have access to professional musicians can turn to it. By using Hatsune Miku and publishing the songs online, these young song writers are able to gain a type of exposure (Hamasaki 223). In fact, people like Linh K. Le argue that, rather than a virtual idol and mascot, Miku is more like a "symbol for a form of large-scale creative collaboration" (Le 2).

While Dumb Type used video recordings and DVDs to expand its reach from theatre to home theatre, Hatsune Miku took another route: video games. These games, multimedia in and of themselves, are best thought of as an extension of Miku's theatre performances and serve to condition the players to a sense of greater liveness in Miku's theatrical concerts.

The video game line created by SEGA known as *Hatsune Miku: Project Diva* (and the spin-off series *Hatsune Miku: Project Mirai*), is another factor explaining the popularity of her theatre performances in Japan. With this series, her popularity rose primarily due to word-of-mouth (Kimura 74). The series started in 2009 with *Hatsune Miku: Project Diva* and her latest home console release was in 2016 with *Hatsune Miku: Project Diva: Future Tone* (VisualGamerTH 2017). That in-home experience could explain why certain individuals would connect with her more (Greenwood 10), in turn making her theatrical presence appear more genuine and lifelike.

The rhythm gaming genre naturally relies heavily on music, making it intrinsic to the gameplay mechanics. Generally, in a rhythm game the player is tasked with hitting specific buttons in time

with the music. For rhythm games like *Hatsune Miku: Project Diva* there are button prompts on the screen that the player must follow, instructing them to either tap or hold a button in order to keep in time with the music (Paulson 2014). In addition to the core rhythm gameplay, there is also a dating simulation gameplay aspect to the series (Paulson 2014). A dating simulation generally involves the player choosing one virtual boy or girl to pursue. Using different dialogue options to impress the potential virtual boyfriend/girlfriend, as well as providing them with gifts that suit their tastes, the player will eventually win them over. It may be that the dating simulation aspect of Sega's game could have launched Miku's popularity to new heights, thereby confirming that to many, there is a perception of liveness in the character's theatre performances. This is not the only example of a dating simulation option influencing the popularity of a franchise. For example, the *Fire Emblem* series was quickly fading in popularity. The eleventh installment, *Fire Emblem Awakening*, recovered that popularity by adding a dating simulation option, which in turn, influenced the story and persisted in the indirect sequel, *Fire Emblem Fates* (Moser 2013).

This connection to video games is important because, despite Hatsune Miku and the other Vocaloid characters being born out of a voice synthesizer program, their concerts (see fig. 7) are based on those video games series (Greenwood 15). The initial interaction with the audience takes place during the gameplay of the video games, which are interactive by nature. Hence, the advantage of video games is that the characters can portray themselves, as Miku has, thereby providing a sense of continuity and continued interaction for those already familiar with Miku. If audience members had not played the related video games prior to attending her concert, they would not have had the same sense of familiarity and connection with the show. Consequently, a video game stage adaptation, regardless of whether a live actor is portraying the character or not, would provide a different experience, such as is case with the adaptation of *Danganronpa 2: Goodbye Despair* that I talked about at length of in my third chapter.

The commercial tie-in is obvious considering that it was SEGA that produced the multimedia concerts (Greenwood 11): the animations for the characters are ripped from the games, and in Miku's early concerts she would sing the SEGA jingle at the top of the performance. Thus, in Hatsune Miku's case, the entire live production comes from the source material (VocaloidLiveConcert 2012). In fact, due to the ever-increasing presence of CGI special effects

in cinema, people like Lev Manovich and Forrest Greenwood have argued that "Live-action footage is now only raw material to be manipulated by hand, and all films are potentially animations" (Greenwood 13). Indeed, the animations presented in *Vocaloid* software and games are at a level where it appears that they are imbued with life, which allows them to easily move from one medium to another, regardless of the restrictions on movement (15).

Fig. 7. Hatsune Miku in Concert (Tan, *4 Things To Expect At Hatsune Miku's First Live Hologram Concert In M'sia*)

Due to Miku's origins and community involvement in creating her music, there are some who believe that all of Miku's songs were created by the fans (Hamasaki 223); however, when comparing gameplay footage with concert footage, it becomes clear that the music comes from the games. SEGA's position on this matter is that, "As a company, [SEGA] can't take ideas from consumers due to very strict legal reasons" (Mehlfeld 2011). The very existence of this debate, testifies to the depth of the involvement of the fan base with Hatsune Miku and her concerts. The interaction with the audience, on and off the stage, gives Hatsune Miku and her "friends" a real sense of life for her audience.

The Vocaloid characters were marketed in a similar way to human idols (Le 2). That marketing scheme is successful because some people feel that, despite their technological nature, the *Vocaloid* characters are more "real" than living pop idols. Interestingly, one aspect of this perception depends upon marketing failures of living pop idols. On occasion, the public discovers that certain aspects of those idols, such as their physical appearance, were manufactured and in a sense, the idol becomes less real. In contrast, Vocaloid cannot betray nor even pretend to betray their nature. As such, as the public becomes more familiar with them, that consistency increases, or at least does not detract from the perception of their liveness (Rugnetta 2012). The people who write songs for Hatsune Miku and the other Vocaloid characters do, indeed, regard them in the same way that one would regard a real pop singer. Hence, "they write

and publish songs that are suitable for her" (Hamasaki 223). Since *Vocaloid* characters perform their own shows, naturally the technology serves the audience rather than those on the stage.

Of course, I am not arguing that Hatsune Miku is physically alive, but she does share some characteristics used to define life. It is clearly common sense to say that Hatsune Miku and the other Vocaloid characters are not alive in the same way as biological creatures; however, it should be noted that, from a scientific point of view, there has never been a consensus regarding a definition of "life" (Macklem 330). This is clearly demonstrated in debates regarding whether viruses, self-replicating proteins, and computer programs could be considered to be alive (Li 338).

Although there is no consensus on a concrete and unambiguous definition of life, there are various lists related to what characteristics constitute life. According to scientists like Dominic Corsini, Douglas Wilkin, and Niamh Gray-Wilson, there are seven or eight characteristics (depending on the opinion of the source) that are required for a being to be alive: ability to grow older, ability to respond to one's environment, possession of a cellular organization, maintenance of homeostasis, possession of a metabolism, potential for evolution (Corsini, "Eight Characteristics"), and the ability to reproduce and pass on hereditary skills (Wilkin 2017). However, it is a fallacy to state that all of these are prerequisite for having life. One prevalent example is the mule. The mule is unable to reproduce; therefore, treating the above noted characteristics of life as "mandatory" would mean that mules are inanimate objects: "The conclusion is absurd, so the definition must be wrong" (Chodasewicz 42). Other examples include bristlecone pines and some jellyfish, which do not age (Barras 2015), again negating their inclusion in the definition of the living. In addition to a scientific definition of life, there is also a folk concept. As the name implies, the folk concept of life is the "everyman's instinctual intuition" as to what is alive and what is not (Machery 146).

To some, a broadened definition of life may become a slippery slope. Starting with the positon that bacteria and viruses are alive, (Wilkin 2017), Jun Li and Paul Knickerbocker hold that the same argument could be applied to computer programs (Li 339). This makes sense from an engineer's point of view because virtual entities are "supposed to possess various properties that are deemed to be critical to living entities" (Machery 148). Li and Knickerbocker even argue that computers have their own immune systems via firewalls and other such programs to protect them

against viruses (Li 340). In regard to Hatsune Miku, and by extension the other Vocaloid characters, they do share some, but not all traits of real living beings. Similar to the way in which living creatures are made up of various cells, it can be argued that the individual pixels which comprise Hatsune Miku are an artificial analogue to chemical cells. It could further be argued that she and the other Vocaloid characters demonstrate an analogous structure, ranging from photons to image. Additionally, the aforementioned list of characteristics mentions metabolism, or a way to use energy, which Hatsune Miku does via electricity. Living things also respond to their environment, and theatre patrons see and hear Hatsune Miku seemingly respond to her audience by recognizing that they wish for an encore, which she will then provide (Kun 2013). I recognize that this point is quite a stretch, as Miku is not actually reacting due to the fictional nature of theatre and her performance; rather it would be the people behind the scenes who would send her back to the stage. However, if the programmers can successfully predict the reaction of audience members to Miku's proposed movements, then they can program those movements to appear as if she is responding to the audience. The next element in the definition of life is that living things grow. Although the Vocaloid do not grow in the same way as living organisms, they do grow in terms of better graphics. For example, in her early concerts, Hatsune Miku's hair looked like it could have been made of clay (VocaloidLiveConcert 2012), for lack of a better word; more recently, not only does it look like care went into making separate strands of hair, but the hair is now also subject to physics formulae that make it move in a much more natural way than in previous iterations (MoChan.Official 2012). Although it is quite easy to dismiss this point with the argument that the only beings that can possess any of these traits must be made up of important biological chemicals, it is nonetheless important to note that these similarities do exist. Hence, it is reasonable to argue that some may see Hatsune Miku as having some sense of liveness because she seems to display some characteristics of life. Furthermore, it is the individual reaction that is important here because Miku's character is left mostly up to the individual's interpretation (Le 9). How Miku is marketed also likely plays a hand into how she is interpreted, such as the songs and dances selected for the games and concerts.

Hatsune Miku also had a unique experience performing in, what is essentially, a one-woman opera. This show was conceived by Keiichiro Shibuya and is known as *The End*, debuting in 2013 at the Yamaguchi Center for Arts and Media. Shibuya implied during an interview that the inclusion of Hatsune Miku in the opera was an afterthought and was partly a business decision to

capitalize on her popularity. Ironically, she was included not because of any perception of her liveness, but rather because she was not actually alive (HatsuneMiku 2013). She served to replace human actors and thus underscored the emptiness of the environment (HatsuneMiku 2013). As the theme for *The End* was life and death, the empty and lonely atmosphere was possibly to emphasize the specific concept of death. The atmosphere presented an absence of joy which certainly plays into the ideas of the script. Like *Vocaloid* concerts, the only living human on the Opera's stage is a pianist who is hidden behind a projection screen, while the story is told entirely by Hatsune Miku. The other two characters are an alien Hatsune Miku and a robotic mouse.

Coincidently, the plot has a number of parallels with two Hatsune Miku songs, in particular: "Hello Planet" and "The Disappearance of Hatsune Miku." In fact, the penultimate song of *The End* has a very similar tune to "Hello Planet," albeit with quite different lyrics. The song "Hello Planet" is about Miku waking up in a post-apocalyptic world and wishing to meet her dear friend, possibly her creator, once more. In the second song, "The Disappearance of Hatsune Miku" Miku comes to understand that she is part of a bigger franchise and that there are hundreds of copies of her including toys and games. She begs her owner not to delete her since she wants to keep singing.

The lyrics of these songs echo the theme of death in *The End.* In fact, opera was the chosen medium not simply because Hatsune Miku is a song program, but because of this theme of death. Keiichirou Shibuya explained that because opera is a dying art form, it made sense to use it as a "coffin" for the story (HatsuneMiku 2013).

The End starts with Miku waking up, presumably upon her creation, and being greeted by the robotic mouse. Shortly afterwards, the alien Miku appears and communicates with the real Miku after the mouse leaves. This latter exchange in the context of the presented environment leads Miku to question her own mortality, along with the implication that humanity is dead. While questioning the nature of her life and her eventual death, Miku appears to suffer through hallucinations while in communication with the alien Miku. The mouse then returns when Miku has come to terms with the fact that she is going to die someday. This coming to terms combined with her imperfection, makes her seem more human and vulnerable. The mouse argues that she does not need to remain imperfect if they become one. When they do so, Miku transforms into a

dragon. After returning to her human form and confronting the alien Miku one last time, the real Miku runs and leaps through a number of glass panes. The final image is Miku floating in the air, asking the audience if they think she's dead or sleeping, thus tying into the theme of the acceptance of death and bookending the play with similar imagery (Nanana 2014).

A comment left on the video of the opera argued that the merging of Hatsune Miku with the mouse to create a dragon Miku is a metaphorical interpretation of how the fanbase sees Hatsune Miku. Should this be the case, then the dragon could reference Miku's status as the most popular and recognizable *Vocaloid* character, similar to the divine nature of the Japanese dragon. Japanese dragons are unique in that they "look mild and folksy. They are not [just] awe-inspiring symbols of imperial power but benevolent familiar figures who grant the everyday requests of ordinary people" (Yutaka 170). That is, dragons fulfill the wishes of ordinary people despite also being grand divine entities (163). Alternatively, if the inclusion of Hatsune Miku was an afterthought then it is possible that the originally planned character was more dragon-like and therefore less visually jarring than the transformation of Hatsune Miku. However, there may be an unexpected parallel between the dragon and Hatsune Miku. Just as the dragon is a powerful and well-known creature, so Miku is highly popular, and as the dragon can grant popular wishes, Miku can perform whatever song the user wants.

The opera could also be interpreted as taking place within a computer. The alien Miku can be interpreted as representing the creator or owner of this particular Hatsune Miku software. During a hallucination scene, on the screen that is hiding the pianist, an image of someone writing on a keyboard becomes evident. Furthermore, for a very brief moment, there is a scene where the alien Miku's hand temporarily takes on the appearance of a realistic human hand (Nanana 2014). In this case the mouse character could be a reference to a computer mouse. If this is the intended reading of the opera, then that would mean that the ending where Miku is running and smashing through a large number of glass panes could represent her trying to get out of the computer. However, if this is the case then there is a missed opportunity where a human actor dressed as Miku could have jumped out at the very end, symbolising her escape, and then of course the curtain would need to close before any other moves by the human actor could be recognized as such. Although that human appearance would go against the convention of Hatsune Miku always performing herself rather than through a human doppelganger taking her place, it would have

solidified the apparent reality and mortality of Hatsune Miku. Furthermore, as mentioned above, Shibuya's casting of Miku was because she is not alive rather than the idea I presented.

Regardless, the finished product is about Hatsune Miku. Of course, technically the only way for Hatsune Miku to die, would be through deletion or destruction of her software. In this interpretation, the ambiguous death of Miku at the end of the production could be the result of her being deleted. Such a death would demonstrate the dependence of her existence on the audience as a whole, again emphasizing that the perception of liveness is not the same thing as being alive. Most of this audience consists of particularly committed fans known as *otaku*.

Otaku is a term that refers to someone who is strongly dedicated to a certain or often multiple subcultures, usually but not exclusively relating to anime, video games, computers and so on (Azuma 3). Otakus are described as being fanatics who are very knowledgeable about their subculture of interest. They are so invested that, "they forget about everything else." Some otaku prefer to detach themselves from outside social interactions, such as from family and co-workers, and instead spend their time in their fictional worlds (Azuma 26).They may take those fictional topics more seriously than real life social interactions (27) to the extent that otaku can also become "dangerously" obsessive towards their area of interest (That Japanese Man Yuta 2015). As delusional and unhealthy as that may be, for them their perceived relationship is real enough to include marrying a fictional character (Lah 2009).

Otaku culture emerged after Japan's loss in World War II. However, at this stage the culture was still budding and would not blow-up into being widespread until the 1990s. Hiroki Azuma holds that the immense rise in popularity of these subcultures reflected a desire to reclaim Japanese traditional culture (Azuma 15), and therefore incorporated many Japanese-specific images (14). Indeed, Hatsune Miku has appeared in traditional clothing during some songs in her live concerts. As time went on though, the word otaku became less well-defined partly as a result of globalization, and came to incorporate non-Japanese elements such as the Disney *otaku* (That Japanese Man Yuta 2015).

While a desire to recapture traditional Japanese culture may be an element in the immense rise of otaku subcultures during and after World War II (Azuma 13 - 14), it may not be the whole story. The timing and form of this entertainment is similar if not identical to the rise of the

Broadway musical. Broadway picked up in popularity during this timeframe as a form of escapism from the fear and stress of the war (PBS 2018). As conditions in Japan were worse considering the results of the war, it is plausible that the rise of otaku culture could have also been a form of escapism. The attraction of escapism may have been continually renewed by the stressful demands placed on labor in Japan (Lane 2017).

Regardless of one's level of obsession, the benefits to the local economy are evident in the amount of money one may spend. For example, a Disney otaku claimed that she goes to Tokyo Disney at least five or six times a year (That Japanese Man Yuta 2015). Other otaku spend money on Hatsune Miku related merchandise. In fact, Hatsune Miku has been described as being a symbol or mascot for otaku culture (Le 8). The potentially delusional nature of otaku subcultures has been noted by psychologists such as Tamaki Saitou (Greenwood 11).

The Vocaloid characters seem so real to some people that their concerts are worrying to some psychologists. This is because the concerts, in a way, "mentalize [the fictional] characters, lifting them outside the screen and into the world of tactical reality…" (Greenwood 11). This worry may be amplified by the *Hatsune Miku: Project Mirai* series on the 3DS (15), as well as in specific fan-made VR games that allow the player to "live" together with Miku (Geroimenko 105). In the case of the 3DS series, the 3D function, coupled with its augmented reality capacity, could make Miku and her friends seem to appear in the player's real environment (Greenwood 15). There is also an optional dating simulation component in the game. However, in this dating application, the art of the Vocaloid characters is in the *chibi* style (a style that emphasises a cute look resulting in unusually large heads and large eyes), causing the Vocaloid characters to feel more like pets than like virtual girlfriends/boyfriends (Paulson 2015), which is unlike most games in the main *Hatsune Miku: Project Diva* series (Paulson 2014).

Tamaki Saitou does not easily accept this mentalisation as being a mainstream phenomenon. He goes so far as to state that those who enjoy Hatsune Miku concerts are immature and are "unable to let go of infantile transitional objects," such as the Vocaloid characters (Greenwood 11). While I am sure there are some fans who fall into Saitou's description, I highly doubt that all fans can be described as such. Saitou may feel this way because he may be generalizing based on a vocal minority who can make it an embarrassment to be fan (Saberspark 2015). Furthermore, there is the negative connotation that there must be something wrong with the fandom if they can

believe "even for a minute, that a teal-haired angel can occupy the same stage commanded by idols of the human persuasion" (Greenwood 16); the argument is that it is impossible to replace a human with a soulless machine (Turkle 10). However, on the other side of the debate regarding the psychology of those who enjoy *Vocaloid* concerts, it is not that the participants mistake fiction for reality, but rather give equal priority to both (Greenwood 13). By this, I believe that Greenwood is asserting that while reality will always take precedence over fiction, the way fiction has affected the consumer may dictate how they go about their everyday life. In this sense, for the sake of participatory fun, it is likely that the average fan envisions a sense of liveness in the *Vocaloid* idols only temporarily during the duration of the concert; afterwards they would return to separating reality from fiction. While the Concrete Time and Abstract Time in these concerts run on the same clock, it is Miku's temporary "life" that exists in the Abstract, something that can be arguably extended via the *Hatsune Miku: Project Diva* game series.

Due to the popularity of *Vocaloid*, and Hatsune Miku in particular, it is natural that other companies would eventually try to produce live concerts with their own characters. As an example, the Squid Sisters is a band that originated in the hit game *Splatoon*, who held *Vocaloid*-like concerts, and was quite successful (Nintendo Kōshiki Chaneru 2016). Unlike *Vocaloid*, *Splatoon* is not a rhythm game but a third-person shooter game and does not have any dating simulation gameplay (Byford 2015). In comparison, third-person shooters are, as the name implies, games where the player shoots things (Barlett 488); in third-person shooters, the camera is placed behind the player, and can be rotated by the player if necessary to get a better view of the surroundings (Apperley 15). Whereas the main draw of a rhythm game tends to be the music (Paulson 2014), the primary draw of a shooter game is the multiplayer interaction, where the players compete with and/or against each other (Apperley 10). However, in *Splatoon*, during the monthly worldwide tournament called Splatfest, the band performs apart from the game. The presentation implies that it is a full concert although the player only ever sees one song/dance repeatedly. Thus, it can be assumed that the success of the Squid Sisters' concert resulted from the wish of audience members to attend a concert like the player character does in the game's lobby during tournaments ("Splatfest"). Regardless of the setting, almost all of the animations for the Squid Sisters must have been created specifically for the live concert (Nintendo Kōshiki Chaneru 2016). Additionally, there were two songs that debuted at a Squid Sisters concert in Paris (Nintendo "Splatoon – Squid Sisters Concert" 2016). Those songs would later appear in the

game as content that could be unlocked by scanning in toys called Amiibo. For the sake of context, Amiibo are figurines with a special computer chip in their base that allows the figurine to be scanned into a compatible game. The hardware recognizes the chip inside the figurine toy and sends that data to the software. If the game is compatible with the Amiibo then it could add additional content or allow the player access to something early. In this case, the Amiibo were designed to resemble the Squid Sisters duo (Nintendo "Splatoon - Squid Sisters - New Amiibo" 2016). It is possible that the songs were made specifically for the concert; however, the counter argument is that Nintendo was already making the new songs for the games and merely debuted them at the concert to promote the content. Nintendo did not respond to my query regarding this question (Bibanco 2017). As an aside, the 2017 release of *Splatoon 2* is for the vastly more popular Nintendo Switch. It seems likely that the band from *Splatoon 2*, called Off the Hook, could replace or join the Squid Sisters in live concerts.

Similar to Hatsune Miku, the concerts held by the Squid Sisters have the fictional characters "live" on stage, with the only live humans being the back-up band (Nintendo Kōshiki Chaneru 2016). However, unlike the Vocaloid characters, who find their voice via a voice synthesizer, the Squid Sisters have present voice actors with Keity.pop ("Voice of Callie" 2016) and Mari Kikuma ("Voice of Marie" 2016) portraying the characters. Hence, like Sayaka Kanda's performance in the previously discussed *Super Danganronpa 2 The Stage ~Sayonara Zetsubō Gakuen~*, the pair of voice actors could have performed the concert themselves. Even though this is the case, there are several reasons why the humans' liveness would have been detrimental to the overall experience. The most obvious reason is that, as the band name implies, Callie and Marie are both anthropomorphic squids. Costuming of the human voice actors would have been possible to a degree, but would nevertheless have broken the illusion. This is similar to Hatsune Miku concerts where the appeal, spectacle and connection to the character(s) could be reduced if they were portrayed by live actors rather than by themselves (Greenwood 13). This is possibly due to a change in perspective. The consumer built a relationship with the character, but the live human is not the character, just a singer in an elaborate costume. In this regard, another difficulty in substituting live actors for the Squid Sisters, is the spoken language. Specifically, the Squid Sisters introduce themselves at the beginning of the concert and give their thanks at the end. Their language is dubbed as "inklish," and although it does have Japanese and English words sprinkled throughout, overall it is gibberish spoken with a filter that makes it sound bubbly

(Amano 2015). Teaching the fictional language to human singers and creating a microphone that would provide the same speaking effect as in the source material would be difficult and time consuming. Again, my correspondence with Nintendo on this matter went unanswered (Bibanco 2017).

The technologies discussed here are converging. For example, in the same way that the Amiibo allow players to watch Squid Sister concerts in the original *Splatoon* game, there is now a way to watch Hatsune Miku concerts in the home via a VR game called *Hatsune Miku: VR Future Live*. However, unlike the Amiibo, the player is still able to participate in the experience. This interaction is achieved through a glow stick or leek-shaped icon motion control appearing on the screen. As an aside, the leek was a key prop used in a Hatsune Miku recording of "Ievan Polkka," which was the first music video that became widely viewed and started Miku's launch into popularity. In the VR game, the user can wave the control in time to the music (VisualGamerTH 2017), just like at an actual concert (Kun 2013).

Another convergence is internet live-streaming of videos and events. There are some people who make their entire living from live-streaming (Good 2017). It is reasonable to predict that in the foreseeable future, a sequel to *Hatsune Miku: VR Future Live* could allow owners to live-stream actual Hatsune Miku concerts. With this facility, the participants could feel as though they were at the actual concert because of the VR technology. In fact, researchers had conceived of live streaming through VR in the 1970s (Rheingold 216). This development would be consistent with the evolution of technology and popularity of live-streaming, and it may be inevitable.

It is nevertheless an open question whether deeper immersion into a virtual world would be desirable for either Hatsune Miku or her fans. On the one hand, there are existing websites where it is possible to live stream a Hatsune Miku concert, and this has not damaged the sense of her liveness in the least, even though the experience does not have the same feel as being in a crowded concert hall (Lanson 2011). Based on my personal experience, watching a live stream is different from concerts or VR, and it also depends on the stream. With smaller streams, generally the viewer can interact with the person recording in real time through text. However, in bigger corporate-produced streams should the viewer choose to participate then the primary person they would interact with would be the other people watching live. While the viewer and streamer do

not have the same type of synergy that an audience and performer would have, there is a sense of community through the communication with the other viewers and/or the streamer. On the other hand, society's view of the fan base, and therefore of Hatsune Miku herself, could take a negative turn if certain fans found her to be so alive that they abandoned human contact in favor of staying home to participate in her concerts (Rheingold 352). Indeed, there are already VR fan games that allow the owner to "live" with Hatsune Miku as the ideal wife (Geroimenko 105), thus negatively affecting how outsiders may perceive the *Vocaloid* fandom (Saberspark 2015). Since it is Miku's fandom who breathes life into her very existence (Hamasaki 223), a negative social perception could impact the perception of her liveness, thus demonstrating the importance of the public to the Vocaloid's presence (Saberspark 2015).

In conclusion, the combination of multimedia, including projection technology and set design used in Dumb Type performances and *Vocaloid* concerts, presents a sense of liveness to those entities that are obviously not truly alive. While Dumb Type consists of live human performers, the only humans upon the stage for *Vocaloid* concerts are the back-up band with the main attraction being the virtual idols themselves.

Dumb Type was formed by frustrated artists of various disciplines and backgrounds who came together to create a unique type of experimental performance. They wanted to rebel against commercial theatre (Dumb Type 59), and highlight issues that were largely ignored by the public (Hood 8). Their success made commercial theatre start to incorporate multimedia into their performances hence leaving Dumb Type with nothing to rebel against (Dumb Type 55), similar to how Adolphe Appia hated the idea of multimedia in theatre (Appia 10), but inadvertently paved the way for it (Wiens 26).

At the center of Dumb Type was Teiji Furuhashi. Furuhashi had a background in music, stating that his experience as a drummer was beneficial towards his choreography as it allowed him to have the ability to work with "complex rhythms." Unfortunately, he died young, at age 35, from AIDS with the play *S/N* being somewhat of an autobiography, depicting what it was like for him to live with that disease.

In regard to their incorporation of media technology, Dumb Type is credited as being the "first of its kind" when it comes to mediatized performance in Japan (Cooper 1990). They are often

accused of being a futuristic theatre due to how experimental they are; however as their theatre takes place in the present any futuristic impression was merely a coincidental by-product of their methods (Dumb Type 57).

Dumb Type's 1990 production of *pH* dealt with the themes of the relationship between humans and modern technology, as explained by Furuhashi (Dumb Type 123); however, in another instance he also said that there was no theme because it dealt with contemporary society which has no theme (61). Despite this comment from Furuhashi, the statement that it is about contemporary society is itself a theme.

Whether it is the virtual idol of Crypton Future Media's Hatsune Miku or Dumb Type's antagonistic stage in *pH*, it is undeniable that these two Japanese productions can instill a sense of liveness into their shows. The performances offer a unique interactivity for the audience, especially in Hatsune Miku's case, because each individual audience member can take her home. Naturally the liveness of Hatsune Miku is more obvious due to her physical design and possession of similar characteristics to the scientific qualities of life. In Dumb Type's case, the stage itself produces the same sensation of life to an extent. However, it cannot even pretend to be alive its role in the production can make it seem like another character in the script, hence creating a unique sense of liveness in said non-human entity. Thus, both the experimental and commercial stages of Japan are able to apply digital media in innovative ways from both the perspective of the audience members and the performers.

Chapter Six: Summary and Conclusion

In this thesis I have discussed the elements of liveness, projections, and robots in theatre, focussing in my fifth chapter on two specific Japanese groups that exploit modern technology to create a unique experience in their performances. Ultimately, the audience itself determines whether what it sees upon the stage has a sense of liveness or not, thus placing itself at the heart of the production (Machon 22). Although this type of theatre exists worldwide, it is the existence of a virtual pop idol, real robots on the stage, as well as "living" stages that point me towards Japan.

It is always best to know the origins of a subject and the man who is said to have paved the way for multimedia in theatre is Adolphe Appia, although the irony is that Appia had a strong distaste for the idea. Nevertheless, as an architect and innovator, his influences on the stage persist. In retrospect, his idea to move away from painted sets to realistic sets would have been a natural progression for theatre. As a designer, Appia rejected the "visual fraud" of theatrical sets of that time, in turn freeing the actors and thus enabling them to portray more physically expressive performances. This 3D environment allowed the actors to transmit the concepts and ideas behind the script to the audience in a stronger manner because of the physical freedom.

Additionally, electric lighting was introduced in Appia's time. This facility allowed Appia to give the actor physical depth on stage. The lighting also had the power to affect the perception of a character, as certain angles can make a character look like a good person, a bad person, and/or a mysterious person. It also had the power to engender a subliminal effect on the audience and their reactions by using the lighting to set the mood of the scene.

It was specifically Appia's innovations with lighting and set design that opened the door to media innovation in theatre. Opening this door forces the consideration of the liveness of the non-human, a key concept in this thesis because of the nature of artificial actors. The main resource for this specific research was Philip Auslander's *Liveness: Performance in a Mediatized Culture*.

One major element of mediatized theatre is the use of video on stage. Although video has been used in theatrical performances since the 1980s, it is still received as spectacle by many audience

members. In general, there are two ways to use video: as part of the set or to create an artificial actor. In either instance, the inclusion of pre-recorded material in live theatre forces both the participants and the audience to rethink traditional theatrical practices. Although the work is pre-recorded, because it is on a live stage, it is also perceived as live. Thus, this type of theatre makes the technology and live performances into "symbiotic creatures". Such eventuality is fitting, considering how early film mimicked theatre, and how film is being integrated into theatre. Regardless, the individual audience member determines whether the artificial actor is "alive" or not.

Others have followed Appia's lead. Projections have been used in theatre by people such as Timothy Bird, Kris Verdonck, and Simon McBurney. My own production of "A One Woman Show" and the Japanese play *Super Danganronpa 2 The Stage ~Sayonara Zetsubō Gakuen~* are examples to illustrate this point.

Video and projections are closely linked to lighting design because the designer must create a place where both the actor and the projection are equally visible. Video and projection have been used to create more depth owing to their potential to add an air of realism. This realism is magnified by graphics technology, which has made it is sometimes difficult to tell the difference between a real human and an animated one. However, challenges remain: human actors may not easily connect with an artificial actor owing to the latter's lack of emotions, especially when the artificial actor also lacks a physical form. Hence, the relationship that they share is a type of performance in and of itself. Although an artificial actor can seemingly emote, it is pre-recorded by a voice talent, resulting in it only providing the illusion of genuine emotions. Regardless, in a theatrical setting, these emotions should not be viewed as being lesser than human emotions; should the cast and crew be doing their job correctly, the audience should still be able to believe in the liveness of the artificial actor. The sense of connection upon the stage, fabricated or otherwise, bolsters the audience's perception of the artificial actor as having life, thus giving it a type of temporary life upon the stage. In this case it is everyone present - the cast, crew, and even the audience - that make this sense of life exist.

There is also the physical artificial actor: the robot in the sample play I addressed, *Sayonara*. Robots represent an ever-evolving technology designed to make life easier for humans. Robot design has evolved to a point where some have cameras and sensors that allow them to recognize

human emotions and react appropriately, but not yet at the level appropriate for everyday public consumption.

Theatre is used as a research platform for roboticists to study human interactions and emotions. Through theatre, the roboticists are able to determine what behaviors the robot must exhibit in order to appear as though it has emotions like a human. One such behaviour is to have robots perform actions spontaneously, or with the appearance of doing so without thinking, such as fidgeting. However, in entertainment, robots' complicated design and draining of electricity restrict their movements, unlike a human actor who can potentially move anywhere. In this sense, the presence of a robotic actor has been compared to a body with a disability where technology has trivialized the disability and essentially made the disability moot.

On stage, it is the actor's responsibility to ensure the robot's acting is believable for the audience; actors must at the very least pretend to believe in the robot's liveness. Actress Bryerly Long stated that her job in such a situation is to act in a way that would make the audience believe that the robot is emoting. Presently, with an operator working backstage to make sure the robot acts accordingly, the robot can be equated to a type of puppet, like a glorified prop. Thus, the robot's acting is a reflection of the human actor's acting.

When a show's run is over, any sense of the robot actor's connections and relationships cease to exist. Although there are people who wish to create long-lasting friendships with machines, the technology is simply not there yet.

Nonetheless, director Oriza Hirata has expressed an interest in casting a robot in a human role in the future, hoping that one day it could be akin to colour-blind casting but rather a life-form blind casting instead. The play *I, Worker* proposes that humans can become robot-like via overwork; hence, the opposite, a robot acting as a human, is plausible as well. Furthermore, both literally through implants and metaphorically through constant online time, humans are becoming more machine-like.

The time for such a vision of robot actors may not be too far off. Technology pertaining to artificial intelligence is evolving. Since 1984, developers have been attempting to create a learning artificial intelligence that can understand and take commands in a number of different languages. Should this be realized then it could make it possible to direct a robotic actor and

possibly even improvise with one. Technology has evolved to a point where it is not uncommon to view digital beings and mechanical objects as being both creatures and devices in everyday life. On 25 October 2017, a robot named Sophia was granted full citizenship in Saudi Arabia, making her the world's first robot citizen. It was done as a type of publicity stunt to promote the country's expansion into cutting-edge technology. Far more significant than the granting of citizenship, however, was the reaction of the public. The outcry was immediate, criticising the granting of full citizenship to a robot but not to women. That is, the public did not see the event as a stunt. Hussein Abbass warned that technology has not evolved to a point where it is safe to grant citizenship to a robot along with all the perks that come with being a full citizen, and this is especially troubling when considering the country where this event took place. The creator of Sophia, David Hanson, claimed that owing to her superior learning artificial intelligence programming, Sophia is "basically alive."

Finally, I covered two different groups in Japan that innovate with multimedia technology in performance: Dumb Type and Vocaloid concerts. I also compared and contrasted the latter with a similar group made by Nintendo known as the Squid Sisters.

Dumb Type's experimentation made the technologies used appear to take on a life of their own. This is demonstrated in the play *pH*, which is described as being about the relationship that humans have with technology. There is even a constant threat from the antagonistic character: the stage itself. Two metal beams run across the stage, one of which runs mere feet above the stage, forcing the performers to dodge the bar at set intervals by either jumping over or lying under it (Mezur, "Fleeting Moments" 193). Given the limited space, it can be interpreted that the bar is in control of many of their actions. Like the aforementioned robotic and projected actors, the bar indeed controls the show, and as a character, the human performers must move at its pace.

The second group I considered was that of Hatsune Miku and the other Vocaloids. Crypton Future Media created the Vocaloid sound synthesizer program, and Hatsune Miku is a result of this program ("My Vocaloid"). To market Vocaloid the characters were sold as virtual idols with human designs; this strategy proved fruitful in not only sales but also in establishing a sense of liveness and connection between the characters and the audience (Le 3). Through on-stage projections, Hatsune Miku and the other Vocaloids appear as themselves rather than being replaced by human look-a-likes (Greenwood 15). Although she is obviously not alive, Hatsune

Miku does show some characteristics that define life (Kun 2013). Moreover, although the fans know she is not real, they want to believe, at the very least during the concert, that she is (Marsh 2016). The fact that people can view Hatsune Miku and the other Vocaloids this way proves that they have a sense of liveness.

So the question remains, why have these developments occurred in Japan and not elsewhere to the same degree? After all, while Dumb Type may have paved the way for this type of theatre in Japan, it is argued that the same path has already been forged in the West unintentionally through the work of Adolphe Appia (Wiens 26). It is also obvious that the technology used by Dumb Type and Vocaloid are available globally. I think that there are a number of factors that are more true in Japan than elsewhere. Chief among those factors is the cultural inheritance of spiritual beliefs which ascribe liveness to inanimate objects such as demonstrated by the funeral rituals associated with the death of dolls. It is not a stretch from there to the perception of liveness in artificial actors. The exponential growth of post-war otaku sub-culture has also heightened the willingness to attribute a sense of liveness to those actors. As well, the reality of Japanese demographics has led to a broad acceptance of technology at work, and intended reliance of technology to support the aging population. Consequently, technology is viewed somewhat differently in the West and Japan: the West has the Terminator whereas Japan has Astroboy.

Given these cultural differences, can anything be said about the influence on Western theatre of these developments in Japan? The influence of the traditional forms of Japanese theatre including Noh and Kabuki, has been the subject of much research and comment. However, the influence of mediatization of modern and post-modern theatre in Japan is too recent to have been extensively studied in terms of its impact on Western theatre. It may be that the influence will go beyond Western theatre and come to affect other performance arts as well. A complicating factor in trying to identify this influence is the rapidity and interconnectedness of globalization. The back-and-forth of modern communications may be too complex to be able to identify unique threads of exchange of ideas. Ideas may also arise more than once in different places because people may recognize the opportunities presented by the technology itself. For example, Disney's Crush may have been developed even in the absence of Hatsune Miku. The influences of mediatization of Japanese theatre may become evident only in retrospect after decades have passed, and could become a further subject for research.

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